APPENDICES

May 2024

Appendix A

Site Plans

PARK PLAN

GRANADA COMMUNITY PARK & RECREATION CENTER

OBISPO ROAD AT PORTOLA AVENUE, EL GRANADA

Kikuchi + Kankel Design Group
Half Moon Bay & Los Gatos
www.kkdesigngroup.com

APRIL 2024

SCALE: 1/32" = 1'-0"

Appendix B

CalEEMod Results

Burnham Custom Report

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5.17. User Defined

8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Burnham
Construction Start Date	1/1/2025
Operational Year	2028
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	4.60
Precipitation (days)	41.0
Location	37.50307686096275, -122.47381754029335
County	San Mateo
City	Unincorporated
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	1226
EDFZ	1
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.21

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

City Park	7.10	Acre	7.10	0.00	6.70	6.70	—	—
Parking Lot	0.20	Acre	0.20	0.00	0.00	—	—	—
Other Non-Asphalt Surfaces	0.41	Acre	0.41	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

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

Un/Mit.	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.	4.02	3.36	32.0	30.9	0.05	1.37	37.3	38.6	1.26	6.92	8.18	—	5,627	5,627	0.24	0.10	1.25	5,656
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.02	11.0	32.0	30.9	0.05	1.37	37.3	38.6	1.26	6.92	8.18	—	5,619	5,619	0.25	0.11	0.04	5,649
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.72	2.27	21.7	20.9	0.04	0.92	23.8	24.8	0.85	4.49	5.33	—	3,874	3,874	0.17	0.07	0.34	3,896
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.50	0.41	3.95	3.82	0.01	0.17	4.35	4.52	0.15	0.82	0.97	—	641	641	0.03	0.01	0.06	645

2.2. Construction Emissions by Year, Unmitigated

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

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	4.02	3.36	32.0	30.9	0.05	1.37	37.3	38.6	1.26	6.92	8.18	—	5,627	5,627	0.24	0.07	0.86	5,656
2026	2.13	1.73	16.8	17.3	0.03	0.65	32.2	32.9	0.60	4.31	4.91	—	3,948	3,948	0.21	0.10	1.25	3,984
2027	1.32	1.08	9.96	13.5	0.03	0.35	29.5	29.9	0.32	2.96	3.28	—	2,719	2,719	0.13	0.06	0.61	2,740
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	4.02	3.36	32.0	30.9	0.05	1.37	37.3	38.6	1.26	6.92	8.18	—	5,619	5,619	0.25	0.11	0.04	5,649
2026	2.13	1.73	16.8	17.2	0.03	0.65	32.2	32.9	0.60	4.31	4.91	—	3,941	3,941	0.21	0.10	0.03	3,977
2027	1.32	11.0	9.98	13.5	0.03	0.35	29.6	29.9	0.32	2.98	3.28	—	2,717	2,717	0.13	0.06	0.02	2,737
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	2.72	2.27	21.7	20.9	0.04	0.92	23.8	24.8	0.85	4.49	5.33	—	3,874	3,874	0.17	0.06	0.28	3,896
2026	1.41	1.15	11.1	11.5	0.02	0.43	20.2	20.6	0.40	2.61	3.01	—	2,568	2,568	0.13	0.07	0.34	2,591
2027	0.84	1.29	6.39	8.69	0.02	0.23	18.6	18.8	0.21	1.86	2.07	—	1,730	1,730	0.08	0.04	0.18	1,744
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.50	0.41	3.95	3.82	0.01	0.17	4.35	4.52	0.15	0.82	0.97	—	641	641	0.03	0.01	0.05	645
2026	0.26	0.21	2.02	2.10	< 0.005	0.08	3.69	3.76	0.07	0.48	0.55	—	425	425	0.02	0.01	0.06	429
2027	0.15	0.24	1.17	1.59	< 0.005	0.04	3.39	3.43	0.04	0.34	0.38	—	286	286	0.01	0.01	0.03	289

2.4. 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.	0.07	0.55	0.26	0.63	< 0.005	0.02	0.14	0.15	0.02	0.03	0.05	12.4	503	515	1.32	0.04	0.33	560
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.07	0.55	0.26	0.61	< 0.005	0.02	0.14	0.15	0.02	0.03	0.05	12.4	497	509	1.32	0.04	0.01	553
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.05	0.53	0.24	0.40	< 0.005	0.02	0.07	0.09	0.02	0.02	0.03	12.4	416	429	1.31	0.03	0.08	472
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.01	0.10	0.04	0.07	< 0.005	< 0.005	0.01	0.02	< 0.005	< 0.005	0.01	2.06	68.9	71.0	0.22	0.01	0.01	78.1

2.5. 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	0.05	0.04	0.03	0.44	< 0.005	< 0.005	0.14	0.14	< 0.005	0.03	0.03	—	140	140	< 0.005	< 0.005	0.33	141
Area	—	0.49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.02	0.01	0.22	0.19	< 0.005	0.02	—	0.02	0.02	—	0.02	—	341	341	0.04	< 0.005	—	342
Water	—	—	—	—	—	—	—	—	—	—	—	12.1	22.9	35.0	1.25	0.03	—	75.1
Waste	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.15
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	0.07	0.55	0.26	0.63	< 0.005	0.02	0.14	0.15	0.02	0.03	0.05	12.4	503	515	1.32	0.04	0.33	560
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.05	0.04	0.04	0.42	< 0.005	< 0.005	0.14	0.14	< 0.005	0.03	0.03	—	133	133	< 0.005	< 0.005	0.01	135

Area	—	0.49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.02	0.01	0.22	0.19	< 0.005	0.02	—	0.02	0.02	—	0.02	—	341	341	0.04	< 0.005	—	342
Water	—	—	—	—	—	—	—	—	—	—	—	12.1	22.9	35.0	1.25	0.03	—	75.1
Waste	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.15
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	0.07	0.55	0.26	0.61	< 0.005	0.02	0.14	0.15	0.02	0.03	0.05	12.4	497	509	1.32	0.04	0.01	553
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.02	0.02	0.02	0.21	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	70.2	70.2	< 0.005	< 0.005	0.08	71.1
Area	—	0.49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.02	0.01	0.22	0.19	< 0.005	0.02	—	0.02	0.02	—	0.02	—	323	323	0.03	< 0.005	—	324
Water	—	—	—	—	—	—	—	—	—	—	—	12.1	22.9	35.0	1.25	0.03	—	75.1
Waste	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.15
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	0.05	0.53	0.24	0.40	< 0.005	0.02	0.07	0.09	0.02	0.02	0.03	12.4	416	429	1.31	0.03	0.08	472
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	< 0.005	< 0.005	< 0.005	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	11.6	11.6	< 0.005	< 0.005	0.01	11.8
Area	—	0.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	< 0.005	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	53.5	53.5	0.01	< 0.005	—	53.7
Water	—	—	—	—	—	—	—	—	—	—	—	2.01	3.79	5.79	0.21	< 0.005	—	12.4
Waste	—	—	—	—	—	—	—	—	—	—	—	0.05	0.00	0.05	0.01	0.00	—	0.19
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	0.01	0.10	0.04	0.07	< 0.005	< 0.005	0.01	0.02	< 0.005	< 0.005	0.01	2.06	68.9	71.0	0.22	0.01	0.01	78.1

3. Construction Emissions Details

3.1. Site Preparation (2025) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.94	3.31	31.6	30.2	0.05	1.37	—	1.37	1.26	—	1.26	—	5,295	5,295	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—	—
Onsite truck	0.02	< 0.005	0.14	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	80.3	80.3	0.01	0.01	0.16	84.6
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.94	3.31	31.6	30.2	0.05	1.37	—	1.37	1.26	—	1.26	—	5,295	5,295	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—	—
Onsite truck	0.02	< 0.005	0.14	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	80.3	80.3	0.01	0.01	< 0.005	84.4
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.48	2.09	19.9	19.0	0.03	0.86	—	0.86	0.79	—	0.79	—	3,337	3,337	0.14	0.03	—	3,348
Dust From Material Movement	—	—	—	—	—	—	4.83	4.83	—	2.48	2.48	—	—	—	—	—	—	—
Onsite truck	0.01	< 0.005	0.09	0.06	< 0.005	< 0.005	16.5	16.5	< 0.005	1.64	1.64	—	50.6	50.6	0.01	0.01	0.04	53.2

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.45	0.38	3.64	3.47	0.01	0.16	—	0.16	0.14	—	0.14	—	552	552	0.02	< 0.005	—	554
Dust From Material Movement	—	—	—	—	—	—	0.88	0.88	—	0.45	0.45	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	3.01	3.01	< 0.005	0.30	0.30	—	8.37	8.37	< 0.005	< 0.005	0.01	8.82
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.03	0.55	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	144	144	< 0.005	< 0.005	0.48	145
Vendor	< 0.005	< 0.005	0.04	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	28.8	28.8	< 0.005	< 0.005	0.07	30.1
Hauling	0.01	< 0.005	0.12	0.08	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	78.6	78.6	0.01	0.01	0.16	82.8
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.04	0.50	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	136	136	< 0.005	0.01	0.01	138
Vendor	< 0.005	< 0.005	0.04	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	28.8	28.8	< 0.005	< 0.005	< 0.005	30.1
Hauling	0.01	< 0.005	0.13	0.08	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	78.6	78.6	0.01	0.01	< 0.005	82.7
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.02	0.31	0.00	0.00	0.09	0.09	0.00	0.02	0.02	—	86.1	86.1	< 0.005	< 0.005	0.13	87.3
Vendor	< 0.005	< 0.005	0.03	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	18.1	18.1	< 0.005	< 0.005	0.02	19.0
Hauling	0.01	< 0.005	0.08	0.05	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	49.5	49.5	0.01	0.01	0.04	52.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	< 0.005	< 0.005	0.06	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	14.3	14.3	< 0.005	< 0.005	0.02	14.5
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.00	3.00	< 0.005	< 0.005	< 0.005	3.14
Hauling	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	8.20	8.20	< 0.005	< 0.005	0.01	8.63

3.3. Grading (2025) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.10	1.76	17.2	16.8	0.03	0.71	—	0.71	0.65	—	0.65	—	3,366	3,366	0.14	0.03	—	3,377
Dust From Material Movement	—	—	—	—	—	—	2.56	2.56	—	1.31	1.31	—	—	—	—	—	—	—
Onsite truck	0.02	< 0.005	0.14	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	80.3	80.3	0.01	0.01	< 0.005	84.4
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	0.15	1.45	1.41	< 0.005	0.06	—	0.06	0.05	—	0.05	—	283	283	0.01	< 0.005	—	284
Dust From Material Movement	—	—	—	—	—	—	0.22	0.22	—	0.11	0.11	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	2.20	2.20	< 0.005	0.22	0.22	—	6.75	6.75	< 0.005	< 0.005	0.01	7.11
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.26	0.26	< 0.005	0.01	—	0.01	0.01	—	0.01	—	46.9	46.9	< 0.005	< 0.005	—	47.1

Dust From Material Movement	—	—	—	—	—	—	0.04	0.04	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.40	0.40	< 0.005	0.04	0.04	—	1.12	1.12	< 0.005	< 0.005	< 0.005	1.18
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.04	0.43	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	117	117	< 0.005	< 0.005	0.01	118
Vendor	< 0.005	< 0.005	0.04	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	28.8	28.8	< 0.005	< 0.005	< 0.005	30.1
Hauling	0.06	0.01	0.58	0.38	< 0.005	< 0.005	0.08	0.09	< 0.005	0.02	0.03	—	360	360	0.05	0.06	0.02	379
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.85	9.85	< 0.005	< 0.005	0.01	9.99
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.42	2.42	< 0.005	< 0.005	< 0.005	2.53
Hauling	0.01	< 0.005	0.05	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.3	30.3	< 0.005	< 0.005	0.03	31.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.63	1.63	< 0.005	< 0.005	< 0.005	1.65
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.40	0.40	< 0.005	< 0.005	< 0.005	0.42
Hauling	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.02	5.02	< 0.005	< 0.005	< 0.005	5.28

3.5. Grading (2026) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.01	1.69	16.0	16.3	0.03	0.65	—	0.65	0.59	—	0.59	—	3,368	3,368	0.14	0.03	—	3,379
Dust From Material Movement	—	—	—	—	—	—	2.56	2.56	—	1.31	1.31	—	—	—	—	—	—	—
Onsite truck	0.01	< 0.005	0.13	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	78.5	78.5	0.01	0.01	0.15	82.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.01	1.69	16.0	16.3	0.03	0.65	—	0.65	0.59	—	0.59	—	3,368	3,368	0.14	0.03	—	3,379
Dust From Material Movement	—	—	—	—	—	—	2.56	2.56	—	1.31	1.31	—	—	—	—	—	—	—
Onsite truck	0.01	< 0.005	0.14	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	78.5	78.5	0.01	0.01	< 0.005	82.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.10	0.92	8.76	8.92	0.02	0.35	—	0.35	0.32	—	0.32	—	1,839	1,839	0.07	0.01	—	1,845
Dust From Material Movement	—	—	—	—	—	—	1.40	1.40	—	0.72	0.72	—	—	—	—	—	—	—
Onsite truck	0.01	< 0.005	0.07	0.05	< 0.005	< 0.005	14.3	14.3	< 0.005	1.42	1.43	—	42.9	42.9	0.01	0.01	0.03	45.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.20	0.17	1.60	1.63	< 0.005	0.06	—	0.06	0.06	—	0.06	—	304	304	0.01	< 0.005	—	305

Dust From Material Movement	—	—	—	—	—	—	0.25	0.25	—	0.13	0.13	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	2.60	2.60	< 0.005	0.26	0.26	—	7.10	7.10	< 0.005	< 0.005	0.01	7.46
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.03	0.43	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	121	121	< 0.005	< 0.005	0.36	122
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	28.2	28.2	< 0.005	< 0.005	0.07	29.6
Hauling	0.06	0.01	0.53	0.37	< 0.005	< 0.005	0.08	0.09	< 0.005	0.02	0.03	—	352	352	0.05	0.06	0.68	371
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.03	0.40	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	114	114	< 0.005	< 0.005	0.01	116
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	28.2	28.2	< 0.005	< 0.005	< 0.005	29.5
Hauling	0.06	0.01	0.55	0.37	< 0.005	< 0.005	0.08	0.09	< 0.005	0.02	0.03	—	352	352	0.05	0.06	0.02	370
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.21	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	62.6	62.6	< 0.005	< 0.005	0.08	63.5
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	15.4	15.4	< 0.005	< 0.005	0.02	16.1
Hauling	0.03	< 0.005	0.30	0.20	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.01	—	192	192	0.03	0.03	0.16	202
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.4	10.4	< 0.005	< 0.005	0.01	10.5
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.55	2.55	< 0.005	< 0.005	< 0.005	2.67
Hauling	0.01	< 0.005	0.05	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	31.8	31.8	< 0.005	0.01	0.03	33.5

3.7. Building Construction (2026) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.31	1.10	10.1	13.1	0.02	0.39	—	0.39	0.36	—	0.36	—	2,425	2,425	0.10	0.02	—	2,434
Onsite truck	0.01	< 0.005	0.14	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	78.5	78.5	0.01	0.01	< 0.005	82.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.45	0.59	< 0.005	0.02	—	0.02	0.02	—	0.02	—	109	109	< 0.005	< 0.005	—	110
Onsite truck	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	1.18	1.18	< 0.005	0.12	0.12	—	3.53	3.53	< 0.005	< 0.005	< 0.005	3.72
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.08	0.11	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	18.1	18.1	< 0.005	< 0.005	—	18.1
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.21	0.21	< 0.005	0.02	0.02	—	0.59	0.59	< 0.005	< 0.005	< 0.005	0.62
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.01	0.17	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	49.3	49.3	< 0.005	< 0.005	< 0.005	49.9
Vendor	0.01	< 0.005	0.13	0.08	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01	—	93.5	93.5	0.01	0.01	0.01	97.7

Hauling	0.01	< 0.005	0.12	0.08	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	76.9	76.9	0.01	0.01	< 0.005	80.8
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.22	2.22	< 0.005	< 0.005	< 0.005	2.26
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.21	4.21	< 0.005	< 0.005	< 0.005	4.40
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.46	3.46	< 0.005	< 0.005	< 0.005	3.64
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.37	0.37	< 0.005	< 0.005	< 0.005	0.37
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.70	0.70	< 0.005	< 0.005	< 0.005	0.73
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.57	0.57	< 0.005	< 0.005	< 0.005	0.60

3.9. Building Construction (2027) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.26	1.06	9.60	13.1	0.02	0.34	—	0.34	0.32	—	0.32	—	2,425	2,425	0.10	0.02	—	2,434
Onsite truck	0.01	< 0.005	0.12	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	76.6	76.6	0.01	0.01	0.14	80.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.26	1.06	9.60	13.1	0.02	0.34	—	0.34	0.32	—	0.32	—	2,425	2,425	0.10	0.02	—	2,434
Onsite truck	0.01	< 0.005	0.13	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	76.6	76.6	0.01	0.01	< 0.005	80.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.74	0.62	5.62	7.66	0.01	0.20	—	0.20	0.19	—	0.19	—	1,419	1,419	0.06	0.01	—	1,424
Onsite truck	0.01	< 0.005	0.07	0.05	< 0.005	< 0.005	15.3	15.3	< 0.005	1.53	1.53	—	44.8	44.8	0.01	0.01	0.03	47.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	1.02	1.40	< 0.005	0.04	—	0.04	0.03	—	0.03	—	235	235	0.01	< 0.005	—	236
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	2.79	2.79	< 0.005	0.28	0.28	—	7.42	7.42	< 0.005	< 0.005	0.01	7.81
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.17	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	51.1	51.1	< 0.005	< 0.005	0.14	51.4
Vendor	0.01	< 0.005	0.12	0.08	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01	—	91.4	91.4	0.01	0.01	0.20	95.7
Hauling	0.01	< 0.005	0.11	0.08	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	74.9	74.9	0.01	0.01	0.14	79.0
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.16	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	48.3	48.3	< 0.005	< 0.005	< 0.005	48.5
Vendor	0.01	< 0.005	0.13	0.08	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01	—	91.4	91.4	0.01	0.01	0.01	95.5
Hauling	0.01	< 0.005	0.12	0.08	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	74.9	74.9	0.01	0.01	< 0.005	78.8
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.09	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	28.4	28.4	< 0.005	< 0.005	0.03	28.5
Vendor	0.01	< 0.005	0.07	0.05	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	53.5	53.5	0.01	0.01	0.05	55.9
Hauling	0.01	< 0.005	0.07	0.05	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	43.9	43.9	0.01	0.01	0.03	46.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	4.70	4.70	< 0.005	< 0.005	0.01	4.72
Vendor	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	8.86	8.86	< 0.005	< 0.005	0.01	9.26
Hauling	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	7.26	7.26	< 0.005	< 0.005	0.01	7.64

3.11. Paving (2027) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.88	0.74	6.94	9.95	0.01	0.30	—	0.30	0.27	—	0.27	—	1,511	1,511	0.06	0.01	—	1,516
Paving	—	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	< 0.005	0.13	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	76.6	76.6	0.01	0.01	< 0.005	80.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.48	0.68	< 0.005	0.02	—	0.02	0.02	—	0.02	—	104	104	< 0.005	< 0.005	—	104
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	1.79	1.79	< 0.005	0.18	0.18	—	5.24	5.24	< 0.005	< 0.005	< 0.005	5.52
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.09	0.12	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	17.1	17.1	< 0.005	< 0.005	—	17.2
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.33	0.33	< 0.005	0.03	0.03	—	0.87	0.87	< 0.005	< 0.005	< 0.005	0.91
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.38	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	112	112	< 0.005	< 0.005	0.01	113
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	27.6	27.6	< 0.005	< 0.005	< 0.005	28.8
Hauling	0.01	< 0.005	0.12	0.08	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	74.9	74.9	0.01	0.01	< 0.005	78.8
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.71	7.71	< 0.005	< 0.005	0.01	7.74
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.89	1.89	< 0.005	< 0.005	< 0.005	1.98
Hauling	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.13	5.13	< 0.005	< 0.005	< 0.005	5.40
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.28	1.28	< 0.005	< 0.005	< 0.005	1.28
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.31	0.31	< 0.005	< 0.005	< 0.005	0.33
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.85	0.85	< 0.005	< 0.005	< 0.005	0.89

3.13. Architectural Coating (2027) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	0.11	0.83	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	10.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.01	< 0.005	0.13	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	76.6	76.6	0.01	0.01	< 0.005	80.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.05	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.32	7.32	< 0.005	< 0.005	—	7.34
Architectural Coatings	—	0.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	1.43	1.43	< 0.005	0.14	0.14	—	4.20	4.20	< 0.005	< 0.005	< 0.005	4.42
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.21	1.21	< 0.005	< 0.005	—	1.22
Architectural Coatings	—	0.11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.26	0.26	< 0.005	0.03	0.03	—	0.69	0.69	< 0.005	< 0.005	< 0.005	0.73
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.65	9.65	< 0.005	< 0.005	< 0.005	9.68
Vendor	< 0.005	< 0.005	0.03	0.02	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	18.2	18.2	< 0.005	< 0.005	< 0.005	19.0
Hauling	0.01	< 0.005	0.12	0.08	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	74.9	74.9	0.01	0.01	< 0.005	78.8
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.53	0.53	< 0.005	< 0.005	< 0.005	0.53
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.00	1.00	< 0.005	< 0.005	< 0.005	1.04

Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.11	4.11	< 0.005	< 0.005	< 0.005	4.32
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.09	0.09	< 0.005	< 0.005	< 0.005	0.09
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.17	0.17	< 0.005	< 0.005	< 0.005	0.17
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.68	0.68	< 0.005	< 0.005	< 0.005	0.72

3.15. Trenching (2026) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.49	1.25	11.5	11.9	0.02	0.48	—	0.48	0.44	—	0.44	—	2,122	2,122	0.09	0.02	—	2,129
Onsite truck	0.01	< 0.005	0.14	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	78.5	78.5	0.01	0.01	< 0.005	82.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	0.15	1.41	1.47	< 0.005	0.06	—	0.06	0.05	—	0.05	—	262	262	0.01	< 0.005	—	262
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	3.22	3.22	< 0.005	0.32	0.32	—	9.68	9.68	< 0.005	< 0.005	0.01	10.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.26	0.27	< 0.005	0.01	—	0.01	0.01	—	0.01	—	43.3	43.3	< 0.005	< 0.005	—	43.5
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.59	0.59	< 0.005	0.06	0.06	—	1.60	1.60	< 0.005	< 0.005	< 0.005	1.69

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.02	0.02	0.27	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	76.2	76.2	< 0.005	< 0.005	0.01	77.3
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	28.2	28.2	< 0.005	< 0.005	< 0.005	29.5
Hauling	0.01	< 0.005	0.12	0.08	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	76.9	76.9	0.01	0.01	< 0.005	80.8
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.43	9.43	< 0.005	< 0.005	0.01	9.57
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.48	3.48	< 0.005	< 0.005	< 0.005	3.64
Hauling	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	9.48	9.48	< 0.005	< 0.005	0.01	9.97
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.56	1.56	< 0.005	< 0.005	< 0.005	1.58
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.58	0.58	< 0.005	< 0.005	< 0.005	0.60
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.57	1.57	< 0.005	< 0.005	< 0.005	1.65

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. 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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	0.05	0.04	0.03	0.44	< 0.005	< 0.005	0.14	0.14	< 0.005	0.03	0.03	—	140	140	< 0.005	< 0.005	0.33	141
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.05	0.04	0.03	0.44	< 0.005	< 0.005	0.14	0.14	< 0.005	0.03	0.03	—	140	140	< 0.005	< 0.005	0.33	141
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	0.05	0.04	0.04	0.42	< 0.005	< 0.005	0.14	0.14	< 0.005	0.03	0.03	—	133	133	< 0.005	< 0.005	0.01	135
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.05	0.04	0.04	0.42	< 0.005	< 0.005	0.14	0.14	< 0.005	0.03	0.03	—	133	133	< 0.005	< 0.005	0.01	135
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	< 0.005	< 0.005	< 0.005	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	11.6	11.6	< 0.005	< 0.005	0.01	11.8
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	< 0.005	< 0.005	< 0.005	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	11.6	11.6	< 0.005	< 0.005	0.01	11.8

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	70.5	70.5	0.01	< 0.005	—	71.2
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	4.27	4.27	< 0.005	< 0.005	—	4.31
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	74.8	74.8	0.01	< 0.005	—	75.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	70.5	70.5	0.01	< 0.005	—	71.2
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	4.27	4.27	< 0.005	< 0.005	—	4.31
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	74.8	74.8	0.01	< 0.005	—	75.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	8.78	8.78	< 0.005	< 0.005	—	8.86
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	0.71	0.71	< 0.005	< 0.005	—	0.71
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	9.48	9.48	< 0.005	< 0.005	—	9.57

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	0.02	0.01	0.22	0.19	< 0.005	0.02	—	0.02	0.02	—	0.02	—	266	266	0.02	< 0.005	—	267
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.02	0.01	0.22	0.19	< 0.005	0.02	—	0.02	0.02	—	0.02	—	266	266	0.02	< 0.005	—	267
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	0.02	0.01	0.22	0.19	< 0.005	0.02	—	0.02	0.02	—	0.02	—	266	266	0.02	< 0.005	—	267
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.02	0.01	0.22	0.19	< 0.005	0.02	—	0.02	0.02	—	0.02	—	266	266	0.02	< 0.005	—	267
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	< 0.005	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.1
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	< 0.005	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.1

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	—	0.43	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.43	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	12.1	22.9	35.0	1.25	0.03	—	75.1
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	12.1	22.9	35.0	1.25	0.03	—	75.1
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	12.1	22.9	35.0	1.25	0.03	—	75.1
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	12.1	22.9	35.0	1.25	0.03	—	75.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	2.01	3.79	5.79	0.21	< 0.005	—	12.4
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	2.01	3.79	5.79	0.21	< 0.005	—	12.4

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.15
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.15
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.15
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.15
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

City Park	—	—	—	—	—	—	—	—	—	—	—	0.05	0.00	0.05	0.01	0.00	—	0.19
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.05	0.00	0.05	0.01	0.00	—	0.19

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	1/01/2025	11/18/2025	5.00	230	—
Grading	Grading	11/19/2025	10/6/2026	5.00	230	—
Building Construction	Building Construction	12/09/2026	10/26/2027	5.00	230	—
Paving	Paving	10/27/2027	11/30/2027	5.00	25.0	—

Architectural Coating	Architectural Coating	12/01/2027	12/28/2027	5.00	20.0	—
Trenching	Trenching	10/07/2026	12/8/2026	5.00	45.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Other Construction Equipment	Diesel	Average	1.00	8.00	249	0.42
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Cement and Mortar Mixers	Diesel	Average	1.00	4.00	10.0	0.56
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48
Trenching	Trenchers	Diesel	Average	1.00	8.00	40.0	0.50

Trenching	Skid Steer Loaders	Diesel	Average	1.00	8.00	71.0	0.37
Trenching	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Trenching	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	1.00	8.40	HHDT,MHDT
Site Preparation	Hauling	1.00	20.0	HHDT
Site Preparation	Onsite truck	2.00	10.0	HHDT
Grading	—	—	—	—
Grading	Worker	15.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	1.00	8.40	HHDT,MHDT
Grading	Hauling	4.58	20.0	HHDT
Grading	Onsite truck	2.00	10.0	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	6.46	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	3.31	8.40	HHDT,MHDT
Building Construction	Hauling	1.00	20.0	HHDT
Building Construction	Onsite truck	2.00	10.0	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	1.00	8.40	HHDT,MHDT
Paving	Hauling	1.00	20.0	HHDT

Paving	Onsite truck	2.00	10.0	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	1.29	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	0.66	8.40	HHDT,MHDT
Architectural Coating	Hauling	1.00	20.0	HHDT
Architectural Coating	Onsite truck	2.00	10.0	HHDT
Trenching	—	—	—	—
Trenching	Worker	10.0	11.7	LDA,LDT1,LDT2
Trenching	Vendor	1.00	8.40	HHDT,MHDT
Trenching	Hauling	1.00	20.0	HHDT
Trenching	Onsite truck	2.00	10.0	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	0.00	0.00	30,300	10,100	1,594

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)
Site Preparation	0.00	0.00	345	0.00	—
Grading	4,790	3,640	115	0.00	—

Paving	0.00	0.00	0.00	0.00	0.61

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
City Park	0.00	0%
Parking Lot	0.20	100%
Other Non-Asphalt Surfaces	0.41	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2025	0.00	204	0.03	< 0.005
2026	0.00	204	0.03	< 0.005
2027	0.00	204	0.03	< 0.005

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
City Park	5.54	13.9	15.5	2,980	68.5	172	192	36,881
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

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	0.00	30,300	10,100	1,594

5.10.3. Landscape Equipment

Equipment Type	Fuel Type	Number Per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
Lawn Mowers	Electric	1.00	8.00	416	3.86	0.36
Leaf Blowers/Vacuums	Electric	1.00	8.00	416	1.79	0.94
Riding Mowers	Electric	1.00	8.00	416	21.4	0.38
Trimmers/Edgers/Brush Cutters	Electric	2.00	8.00	416	1.13	0.91
Other Lawn & Garden Equipment	Electric	1.00	8.00	416	6.09	0.58

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
City Park	89,635	204	0.0330	0.0040	829,430
Parking Lot	7,632	204	0.0330	0.0040	0.00
Other Non-Asphalt Surfaces	0.00	204	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
City Park	6,320,378	123
Parking Lot	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
City Park	0.61	—
Parking Lot	0.00	—
Other Non-Asphalt Surfaces	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
City Park	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
City Park	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00

5.17. User Defined

Equipment Type	Fuel Type

8. User Changes to Default Data

Screen	Justification
Characteristics: Project Details	Site Specific information on construction and operation start dates
Construction: Construction Phases	Construction schedule is anticipated to be 36 months. Extended site preparation and grading time.
Construction: Off-Road Equipment	Added equipment for trenching, added cement and mortar mixers to building construction, added compactor (other construction equipment) to grading and remove grader.
Operations: Energy Use	used value for day care with 20,200 sqft to represent the building.
Operations: Water and Waste Water	assumed indoor water use was same as daycare center for 20,200 sqft building
Construction: Trips and VMT	Based workers and vendors for building construction on community center sqft. Assumed 1 vendor and 1 hauling for any phase without other defaults. Assumed 2 onsite trucks with 10 miles per day.

Burnham Summary Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Burnham
Construction Start Date	1/1/2025
Operational Year	2028
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	4.60
Precipitation (days)	41.0
Location	37.50307686096275, -122.47381754029335
County	San Mateo
City	Unincorporated
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	1226
EDFZ	1
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.21

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

City Park	7.10	Acre	7.10	0.00	6.70	6.70	—	—
Parking Lot	0.20	Acre	0.20	0.00	0.00	—	—	—
Other Non-Asphalt Surfaces	0.41	Acre	0.41	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

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

Un/Mit.	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.	4.02	3.36	32.0	30.9	0.05	1.37	37.3	38.6	1.26	6.92	8.18	—	5,627	5,627	0.24	0.10	1.25	5,656
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.02	11.0	32.0	30.9	0.05	1.37	37.3	38.6	1.26	6.92	8.18	—	5,619	5,619	0.25	0.11	0.04	5,649
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.72	2.27	21.7	20.9	0.04	0.92	23.8	24.8	0.85	4.49	5.33	—	3,874	3,874	0.17	0.07	0.34	3,896
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.50	0.41	3.95	3.82	0.01	0.17	4.35	4.52	0.15	0.82	0.97	—	641	641	0.03	0.01	0.06	645

2.4. 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.	0.07	0.55	0.26	0.63	< 0.005	0.02	0.14	0.15	0.02	0.03	0.05	12.4	503	515	1.32	0.04	0.33	560
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.07	0.55	0.26	0.61	< 0.005	0.02	0.14	0.15	0.02	0.03	0.05	12.4	497	509	1.32	0.04	0.01	553
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.05	0.53	0.24	0.40	< 0.005	0.02	0.07	0.09	0.02	0.02	0.03	12.4	416	429	1.31	0.03	0.08	472
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.01	0.10	0.04	0.07	< 0.005	< 0.005	0.01	0.02	< 0.005	< 0.005	0.01	2.06	68.9	71.0	0.22	0.01	0.01	78.1

6. Climate Risk Detailed Report

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	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	N/A	N/A	N/A	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	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	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	N/A	N/A	N/A	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 include implementation of climate risk reduction measures.

7. Health and Equity Details

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	13.0
Healthy Places Index Score for Project Location (b)	90.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

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

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

Technical Report

FINAL
BIOLOGICAL RESOURCES REPORT
PROPOSED GRANADA COMMUNITY PARK
AND RECREATION CENTER PROJECT

May 2024

Prepared for:

Granada Community Services District
504 Avenue Alhambra
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Contact: Brian Piontek

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Acronyms and Abbreviations

AMMs	Avoidance and minimization measures
CDFW	California Department of Fish and Wildlife
City	City of El Granada
CCR	California Code of Regulations
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
County	County of San Mateo
CRPR	California Rare Plant Rank
CWA	Clean Water Act
ESA	Endangered Species Act
Federal Register	FR
GCSD	Granada Community Services District
IPaC	Information for Planning and Conservation
LCP	Local Coastal Program
LF	Linear Feet
MBTA	Migratory Bird Treaty Act
Montrose	Montrose Environmental Group, Inc
NAVD 88	North American Vertical Datum 1988
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
Project	Burnham Park Project
RWQCB	Regional Water Quality Control Board
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
°F	degrees Fahrenheit

1 Introduction

1.1 Project Overview

The Granada Community Services District (GCSD) has initiated the planning process to develop a new community park, Proposed GCSD Burnham Park Project (Project), on a collection of parcels known locally as the Burnham Strip. The new park will consist of three distinct zones: Burnham Creek Riparian Zone to the south, Active Recreation in the central portion, and Passive Recreation and Proposed Community Center to the north.

The purpose of the Project is to develop the site for recreational uses. Potential actions include: Active Recreational Area, Passive Recreational Area with Proposed Community Center, proposed permeable walking trails that connect to existing pedestrian facilities, permeable parking area, removal of non-native plants and invasive plants, replanting native plants species throughout park areas, enhancement of onsite drainages, improve onsite riparian habitat, and potential construction of two dog parks. The Project will also support leaving the existing vegetation and drainage watercourse largely untouched in the Burnham Riparian Zone (Kituchi + Kankel Design Group 2022).

The Project would include improvement of the existing channel areas in the Active Recreational Zone would be widened and realigned to increase sinuosity and allowing for more percolation and filtration in drainages. Additionally, a permeable parking area with curbside biotreatment planters with native shrubs and grasses that would treat runoff prior to entering two onsite drainages channels. A large pastoral field with mounded landforms consisting of native grasses and shrubs would in the Passive Recreational Zone (Kituchi + Kankel Design Group 2022).

1.2 Location and Study Area

For the purpose of this report, the study area includes the entirety of the 6.2 acres (approximate) Project area (**Figure 1**). **Appendix A** provides representative site photographs.

The study area is located in the unincorporated community of El Granada, San Mateo County, California, approximately 3.7 miles north of Half Moon Bay. The study area is within the U.S. Geological Survey (USGS) Montara Mountain quadrangle (USGS 2015). The study area is bordered by Highway 1 to the south and by Obispo Road to the north, with site access available from Obispo Road. The study area is currently open space with three distinct drainage features (Burnham Creek and two unnamed drainages) running across the property north to south. Local land use includes a mix of residential and commercial properties north of the study area, with several commercial properties south of Highway 1, an RV park, and publicly accessible shoreline at El Granada Beach and Surfer’s Beach.

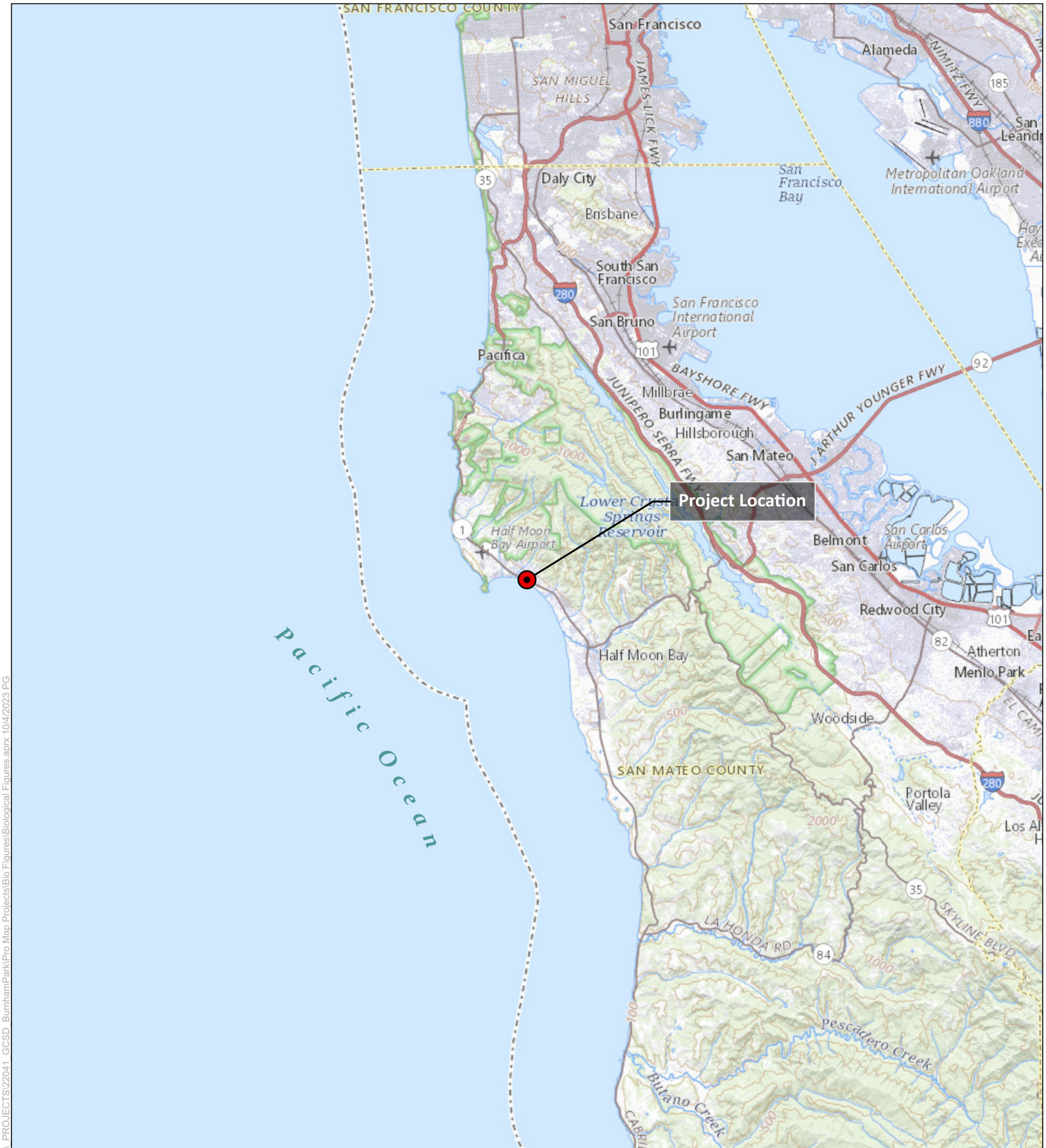

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Figure 1

Project Vicinity

Project Location

N

0 5

Miles

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Burnham Park Master Plan

2 Study Area Description

2.1 Environmental Setting

2.1.1 Watershed and Hydrology

The study area is a part of the Santa Maria Ave Drainage Watershed (**Figure 1**), originating from an elevation of 520 feet from Montara Mountain (USGS 2015). Site topography in study area is relatively flat, sloping slightly towards the southwest. Site elevations in the study area range from 20 to 30 feet above mean sea level (USGS 2015).

The primary hydrological feature in the study area is Burnham Creek. Burnham Creek drains the northeast portion of El Granada and the hillslopes above with a catchment area of approximately 0.5 square miles (USGS 2023). The Creek is culverted from Quarry Park under El Granada before daylighting near Obispo Road. Burnham Creek flows parallel to Obispo Road along the southeastern end of the study area before crossing under Highway 1 and discharging to the Pacific Ocean at Surfer's Beach.

Two other hydrological features within the study area include unnamed drainages, which convey stormwater runoff from the El Granada stormwater system across the study area and under Highway 1 before discharging to the Pacific Ocean. Burnham Creek and the unnamed drainage near Ave Portola maintain intermittent flow regimes and support dense riparian vegetation. The other unnamed drainage farther northwest is a relatively minor ephemeral drainage but with a well-defined bed and bank.

In addition, an approximate 400,000-gallon passive underground stormwater retention basin lies beneath a portion of the study area. Evidence of the retention basin location is made visible by a series of manhole covers spread across the study area northwest of the ephemeral drainage. However, specifications and operations of the stormwater system and retention basin are outside the scope of this report and not discussed further.

2.1.2 Climate

The study area has a Mediterranean climate characterized by cool, wet winters and dry summers. Average temperatures range from a low of 40.5 degrees Fahrenheit (°F) in January to a high of 79.3°F in September. Average annual precipitation is approximately 19 inches, with the majority of precipitation occurring from November through April (NRCS 2023a).

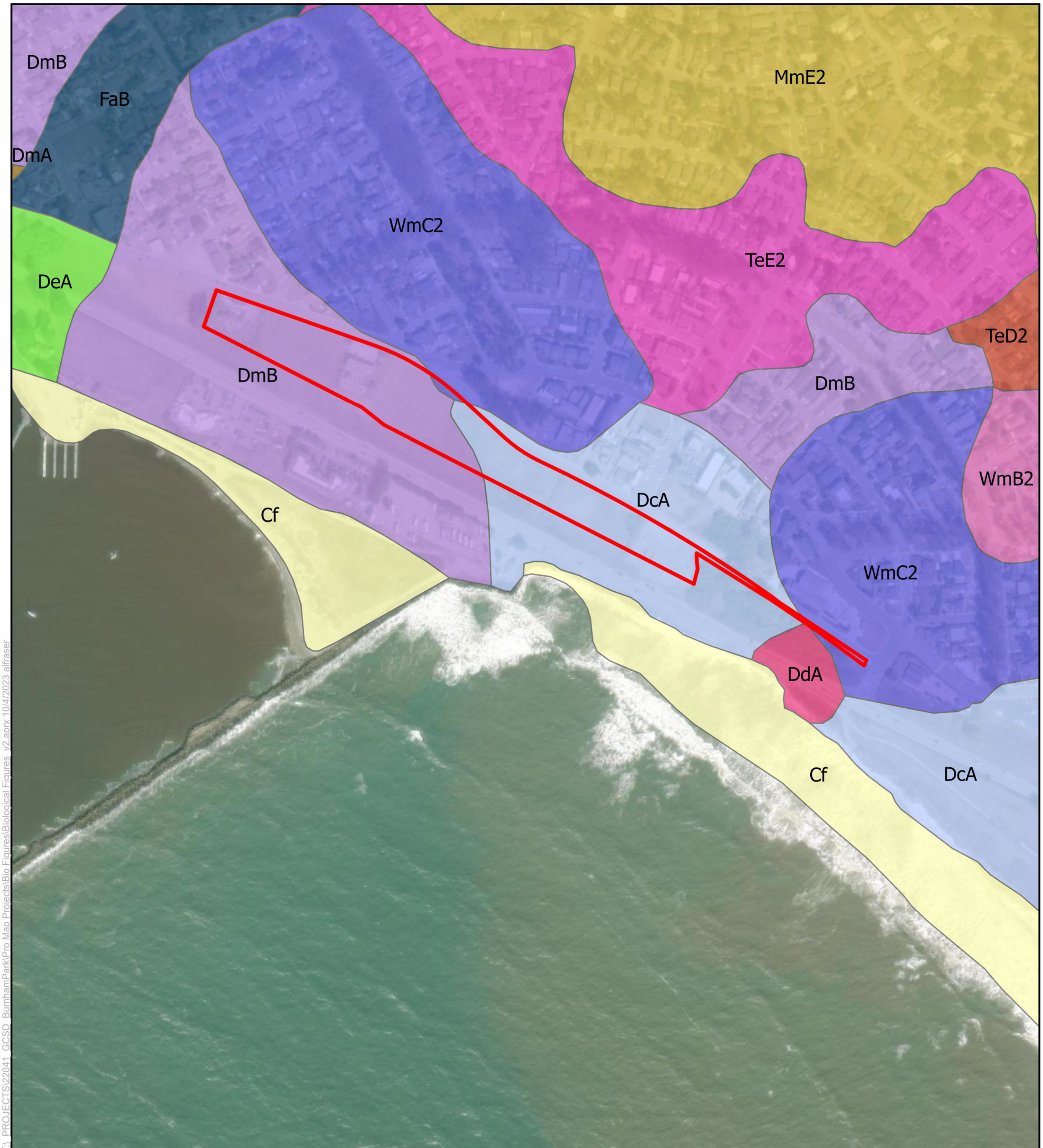
2.1.3 Soils

The study area is underlain by four soil types: (1) Denison loam, gently sloping and (2) Denison clay loam, nearly level and (3) Watsonville loam, sloping, eroded and (4) Denison clay loam, nearly level, imperfectly drained. The distribution of these soils within the study area are shown in **Figure 2** (NRCS 2023b). These soils are not classified as hydric soils (NRCS 2019).

2.1.4 Land Use

The study area is relatively undeveloped, open space vegetated with ruderal species. Riparian habitat is present along Burnham Creek and the unnamed drainage near Ave Portola, with a graveled lot and unofficial skate park area located between the two hydrological features.

Historically, the study area was previously disturbed by anthropomorphic activities prior to the establishment of Burnham Park. Previous disturbance includes row crop farming in the 1990's and significant earthmoving during the construction of Highway 1. In the past decade the site has revegetated naturally with non-native grassland species (San Mateo County Resource Conservation District 2022).



Project Area

MUSYM

Cf - Coastal beaches

DcA - Denison clay loam, nearly level

DdA - Denison clay loam, nearly level, imperfectly drained

DeA - Denison coarse sandy loam, nearly level

DmA - Denison loam, nearly level

DmB - Denison loam, gently sloping

FaB - Farallone loam, gently sloping

MmE2 - Miramar coarse sandy loam, steep, eroded

TeD2 - Tierra loam, moderately steep, eroded

TeE2 - Tierra loam, steep, eroded

WmB2 - Watsonville loam, gently sloping, eroded

WmC2 - Watsonville loam, sloping, eroded

N

0 100 200

Feet

Figure 2

NRCS Soils Map

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Source: NRCS Soil Survey, 09/11/ 2023; Vivid Premium Aerial Photography, 10/25/2021; ESRI 2023.

Burnham Park Master Plan

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3 Existing Biological Resources

3.1 Inventory Methods

Baseline biological resources in the study area were evaluated by reviewing pertinent literature and conducting a field survey to supplement background information with representative site-specific data. The methods are described below.

3.1.1 Literature Reviewed

The primary documents used to support this report include:

- Burnham Strip Natural Resources Management Plan, San Mateo County Resource Conservation District 2017; and
- GCSD Wetland Assessment, San Mateo County Resource Conservation District 2021

Biological resource information in the study area was evaluated by reviewing the following data sources:

- U.S. Fish and Wildlife Service (USFWS), Information for Planning and Conservation (IPaC) list of federally endangered and threatened species (USFWS 2023a);
- USFWS's Critical Habitat Portal (USFWS 2023b);
- National Wetland Inventory (NWI) results (USFWS 2023c);
- National Marine Fisheries Service (NMFS) California Species List (NMFS 2023a);
- Occurrence records within five miles of the study area for special-status plants and wildlife species in California Department of Fish and Wildlife (CDFW), California Natural Diversity Database (CNDDB) queries within the U.S. Geological Survey (USGS) 7.5-minute quadrangles encompassing and surrounding the study area: San Mateo, San Francisco South, Hunters Point, Redwood Point, Palo Alto, Woodside, Half Moon Bay, Montara Mountain (CDFW 2023);
- eBird records for the study area (Cornell Lab of Ornithology 2023); and
- Aerial photography (Google Earth 2023).

Results from the database queries are provided in **Appendix B.**

3.1.2 Field Survey

Montrose Environmental (Montrose) biologists Brian Piontek, Jedidiah Dowell, and Jessica Gonzalez, conducted a biological reconnaissance survey on March 16, 2023. The survey efforts consisted of a visual assessment of site conditions. Maps of baseline biological resources including a regional aerial photographic overview of the study area and detailed aerial photography were used in the survey.

Surveys were conducted in the field on-foot. Natural and anthropogenic features, land cover types, and the presences of common and special-status species were noted. Visual aids, such as binoculars, were used to better assess wildlife species when appropriate.

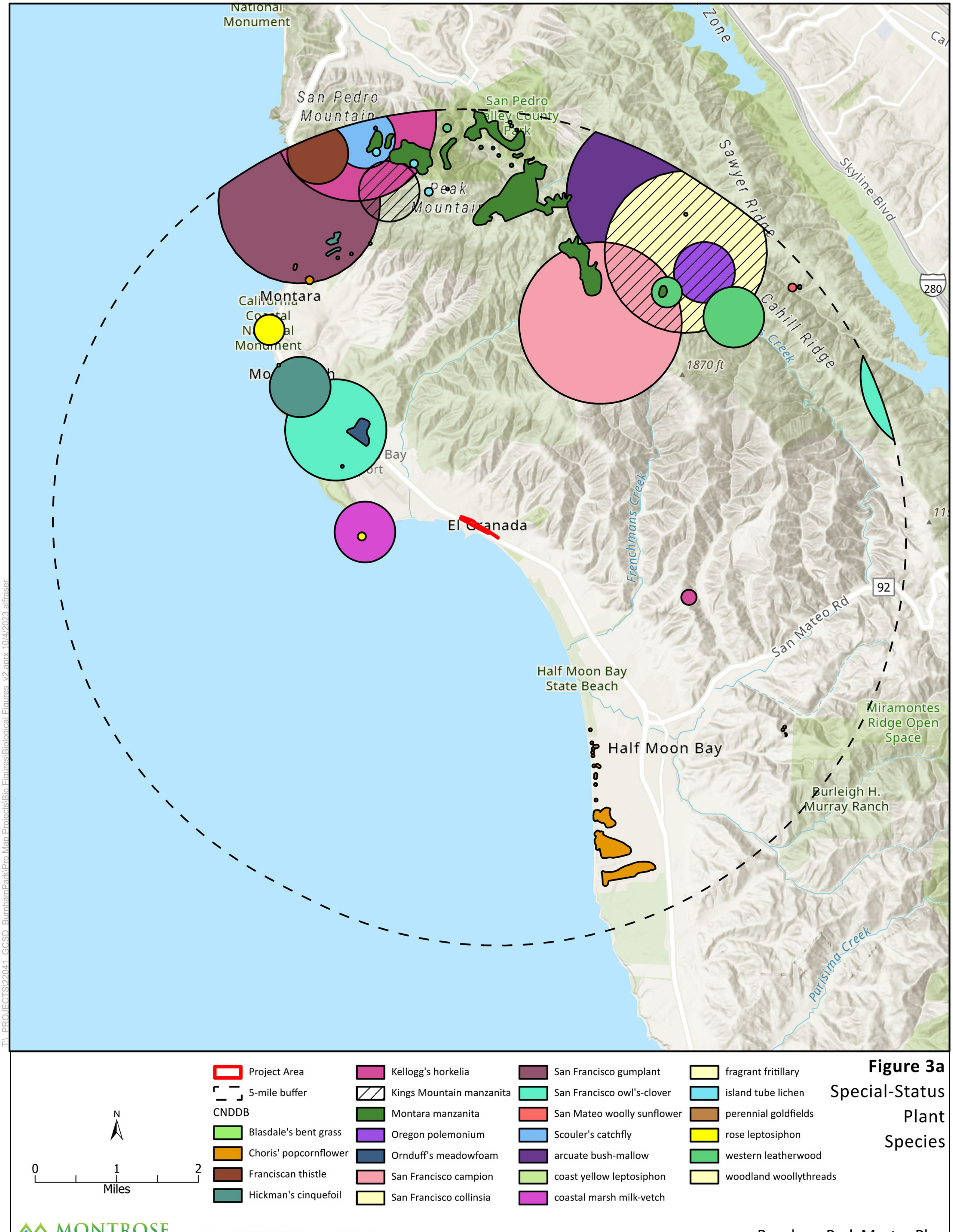

Figure 3a
Special-Status Plant Species

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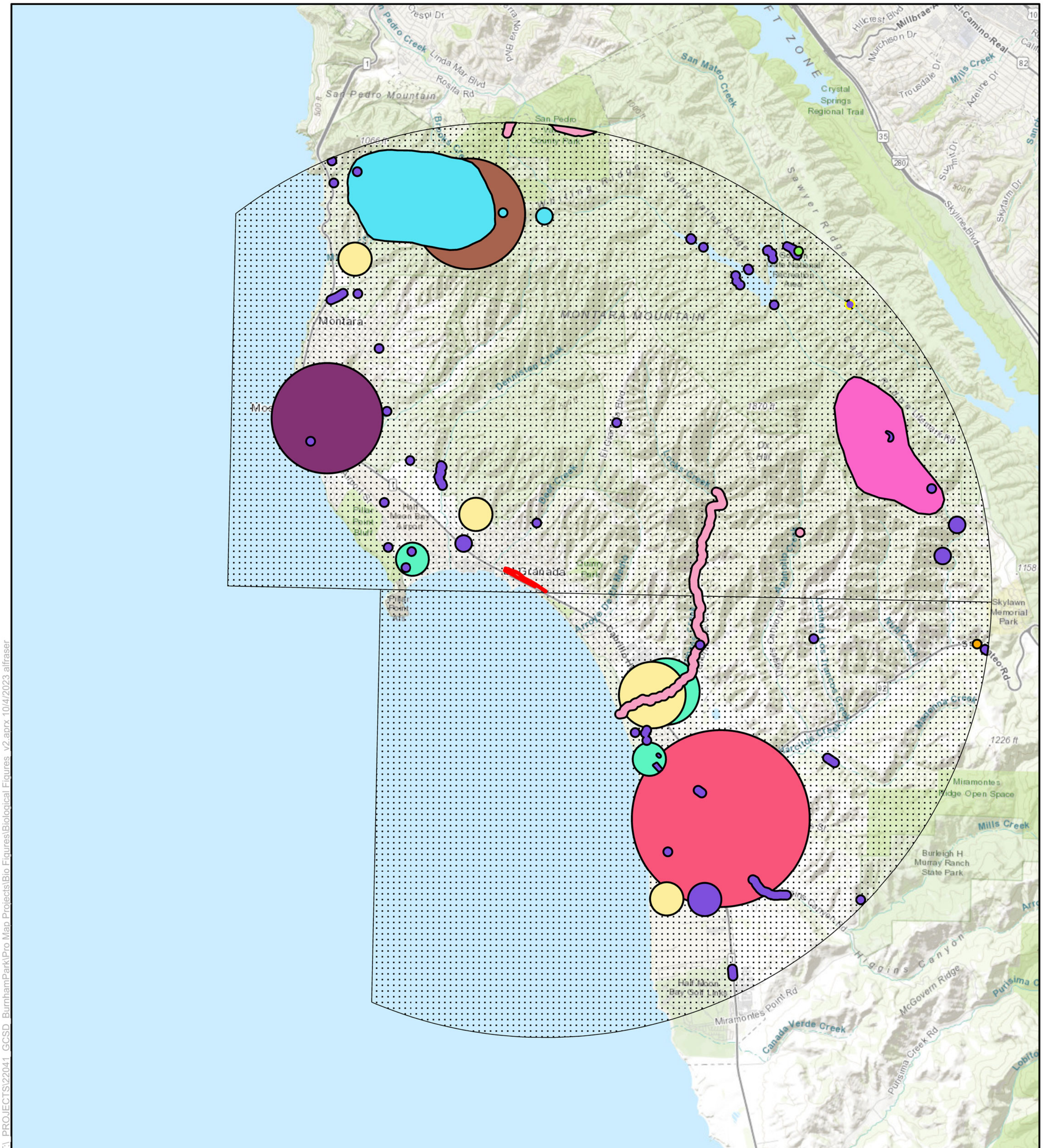
Source: CDFW CNDDB, September 2023; ESRI 2023.

Burnham Park Master Plan



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- Project Area
- CNDDB
- American badger
- California giant salamander
- California red-legged frog
- San Bruno elfin butterfly
- San Francisco dusky-footed woodrat
- San Francisco gartersnake
- marbled murrelet
- monarch - California overwintering population
- obscure bumble bee
- saltmarsh common yellowthroat
- western bumble bee
- steelhead - central California coast DPS
- western pond turtle
- western snowy plover

N

0 1 2
Miles

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Source: CDFW CNDDB, September 2023; ESRI 2023.

Figure 3b

Special-Status Animal Species

Burnham Park Master Plan

3.2 Land Cover Types

This section describes habitat and land cover present within the study area. Reconnaissance-level surveys identified three land cover types in the study area: intermittent drainage, ephemeral drainage, arroyo willow thicket, non-native grassland/ruderal, and developed. Botanical nomenclature follows the second edition of the Jepson Manual (Baldwin et al. 2012). The characteristics of each land cover type are described below.

3.2.1 Aquatic

Intermittent Drainage

Intermittent drainages are primarily fed by a perched groundwater table that is seasonally supplemented by precipitation and storm water runoff. These features generally maintain persistent flows for weeks or months following precipitation events. Intermittent drainages in the study area are generally devoid of vegetation in the center of the channel with dense herbaceous growth along the channel margins.

Burnham Creek and the unnamed drainage near Ave Portola are intermittent channels during most water years. Burnham Creek daylights on the north side of Obispo Road and flows southeast approximately 750 linear feet (LF) parallel to the south side of Obispo Road before being culverted under Highway 1.

The unnamed drainage daylights on the south side or Obispo Road. A small scour pool is located near the culvert outfall and is surrounded by a 100-LF riparian corridor (see *arroyo willow thicket,* below) before traversing the open area adjacent to the Surfer's Beach parking lot for approximately 115 LF where it enters a cross culvert under Highway 1. This channel is generally less than 3-feet in width and 2-feet deep.

Ephemeral Drainage

Ephemeral drainages convey surface water and storm runoff during and immediately following storm events. Ephemeral drainages exhibit a defined bed and bank that form from scouring from rapid flow events with minimal instream vegetation growth.

The western-most unnamed drainage is an ephemeral channel. This drainage conveys stormwater generated from the neighborhood northwest of the study area in a linear channel approximately 210 LF across the site to a pass-through culvert at Highway 1. The drainage channel maintains relatively uniform dimension approximately 2-feet wide and 1-foot deep.

3.2.2 Terrestrial

Arroyo Willow Thickets (Riverine)

Arroyo willow thickets are dominated by arroyo willows (*Salix lasiolepis*) of varying size and density. Other tree species present include blue gum eucalyptus (*Eucalyptus globulus*), which overtop the willow canopy, along with acacia (*Acacia sp.*), California coffee berry (*Frangula californica*), and Monterey pine (*Pinus radiata*). The understory is dominated by a dense cover of non-native English ivy (*Hedera helix*), Cape ivy (*Delairea odorata*), and California blackberry (*Rubus ursinus*), and non-native annual grasses in most of this habitat. Arroyo willow thickets are found along the Burnham Creek and the unnamed drainage at Ave Portola, and east of the Surfer's Beach parking lot.

Eucalyptus and willows provide suitable nesting and foraging habitat for raptors and other bird species. Trees may also provide habitat for roosting bats. Bird species observed in Burnham Strip from biological reconnaissance survey on March 16, 2023 by Montrose include: American crow (*Corvus brachyrhynchos*), Anna's hummingbird (*Calypte anna*), acorn woodpecker (*Melanerpes formicivorus*), black pheobe (Sayornis nigricans), bushtit (*Psaltriparus minimus*), California Scrub-Jay (Aphelocoma californica), common raven (Corvus corax), dark-eyed junco (*Junco hyemalis*), House Finch (*Haemorhous mexicanus*), house sparrow (*Passer domesticus*), red-winged blackbird (Agelaius phoeniceus), Steller's jay (*Cyanocitta stelleri*), and chestnut-backed chickadee (*Poecile rufescens*).

Arroyo willow thickets in the study area would likely be considered potentially jurisdictional habitat.

Non-native Grassland/Ruderal

Non-native grassland/ruderal habitat is present throughout open areas within the study area. This habitat type is characterized by non-native forbs and grasses in a disturbed habitat typically along the edges of developed/landscaped cover or areas with frequent disturbance. Some species observed in the study area in this habitat include: Italian rye (*Festuca perennis*), wild oat (*Avena barbata*), Italian thistle (Carduus pycnocephalus ssp. pycnocephalus), bristly oxtongue (*Helminthotheca echioides),* rough cat's ear (*Hypochaeris radicata*), Pacific willow dock (*Rumex transitorius*), California fescue (*Festuca californica*), Bermuda buttercup (*Oxalis pes-caprae*), ganzia (*Gazania linearis*), yellow sweet clover (*Melilotus officinalis*), field mustard (*Brassica rapa*), rescue grass (*Bromus catharticus*), poison hemlock (*Conium maculatum*), ripgut brome (*Bromus diandrus*), rushes (*Scirpus spp*.), and other grasses (*Poaceae spp.).*

Developed

Developed land cover includes the Surfer's parking lot, Highway 1, and adjacent surface roads. Landscaped vegetation associated with the Picaso Pre-school and the resident at 400 Ave Alhambra are also included in this land cover type. Vegetation in these areas, if present at all, is usually sparse, dominated by opportunistic weedy herbaceous species or, in the landscaped areas, typically ornamental horticultural species. Trees within this habitat may support nesting habitat for bird species.

3.3 Special-Status Species

For the purpose of this report, special-status plant and wildlife species refer to those species that meet one or more of the following criteria:

- Species that are listed as threatened or endangered under the federal Endangered Species Act (ESA) (50 Code of Federal Regulations [CFR] Section 17.12 for listed plants, 50 CFR Section 17.11 for listed animals);
- Species that are candidates for possible future listing as threatened or endangered under ESA (76 Federal Register [FR] Section 66370);
- Species that are listed or proposed for listing by the State of California as threatened or endangered under the California Endangered Species Act (CESA) (14 California Code of Regulations [CCR] 670.5);
- Plants listed as rare under the California Native Plant Protection Act of 1977 (Fish and Game Code Section 1900 et seq.);

- California Rare Plant Rank (CRPR) List 1 and 2 species; and
- Animals fully protected in California (Fish and Game Code Sections 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]) or species designated as "Species of Special Concern" by CDFW.

3.3.1 Plants

Special-status plants known to occur in the vicinity of the study area were evaluated for their potential to occur (**Appendix C**). No special-status plant species are anticipated to occur in the study area. No special-status species were observed during the biological reconnaissance survey conducted in March 16, 2023 by Montrose or during a previous biological site assessment conducted by San Mateo County Resources Conservation District (2017).

3.3.2 Wildlife

No special-status wildlife species were observed during the biological reconnaissance survey conducted March 16, 2023 by Montrose or during a previous biological site assessment conducted by San Mateo County Resources Conservation District (2017). Special-status wildlife known to occur in the vicinity of the study area were evaluated for their potential to occur are described in detail in **Appendix C** and summarized below.

Two special-status invertebrate species, California overwintering population monarch (*Danaus plexippus* pop. 1) and western bumble bee (*Bombus occidentalis*), may potentially occur within the vicinity of study area. CNDDB records for monarch occur within 5 miles of the study area with three documented overwintering sites occurring less than a 0.5 mile from the study area (CDFW 2023; Western Monarch Count Resource Center 2023). However, monarch butterfly overwintering groves are not documented in the study area and the study area generally lack key habitat elements for this species, such as milkweeds (*Asclepias* spp.) and other late-blooming flowers or other nectar source. Although unlikely to persist within the study area, a small cluster of approximately three eucalyptus trees along Burnham Creek and a small grove of young eucalyptus trees near the intersection of Obispo Road and Alhambra Ave (outside of the Project area) may provide marginally suitable winter roosting habitat for this species.

CNDDB records for western bumble bee occur within 2.2 miles east of the study area; however, these occurrences are historical (CDFW 2023). Furthermore, the study area generally lacks key habitat elements for western bumble bee as a result of significant site modifications, such Highway 1 construction, the parking lot and skate park construction, the stormwater retention basin installation, and vegetation management practices of the open space grassland area. These site modifications essentially limit suitable food supply (flowers that produce the nectar and pollen they require), nest sites (e.g. abandoned rodent burrows and bird nests), and hibernation sites for over-wintering. This species is not expected to occur in the study area.

California red-legged frog (*Rana draytonii:* CRLF), have potential to occur in riparian habitats within the vicinity of study area. Two CNDDB occurrence records of CRLF occur within 0.5 mile of the study area in Deer Creek and another less than 0.5 mile west of the study area (CDFW 2023). While CRLFs can disperse within riverine and riparian habitats, the riparian areas associated with the hydrological features in the study area are isolated as these drainages have been disconnected from the upper catchment areas and are culverted under El Granada. Urban development, Highway 1, and other anthropomorphic disturbances and land use surround the riparian areas at the study area thereby preventing overland travel to the study area. Burnham Creek and the associated riparian habitat provide ostensibly suitable habitat for CRLF, however, this species is unlikely to occur in the study area.

One special-status reptile species may potentially occur within the vicinity of the study area. San Francisco garter snake (*Thamnophis sirtalis tetrataenia*: SFGS), have potential to occur in riparian habitats. CNDDB records for SFGS occur within 5 miles of the study area and within the Montara Mountain area (CDFW 2023). However, as described above, the aquatic and upland habitats within the study area are isolated with no continuous nor semi-continuous connection to known locations or suitable habitat areas for this species. High pedestrian use and the presence of cats in the riparian areas generally prohibits suitable or protected basking areas further reducing the likelihood that these species may occur within the study area.

Two special-status mammal species may potentially occur within the study area. Pallid bat (*Antrozous pallidus*), and Townsend's big-eared bat (*Corynorhinus townsendii*), have potential to occur near the study area. Although there are reported CNDDB occurrence records for pallid bat and Townsend's big-eared bat within 5 miles of the study area (CDFW 2023), the three eucalyptus trees along Burnham Creek may provide suitable roosting habitat (e.g., exfoliating bark, cavities, hollows, and cracks) for pallid bat and Townsend's big-eared bat. Possible bat presence should be considered near the eucalyptus trees along the riparian area of Burnham Creek.

3.4 Critical Habitat

No Critical Habitat is designated within the study area (USFWS 2023b, NMFS 2023b).

4 Summary and Conclusions

4.1 Special-Status Species

Six special-status species were found to have the potential to occur within the vicinity of the study area. However, only two species, pallid bat and Townsend's big-eared bat have reasonable potential to occur within the study area due to habitat fragmentation and isolation from urban development, Highway 1, high pedestrian usage, feral cat presence, and limited suitable habitat. Project activities could directly affect special-status bat species during construction activities.

Prior to any construction activities, a survey for special-status bats conducted by a qualified biologist is recommended to identify potential roost habitat and bat occupation in the riparian areas within study area. Should special-status bats be observed on site, consultation with CDFW may be required to determine appropriate mitigating actions that would avoid, minimize, or reduce impacts on these species.

Project development at this site may have direct and/or indirect impacts on wildlife species inhabiting habitats within the study area. A qualified biologist shall conduct a pre-construction survey for wildlife and special-status species no more than 5 days prior to ground disturbance. Surveys should focus on drainages and riparian habitat associated with Burnham Creek. Should special-status species be identified within the Project area, USFWS or CDFW may need to be consulted prior to ground disturbance, depending on the species observed.

Considerations to avoid and minimize potential impacts to nesting birds should be implemented, such as initiating Project construction activities near the riparian area outside of the nesting season (February 1 – August 31) or by conducting pre-activity surveys for active nests if construction were to occur during the nesting season.

4.2 Federal and State Waters and Wetlands

Burnham Creek and the two unnamed drainages are subject to U.S. Army Corps of Engineers (USACE) jurisdiction as a water of the U.S. and Regional Water Quality Control Board (RWQCB) jurisdiction as a water of the state. GCSD Burnham Proposed Parks plans include altering the unnamed drainages features in the central portion of the study area. Project activities affecting the unnamed drainages would require a Clean Water Act (CWA) Section 404 Permit from USACE and a CWA Section 401 Water Quality Certification from RWQCB depending on the nature of the specific impact within jurisdictional areas.

CDFW regulates activities that may: divert or obstruct the natural flow of any river, stream, or lake; change the bed, channel, or bank of any river, stream, or lake; use material from any river, stream, or lake; or deposit or dispose of material into any river, stream, or lake within streambanks and other waters of the state under California Fish and Game Code Section 1600. Additionally, CDFW regulates the removal of riparian habitat associated with such waters of the state. Project activities affecting Burnham Creek and unnamed drainages are anticipated to require a Lake or Streambed Alteration Agreement from CDFW.

4.3 San Mateo County Local Coastal Program Policies

All development within the Coastal Zone of San Mateo County requires either a Coastal Development Permit or an exemption from Coastal Development Permit requirements. For a permit to be issued, the development must comply with the policies of the Local Coastal Program (LCP) and those ordinances adopted to implement the LCP. The LCP permitting policies within Sensitive Habitat Component requires that projects to not adversely impact riparian habitat, sensitive habitats, rare and endangered species or their associated habitat, or to restore damaged habitats within the project area and to protect and encourage the survival of rare and endangered species.

The Burnham Creek riparian area and unnamed drainage channels are considered sensitive habitats under the LCP. Project work within the Burnham Creek riparian area and unnamed drainage channels would require authorization under the LCP.

5 References

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

California Department of Fish and Wildlife (CDFW). 2023. California Natural Diversity Database. RareFind 5. Available at: www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data. Accessed April 20, 2023.

CDFW. See California Department of Fish and Wildlife.

Cornell Lab of Ornithology. 2023. eBird Species Database. Available at: ebird.org/map. Accessed April 20, 2023.

Google Earth. 2023. Aerial Photography. Google Earth Pro, Version 7.3.4.8248. El Granada, California.

Kituchi + Kankel Design Group. 2022. Master Plan Burnham Park.

National Marine Fisheries Service (NMFS). 2023a. California Species List. National Oceanic and Atmospheric Administration, U.S. Department of Commerce. Available at: www.westcoast.fisheries.noaa.gov/maps_data/california_species_list_tools.html. Accessed April 20, 2023.

National Marine Fisheries Service (NMFS). 2023b. National ESA Critical Habitat Mapper. Available at: www.fisheries.noaa.gov/resource/map/national-esa-critical-habitat-mapper. Accessed April 20, 2023.

Natural Resources Conservation Service (NRCS). 2019. National Hydric Soils List. Available at: www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/. Accessed April 20, 2023

Natural Resources Conservation Service (NRCS). 2023a. Climate Analysis for Wetlands by County (WETS). Available at: agacis.rcc-acis.org/?fips=06081. Accessed April 20, 2023.

Natural Resources Conservation Service (NRCS). 2023b. Web Soil Survey. Available at: websoilsurvey.nrcs.usda.gov/app/HomePage.htm. Accessed April 20, 2023.

NMFS. See National Marine Fisheries Service.

NRCS. See Natural Resources Conservation Service.

San Mateo County Resources District. 2017. Natural Resources Management Plan Granada Community Services District Burnham Strip Property: Burnham Strip Natural Resource Management Plan.

San Mateo County Resources District. 2022. Natural Resources Information for Burnham Strip Park Email.

San Mateo County Resources District. 2021. Wetland Determination and Initial Delineation Memo.

U.S. Fish and Wildlife Service (USFWS). 2023a. Information for Planning and Conservation List of Federally Endangered and Threatened Species. Available at: ecos.fws.gov/ipac/. Accessed July 26, 2022.

U.S. Fish and Wildlife Service (USFWS). 2023b. Critical Habitat Data. Available at: www.fws.gov/sacramento/es/Critical-Habitat/Data/. Accessed April 20, 2023.

U.S. Fish and Wildlife Service (USFWS). 2023c. National Wetland Inventory. Available at: www.fws.gov/wetlands/. Accessed April 20, 2023.

USFWS. See U.S. Fish and Wildlife Service.

USGS. See U.S. Geological Survey.

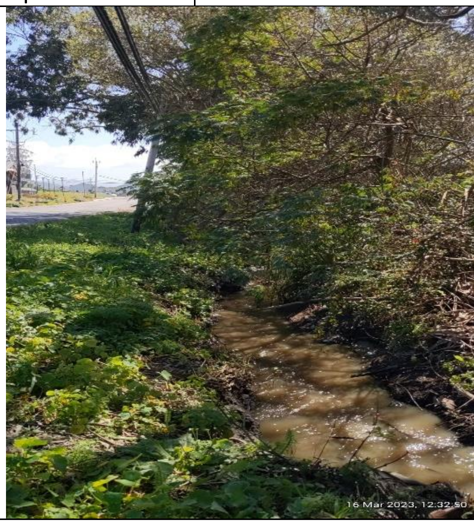
U.S. Geological Survey. 2015. Quadrangle for Montara Mountain, CA. 7.5-Minute Series, 1:24000-scale. Available at: ngmdb.usgs.gov/topoview/viewer/. Accessed April 20, 2023.

Western Monarch Count Resource Center. 2023. Find an Overwintering Site Near You. Available at: www.westernmonarchcount.org/find-an-overwintering-site-near-you/. Accessed April 20, 2023

Appendix A
Site Photographs

Appendix A. Site Photographs

Photo No. 1	Feature:	Photo No. 2	Feature:
Aspect (facing): Southeast, adjacent to Obispo Road	Burnham Creek	**Aspect (facing):** Northeast, adjacent to Obispo Road	Burnham Creek



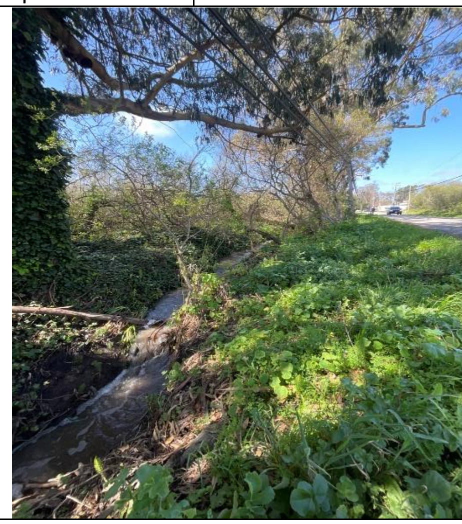


Photo No. 1	Photo No. 2
Downstream view of Burnham Creek adjacent to Obispo Rd (March 2023)	Upstream view of Burnham Creek adjacent to Obispo Rd (March 2023)

Photo No. 3	Feature:	Photo No. 4	Feature:
Aspect (facing): South	Unnamed drainage # 2	**Aspect (facing):** North	Unnamed drainage # 2

Photo No. 3	Photo No. 4
Downstream view of unnamed drainage near Ave Portola and arroyo willow thicket (March 2023)	Upstream view of unnamed drainage near Highway 1 (March 2023)

Appendix A. Site Photographs

Photo No. 5	**Feature:** Unnamed drainage # 1	**Photo No.** 6	**Feature:** Unnamed drainage # 1
Aspect (facing): North		**Aspect (facing):** South	

Upstream view of unnamed ephemeral drainage from Highway 1 (March 2023)

Downstream view of Unnamed drainage # 1 from Obispo Rd (March 2023)

Photo No. 7	**Feature:** Open field	**Photo No.** 8	**Feature:** Open field at near the pre-school
Aspect (facing): Southeast		**Aspect (facing):** South	

Looking southeast across the study area and grassland open space (March 2023)

Looking south across the study area with Highway 1 in the background (March 2023)

Appendix B
USFWS and CNDDB Species Lists

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Woodside (3712243) OR Half Moon Bay (3712244) OR Montara Mountain (3712254) OR San Francisco South (3712264) OR San Mateo (3712253) OR Hunters Point (3712263))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Acanthomintha duttonii San Mateo thorn-mint	PDLAM01040	Endangered	Endangered	G1	S1	1B.1
Acipenser medirostris pop. 1 green sturgeon - southern DPS	AFCAA01031	Threatened	None	G2T1	S1	
Adela oplerella Opler's longhorn moth	IILEE0G040	None	None	G2	S2	
Agrostis blasdalei Blasdale's bent grass	PMPOA04060	None	None	G2G3	S2	1B.2
Allium peninsulare var. franciscanum Franciscan onion	PMLIL021R1	None	None	G5T2	S2	1B.2
Ambystoma californiense pop. 1 California tiger salamander - central California DPS	AAAAA01181	Threatened	Threatened	G2G3T3	S3	WL
Amsinckia lunaris bent-flowered fiddleneck	PDBOR01070	None	None	G3	S3	1B.2
Aneides niger Santa Cruz black salamander	AAAAD01070	None	None	G3	S3	SSC
Antrozous pallidus pallid bat	AMACC10010	None	None	G4	S3	SSC
Arctostaphylos andersonii Anderson's manzanita	PDERI04030	None	None	G2	S2	1B.2
Arctostaphylos franciscana Franciscan manzanita	PDERI040J3	Endangered	None	GHC	S1	1B.1
Arctostaphylos imbricata San Bruno Mountain manzanita	PDERI040L0	None	Endangered	G1	S1	1B.1
Arctostaphylos montana ssp. ravenii Presidio manzanita	PDERI040J2	Endangered	Endangered	G3T1	S1	1B.1
Arctostaphylos montaraensis Montara manzanita	PDERI042W0	None	None	G1	S1	1B.2
Arctostaphylos pacifica Pacific manzanita	PDERI040Z0	None	Endangered	G1	S1	1B.1
Arctostaphylos regismontana Kings Mountain manzanita	PDERI041C0	None	None	G2	S2	1B.2
Astragalus pycnostachyus var. pycnostachyus coastal marsh milk-vetch	PDFAB0F7B2	None	None	G2T2	S2	1B.2
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T1	S1	1B.2
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Banksula incredula incredible harvestman	ILARA14100	None	None	G1	S1	
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G2G3	S1S2	
Bombus occidentalis western bumble bee	IIHYM24252	None	Candidate Endangered	G3	S1	
Brachyramphus marmoratus marbled murrelet	ABNNN06010	Threatened	Endangered	G3	S2	
Caecidotea tomalensis Tomales isopod	ICMAL01220	None	None	G2	S2S3	
Calicina minor Edgewood blind harvestman	ILARA13020	None	None	G1	S1	
Callophrys mossii bayensis San Bruno elfin butterfly	IILEPE2202	Endangered	None	G4T1	S2	
Carex comosa bristly sedge	PMCYP032Y0	None	None	G5	S2	2B.1
Centromadia parryi ssp. parryi pappose tarplant	PDAST4R0P2	None	None	G3T2	S2	1B.2
Charadrius nivosus nivosus western snowy plover	ABNNB03031	Threatened	None	G3T3	S3	SSC
Chloropyron maritimum ssp. palustre Point Reyes salty bird's-beak	PDSCR0J0C3	None	None	G4?T2	S2	1B.2
Chorizanthe cuspidata var. cuspidata San Francisco Bay spineflower	PDPGN04081	None	None	G2T1	S1	1B.2
Chorizanthe robusta var. robusta robust spineflower	PDPGN040Q2	Endangered	None	G2T1	S1	1B.1
Cicindela hirticollis gravida sandy beach tiger beetle	IICOL02101	None	None	G5T2	S2	
Cirsium andrewsii Franciscan thistle	PDAST2E050	None	None	G3	S3	1B.2
Cirsium fontinale var. fontinale fountain thistle	PDAST2E161	Endangered	Endangered	G2T1	S1	1B.1
Cirsium occidentale var. compactum compact cobwebby thistle	PDAST2E1Z1	None	None	G3G4T2	S2	1B.2
Collinsia corymbosa round-headed collinsia	PDSCR0H060	None	None	G1	S1	1B.2
Collinsia multicolor San Francisco collinsia	PDSCR0H0B0	None	None	G2	S2	1B.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G4	S2	SSC
Danaus plexippus plexippus pop. 1 monarch - California overwintering population	IILEPP2012	Candidate	None	G4T1T2Q	S2	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Dicamptodon ensatus California giant salamander	AAAAH01020	None	None	G2G3	S2S3	SSC
Dipodomys venustus venustus Santa Cruz kangaroo rat	AMAFD03042	None	None	G4T1	S1	
Dirca occidentalis western leatherwood	PDTHY03010	None	None	G2	S2	1B.2
Dufourea stagei Stage's dufourine bee	IIHYM22010	None	None	G1G2	S1	
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Eriophyllum latilobum San Mateo woolly sunflower	PDAST3N060	Endangered	Endangered	G1	S1	1B.1
Eucyclogobius newberryi tidewater goby	AFCQN04010	Endangered	None	G3	S3	
Eumetopias jubatus Steller sea lion	AMAJC03010	Delisted	None	G3	S2	
Euphydryas editha bayensis Bay checkerspot butterfly	IILEPK4055	Threatened	None	G5T1	S3	
Falco columbarius merlin	ABNKD06030	None	None	G5	S3S4	WL
Falco peregrinus anatum American peregrine falcon	ABNKD06071	Delisted	Delisted	G4T4	S3S4	FP
Fritillaria biflora var. ineziana Hillsborough chocolate lily	PMLIL0V0M1	None	None	G3G4T1	S1	1B.1
Fritillaria liliacea fragrant fritillary	PMLIL0V0C0	None	None	G2	S2	1B.2
Geothlypis trichas sinuosa saltmarsh common yellowthroat	ABPBX1201A	None	None	G5T3	S3	SSC
Gilia capitata ssp. chamissonis blue coast gilia	PDPLM040B3	None	None	G5T2	S2	1B.1
Gilia millefoliata dark-eyed gilia	PDPLM04130	None	None	G2	S2	1B.2
Grindelia hirsutula var. maritima San Francisco gumplant	PDAST470D3	None	None	G5T1Q	S1	3.2
Helianthella castanea Diablo helianthella	PDAST4M020	None	None	G2	S2	1B.2
Hemizonia congesta ssp. congesta congested-headed hayfield tarplant	PDAST4R065	None	None	G5T2	S2	1B.2
Hesperevax sparsiflora var. brevifolia short-leaved evax	PDASTE5011	None	None	G4T3	S3	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Hesperolinon congestum Marin western flax	PDLIN01060	Threatened	Threatened	G1	S1	1B.1
Heteranthera dubia water star-grass	PMPON03010	None	None	G5	S2	2B.2
Horkelia cuneata var. sericea Kellogg's horkelia	PDROS0W043	None	None	G4T1?	S1?	1B.1
Horkelia marinensis Point Reyes horkelia	PDROS0W0B0	None	None	G2	S2	1B.2
Hydrochara rickseckeri Ricksecker's water scavenger beetle	IICOL5V010	None	None	G2?	S2?	
Hydroporus leechi Leech's skyline diving beetle	IICOL55040	None	None	G1?	S2S3	
Hypogymnia schizidiata island tube lichen	NLT0032640	None	None	G2G3	S2	1B.3
Icaricia icarioides missionensis Mission blue butterfly	IILEPG801A	Endangered	None	G5T1	S2	
Icaricia icarioides pheres Pheres blue butterfly	IILEPG8019	None	None	G5TX	SX	
Ischnura gemina San Francisco forktail damselfly	IIODO72010	None	None	G2	S2	
Lasiurus cinereus hoary bat	AMACC05032	None	None	G3G4	S4	
Lasthenia californica ssp. macrantha perennial goldfields	PDAST5L0C5	None	None	G3T2	S2	1B.2
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G3T1	S1	FP
Layia carnosa beach layia	PDAST5N010	Threatened	Endangered	G2	S2	1B.1
Leptosiphon croceus coast yellow leptosiphon	PDPLM09170	None	Endangered	G1	S1	1B.1
Leptosiphon rosaceus rose leptosiphon	PDPLM09180	None	None	G1	S1	1B.1
Lessingia arachnoidea Crystal Springs lessingia	PDAST5S0C0	None	None	G2	S2	1B.2
Lessingia germanorum San Francisco lessingia	PDAST5S010	Endangered	Endangered	G1	S1	1B.1
Lichnanthe ursina bumblebee scarab beetle	IICOL67020	None	None	G2	S2	
Limnanthes douglasii ssp. ornduffii Ornduff's meadowfoam	PDLIM02039	None	None	G4T1	S1	1B.1
Malacothamnus arcuatus arcuate bush-mallow	PDMAL0Q0E0	None	None	G2Q	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Melospiza melodia pusillula Alameda song sparrow	ABPBXA301S	None	None	G5T2T3	S2S3	SSC
Microcina edgewoodensis Edgewood Park micro-blind harvestman	ILARA47010	None	None	G1	S1	
Monardella sinuata ssp. nigrescens northern curly-leaved monardella	PDLAM18162	None	None	G3T2	S2	1B.2
Monolopia gracilens woodland woollythreads	PDAST6G010	None	None	G3	S3	1B.2
Mylopharodon conocephalus hardhead	AFCJB25010	None	None	G3	S3	SSC
Myotis thysanodes fringed myotis	AMACC01090	None	None	G4	S3	
Nannopterum auritum double-crested cormorant	ABNFD01020	None	None	G5	S4	WL
Neotoma fuscipes annectens San Francisco dusky-footed woodrat	AMAFF08082	None	None	G5T2T3	S2S3	SSC
Northern Coastal Salt Marsh Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
Northern Maritime Chaparral Northern Maritime Chaparral	CTT37C10CA	None	None	G1	S1.2	
Nyctinomops macrotis big free-tailed bat	AMACD04020	None	None	G5	S3	SSC
Oncorhynchus mykiss irideus pop. 8 steelhead - central California coast DPS	AFCHA0209G	Threatened	None	G5T2T3Q	S3	
Pentachaeta bellidiflora white-rayed pentachaeta	PDAST6X030	Endangered	Endangered	G1	S1	1B.1
Plagiobothrys chorisianus var. chorisianus Choris' popcornflower	PDBOR0V061	None	None	G3T1Q	S1	1B.2
Polemonium carneum Oregon polemonium	PDPLM0E050	None	None	G3G4	S2	2B.2
Polygonum marinense Marin knotweed	PDPGN0L1C0	None	None	G2Q	S2	3.1
Pomatiopsis californica Pacific walker	IMGASJ9020	None	None	G1	S1	
Potentilla hickmanii Hickman's cinquefoil	PDROS1B370	Endangered	Endangered	G1	S1	1B.1
Rallus obsoletus obsoletus California Ridgway's rail	ABNME05011	Endangered	Endangered	G3T1	S1	FP
Rana boylii pop. 4 foothill yellow-legged frog - central coast DPS	AAABH01054	Proposed Threatened	Endangered	G3T2	S2	
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Reithrodontomys raviventris salt-marsh harvest mouse	AMAFF02040	Endangered	Endangered	G1G2	S1S2	FP
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2	
Sanicula maritima adobe sanicle	PDAPI1Z0D0	None	Rare	G2	S2	1B.1
Senecio aphanactis chaparral ragwort	PDAST8H060	None	None	G3	S2	2B.2
Serpentine Bunchgrass Serpentine Bunchgrass	CTT42130CA	None	None	G2	S2.2	
Silene scouleri ssp. scouleri Scouler's catchfly	PDCAR0U1MC	None	None	G5T4T5	S2S3	2B.2
Silene verecunda ssp. verecunda San Francisco campion	PDCAR0U213	None	None	G5T1	S1	1B.2
Speyeria callippe callippe callippe silverspot butterfly	IILEPJ6091	Endangered	None	G5T1	S1	
Speyeria zerene myrtleae Myrtle's silverspot butterfly	IILEPJ608C	Endangered	None	G5T1	S1	
Spirinchus thaleichthys longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	
Suaeda californica California seablite	PDCHE0P020	Endangered	None	G1	S1	1B.1
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Thamnophis sirtalis tetrataenia San Francisco gartersnake	ARADB3613B	Endangered	Endangered	G5T2Q	S2	FP
Trachusa gummifera San Francisco Bay Area leaf-cutter bee	IIHYM80010	None	None	G1	S1	
Trifolium amoenum two-fork clover	PDFAB40040	Endangered	None	G1	S1	1B.1
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2
Triphysaria floribunda San Francisco owl's-clover	PDSCR2T010	None	None	G2?	S2?	1B.2
Triquetrella californica coastal triquetrella	NBMUS7S010	None	None	G2	S2	1B.2
Tryonia imitator mimic tryonia (=California brackishwater snail)	IMGASJ7040	None	None	G2	S2	
Usnea longissima Methuselah's beard lichen	NLLEC5P420	None	None	G4	S4	4.2
Valley Needlegrass Grassland Valley Needlegrass Grassland	CTT42110CA	None	None	G3	S3.1	

Record Count: 124

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 Mateo County, California

Local office

Sacramento Fish And Wildlife Office

(916) 414-6600
(916) 414-6713

Federal Building

2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

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

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Salt Marsh Harvest Mouse Reithrodontomys raviventris Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/613	Endangered

Birds

NAME	STATUS
California Clapper Rail Rallus longirostris obsoletus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4240	Endangered
California Least Tern Sterna antillarum browni Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8104	Endangered
Marbled Murrelet Brachyramphus marmoratus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/4467	Threatened
Western Snowy Plover Charadrius nivosus nivosus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/8035	Threatened

Reptiles

NAME	STATUS
Green Sea Turtle Chelonia mydas No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6199	Threatened

San Francisco Garter Snake Thamnophis sirtalis tetrataenia Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5956	Endangered

Amphibians

NAME	STATUS
California Red-legged Frog Rana draytonii Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/2891	Threatened
Foothill Yellow-legged Frog Rana boylii No critical habitat has been designated for this species.	Proposed Threatened

Fishes

NAME	STATUS
Tidewater Goby Eucyclogobius newberryi Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/57	Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Hickman's Potentilla Potentilla hickmanii Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6343	Endangered

San Mateo Woolly Sunflower Eriophyllum latilobum — Endangered
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/7791

White-rayed Pentachaeta Pentachaeta bellidiflora — Endangered
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/7782

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.

Migratory birds

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

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

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

NAME	BREEDING SEASON
Allen's Hummingbird Selasphorus sasin This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9637	Breeds Feb 1 to Jul 15
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jan 1 to Aug 31
Belding's Savannah Sparrow Passerculus sandwichensis beldingi This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8	Breeds Apr 1 to Aug 15
Black Oystercatcher Haematopus bachmani This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9591	Breeds Apr 15 to Oct 31

Black Skimmer Rynchops niger — Breeds May 20 to Sep 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5234

Black Swift Cypseloides niger — Breeds Jun 15 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8878

Black Turnstone Arenaria melanocephala — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

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.

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

Marbled Godwit Limosa fedoa This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds elsewhere
Nuttall's Woodpecker Picoides nuttallii 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	Breeds Apr 1 to Jul 20
Olive-sided Flycatcher Contopus cooperi This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Scripps's Murrelet Synthliboramphus scrippsi This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Feb 20 to Jul 31
Short-billed Dowitcher Limnodromus griseus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Tricolored Blackbird Agelaius tricolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3910	Breeds Mar 15 to Aug 10
Western Grebe aechmophorus occidentalis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/6743	Breeds Jun 1 to Aug 31
Willet Tringa semipalmata This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Wrentit Chamaea fasciata This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 10

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

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

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

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

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

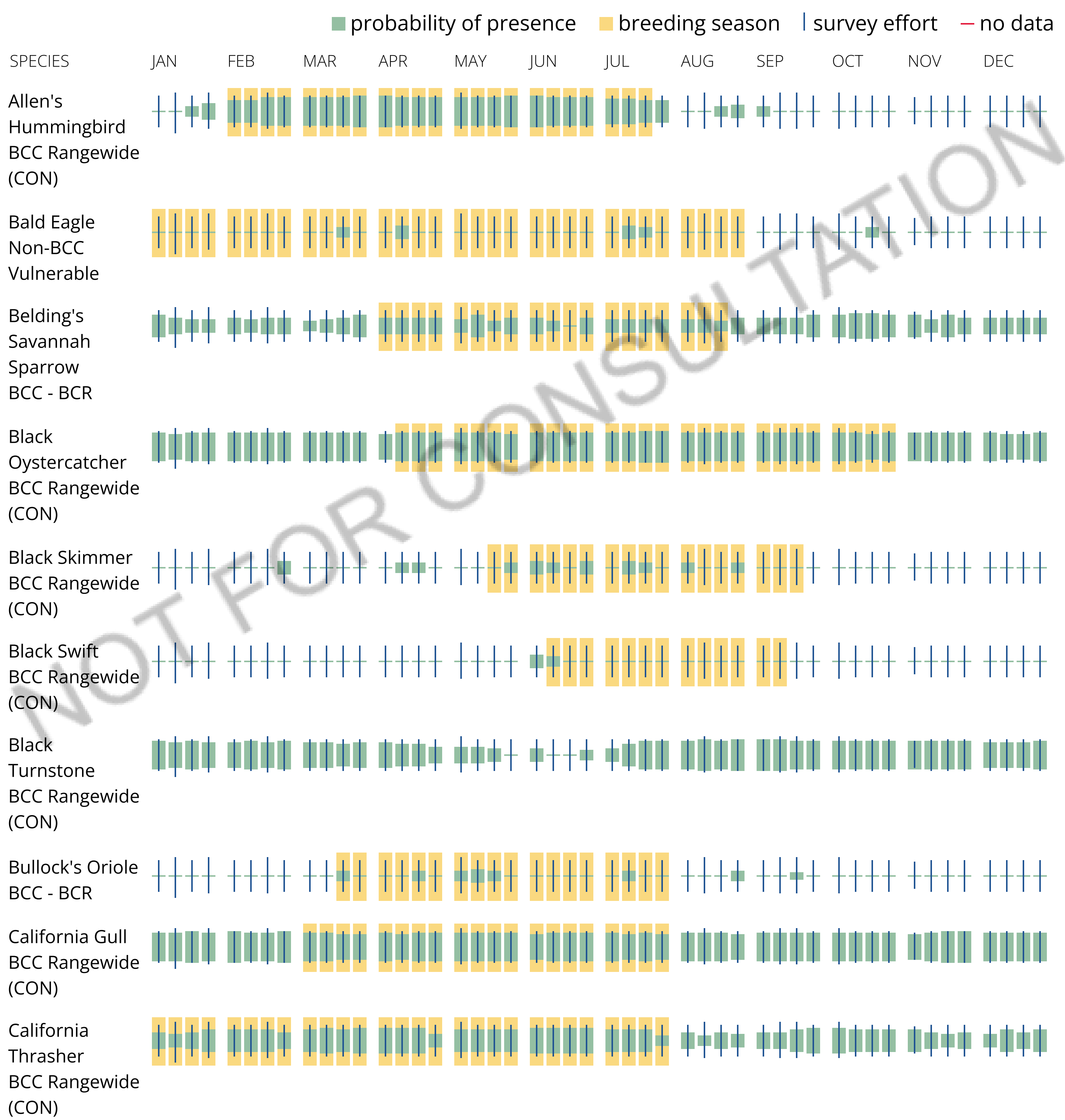
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Clark's Grebe
BCC Rangewide
(CON)

Common
Yellowthroat
BCC - BCR

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

Golden Eagle
Non-BCC
Vulnerable

Marbled
Godwit
BCC Rangewide
(CON)

Nuttall's
Woodpecker
BCC - BCR

Olive-sided
Flycatcher
BCC Rangewide
(CON)

Scripps's
Murrelet
BCC Rangewide
(CON)

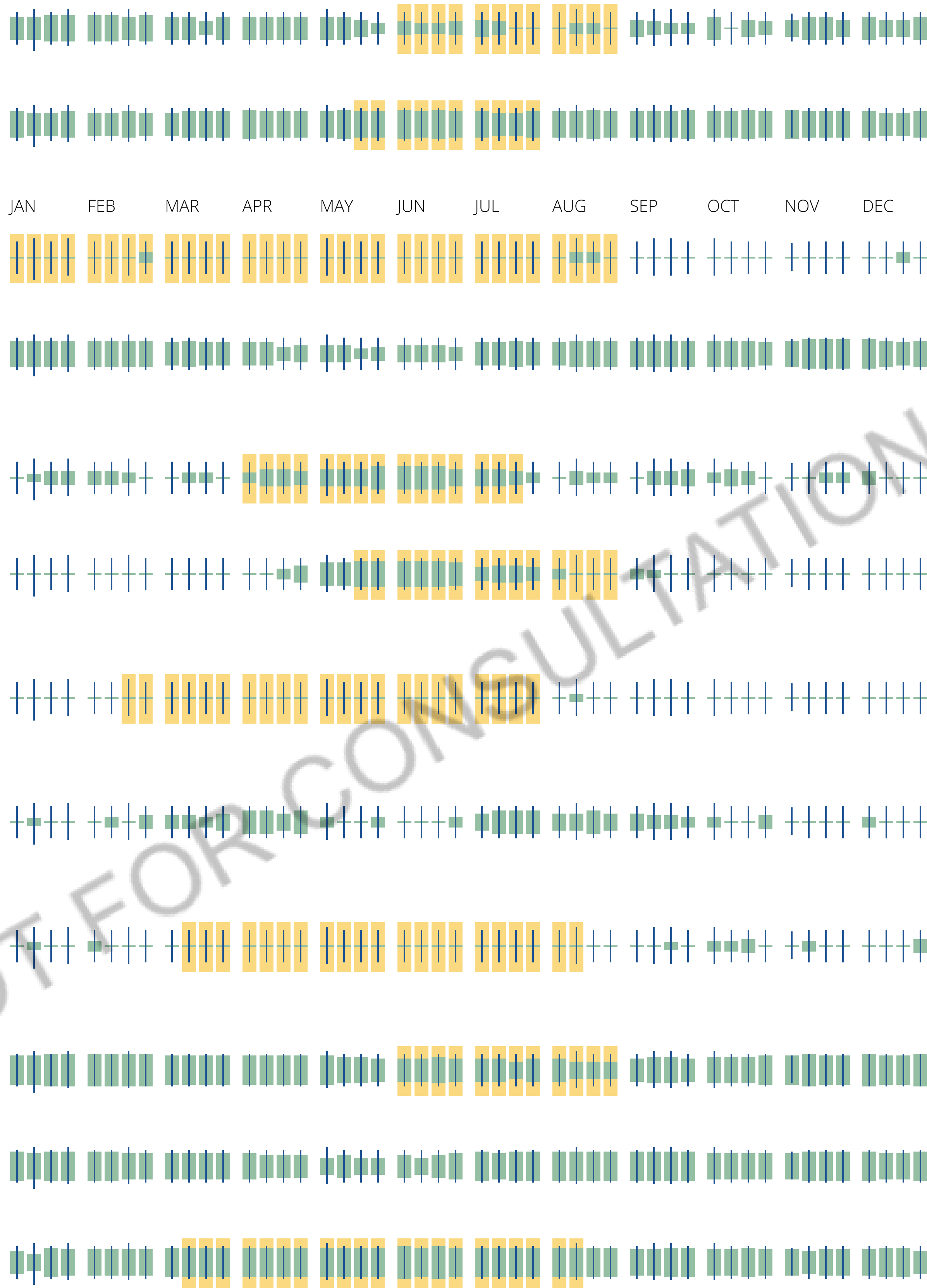
Short-billed
Dowitcher
BCC Rangewide
(CON)

Tricolored
Blackbird
BCC Rangewide
(CON)

Western Grebe
BCC Rangewide
(CON)

Willet
BCC Rangewide
(CON)

Wrentit
BCC Rangewide
(CON)



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

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin

Islands);

2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Appendix C
Special-status Species Tables

Appendix C

The potential for each species to occur in the Project Area was assessed using the criteria outlined below.

> **None:** the area contains a complete lack of suitable habitat, the local range for the species is restricted, and/or the species is extirpated in this region.
>
> **Not Expected**: suitable habitat or key habitat elements might be present but might be of poor quality or isolated from the nearest extant occurrences, and/or the species is not known to occur in the area.
>
> **Possible**: presence of suitable habitat or key habitat elements that potentially support the species.
>
> **Present**: the species was either observed directly or its presence was confirmed by field investigations or in previous studies in the area.

Table 1. Special Status Plants

Name	Listing status* (Federal/ State/CNPS)	Habitat and Flowering Period	Potential to Occur in the Project
Acanthomintha duttonii San Mateo thorn-mint	FE / SE / 1B.1	Chaparral, valley and foothill grassland. Uncommon serpentinite vertisol clays; in relatively open areas. 50-185 m.	**None.** Suitable habitat is not present in the Project.
Agrostis blasdalei Blasdale's bent grass	- / - / 1B.2	Coastal dunes, coastal bluff scrub, coastal prairie. Sandy or gravelly soil close to rocks; often in nutrient-poor soil with sparse vegetation. 5-365 m.	**None.** Suitable habitat is not present in the Project.
Allium peninsulare var. franciscanum Franciscan onion	- / - / 1B.2	Cismontane woodland, valley and foothill grassland. Clay soils; often on serpentine; sometimes on volcanics. Dry hillsides. 5-320 m.	**None.** Suitable habitat is not present in the Project.
Amsinckia lunaris bent-flowered fiddleneck	- / - / 1B.2	Cismontane woodland, valley and foothill grassland, coastal bluff scrub. 3-795 m.	**None.** Suitable habitat is not present in the Project.
Arctostaphylos andersonii Anderson's manzanita	- / - / 1B.2	Broadleafed upland forest, chaparral, north coast coniferous forest. Open sites, redwood forest. 95-765 m.	**None.** Suitable habitat is not present in the Project.
Arctostaphylos franciscana Franciscan manzanita	FE / - / 1B.1	Chaparral. Serpentine outcrops in chaparral. 30-215 m.	**None.** Suitable habitat is not present in the Project.
Arctostaphylos imbricata San Bruno Mountain manzanita	- / SE / 1B.1	Chaparral, coastal scrub. Mostly known from a few sandstone outcrops in chaparral. 275-305 m.	**None.** The Project is not within the elevation range for this species.
Arctostaphylos montana ssp. *ravenii* Presidio manzanita	FE / SE / 1B.1	Chaparral, coastal prairie, coastal scrub. Open, rocky serpentine slopes. 20-215 m.	**None.** Suitable habitat is not present in the Project.
Arctostaphylos montaraensis Montara manzanita	- / - / 1B.2	Chaparral, coastal scrub. Slopes and ridges. 270-460 m.	**None.** Suitable habitat is not present in the Project.
Arctostaphylos pacifica Pacific manzanita	- / SE / 1B.1	Coastal scrub, chaparral. 320 m.	**None.** Suitable habitat is not present in the Project.
Arctostaphylos regismontana Kings Mountain manzanita	- / - / 1B.2	Broadleafed upland forest, chaparral, north coast coniferous forest. Granitic or sandstone outcrops. 240-705 m.	**None.** Suitable habitat is not present in the Project.
Astragalus pycnostachyus var. *pycnostachyus* coastal marsh milk-vetch	- / - / 1B.2	Coastal dunes, marshes and swamps, coastal scrub. Mesic sites in dunes or along streams or coastal salt marshes. 0-155 m.	**Not expected.** Marginally suitable habitat is present in the Project. Closest CNDDB record is located 1 mile to the west.

Name	Listing status* (Federal/ State/CNPS)	Habitat and Flowering Period	Potential to Occur in the Project
Astragalus tener var. *tener* alkali milk-vetch	- / - / 1B.2	Alkali playa, valley and foothill grassland, vernal pools. Low ground, alkali flats, and flooded lands; in annual grassland or in playas or vernal pools. 0-170 m.	**None.** Suitable habitat is not present in the Project.
Centromadia parryi ssp. *parryi* pappose tarplant	- / - / 1B.2	Chaparral, coastal prairie, meadows and seeps, coastal salt marsh, valley and foothill grassland. Vernally mesic, often alkaline sites. 1-500 m.	**None.** Suitable habitat is not present in the Project.
Chloropyron maritimum ssp. *palustre* Point Reyes salty bird's-beak	- / - / 1B.2	Coastal salt marsh. Usually in coastal salt marsh with *Salicornia, Distichlis, Jaumea, Spartina*, etc. 0-115 m.	**None.** Suitable habitat is not present in the Project.
Chorizanthe cuspidata var. *cuspidata* San Francisco Bay spineflower	- / - / 1B.2	Coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub. Closely related to *C. pungens*. Sandy soil on terraces and slopes. 2-550 m.	**None.** Suitable habitat is not present in the Project.
Chorizanthe robusta var. *robusta* robust spineflower	FE / - / 1B.1	Cismontane woodland, coastal dunes, coastal scrub, chaparral. Sandy terraces and bluffs or in loose sand. 5-245 m.	**None.** Suitable habitat is not present in the Project.
Cirsium andrewsii Franciscan thistle	- / - / 1B.2	Coastal bluff scrub, broadleafed upland forest, coastal scrub, coastal prairie. Sometimes serpentine seeps. 0-295 m.	**None.** Suitable habitat is not present in the Project.
Cirsium fontinale var. *fontinale* fountain thistle	FE / SE / 1B.1	Valley and foothill grassland, chaparral, cismontane woodland, meadows and seeps. Serpentine seeps and grassland. 45-185 m.	**None.** Suitable habitat is not present in the Project.
Cirsium occidentale var. *compactum* compact cobwebby thistle	- / - / 1B.2	Chaparral, coastal dunes, coastal prairie, coastal scrub. On dunes and on clay in chaparral; also in grassland. 5-245 m.	**None.** Suitable habitat is not present in the Project.
Cirsium praeteriens lost thistle	- / - / 1A	Little information exists on this plant; it was collected from the Palo Alto area at the turn of the 20th Century. Although not seen since 1901, this Cirsium is thought to be quite distinct from other *Cirsiums* acc. to D. Keil. 0-100 m.	**None.** Suitable habitat is not present in the Project.
Collinsia corymbosa round-headed Chinese-houses	- / - / 1B.2	Coastal dunes. 0-30 m.	**None.** Suitable habitat is not present in the Project.
Collinsia multicolor San Francisco collinsia	- / - / 1B.2	Closed-cone coniferous forest, coastal scrub. On decomposed shale (mudstone) mixed with humus; sometimes on serpentine. 10-275 m.	**None.** Suitable habitat is not present in the Project.

Name	Listing status* (Federal/ State/CNPS)	Habitat and Flowering Period	Potential to Occur in the Project
Dirca occidentalis western leatherwood	- / - / 1B.2	Broadleafed upland forest, chaparral, closed-cone coniferous forest, cismontane woodland, north coast coniferous forest, riparian forest, riparian woodland. On brushy slopes, mesic sites; mostly in mixed evergreen and foothill woodland communities. 20-640 m.	**None.** Suitable habitat is not present in the Project.
Eriophyllum latilobum San Mateo woolly sunflower	FE / SE / 1B.1	Cismontane woodland, coastal scrub, lower montane coniferous forest. Often on roadcuts; found on and off of serpentine. 30-610 m.	**None.** Suitable habitat is not present in the Project.
Fritillaria biflora var. *ineziana* Hillsborough chocolate lily	- / - / 1B.1	Cismontane woodland, valley and foothill grassland. Probably only on serpentine; most recent site is in serpentine grassland. 90-170 m.	**None.** Suitable habitat is not present in the Project.
Fritillaria lanceolata var. tristulis Marin checker lily	- / - / 1B.1	Coastal bluff scrub, coastal scrub, coastal prairie. Occurrences reported from canyons and riparian areas as well as rock outcrops; often on serpentine. 30-300m.	**None.** Suitable habitat is not present in the Project.
Fritillaria liliacea fragrant fritillary	- / - / 1B.2	Coastal scrub, valley and foothill grassland, coastal prairie, cismontane woodland. Often on serpentine; various soils reported though usually on clay, in grassland. 3-385 m.	**None.** Suitable habitat is not present in the Project.
Gilia capitata ssp. *chamissonis* blue coast gilia	- / - / 1B.1	Coastal dunes, coastal scrub. 3-200 m.	**None.** Suitable habitat is not present in the Project.
Gilia millefoliata dark-eyed gilia	- / - / 1B.2	Coastal dunes. 1-60 m.	**None.** Suitable habitat is not present in the Project.
Helianthella castanea Diablo helianthella	- / - / 1B.2	Broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland. Usually in chaparral/oak woodland interface in rocky, azonal soils. Often in partial shade. 45-1070 m.	**None.** Suitable habitat is not present in the Project.
Hemizonia congesta ssp. *congesta* congested-headed hayfield tarplant	- / - / 1B.2	Valley and foothill grassland. Grassy valleys and hills, often in fallow fields; sometimes along roadsides. 5-520 m.	**None.** Suitable habitat is not present in the Project.
Hesperevax sparsiflora var. *brevifolia* short-leaved evax	- / - / 1B.2	Coastal bluff scrub, coastal dunes, coastal prairie. Sandy bluffs and flats. 0-640 m.	**None.** Suitable habitat is not present in the Project.
Hesperolinon congestum Marin western flax	FT / ST / 1B.1	Chaparral, valley and foothill grassland. In serpentine barrens and in serpentine grassland and chaparral. 60-400 m.	**None.** Suitable habitat is not present in the Project.

Name	Listing status* (Federal/ State/CNPS)	Habitat and Flowering Period	Potential to Occur in the Project
Heteranthera dubia water star-grass	- / - / 2B.2	Marshes and swamps. Alkaline, still or slow-moving water. Requires a pH of 7 or higher, usually in slightly eutrophic waters. 15-1510 m.	**None.** Suitable habitat is not present in the Project.
Horkelia cuneata var. *sericea* Kellogg's horkelia	- / - / 1B.1	Closed-cone coniferous forest, coastal scrub, coastal dunes, chaparral. Old dunes, coastal sandhills; openings. Sandy or gravelly soils. 5-430 m.	**None.** Suitable habitat is not present in the Project. Closest CNDDB record is located 3.4 miles to the east.
Horkelia marinensis Point Reyes horkelia	- / - / 1B.2	Coastal dunes, coastal prairie, coastal scrub. Sandy flats and dunes near coast; in grassland or scrub plant communities. 2-775 m.	**None.** Suitable habitat is not present in the Project.
Hypogymnia schizidiata island tube lichen	- / - / 1B.3	Chaparral, closed-cone coniferous forest. On bark and wood of hardwoods and conifers. 255-545 m.	**None.** Suitable habitat is not present in the Project.
Lasthenia californica ssp. *macrantha* perennial goldfields	- / - / 1B.2	Coastal bluff scrub, coastal dunes, coastal scrub. 5-185 m.	**None.** Suitable habitat is not present in the Project.
Layia carnosa beach layia	FE / SE / 1B.1	Coastal dunes, coastal scrub. On sparsely vegetated, semi-stabilized dunes, usually behind foredunes. 3-30 m.	**None.** Suitable habitat is not present in the Project.
Leptosiphon croceus coast yellow leptosiphon	- / SE / 1B.1	Coastal bluff scrub, coastal prairie. 10-150 m.	**None.** Suitable habitat is not present in the Project.
Leptosiphon rosaceus rose leptosiphon	- / - / 1B.1	Coastal bluff scrub. 10-140 m.	**None.** Suitable habitat is not present in the Project.
Lessingia arachnoidea Crystal Springs lessingia	- / - / 1B.2	Coastal sage scrub, valley and foothill grassland, cismontane woodland. Grassy slopes on serpentine; sometimes on roadsides. 90-200 m.	**None.** Suitable habitat is not present in the Project.
Lessingia germanorum San Francisco lessingia	FE / SE / 1B.1	Coastal scrub. On remnant dunes. Open sandy soils relatively free of competing plants. 3-155 m.	**None.** Suitable habitat is not present in the Project.
Limnanthes douglasii ssp. *ornduffii* Ornduff's meadowfoam	- / - / 1B.1	Meadows and seeps, agricultural fields. 5-15 m.	**Not expected.** Marginally suitable habitat is present in the Project. Two CNDDB occurrences are located ~ 1.6 miles to the west.
Malacothamnus arcuatus arcuate bush-mallow	- / - / 1B.2	Chaparral, cismontane woodland. Gravelly alluvium. 1-735 m.	**None.** Suitable habitat is not present in the Project.
Monardella sinuata ssp. *nigrescens* northern curly-leaved monardella	- / - / 1B.2	Coastal dunes, coastal scrub, chaparral, lower montane coniferous forest. Sandy soils. 10-245 m.	**None.** Suitable habitat is not present in the Project.

Name	Listing status* (Federal/ State/CNPS)	Habitat and Flowering Period	Potential to Occur in the Project
Monolopia gracilens woodland woollythreads	- / - / 1B.2	Chaparral, valley and foothill grassland, cismontane woodland, broadleafed upland forest, North Coast coniferous forest. Grassy sites, in openings; sandy to rocky soils. Often seen on serpentine after burns, but may have only weak affinity to serpentine. 120-975 m.	**None.** The Project is not within the elevation range for this species.
Pentachaeta bellidiflora white-rayed pentachaeta	FE / SE / 1B.1	Valley and foothill grassland, cismontane woodland. Open dry rocky slopes and grassy areas, often on soils derived from serpentine bedrock. 35-610 m.	**None.** Suitable habitat is not present in the Project.
Plagiobothrys chorisianus var. *chorisianus* Choris' popcornflower	- / - / 1B.2	Chaparral, coastal scrub, coastal prairie. Mesic sites. 5-705 m.	**None.** Suitable habitat is not present in the Project.
Polemonium carneum Oregon polemonium	- / - / 2B.2	Coastal prairie, coastal scrub, lower montane coniferous forest. 15-1525 m.	**None.** Suitable habitat is not present in the Project.
Potentilla hickmanii Hickman's cinquefoil	FE / SE / 1B.1	Coastal bluff scrub, closed-cone coniferous forest, meadows and seeps, marshes and swamps. Freshwater marshes, seeps, and small streams in open or forested areas along the coast. 5-125 m.	**Not expected.** Closest CNDDB occurrence to Project is located ~2.3 miles to the west.
Sanicula maritima adobe sanicle	- / Rare / 1B.1	Meadows and seeps, valley and foothill grassland, chaparral, coastal prairie. Moist clay or ultramafic soils. 15-215 m.	**Not expected.** This species is presumed extirpated in San Mateo County (CNPS 2022).
Senecio aphanactis chaparral ragwort	- / - / 2B.2	Chaparral, cismontane woodland, coastal scrub. Drying alkaline flats. 20-1020 m.	**None.** Suitable habitat is not present in the Project.
Silene scouleri ssp. *scouleri* Scouler's catchfly	- / - / 2B.2	Coastal bluff scrub, coastal prairie, valley and foothill grassland. 5-315 m.	**None.** Suitable habitat is not present in the Project.
Silene verecunda ssp. *verecunda* San Francisco campion	- / - / 1B.2	Coastal scrub, valley and foothill grassland, coastal bluff scrub, chaparral, coastal prairie. Often on mudstone or shale; one site on serpentine. 30-645 m.	**None.** Suitable habitat is not present in the Project.
Suaeda californica California seablite	FE / - / 1B.1	Marshes and swamps. Margins of coastal salt marshes. 0-5 m.	**None.** Suitable habitat is not present in the Project.
Trifolium amoenum two-fork clover	FE / - / 1B.1	Valley and foothill grassland, coastal bluff scrub. Sometimes on serpentine soil, open sunny sites, swales. Most recently cited on roadside and eroding cliff face. 5-310 m.	**None.** Suitable habitat is not present in the Project.
Trifolium hydrophilum saline clover	- / - / 1B.2	Marshes and swamps, valley and foothill grassland, vernal pools. Mesic, alkaline sites. 1-335 m.	**None.** Suitable habitat is not present in the Project.
Triphysaria floribunda San Francisco owl's-clover	- / - / 1B.2	Coastal prairie, coastal scrub, valley and foothill grassland. On serpentine and non-serpentine substrate (such as at Pt. Reyes). 1-150 m.	**None.** Suitable habitat is not present in the Project.

Name	Listing status* (Federal/ State/CNPS)	Habitat and Flowering Period	Potential to Occur in the Project
Triquetrella californica coastal triquetrella	- / - / 1B.2	Coastal bluff scrub, coastal scrub. Grows within 30m from the coast in coastal scrub, grasslands and in open gravels on roadsides, hillsides, rocky slopes, and fields. On gravel or thin soil over outcrops. 20-1175 m.	**None.** Suitable habitat is not present in the Project.
Usnea longissima Methuselah's beard lichen	- / - / 4.2	North coast coniferous forest, broadleafed upland forest. Grows in the "redwood zone" on tree branches of a variety of trees, including big leaf maple, oaks, ash, Douglas-fir, and bay. 45-1465 m in California.	**Not expected.** This species is presumed extirpated in San Mateo County (CNPS 2022).

* List of Abbreviations for Species Status follow below:
FE = Federal endangered
FT = Federal threatened
FC = Federal Candidate
SC = State Candidate
SE = State Endangered (California)
ST = State Threatened (California)
SCC = Species of Special Concern
FP= Fully Protected

References:
U.S. Fish and Wildlife Service (USFWS). 2023. Species Profile for California seablite (Suaeda californica). Available: https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=Q3AF. Accessed May 15, 2023.
California Department of Fish and Wildlife (CDFW). 2023. California Natural Diversity Database.

CA Rare Plant Rank
1A = Plants presumed extinct in California and rare/extinct elsewhere
1B.1 = Plants rare, threatened, or endangered in California and elsewhere; seriously threatened in California
1B.2 = Plants rare, threatened, or endangered in California and elsewhere; fairly threatened in California
1B.3 = Plants rare, threatened, or endangered in California and elsewhere; not very threatened in California
2B.2 = Plants rare, threatened, or endangered in California, but more common elsewhere; fairly threatened in California

Table 2. Special Status Animal Species

Scientific name	Listing status* (Federal/ State)	Habitat	Potential to Occur in the Project
Invertebrates			
Bombus occidentalis western bumble bee	-/SC	Open grasslands, shrublands, chaparral, desert margins, including Joshua tree and creosote scrub, and semi-urban settings. Food plant include *Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia, and Eriogonum*.	**Not expected.** Nearest CNDDB occurrence ~ 2.2 miles to the east. However, record is historical and site alterations have eliminated most key habitat elements for this species.
Callophrys mossii bayensis San Bruno elfin butterfly	FE/-	Coastal, mountainous areas with grassy ground cover, mainly in the vicinity of San Bruno Mountain, San Mateo County. Colonies are located on steep, north-facing slopes within the fog belt. Larval host plant is *Sedum spathulifolium.*	**None.** Suitable habitat is not present in the Project.
Danaus plexippus pop. 1 monarch - California overwintering population	FC/-	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.	**Possible.** Marginally suitable habitat present in study area.
Euphydryas editha bayensis Bay checkerspot butterfly	FT/-	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco Bay. *Plantago erecta* is the primary host plant*; Orthocarpus densiflorus* and *O. purpurscens* are the secondary host plants.	**None.** Suitable habitat is not present in the Project.
Icaricia icarioides missionensis Mission blue butterfly	FE/-	Inhabits grasslands of the San Francisco peninsula. Three larval host plants: *Lupinus albifrons, L. variicolor,* and *L. formosu*s, of which *L. albifrons* is favored.	**None.** Suitable habitat is not present in the Project.
Speyeria callippe callippe callippe silverspot butterfly	FE/-	Restricted to the northern coastal scrub of the San Francisco Peninsula. Hostplant is *Viola pedunculata*. Most adults found on E-facing slopes; males congregate on hilltops in search of females.	**None.** Suitable habitat is not present in the Project.
Speyeria zerene myrtleae Myrtle's silverspot butterfly	FE/-	Restricted to the foggy, coastal dunes/hills of the Point Reyes peninsula; extirpated from coastal San Mateo County. Larval foodplant thought to be *Viola adunca*.	**None.** Suitable habitat is not present in the Project.
Amphibians			
Ambystoma californiense pop. 1 California tiger	FT/ST	Lives in vacant or mammal-occupied burrows throughout most of the year; in grassland, savanna, or open woodland habitats. Need underground	**None.** Suitable habitat is not present in the Project.

Scientific name	Listing status* (Federal/ State)	Habitat	Potential to Occur in the Project
salamander - central California DPS		refuges, especially ground squirrel burrows, and vernal pools or other seasonal water sources for breeding.	
Aneides niger Santa Cruz black salamander	-/SSC	Mixed deciduous and coniferous woodlands and coastal grasslands in San Mateo, Santa Cruz, and Santa Clara counties. Adults found under rocks, talus, and damp woody debris.	**None.** Suitable habitat is not present in the Project.
Dicamptodon ensatus California giant salamander	- / SSC	Known from wet coastal forests near streams and seeps from Mendocino County south to Monterey County and east to Napa County Aquatic larvae found in cold, clear streams, occasionally in lakes and ponds. Adults known from wet forests under rocks and logs near streams and lakes.	**None.** Suitable habitat is not present in the Project.
Rana boylii foothill yellow-legged frog	- /SSC	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Need at least some cobble-sized substrate for egg-laying. Need at least 15 weeks to attain metamorphosis.	**None.** Suitable habitat is not present in the Project.
Rana draytonii California red-legged frog	FT/SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	**Not Expected**. Study area does not contain key habitat elements that can potentially support these species. CNDDB occurrence within half a mile of the study area in Deer Creek and another less than half a mile west of the study area (2023).
Reptiles			
Emys marmorata western pond turtle	- /SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation. Need basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	**None.** Suitable habitat is not present in the Project.
Thamnophis sirtalis tetrataenia San Francisco gartersnake	FE/SE/FP	Vicinity of freshwater marshes, ponds and slow-moving streams in San Mateo County and extreme northern Santa Cruz County. Prefers dense cover and water depths of at least one foot. Upland areas near water are also very important.	**Not Expected**. Study area does not contain key habitat elements that can potentially support these species. CNDDB occurrence within 5 miles of the study area and within the Montara Mountain area (2023)
Fish			

Scientific name	Listing status* (Federal/ State)	Habitat	Potential to Occur in the Project
Acipenser medirostris pop. 1 green sturgeon - southern DPS	- /SSC	The green sturgeon ranges from Mexico to at least Alaska in marine waters, and is observed in bays and estuaries up and down the west coast of North America. Green sturgeon are believed to spawn in the Rogue River, Klamath River Basin, and the Sacramento River, and rarely occur in the Umpqua River. Green sturgeon appear to occasionally occupy the Eel River, and may also be using the Trinity River.	**None.** Suitable habitat is not present in the Project.
Eucyclogobius newberryi tidewater goby	FE /SSC	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	**None.** Suitable habitat is not present in the Project.
Mylopharodon conocephalus hardhead	- /SSC	Low to mid-elevation streams in the Sacramento-San Joaquin drainage. Also present in the Russian River. Clear, deep pools with sand-gravel-boulder bottoms and slow water velocity. Not found where exotic centrarchids predominate.	**None.** Suitable habitat is not present in the Project.
Oncorhynchus mykiss irideus pop. 8 steelhead - central California coast DPS	FT / -	DPS includes all naturally spawned populations of steelhead (and their progeny) in streams from the Russian River to Aptos Creek, Santa Cruz County, California (inclusive). Also includes the drainages of San Francisco and San Pablo Bays.	**None.** Suitable habitat is not present in the Project.
Spirinchus thaleichthys longfin smelt	FC /ST	Euryhaline, nektonic and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15-30 ppt, but can be found in completely freshwater to almost pure seawater.	**None.** Suitable habitat is not present in the Project.
Birds			
Athene cunicularia Burrowing Owl	- /SSC	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.	**None.** Suitable habitat is not present in the Project
Brachyramphus marmoratus Marbled Murrelet	FT /SE	Found from the western Aleutian Islands through northern central California. Nests from May through early August in Washington. Outside of the breeding season, found in coastal areas, mainly in salt water within 2 km of shore, including bays and sounds. Nests in trees in terrestrial habitat including alpine, conifer forest, and Tundra	**None.** Suitable habitat is not present in the Project

Scientific name	Listing status* (Federal/ State)	Habitat	Potential to Occur in the Project
Charadrius alexandrinus nivosus Western Snowy Plover	FT/SSC	Sandy beaches, salt pond levees and shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	**None.** Suitable habitat is not present in the Project
Falco peregrinus anatum American Peregrine Falcon	FDL /SDL, FP	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site.	**None.** Suitable habitat is not present in the Project
Geothlypis trichas sinuosa Saltmarsh Common Yellowthroat	- /SSC	Resident of the San Francisco Bay region, in fresh and salt water marshes. Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.	**None.** Suitable habitat is not present in the Project Area.
Laterallus jamaicensis coturniculus California Black Rail	- /ST, FP	Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat.	**None.** Suitable habitat is not present in the Project
Melospiza melodia pusillula Alameda Song Sparrow	- /SSC	Resident of salt marshes bordering south arm of San Francisco Bay. Inhabits *Salicornia* marshes; nests low in *Grindelia* bushes (high enough to escape high tides) and in *Salicornia*.	**None.** Suitable habitat is not present in the Project.
Rallus longirostris obsoletus California Ridgway's Rail	FE/SE, FP	Salt-water and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco Bay. Associated with abundant growths of pickleweed, but feeds away from cover on invertebrates from mud-bottomed sloughs.	**None.** Suitable habitat is not present in the Project.
Riparia riparia Bank Swallow	- /ST	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	**None.** Suitable habitat is not present in the Project.
Mammals			
Antrozous pallidus pallid bat	- /SSC	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	**Not expected.** Marginally suitable foraging habitat is present in the study area. No suitable roosting habitat is present.
Corynorhinus townsendii Townsend's big-eared bat	- /SSC	Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	**Possible.** Marginally suitable foraging habitat is present in the study area.

Scientific name	Listing status* (Federal/ State)	Habitat	Potential to Occur in the Project
Neotoma fuscipes annectens San Francisco dusky-footed woodrat	- /SSC	Forest habitats of moderate canopy and moderate to dense understory. May prefer chaparral and redwood habitats. Constructs nests of shredded grass, leaves and other material. May be limited by availability of nest-building materials.	**None.** Suitable habitat is not present in the Project.
Nyctinomops macrotis big free-tailed bat	- /SSC	Low-lying arid areas in Southern California. Need high cliffs or rocky outcrops for roosting sites. Feeds principally on large moths.	**None.** Suitable habitat is not present in the Project.
Reithrodontomys raviventris salt marsh harvest mouse	FE/SE, FP	Only in the saline emergent wetlands of San Francisco Bay and its tributaries. Pickleweed is primary habitat, but may occur in other marsh vegetation types and in adjacent upland areas. Does not burrow, build sloosely organized nests. Requires higher areas for flood escape.	**None.** Suitable habitat is not present in the Project.
Taxidea taxus American badger	- /SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	**None.** Suitable habitat is not present in the Project.
*** List of Abbreviations for Federal and State Species Status follow below:** **FE = Federal endangered** **FT = Federal threatened** **FC = Federal candidate** **FD = Federal delisted** **SE = State endangered** **ST = State threatened** **SC = State candidate** **SSC = Species of special concern** **FP = State fully protected** **Source:** California Department of Fish and Wildlife (CDFW). 2023. California Natural Diversity Database.			

Appendix D
Plant Species List

Appendix D. Plant Species List

Scientific Name	Common Name	Native
Albizia lophantha	Plume accacia	No
Avena barbata	Slender wild oat	No
Avena fatua	Wild oat	No
Baccharis pilularis	Coyote Brush	Yes
Brassica rapa	Field mustard	No
Bromus catharticus	Rescue grass	No
Bromus diandrus	Ripgut brome	No
Bromus madritensis ssp. rubens	Foxtail Brome	No
Carduus pycnocephalus ssp. pycnocephalus	Italian Thistle	No
Cirsium vulgare	Bull Thistle	No
Cortaderia jubata	Jubata grass	No
Conium maculatum	Poison Hemlock	No
Cyperus eragrostis	tall flatsedge	Yes
Delairea odorata	Cape Ivy	No
Eucalyptus globulus	Blue gum	No
Equisetum telmateia ssp. braunii	Giant horse tail	Yes
Festuca californica	California Fescue	Yes
Festuca perennis	Rye grass	No
Frangula californica	California Coffee berry	Yes
Gazania linearis	Ganzia	No
Genista monspessulana	French broom	No
Geranium dissectum	Cut-leaved Geranium	No
Hedera helix	English ivy	No
Helminthotheca echioides	Bristly oxtongue	No
Hirschfeldia incana	Summer mustard	No
Holcus lanatus	Common Velvet Grass	No
Hordeum murinum	Barley	No
Hypochaeris radicata	Rough Cat’s Ear	No
Medicago polymorpha	California burclover	No
Melilotus indicus	yellow sweetclover	Yes
Oxalis pes-caprae	Bermuda buttercup	No
Pinus radiata	Monterey Pine	Yes
Plantago lanceolata	English plantain	No
Poa annua	Annual blue grass	No
Raphanus sativus	Wild radish	No
Remux spp.	Dock	No
Rubus armeniacus	Himalayan Blackberry	No
Rubus ursinus	california blackberry	Yes
Salix lasiolepis	Arroyo willow	Yes

Appendix D. Plant Species List

Scientific Name	Common Name	Native
Senecio vulgaris	Common Groundsel	No
Taraxacum officinale	Common Dandelion	No
Tropaeolum majus	Garden Nasturtium	No
Vicia sativa	Common Vetch	No
Zantedeschia aethiopica	Calla-lily	No

Appendix D

Cultural Resource Inventory Report [Confidential]

Appendix E

Geotechnical Investigation

GEOTECHNICAL INVESTIGATION

GRANADA COMMUNITY CENTER
AND BURNHAM PARK
OBISPO ROAD AND AVENUA PORTOLA
APN: 047-251-110, 047-251-100, AND 047-262-010
EL GRANADA, CALIFORNIA

Prepared for

Group 4 Architecture, Research + Planning
211 Linden Avenue
South San Francisco, California 94080

October 2022

Project No. 4812-4

October 27, 2022
4812-4

Group 4 Architecture,
Research + Planning, Inc.
211 Linden Avenue
South San Francisco, California 94080

RE: GEOTECHNICAL INVESTIGATION
GRANADA COMMUNITY CENTER
AND BURNHAM PARK
OBISPO ROAD AND AVENUE PORTOLA
APN: 047-251-110, 047-251-100, AND 047-262-010
EL GRANADA, CALIFORNIA

Attention: Ms. Dawn Merkes

Ladies and Gentlemen:

In accordance with your request, we have performed a geotechnical investigation for the proposed Granada Community Center and Burnham Park to be constructed near the intersection of Obispo Road and Avenue Portola (APN: 047-251-110, 047-251-100, and 047-262-010), in an unincorporated area of San Mateo County, near El Granada, California. The accompanying report summarizes the results of our field exploration, laboratory testing and engineering analysis, and presents geotechnical recommendations for the proposed project.

We refer you to the text of our report for specific recommendations.

Thank you for the opportunity to work with you on this project. Please call if you have any questions or comments about site conditions or the findings and recommendations from our investigation.

Very truly yours,

ROMIG ENGINEERS, INC.

Michael Von P. Sacramento

Jonathan J. Fone, P.E.

REGISTERED PROFESSIONAL ENGINEER
JONATHAN J. FONE
80875
CIVIL
STATE OF CALIFORNIA

Copies: Addressee (via email)

GEOTECHNICAL INVESTIGATION
GRANADA COMMUNITY CENTER AND BURNHAM PARK
OBISPO ROAD AND AVENUE PORTOLA
APN: 047-251-110, 047-251-100, AND 047-262-010
EL GRANADA, CALIFORNIA

PREPARED FOR:
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OCTOBER 2022

ROMIG
ENGINEERS

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ROMIG ENGINEERS

GEOTECHNICAL INVESTIGATION
FOR
GRANADA COMMUNITY CENTER AND BURNHAM PARK
OBISPO ROAD AND AVENUE PORTOLA
APN: 047-251-110, 047-251-100, AND 047-262-010
EL GRANADA, CALIFORNIA

INTRODUCTION

This report presents the results of our geotechnical investigation for the proposed Granada Community Center and Burnham Park to be constructed near the intersection of Obispo Road and Avenue Portola (APN: 047-251-110, 047-251-100, and 047-262-010) in an unincorporated area of San Mateo County near El Granada, California. The location of the site is shown on the Vicinity Map, Figure 1. The purpose of this investigation was to evaluate subsurface conditions at the site and to provide geotechnical design and construction recommendations for the proposed improvements.

Project Description

The project consists of constructing a community center and park at the subject site. The site consists of three lots (APN: 047-251-110, 047-251-100, and 047-262-010). The design and layout of the community center is still being developed; however, we understand that the one-story, approximately 3,000-square-foot community center will be located at the northwest lot (APN: 047-251-110) and will include a new parking lot. The existing building on the lot will be extensively renovated for the center. Burnham Park will be constructed on middle and southeast lots (APN: 047-251-100 and 047-262-010) and will include new restroom and shower facilities, two parking areas, two pedestrian bridges, a sports court, a skate area, a new dog park, earth berms, two drainage ditch improvements, and significant landscaping. The property gently slopes down to the southwest towards State Highway 1 and the Pacific Ocean. Structural loads are expected to be relatively light as is typical for this type of construction.

Scope of Work

The scope of work for this investigation was presented in our agreement with you, dated June 3, 2022. In order to accomplish this work, we have performed the following services:

- Review of geologic, geotechnical, and seismic conditions in the vicinity of the site including our previous geotechnical report at the site, dated September 8, 2009.

- Subsurface exploration consisting of advancing two cone penetration tests (CPTs) and drilling, sampling, and logging of five exploratory borings near the proposed improvements.

- Laboratory testing of selected soil sample to aid in material classification and to help evaluate the engineering properties of the soil encountered at the site.

- Engineering analysis and evaluation of the surface and subsurface data to develop geotechnical design criteria for the project.

- Preparation of this report presenting our findings and geotechnical recommendations for the proposed improvements.

Limitations

This report has been prepared for the exclusive use of Group 4 Architecture, Research and Planning, Inc. for specific application to developing geotechnical design criteria for the currently proposed Granada Community Center and Burnham Park to be constructed at Obispo Road and Avenue Portola (APN: 047-251-110, 047-251-100, and 047-262-010) in an unincorporated area of San Mateo County, near El Granada, California. We make no warranty, expressed or implied, for the services we perform for this project. Our services are performed in accordance with the geotechnical engineering principles generally accepted at this time and location. This report was prepared to provide engineering opinions and recommendations only. In the event there are any changes in the nature, design, or location of the project, or if any future improvements are planned, the conclusions and recommendations presented in this report should not be considered valid unless 1) the project changes are reviewed by us, and 2) the conclusions and recommendations presented in this report are modified or verified in writing.

The analysis, conclusions, and recommendations presented in this report are based on site conditions as they existed at the time of our investigation; the currently planned site improvements; review of readily available reports relevant to the site conditions; and laboratory test results. In addition, it should be recognized that certain limitations are inherent in the evaluation of subsurface conditions and that certain conditions may not be detected during an investigation of this type. Changes in the information or data gained from any of these sources could result in changes in our conclusions or recommendations. If such changes occur, we should be advised so that we can review our report in light of those changes.

REVIEW OF PREVIOUS INVESTIGATION

Romig Engineers prepared a geotechnical report, dated September 2009 for construction of an underground storm water storage facility at the southeast lot (APN: 047-262-010) of the subject site. This previous investigation included three exploratory borings to a maximum depth of 20 feet. The borings were located near the planned park improvements and are shown on the Site Plan, Figure 2, and the boring logs are attached in Appendix D.

At the location of Boring EB-1, we encountered approximately 3 feet of hard sandy lean clay of low plasticity underlain by approximately 4 feet of medium dense clayey sand. The upper 7 feet of soil appeared to be fill in Boring EB-1. We then encountered about 2.5 feet of stiff sandy fat clay of high plasticity underlain by medium dense to very dense poorly graded sand and clayey sand, which extended to the maximum depth explored of approximately 18 feet. At Borings EB-2 and EB-3, we generally encountered about 4 to 6 feet of stiff to very stiff sandy fat clay of high plasticity underlain by approximately 4 to 5.5 feet of sandy lean clay of low to moderate plasticity. We then encountered medium dense to very dense clayey sand, which extended to the maximum depth explored of about 10 feet and 20 feet for Borings EB-2 and EB-3, respectively.

A Liquid Limit of 59 and a Plasticity Index of 40 were measured on a sample of near-surface native soil obtained from Boring EB-2. These test results indicate that the near-surface native soils at the site have high plasticity and a high potential for expansion.

Ground water was encountered at the site at depths of about 7.5 feet and 6.5 feet below the ground surface at Borings EB-1 and EB-2, respectively. We also understand ground water was encountered at a depth of 7 feet during percolation testing performed in May 2008. The project design high ground water at the site was estimated to be about 3 feet below the ground surface.

Total liquefaction settlement from the design-level earthquake within the medium dense sands encountered in Boring EB-1 was estimated to be approximately 2 inches. We recommended that the concrete connection vault be supported on a mat foundation.

SITE EXPLORATION AND RECONNAISSANCE

Site reconnaissance and subsurface exploration were performed on September 12, 2022. The subsurface exploration consisted of drilling and sampling five exploratory boring to depths ranging from 6 to 20 feet and advancing two cone penetration tests (CPTs) to depths of about 43 and 45 feet. The exploratory borings were performed using portable drilling and sampling equipment, and the CPTs were advanced using an electronic cone penetration test system, which was truck-mounted, having a downward pressure capacity of 20 tons. The approximate locations of the borings and CPTs are shown on the Site Plan, Figure 2. The boring and CPT logs, and the results of our laboratory tests are attached in Appendices A and B, respectively.

Surface Conditions

The site is located in a rural/residential area and includes three lots (APN: 047-251-110, 047-251-100, and 047-262-010), which are border by Coronado Street at the southeast side, California State Highway 1 (Cabrillo Highway) along the south side, and Obispo Road and Avenue Alhambra along the north side of the site.

At the time of our investigation, the northwest lot (APN: 047-251-110) was occupied by a single-story pre-school building which had a wood siding exterior. An asphalt paved parking lot was located at the front of the building and provided access to Avenue Alhambra. Playground structures and two storage sheds were located at the rear of the building. Concrete walkways and patios were generally located at the building at the front and rear. We expect the building is supported on a shallow foundation; however, the depth and width of the existing foundations are unknown. The exterior perimeter stem wall was generally covered and not visible. The parking lot had alligator cracking with up to about 1/4-inch wide cracks observed throughout. The exterior concrete flatwork was observed with some cracks up to about 1/4-inch wide. Roof downspouts appeared to discharge into a closed pipe system.

The southwest lot (APN: 047-262-010) had a half pipe skate ramp and an undeveloped parking lot located at the southeast portion of the lot and an underground storm water storage facility at the northwest portion. Two drainage ditches were located at the southwest lot and extended from Obispo Road across the lot to concrete culverts at Highway 1. The middle lot (APN: 047-251-100) was currently vacant and undeveloped. The site was landscaped with native grasses, small to large shrubs, and small trees. The site generally sloped down gently towards the southeast towards the drainage ditches.

Subsurface Conditions

At the locations of CPT-1 and CPT-2, advanced near the community center parking lot, we generally encountered firm to very stiff clay and medium dense to very dense sand with interbedded silty sand, sandy silt, and clayey silt to silty clay throughout the subsurface profile to the maximum depth explored of about 45 feet.

At the locations of Borings EB-7 and EB-8, advanced near the planned community center and existing building, we encountered very stiff to hard lean clay and sandy lean clay of low to high plasticity with interbedded lenses of sand and silt to the maximum depth explored of 20 feet. In Boring EB-8, the upper 4 feet of surface soil appeared to be fill.

At Borings EB-4, EB-5 and EB-6, advanced near the planned park improvements, we generally encountered surface fill ranging from 2 to 6 feet thick. The fill consisted of hard sandy lean clay of low plasticity and medium dense to dense well graded and poorly graded sand. Below the fill, we encountered native soil consisting of about 2 feet to 3.5 feet of stiff to very stiff fat and lean clay of high plasticity underlain by very stiff to hard sandy lean clay of low to moderate plasticity with interbedded sand and silts to maximum depth explored of about 20 feet.

A Liquid Limit of 48 and a Plasticity Index of 28 were measured on a sample of near-surface native soil obtained from Boring EB-7. These test results indicate that the near-surface native soils at the site have high plasticity and high potential for expansion.

Based on our experience, surface fills such as were encountered were typically not placed and compacted to today's standards as engineered fill, and these fills often settle over the years, particularly during times of seasonally heavy rainfall or irrigation when the fill becomes wet, or during strong seismic shaking.

We note that portions of the sandy and silty soil strata encountered at the site may be susceptible to liquefaction during strong seismic shaking. Details of our liquefaction evaluations are included in the section below titled "Liquefaction Evaluation".

Ground Water

Ground water was not encountered in Borings EB-4 through EB-8 during our subsurface exploration. Pore pressure dissipation tests conducted in the CPTs indicated that the ground water table was inferred to be located at a depth of about 16 feet below the ground surface. The borings and CPTs were backfilled immediately after drilling and sampling were completed; therefore, a stabilized ground water level may not have been obtained. We also expect that the ground water table or extent of ground water seepage could be influenced by water seepage at and near the Pacifica Ocean, which is located about 200 feet south of the site. Ground water was encountered at depths of about 7.5 and 6.5 feet in Borings EB-1 and EB-2, respectively, during our subsurface investigation in 2009. We also understand ground water was encountered at a depth of 7 feet during percolation testing performed in May 2008.

Please be cautioned that fluctuations in the level of ground water can occur due to variations in rainfall, landscaping, underground drainage patterns, and other factors. It is also possible and perhaps even likely that a relatively shallow ground water table could develop seasonally in the soil during and after significant rainfall in combination with landscape watering at the property and the upslope areas, or during wet years, or a series of wet years.

GEOLOGIC SETTING

As part of our investigation, we briefly reviewed our local experience and geologic information in our files pertinent to the general area of the site. The information reviewed indicates that the site is mapped in an area underlain by Pleistocene age Marine terrace deposits, Qmt (Pampeyan, 1994). The Marine terrace deposits are expected to consist of poorly to moderately consolidated deposits of marine, eolian, and alluvial sand, silt, gravel, and clay in various proportions and combinations, in indistinct to distinct lenses and beds. The geology of the site vicinity is shown on the Vicinity Geologic Map, Figure 3.

The State Seismic Hazard Zones Map of the Montara Mountain Quadrangle (CGS, 2018), Figure 4, indicates that the site is mapped in a liquefaction hazard zone. A site-specific liquefaction discussion is presented later in this report.

The Tsunami Inundation Map for Emergency Planning (CGS, 2009), Figure 5, indicates that a majority of the site is mapped in a tsunami hazard zone. A site-specific tsunami discussion is presented later in this report.

The site and the immediate vicinity are located in an area that slopes gently to the southwest towards the Pacific Ocean at elevations ranging from about 17 to 35 feet above sea level.

Faulting and Seismicity

There are no mapped through-going faults within or adjacent to the site and the site is not located within a State of California Earthquake Fault Zone (formerly known as a Special Studies Zone), an area where the potential for fault rupture is considered probable. The closest active fault is the San Gregorio fault, located approximately 0.9 mile southwest of the property. Thus, the likelihood of surface rupture occurring from active faulting at the site is low.

The San Francisco Bay Area is an active seismic region. Earthquakes in the region result from strain energy constantly accumulating because of the northwestward movement of the Pacific Plate relative to the North American Plate. On average about 1.6-inches of movement occur per year. Historically, the Bay Area has experienced large, destructive earthquakes in 1838, 1868, 1906, and 1989. The faults considered most likely to produce large earthquakes in the area include the San Andreas, San Gregorio, Hayward, and Calaveras faults. The San Andreas fault is located approximately 6.0 miles northeast of the site. The Hayward and Calaveras faults are located approximately 24 and 32 miles northeast of the site, respectively. These faults and significant earthquakes that have been documented in the Bay Area are listed in Table 1 and are shown on the Regional Fault and Seismicity Map, Figure 6.

Table 1. Earthquake Magnitudes and Historical Earthquakes
Granada Community Center and Burnham Park
El Granada, California

Fault	Maximum Magnitude (Mw)	Historical Earthquakes	Estimated Magnitude
San Andreas	7.9	1989 Loma Prieta	6.9
		1906 San Francisco	7.9
		1865 N. of 1989 Loma Prieta Earthquake	6.5
		1838 San Francisco-Peninsula Segment	6.8
		1836 East of Monterey	6.5
Hayward	7.1	1868 Hayward	6.8
		1858 Hayward	6.8
Calaveras	6.8	1984 Morgan Hill	6.2
		1911 Morgan Hill	6.2
		1897 Gilroy	6.3
San Gregorio	7.3	1926 Monterey Bay	6.1

In the future, the subject property will undoubtedly experience severe ground shaking during moderate and large magnitude earthquakes produced along the San Andreas fault or other active Bay Area fault zones. Using information from recent earthquakes, improved mapping of active faults, ground motion prediction modeling, and a new model for estimating earthquake probabilities, a panel of experts convened by the U.S.G.S. have concluded there is a 72 percent chance for at least one earthquake of Magnitude 6.7 or larger in the Bay Area before 2043. The Hayward fault has the highest likelihood of an earthquake greater than or equal to magnitude 6.7 in the Bay Area, estimated at 33 percent, while the likelihood on the San Andreas and Calaveras faults is estimated at approximately 22 and 26 percent, respectively (Aagaard et al., 2016).

Earthquake Design Parameters

The State of California currently requires that buildings and structures be designed in accordance with the seismic design provisions presented in the 2019 California Building Code and in ASCE 7-16, "Minimum Design Loads for Buildings and Other Structures." Based on site geologic conditions and on information from our subsurface exploration at the site, the site may be classified as Site Class D, stiff soil, in accordance with Chapter 20 of ASCE 7-16. Spectral Response Acceleration parameters and site coefficients may be taken directly from the SEAOC/OSHPD website based on the longitude and latitude of the site. For site latitude (37.5030), longitude (-122.4738) and Site Class D, design parameters are presented on Table 2.

Table 2. 2019 CBC Seismic Design Criteria
Granada Community Center and Burnham Park
El Granada, California

Spectral Response Acceleration Parameters		Design Value
Mapped Value for Short Period -	S_S	2.175
Mapped Value for 1-sec Period -	S_1	0.831
Site Coefficient -	F_a	1.0
Site Coefficient -	F_v	1.7
Adjusted for Site Class -	S_{MS}	2.175
Value for Design Earthquake -	S_{DS}	1.450

Liquefaction Evaluation

To evaluate the potential for earthquake-induced liquefaction of the soils at the site, we performed a liquefaction analysis of the CPT data using the program Cliq, developed by GeoLogismiki. The program applied several published methodologies, including Robertson (2009) and Boulanger and Idriss (2014), which use a weighting factor on vertical strains with depth, per Cetin et al 2009; each of these methodologies was assigned a one-half probability of occurring. The silty sand, sandy silt, and clayey silt to silty clay strata encountered between about 10 and 29 feet in CPT-1 and about 7 to 29 feet in CPT-2 that we encountered at the site below the projected high ground water level of about 3 feet were considered in our liquefaction analysis.

The results of our analyses indicate that the interbedded silty sand, sandy silt, and clayey silt to silty clay strata encountered in our CPTs could liquefy when subjected to a peak ground acceleration (PGA) of 1.002, the PGA_M for the maximum considered earthquake based on ASCE 7-16. The results of our liquefaction evaluation are presented in Table 3 and are presented in Figures C-1 and C-2 in Appendix C.

Table 3: Results of Liquefaction Evaluation
Granada Community Center and Burham Park
El Granada, California

CPT No.	Robertson 2009 Settlement (Inches)	Idriss and Boulanger 2014 Settlement (Inches)	Average Settlement (Inches)
CPT-1	0.6	2.3	1.5
CPT-2	0.2	1.8	1.0

Based on our analyses of the CPT data, total settlement that could occur at the ground surface as a result of liquefaction from the design-level earthquake is estimated to range from approximately 1.0 to 1.5 inches, with some variation with regard to the analysis method used and uncertainties with regard to the character of the clay fraction present in our soils. We note the total liquefaction settlement from Boring EB-1 in our 2009 report was estimated to be approximately 2 inches.

In our opinion, differential settlement of about 1.5 inches over a horizontal distance of 50 feet is possible from liquefaction at the ground surface during seismic shaking, and the estimated settlement should be considered during the structural design of the proposed structures and site improvement foundation systems. The differential settlement could also affect exterior flatwork, parking areas, and underground utilities supported at existing surface grades.

Geologic Hazards

In addition to liquefaction potential, we reviewed the potential for other geologic hazards to impact the site, considering the geologic setting and the soil encountered during our investigation. The results of our review are presented below.

- Fault Rupture - The site is not located in an Earthquake Fault Zone or area where fault rupture is considered likely. Therefore, in our opinion active faults are not believed to exist beneath the site, and the potential for fault rupture to occur at the site is considered low.

- Ground Shaking - The site is located in an active seismic area. Moderate to large earthquakes are probable along several active faults in the greater Bay Area over a 30-to-50-year design life. Strong ground shaking should therefore be expected several times during the design life of the development, as is typical for sites throughout the Bay Area. The structures and site improvements should be designed and constructed in accordance with current earthquake resistance standards.

- Dynamic Densification - Dynamic densification can occur during moderate and large earthquakes when unsaturated soft or loose, natural or fill soils are densified and settle, often unevenly across a site. Experience has shown that surface fill soils such as were encountered at the site are susceptible to differential compaction. The very stiff to hard native clay above the historical ground water table encountered during our exploration are not prone to significant differential compaction. In our opinion, the likelihood of significant differential compaction affecting the structures and site improvements is low provided the existing surface fill will be overexcavated and properly compacted below the structures and surface improvement areas and the foundations will bear on native soil or engineered fill. Some differential compaction is possible if the existing surface fill is not excavated and properly compacted below building slab, pavement, flatwork and other surface improvement areas.

- Expansive Soil - Based upon the results of the laboratory testing and our visual classification, the surface and near-surface soils encountered at the site are highly expansive and subject to expansion and contraction during wetting/drying cycles. However, the likelihood of significant damage from expansive soil movement can be reduced provided the recommendations presented in our report are followed during design and construction. However, flatwork and pavement areas supported over the expansive soil will likely be prone to differential settlement/movement and distress due to heaving and shrinkage movement and will have a shorter service life compared to a site underlain by less expansive soil.

- Tsunami Hazard - The site is mapped in a tsunami hazard zone as indicated on the Tsunami Inundation Map for Emergency Planning for the Montara Mountain Quadrangle (CSG, 2009), Figure 5. Areas mapped within a tsunami hazard zone may be affected by a series of waves or surges following a large earthquake in or along the Pacific Ocean. Evaluation of the hazard associated with a design tsunami event is outside the scope of our services and expertise; therefore, we have not included modeling of tsunami events, tsunami forces on the proposed building, accessory structures, and site improvements, and/or the potential tsunami hazard risk at the subject site.

CONCLUSIONS

In our opinion, the site is suitable for the proposed community center building, accessory structures, and site improvements provided the recommendations presented in our report are followed during design and construction. Specific geotechnical recommendations for the proposed improvements are presented in the following sections of this report.

The primary geotechnical concerns at the site are 1) the presence of medium dense sands and silts which are potentially susceptible to liquefaction induced settlement during seismic shaking; 2) the presence of the highly expansive surface soils underlying the site; 3) the presence of undocumented surface fill up to about 7 feet deep encountered across the site; 4) the presence of relatively high historical ground water level; and 5) the potential for severe ground shaking and tsunami inundation at the site during and following a major earthquake.

As discussed previously, differential settlement of about 1.5 inches over a horizontal distance of 50 feet is possible from liquefaction at the ground surface during seismic shaking, and the estimated settlement should be considered during the structural design of the proposed structures and site improvement foundation systems.

The highly expansive soils are subject to significant volume changes (heaving and shrinkage movement) during fluctuations in moisture content from seasonal variations in precipitation or changes from landscape watering. Due to the expansive and uncertain nature of the soils at the site, the owner must also be willing to accept a higher level of risk of differential movement damage and extra maintenance (including the structures, pavements and exterior flatwork), if it occurs. It is also essential to limit the amount of surface water seeping into the ground adjacent to the buildings and hardscape. This will require continual maintenance of the recommended surface drainage facilities to observe that they are properly working after initial construction, and to further observe that they are continuing to work over the life of the improvements.

Preferably, the proposed community center building, restroom facilities, and pedestrian bridges should be supported on drilled pier foundations embedded into stiff/dense native soil below any fill. Interior slabs for pier supported structures preferably should be structurally supported on the pier foundation with a void form used below the slab.

As a less expensive, less predictable alternative, in our opinion, the structures may be supported on relatively rigid shallow foundations bearing on native soil or engineered fill. If shallow foundations are selected, they may consist of a series of relatively deep and rigid continuous spread footings constructed in a grid pattern (i.e., the interior footings should be structurally connected and tied to the perimeter foundations), or on an at-grade mat foundation with added reinforcing to provide a stiffer foundation more capable of tolerating differential soil movement. In addition, concrete slabs-on-grade should be underlain by a layer of non-expansive fill.

If new foundations will be needed for the proposed renovation of the existing building, the new/additional loads within the existing footprint may be supported on conventional spread footings bearing on stiff/dense native soil below any fill. To help reduce the potential for differential settlement between the new and existing foundations due to varying loading conditions and liquefaction-induced settlement, if practical, you should consider supporting the new/additional loads on a series of rigid continuous spread footings, ideally structurally connecting to the existing perimeter foundations or interior continuous footings.

Borings EB-1, EB-4 to EB-6, and EB-8 encountered surface fill ranging from about 2 feet to 7 feet thick across the site. We note Borings EB-2, EB-3, and EB-7 did not appear to encounter fill material. Based on our experience, undocumented surface fills such as this were typically not placed and compacted to current day engineering standards, and often settle over the years particularly during times of seasonally heavy rainfall or irrigation when the fill becomes wet, or during strong seismic shaking. Since portions of the existing building, restroom and beach shower facilities, parking lots, exterior flatwork, and other improvements appear to overlap the existing surface fill, in our opinion, the existing surface fill should generally be excavated and compacted below the interior floors, exterior flatwork, pavements and other site improvements during site preparation. However, removing and compacting the deeper existing surface fills below all the proposed improvements may not be feasible in all areas, particularly adjacent to the existing building and existing street improvements. The reworking of the surface fill and subgrade preparation should proceed as recommended in the section of this report titled "Earthwork." The lateral extent and depth of the surface fill will need to be verified during grading under the direction of our field representative.

We note that the medium dense sand strata encountered at the site were judged to have limited cohesion and may be prone to sloughing and/or caving if excavated near-vertical. Temporary excavation shoring, pier drilling, trench, and other excavations should be designed and installed accordingly. This information should be considered by the contractor when establishing temporary shoring/slope criteria, for pier drilling, and for other temporary excavations.

Because subsurface conditions may vary from those encountered at the location of the borings and CPTs, and to observe that our recommendations are properly implemented, we recommend that we be retained to 1) review the grading and foundation plans for conformance with the recommendations presented in this report and 2) observe and test during earthwork and foundation and slab construction.

FOUNDATIONS

Drilled Piers

In our opinion, the community center building, the restroom facilities, and the pedestrian bridges should be supported on a drilled piers extending in stiff/dense native soil below any fill. Piers should have a minimum diameter of 16 inches and extend at least 12 feet below the bottom of the grade beams and at least 6 feet into native stiff/dense soil below any fill, whichever is deeper. Piers may be designed for an allowable skin friction of 350 pounds per square foot for dead plus live loads, with a one-third increase allowed for total loads including wind or seismic forces. An allowable uplift skin friction of 275 pounds per square foot may be used. Vertical support provided by soil against the upper 2 foot of the piers should be neglected in design. Piers should have a center-to-center spacing of at least three pier diameters.

Due to the medium dense sands encountered at Boring EB-1 to a depth of about 16 feet, the drilled piers supporting the restroom facilities may need to extend to a total depth of 22 feet below the ground surface to be embedded at least 6 feet into dense native soil.

We recommend that relatively stiff grade beams be constructed between the piers as required by the structural engineer. In order to minimize the possible detrimental effects of the expansive on-site soils, the grade beams should have at least 4-inch void between their bottoms and the underlying soils. This may be accomplished with compressible foam, cardboard forms or an equivalent method. In addition, to help limit the infiltration of surface runoff beneath the structures, the grade beam should extend at least 12-inches below the slab subgrade elevation. We also recommend that the grade beams be reinforced with sufficient top and bottom steel reinforcing bars to provide structural continuity and stiffness.

Special Pier Drilling Considerations

Pier drilling operations should be observed by our representative, to establish that pier excavations bear in competent materials, extend the required depth into the expected materials, and that the pier excavations are properly cleaned. The minimum pier depths recommended above may require adjustment if differing conditions are encountered during drilling. Sloughing or caving of pier excavations should be expected within the medium dense sands and potential high ground water that are present below the site.

Pier excavations should be completed with concrete as soon as practical after drilling. Due to the presence of the cohesionless sands and the potential for high ground water mentioned above, the piers may need to be cased or drilled with a stabilization fluid to prevent caving of the pier excavations. In addition, concrete for the piers should be placed the same day the piers are drilled. If caving conditions occur, scheduling several concrete placements each day of drilling may be required. The tremie method should be used to concrete the piers if ground water is encountered during or following drilling.

Lateral Loads for Piers

Lateral loads on the piers may be resisted by passive earth pressure based upon an equivalent fluid pressure of 300 pounds per cubic foot, acting on 2 times the projected area of the pier. The passive resistance of the upper 2 foot of the piers should be neglected in design where soil adjacent to the footing is not covered and protected by a concrete slab or pavement.

Rigid Grid Foundation System

As a less expensive, less predictable alternative to drilled piers, in our opinion, the community center building and the restroom facilities may be supported on a series of conventional spread footings constructed in a grid pattern and bearing on undisturbed stiff native soil or compacted fill. Continuous footings should have a width of at least 12 inches and should extend at least 34 inches below exterior grade and at least 28 inches below the bottom of concrete slabs-on-grade, The use of isolated footings should be avoided. Footings with at least these minimum dimensions may be designed for an allowable bearing pressure of 2,500 pounds per square foot (psf) for dead plus live loads, with a one-third increase allowed when considering additional short-term wind or seismic loading. The weight of the footings may be neglected for design purposes.

Due to the potential for liquefaction related differential settlement and expansive soil movement, we recommend that continuous footings be arranged in a grid pattern, and we suggest that the grids be spaced at intervals no greater than approximately 18 feet or as determined by the structural engineer. In addition, we recommend all continuous footings be capable of spanning a distance of at least 15 feet and cantilevering a minimum distance of at least 5 feet under full dead loads.

All footings located adjacent to utility lines should be embedded below a 1:1 plane extending up from the bottom edge of the utility trench. All continuous footings should be reinforced with sufficient top and bottom steel reinforcement to provide structural continuity and to permit spanning of local irregularities.

The bottom of all footing excavations should be cleaned of fill, loose and soft soil and debris. A member of our staff should observe all footing excavations prior to placement of reinforcing steel to confirm that they expose suitable native or compacted fill material, have at least the recommended minimum dimensions, and have been properly cleaned. If soft or loose soils are encountered in the foundation excavations, our field representative will require these materials to be removed and may require a deeper footing embedment depth before the reinforcing steel and concrete is placed.

Mat Foundation

As a less expensive, less predictable alternative to drilled piers, in our opinion, the community center building and the restroom facilities may be supported on a structural mat foundation bearing on native soil or engineered fill. The mat may be designed for an average allowable bearing pressure of 1,500 pounds per square foot for combined dead plus live loads, with maximum localized bearing pressures of 2,500 pounds per square foot at column or wall loads. These pressures may be increased by one-third for total loads including wind or seismic forces. These pressures are net values; the weight of the mat may be neglected in design.

The mat should be reinforced to provide structural continuity and to permit spanning of local irregularities. A modulus of subgrade reaction (Kv1) of 100 pounds per cubic inch may be assumed for a 1-foot square bearing area, which should be scaled to account for mat foundation size effects. Alternatively, based on the anticipated building load and differential static settlement, a modulus of subgrade reaction (Kv) of 25 pounds per cubic inch (pci) may be assumed for the mat subgrade.

In our opinion, the mat foundation should include a thickened perimeter edge at least 12 inches wide, and should extend at least 34 inches below exterior grade, and at least 28 inches below the bottom of mat, whichever is deeper. This would improve edge stiffness, reduce the potential for mat slab dampness, and increase resistance to lateral loads imposed on the mat. The mat foundation should be designed with sufficient thickness and reinforcing to span an unsupported length of at least 15 feet and cantilever a distance of at least 5 feet.

In our opinion, the mat slab should be underlain by at least 4 inches of free-draining gravel, such as ½- to ¾-inch clean crushed rock, which is in turn underlain by at least 20 inches of non-expansive fill (preferably Class II aggregate base). Prior to mat construction, the mat subgrade should be scarified, prepared and compacted as recommended in the section titled "Compaction." Just prior to mat construction, the non-expansive fill section should be proof-rolled to provide a smooth firm surface for mat support. Our representative should observe and test during the preparation and compaction of the mat subgrade and non-expansive fill section.

Lateral Loads for Footings and Mat

Lateral loads may be resisted by friction between the bottom of the footings or mat and the supporting subgrade, and by passive soil pressure acting against the footings or mat cast neat in foundation excavations or backfilled with properly compacted structural fill. The below values given for coefficient of friction and passive soil resistance are ultimate values. We recommend that a factor of safety of 1.5 be applied.

An ultimate coefficient of friction of 0.35 may be assumed for design for footings bearing directly on compacted fill or native soil. An ultimate coefficient of friction of 0.5 may be assumed for the mat foundation bearing directly on a crushed rock section. However, since it is likely that a water-proofing membrane will be installed between the bottom of the foundations and subgrade soil, the structural engineer should consult with the water proofing consultant for the coefficient of friction between the membrane and subgrade soil. Ultimate passive soil resistance may be simulated by an equivalent fluid pressure of 450 pounds per cubic foot beginning at the ground surface or mat/slab subgrade, where appropriate. The upper one foot of passive soil resistance should be neglected where soil adjacent to the foundations is not covered and protected by a relatively level concrete slab or pavement.

Other Foundation Considerations

Since the existing building foundations were constructed with no geotechnical observation, and the as-built depth and width of the existing building foundations are unknown, there is more uncertainty concerning their performance than for the new foundations as discussed above. If the structural load on the existing foundations will be increased significantly, it may be prudent to selectively underpin the foundations as needed to reduce post-construction differential settlement due to the new loads from the proposed renovation and remodel. Additional stiffening elements, such as tie beams could be added to the existing foundation in order to increase the overall rigidity of the foundation system.

When the existing foundations are exposed prior to or during construction, the design and construction team should observe their condition and determine if any remedial measures or supplemental recommendations would be appropriate.

Settlement

Thirty-year post-construction differential settlement due to static loads is not expected to exceed about 1-inch across the structures supported on a drilled pier foundation, provided the foundations are designed and constructed as recommended.

Thirty-year post-construction differential movement due to static loads is not expected to exceed about 1.5-inch across the structures supported on a shallow foundation, provided the foundation is designed and constructed as recommended.

As discussed in the above sections, differential settlement of up to about 1.5 inches over a horizontal distance of 50 feet is possible across the ground surface from liquefaction of the silty and sandy layers during seismic shaking. The differential settlement mentioned above should be considered during structural design of the foundation system.

SLABS-ON-GRADE

General Slab Considerations

The near-surface native soils at the site have a high expansion potential. Expansive soils have a tendency to expand due to increases in moisture content and shrink as they dry. This can result in some slab cracking and heave regardless of the geotechnical measures implemented. Our recommendations below will help reduce the impacts of the expansive soils beneath slabs-on-grade but will not eliminate the risk entirely. In areas where differential settlement across the flatwork is not desired, the slabs could be designed as a structural slab supported on a pier and grade beam foundation.

To reduce the potential for movement of the soil subgrades below at-grade concrete slabs-on-grade, at least the upper 6-inches of the surface soil should be scarified, moisture conditioned, and compacted at a moisture content at least 3 percent above the laboratory optimum. The native soil subgrade should be kept moist up until the time the non-expansive fill, crushed rock and vapor barrier, and/or aggregate base section is installed. Slab subgrades and non-expansive fill should be prepared and compacted as recommended in the section of this report titled "Earthwork."

Overly soft or moist soils should be removed from slab-on-grade areas. Exterior flatwork and interior slabs-on-grade should be underlain by a layer of non-expansive fill as described below. The non-expansive fill should consist of Class 2 aggregate base or clayey soil with a Plasticity Index of 15 or less.

Considering the potential for expansive soil movements of the surface soil, we expect that reinforced slabs will perform better than unreinforced slabs. Consideration should be given to using a control joint spacing on the order of 2 feet in each direction for each inch of slab thickness.

To reduce the potential for differential movement of slabs-on-grade, pavement and exterior flatwork supported on surface fills, the existing fill should be over-excavated and compacted on a series of level benches to current day compaction standards. The vertical and lateral extent of the surface fill will need to be established during grading. We note that if the entire thickness of existing fill will not be re-worked as engineered fill, slabs and flatwork will likely have a higher potential for differential settlement and distress. We can provide further guidance during the design and grading for slabs-on-grade/exterior flatwork improvements, as needed.

Exterior Flatwork

Concrete walkways and exterior flatwork should be at least 5 inches thick and should be constructed on at least 18 inches of Class 2 aggregate base. The potential for distress to exterior slabs due to expansive soil movements could be reduced by placing and compacting an additional 6-inch-thick layer of aggregate base recommended above (i.e., a total of 24 inches of non-expansive fill).

To improve performance, exterior slabs-on-grade, such as for patios, may be constructed with a thickened edge to improve edge stiffness and to reduce the potential for water seepage under the edge of the slabs and into the underlying base and subgrade. In our opinion, the thickened edges should be at least 8 inches wide and should extend at least 4 inches below the bottom of the underlying aggregate base layer.

Due to the presence of near-surface expansive soil, pervious flatwork/pavement is generally not desirable since the pavement will likely be prone to more significant heaving and shrinkage (uplift and downward) movement due to seasonal moisture fluctuation and introduction of surface water onto the pavement subgrade. More differential settlement under wheel loads could also occur due to soil softening/saturation. In addition, soil saturation at pervious pavement near a structure will likely cause more prominent differential settlement/movement across the building foundations. However, if pervious pavement will be required, the pavement preferably should be located at least 8 feet away from any structures. In addition, the owner must also be willing to accept a higher level of risk of differential movement damage and extra maintenance, if it occurs.

Interior Slabs

At-grade interior slab-on-grade floors should be constructed on a layer of non-expansive fill at least 24 inches thick over a properly prepared and compacted subgrade. Due to the potential for expansive soil movement, it would be preferable for slab-on-grade floors to be at least 5 inches in thickness. Recycled aggregate base should not be used for non-expansive fill below interior slabs-on-grade, since adverse vapor could occur from crushed asphalt components.

In areas where dampness of at-grade concrete floor slabs would be undesirable, such as within the building interiors, concrete slabs should be underlain by at least 4 inches of clean, free-draining gravel, such as ½-inch to ¾-inch clean crushed rock with no more than 5 percent passing the ASTM No. 200 sieve. Pea gravel should not be used. The crushed rock layer should be compacted and leveled with vibratory equipment. The crushed rock layer may be considered as the non-expansive fill layer.

To reduce vapor transmission up through concrete floors, the crushed rock section should be covered with a high quality, UV-resistant vapor barrier conforming to the requirements of ASTM E 1745 Class A, with a water vapor transmission rate less than or equal to 0.01 perms (such as 15-mil thick “Stego Wrap Class A”) or other waterproofing membrane. The vapor barrier should be placed directly below the concrete slab. Sand above the vapor barrier is not recommended. The vapor barrier should be installed in accordance with ASTM E 1643. All seams and penetrations of the vapor barrier should be sealed in accordance with manufacturer’s recommendations.

The permeability of concrete is affected significantly by the water cement ratio of the mix, with lower ratios producing more damp-resistant slabs (or mats) and being stronger structurally. Where moisture protection is important and/or where the concrete will be placed directly on the vapor barrier, the water-to-cement ratio should be 0.45 or less. To increase the workability of the concrete, mid-range plasticizers can be added to the mix. Water should not be added to the mix unless the slump is less than specified and the ratio will not exceed 0.45. Other steps that may be taken to reduce moisture transmission through the slab (or mat) include moist curing for 5 to 7 days and allowing the slab to dry for a period of two months or longer prior to placing floor coverings. Also, prior to installation of the floor covering, it may be appropriate to test the slab moisture content for adherence to the manufacturer’s requirements to determine whether a longer drying time is necessary.

Structural Slabs

In our opinion, interior slabs to be constructed entirely or partially over expansive native soil and/or fill soils preferably should be structurally supported on the pier foundation with a 4-inch minimum void form used below the slab. This may be accomplished with cardboard forms or an equivalent method. Where void forms are used, the non-expansive fill and capillary break section recommended below may be eliminated. At the interior area where floor dampness is a concern, a water-proofing membrane that will adhere to the concrete (such as preproof or polygard) should be placed between the void form and slab, rather than a vapor barrier. The contractor will need to exercise care to maintain the integrity of the void forms while placing reinforcing steel and concrete.

Sports Court

Our experience with sports courts indicates that owners have less tolerance for imperfections in the playing surface. Imperfections can occur primarily because of poor grading practices, lack of control of surface and subsurface drainage, and the presence of varying supporting conditions across the court or if used for the sport court pad soils. In addition, water intrusion below the sports court pad soils can cause heave of portions of the surfacing as the moisture content changes below the court increases during the rainy season or times of heavy watering. Shrinkage can also occur during dry periods.

Our recommendations concerning construction practices for the site conditions which will help reduce the potential for differential movement are as follows:

- Just prior to completing the court, the upper 6-inches of soil on the graded court pad should be scarified and compacted to a relative compaction of approximately 90 percent (ASTM D 1557) at a moisture content at least 3 percent above the laboratory optimum. If fill soil is encountered at the sports court pad, the fill should be entirely excavated and properly compacted.

- For better expected performance, the playing surface would be supported on at least 24-inches, and preferably 30-inches, of imported non-expansive fill material, preferably Class 2 aggregate base over the properly prepared subgrade.

- If a concrete slab is constructed for the sports court, we recommend that the sports court be constructed with a thickened edge to improve edge stiffness and to reduce the potential for water seepage under the edge of the slab. The thickened edge should extend at least 4 inches below the bottom of the aggregate base layer to reduce seepage into the aggregate base layer and underlying soil subgrade.

Concrete surfaces, being more brittle than soft court surfaces, are more prone to cracking as a result of differential ground movement. As concrete cures, it shrinks and cracks can form, especially in restrained and reinforced slabs. In general, the concrete mixture used for the sports court should be developed to control surface cracking during the curing process. Cracking in concrete can be reduced by using a water:cement ratio of less than 0.45. It would also be beneficial to maximize the size and amount of coarse aggregate or using low-shrinkage aggregate. Consideration could also be given to using a shrinkage-reducing admixture to reduce drying shrinkage or use of synthetic fibers to help control plastic shrinkage cracks. These factors should be considered by the sports court designer.

- Surface drainage from areas around the perimeter of the court should not be allowed to flow onto or across the court, but should be carried around the court in a system of well-planned out catch basins and drainage swales or ditches. Area drains should collect surface drainage on the court.

- A plan is developed showing pertinent grading, compaction, drainage, and other details of the court. The geotechnical engineer is retained to review the plan and observe and test the earthwork and drainage aspects of construction.

VEHICLE PAVEMENTS

Asphalt Concrete Pavements

Based on the anticipated composition of the surface soils, and an estimated traffic index for the proposed pavement loading conditions, we developed the minimum pavement sections presented in Table 4 below based on Procedure 630 of the Caltrans Highway Design Manual.

The Traffic Indices used in our pavement thickness calculations are considered reasonable values for this development and are based on engineering judgment rather than on detailed traffic projections. Asphalt concrete and aggregate base should conform to and be placed in accordance with the requirements of the Caltrans Standard Specifications, latest edition, except that compaction should be based on ASTM Test D1557.

Table 4. Pavement Sections
Granada Community Center and Burnham Park
El Granada, California

General Traffic Condition	Traffic Index	AC Thickness (inches)	Aggregate Base* (inches)	Total Section (inches)
Automobile Only	4.0	3.0	8.0	11.0
Light Truck Access	5.0	3.0	10.0	13.0
Moderate Truck Access	6.0	4.0	11.0	15.0
Heavy Truck Access	7.0	4.0	16.0	20.0

*Caltrans Class 2 Aggregate Base (minimum R-value = 78).

Pavement Cutoff

We recommend that measures be taken to limit the amount of surface water that seeps into the aggregate base and subgrade below vehicle pavements, particularly where the pavements are adjacent to landscape areas. Seepage of water into the pavement base material tends to soften the subgrade, increasing the amount of pavement maintenance that is required and shortening the pavement service life. Deepened curbs extending 4-inches below the bottom of the aggregate base layer are generally effective in limiting excessive water seepage. Other types of water cutoff devices or edge drains may also be considered to maintain pavement service life.

Rigid Concrete Pavements

The minimum thickness of the concrete pavements at the site should be based on the anticipated traffic loading, the modulus of rupture of the concrete used for pavement construction, and the composition and supporting characteristics of the subgrade below the pavement section. If rigid concrete pavement is planned, the pavement section may be designed and constructed in accordance with American Concrete Institute (ACI) 330R-08 - Guide for Design and Construction of Concrete Parking Lots.

Based on the near-surface clayey soils we encountered at the project site, a low subgrade-subbase support strength value of 100 pci was assumed in our analysis. In addition, our design assumes that pavements are restrained laterally by a concrete shoulder or curb, and the concrete should have a compressive strength, f 'c, of at least 3,500 psi and a flexural strength, M_R, of at least 500 psi.

Reinforcing steel may be used for shrinkage crack control. In addition, maximum spacing should be provided between contraction joints in both directions. Our recommendations for minimum rigid pavement sections and maximum spacing between joints are presented in Table 5.

Table 5. Rigid Concrete Pavement Design
Granada Community Center and Burnham Park
El Granada, California

Traffic Categories	Maximum ADTT*	Concrete Thickness (inches)	Aggregate Base (inches)	Total Section (inches)	Maximum Spacing between Joints (feet)
Car Parking and Access Lanes	1	5.0	8.0	13.0	12
Truck Parking and Access Lanes	25	6.0	8.0	14.0	15
	300	7.0	8.0	15.0	15

*ADTT = Average daily truck traffic in both directions (excludes panel trucks, pickup trucks, and other four-wheel vehicles)

EARTHWORK

Clearing and Subgrade Preparation

All deleterious materials, such as concrete, pavement, abandoned utility lines, surface fill, vegetation, root systems, topsoil, etc., should be cleared from areas of the site to be built or paved. The actual stripping depth should be established by us at the time of construction. Excavations that extend below finished grade should be backfilled with structural fill that is water-conditioned, placed, and compacted as recommended in the section of this report titled “Compaction.”

After the site has been properly cleared, and excavated to the required grades, exposed soil surfaces in areas to receive structural fill or slabs-on-grade may need to be scarified to a depth of 6 inches, moisture conditioned, and compacted as recommended for structural fill in the section of this report titled "Compaction."

To help reduce the potential effects of the expansive on-site soils, exterior flatwork, slab and pavement subgrades, foundation and utility trench excavations should be kept in a moist condition throughout the construction period.

Existing Surface Fill Recommendations

In our opinion, the existing surface fill should be excavated and compacted below building footprints, pavements, sports court, exterior flatwork, and other site improvements. The fill should be excavated down to competent stiff native soil and compacted under our direction. The resulting excavation bottom and sidewalls should be cut (benched) into as the structural backfill is being placed and compacted as discussed below. Imported backfill materials should be approved by a member of our staff prior to delivery to the site. The backfill should be moisture conditioned and compacted as recommended in the section of the report titled "Compaction." A member of our staff should observe and test during re-working of the surface fill and placement of new fill, as required.

Material for Fill

All on-site soil containing less than 3 percent organic material by weight (ASTM D2974) should be suitable for use as structural fill. Structural fill should not contain rocks or pieces larger than 6 inches in greatest dimension and no more than 15 percent larger than 2.5 inches. Imported non-expansive fill should have a Plasticity Index no greater than 15, should be predominately granular, and should have sufficient binder so as not to slough or cave into foundation excavations and utility trenches. Recycled aggregate base should not be used for non-expansive fill at building interior. A member of our staff should approve proposed import materials prior to their delivery to the site.

Finished Slopes

We recommend that finished slopes be cut or filled to an inclination preferably no steeper than 2:1 (horizontal:vertical). Exposed slopes may be subject to minor sloughing and erosion that would require periodic maintenance. We recommend that all slopes and soil surfaces disturbed during construction be planted to with erosion resistant vegetation.

Compaction

Scarified soil surfaces and all structural fill should be compacted in uniform lifts no thicker than 8 inches in pre-compacted thickness, conditioned to the appropriate moisture content, and compacted as recommended for structural fill in Table 6. The relative compaction and moisture content recommended in Table 6 is relative to ASTM Test D1557, latest edition.

Table 6. Compaction Recommendations
Granada Community Center and Burnham Park
El Granada, California

General	Relative Compaction*	Moisture Content*
• Scarified subgrade in areas to receive structural fill.	85 to 90 percent	At least 3 percent above optimum
• Structural fill composed of native soil.	85 to 90 percent	At least 3 percent above optimum
• Structural fill composed of non-expansive fill.	90 percent	Near optimum
• Structural fill composed of non-expansive fill below a depth of 4 feet.	93 percent	Above optimum
Pavement Areas		
• Upper 6-inches of low plasticity soil below baserock.	95 percent	Near optimum
• Upper 6-inches of high plasticity soil below baserock.	90 percent	2 to 3 percent above optimum
• Aggregate baserock.	95 percent	Near optimum
Utility Trench Backfill		
• On-site soil.	85 to 90 percent	At least 3 percent above optimum
• Imported sand	93 percent	Near optimum

* Relative to ASTM Test D1557, latest edition.

At the start of site grading and earthwork construction, and prior to subgrade preparation and placement of non-expansive fill, representative samples of on-site soil and import material will need to be collected in order for a laboratory compaction test to be performed for use during on-site density testing. Sampling of on-site soil and proposed import material should be requested by the contractor at least 5 days prior to when our staff will be needed for density testing to allow time for soil sampling and laboratory testing to be performed prior to our on-site compaction testing.

Temporary Slopes, Excavations, Dewatering

The contractor should be responsible for the design and construction of all temporary slopes, dewatering, and any required shoring. Shoring and bracing should be provided in accordance with all applicable local, state, and federal safety regulations, including current OSHA excavation and trench safety standards.

Due to the potential for variation of the on-site soil, field modification of temporary cut slopes may be required. Unstable materials encountered on and near excavations and slopes during and after excavation should be trimmed off even if this requires cutting the slopes back to a flatter inclination.

We note that the sandy soils encountered at the site had limited cohesion and a relatively high ground water table is present at the site. This sandy soil is judged to be prone to sloughing and caving if excavated to nearly-vertical or steep temporary slope inclinations particularly where below the ground water level. This information should be considered by the contractor when planning and constructing temporary excavation shoring, pier drilling, over excavation and backfilling of the existing surface fill, installing and backfilling new utilities, and performing other miscellaneous on-site earthwork and underground construction.

Protection of structures near cuts and excavations should also be the responsibility of the contractor.

Excavations that extend below ground water will require flatter inclinations. Depending on the depth of the excavation and the ground water level and/or extent of ground water seepage at the time of the excavations, construction dewatering may be required via a series of sump pumps or other methods.

Please note that our scope or site visits do not (and will not) include reviewing the adequacy of the contractor's safety measures or stability of temporary cuts, and the contractor should be solely responsible for the safety of the persons and properties at and near the excavations. In our experience, a preconstruction survey is generally performed to document existing conditions prior to construction, with intermittent monitoring of the structures during construction.

Surface Drainage

Finished grades should be designed to prevent ponding and to drain surface water away from foundations and edges slabs and pavements, and toward suitable collection and discharge facilities. Slopes of at least 2 percent are recommended for flatwork and pavement areas with 5 percent preferred in landscape areas within 8 feet of the structures, where possible. Roof downspout water preferably should be collected in a closed pipe system that is routed to a storm drain system or other suitable location.

Infiltration basins or bioswales, if any, preferably should not be placed within about 10 feet of shallow foundation supported structures or slab or flatwork areas. Drains should be provided for infiltration basins that direct water to an appropriate outlet as required by the civil engineer.

Drainage facilities should be observed to verify that they are adequate and that no adjustments need to be made, especially during the first two years following construction. We recommend preparing an as-built plan showing the locations of surface and subsurface drain lines and clean-outs. The drainage facilities should be periodically checked to verify that they are continuing to function properly. It is likely the drainage facilities will need to be periodically cleaned of silt/debris that may build up in the lines.

FUTURE SERVICES

Plan Review

Romig Engineers should review the completed project plans for conformance with the recommendations contained in this report. We should be provided with these plans as soon as possible upon completion in order to limit the potential for delays in the permitting process that might otherwise be attributed to our review process. In addition, it should be noted that many of the local building and planning departments now require "clean" geotechnical plan review letters prior to acceptance of plans for their final review. Since our plan reviews typically do result in recommendations for additional changes to the plans, our generation of a "clean" review letter often requires two iterations.

At a minimum, we recommend that the following note be added to the plans: "Earthwork, pier drilling, foundation construction, void form installation, surface fill over excavation and backfilling, slab subgrade and non-expansive fill preparation, utility trench backfilling, pavement construction, sports court construction, and site drainage should be performed in accordance with the geotechnical report prepared by Romig Engineers, Inc., dated October 27, 2022. Romig Engineers should be notified at least 48 hours in advance of any earthwork or foundation construction and should observe and test during the earthwork and foundation construction phases of the project as recommended in the geotechnical report. Romig Engineers should be notified at least 5 days prior to earthwork, trench backfill and subgrade preparation work to allow time for sampling of on-site soil and laboratory compaction curve testing to be performed prior to on-site compaction density testing."

Construction Observation and Testing

The earthwork and foundation phases of construction should be observed and tested by us to 1) establish that subsurface conditions are compatible with those used in the analysis and design; 2) observe compliance with the design concepts, specifications and recommendations; and 3) allow design changes in the event that subsurface conditions differ from those anticipated. The recommendations in this report are based on a limited amount of subsurface exploration. The nature and extent of variation across the site may not become evident until construction. If variations are exposed during construction, it will be necessary to reevaluate our recommendations.

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REFERENCES

Aagaard, B.T., Blair, J.L., Boatwright, J., Garcia, S.H., Harris, R.A., Michael, A.J., Schwartz, D.P., and DiLeo, J.S., 2016, Earthquake outlook for the San Francisco Bay region 2014–2043 (ver. 1.1, August 2016): U.S. Geological Survey Fact Sheet 2016–3020, 6 p., http://dx.doi.org/10.3133/fs20163020.

Pampeyan, Earl H., 1994, Geologic Map of the Montara Mountain and San Mateo 7-1/2' Quadrangles, San Mateo, County, California, U.S. Geological Survey Map 1-2390.

American Society of Civil Engineers, 2019, Minimum Design Loads for Buildings and Other Structures, ASCE Standard 7-16.

Idriss, I.M., and Boulanger, R.W., 2008, Soil Liquefaction During Earthquakes, Earthquake Engineering Research Institute (EERI), Oakland, California.

Seismic Hazard Zone Report for the Montara Mountain 7.5-minute Quadrangle, San Mateo County, California. California Geological Survey, Seismic Hazard Zone Report 128.

California Building Standards Commission, and International Code Council, 2019 California Building Code, California Code of Regulations, Title 24, Part 2.

California Department of Conservation, Division of Mines and Geology (DMG), 1994, Fault-Rupture Hazard Zones in California, Special Publication 42.

SEAOC/OSHPD, 2022, Seismic Design Maps, https://seismicmaps.org/

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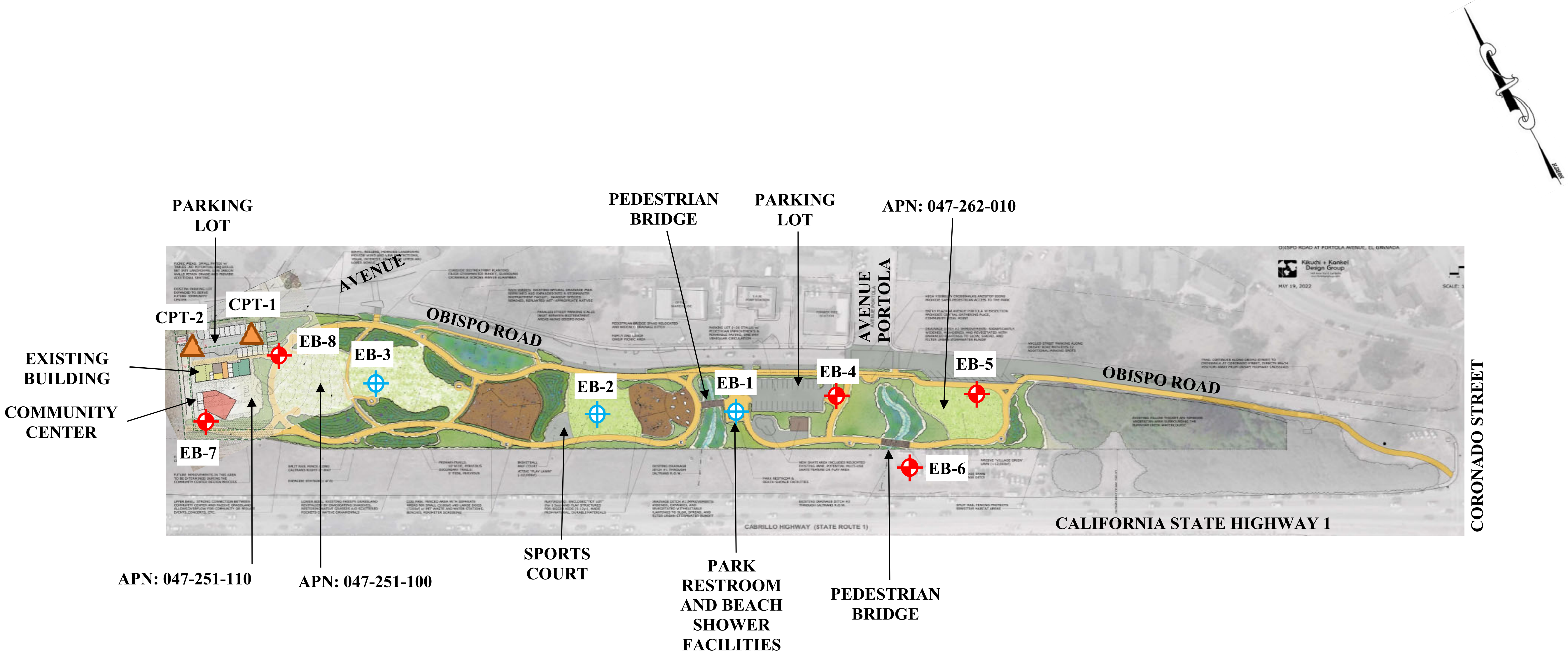
Scale: 1 inch = 2000 feet
Base is United States Geological Survey Montara Mountain and Half Moon Bay 7.5 Minute Quadrangle, dated 1997.

VICINITY MAP **FIGURE 1**
GRANADA COMMUNITY CENTER AND BURNHAM PARK OCTOBER 2022
HALF MOON BAY, CALIFORNIA PROJECT NO. 4812-4

ROMIG ENGINEERS

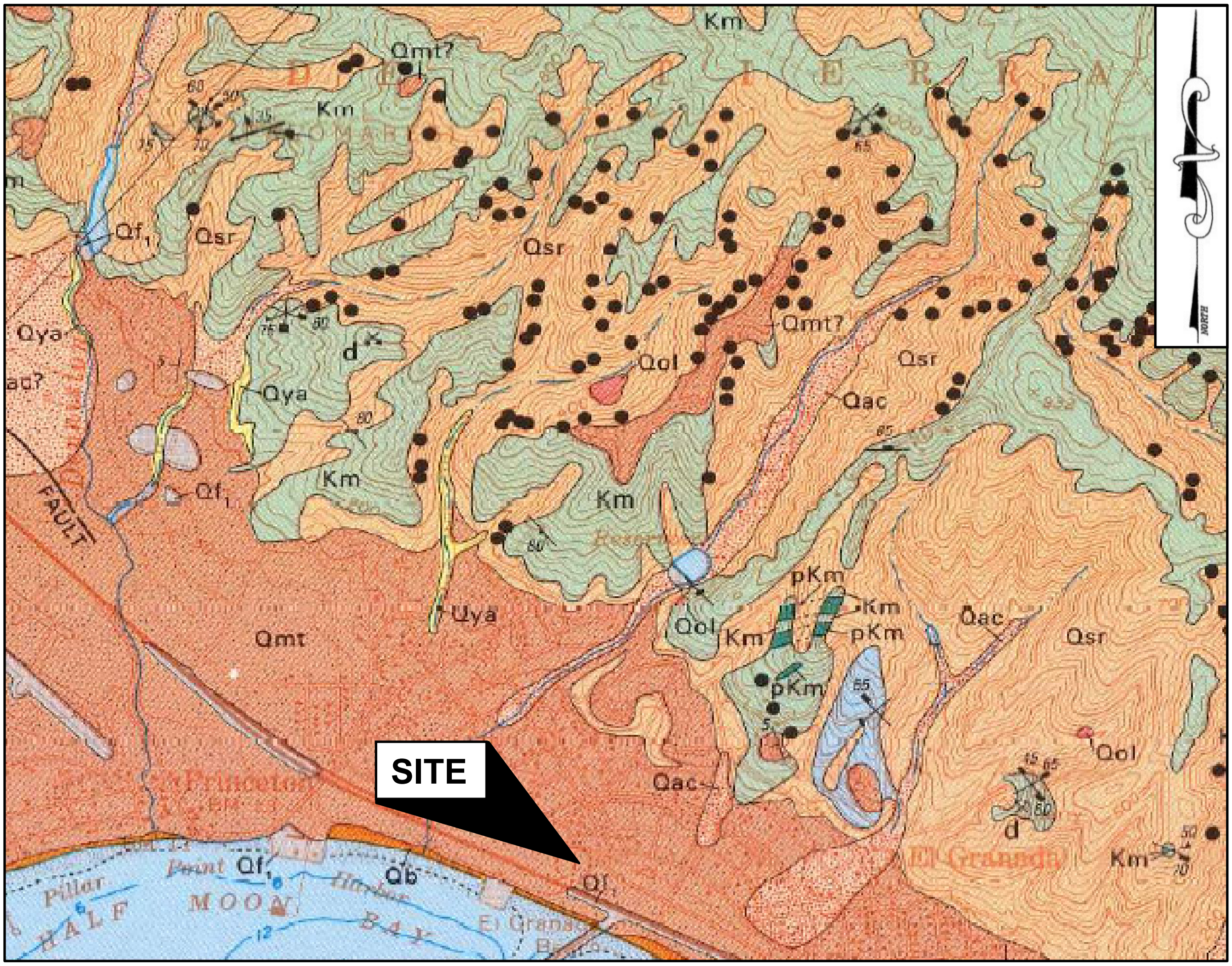


LEGEND

EB-3	Approximate Location of Exploratory Borings (Romig Engineers, 2009).
EB-8	Approximate Location of Exploratory Borings.
CPT-2	Approximate Location of Cone Penetration Test.
	Approximate Scale: 1 inch = 200 feet.
	Base is site plan provided by you, undated.

SITE PLAN
GRANADA COMMUNITY CENTER AND BURNHAM PARK
HALF MOON BAY, CALIFORNIA

FIGURE 2
OCTOBER 2022
PROJECT NO. 4812-4



LEGEND

Qac	Coarse-grained alluvium
Qsr	Slope wash, ravine fill, and colluvium
Qol	Older landslide deposits
Qmt	Marine terrace deposits
Qf_1	Artificial fill, Unit 1

Geologic Contact - dashed where approximate, dotted where inferred.

Fault - dashed where approximate, dotted where inferred.

Shallow landslide, commonly in surficial material

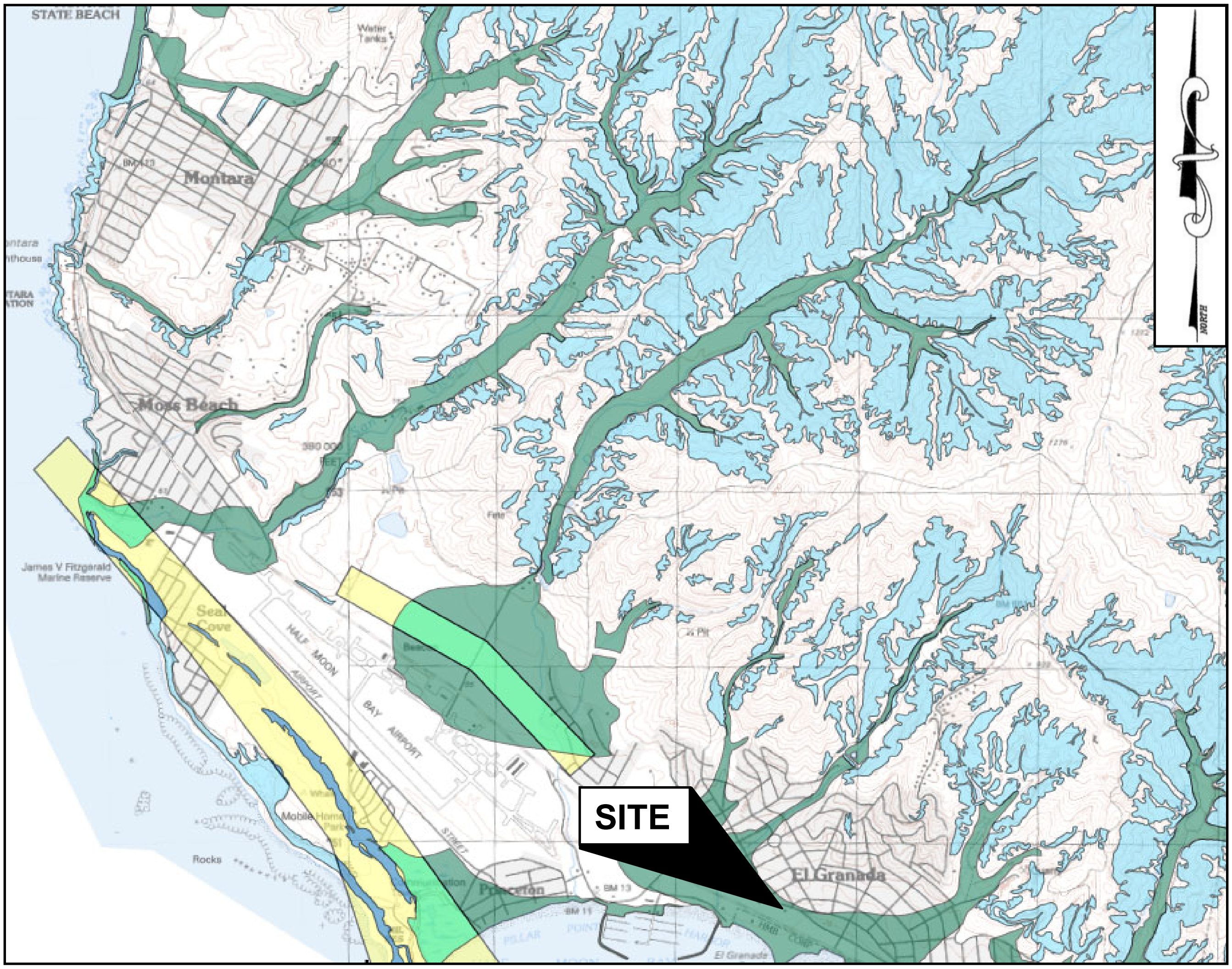
0 1000 2000 4000 feet

Scale: 1 inch = 2000 feet

Base is Geologic Map of the Montara Mountain and San Mateo 7.5 Minute Quadrangles, San Mateo County, California, (Pampeyan, 1994).

VICINITY GEOLOGIC MAP
GRANADA COMMUNITY CENTER AND BURNHAM PARK
HALF MOON BAY, CALIFORNIA

FIGURE 3
OCTOBER 2022
PROJECT NO. 4812-4



LEGEND

Earthquake Fault Zones

Liquefaction Hazard Zones

Earthquake-Induced Landslide Zones

Overlap of Earthquake Fault Zones and Liquefaction Zone

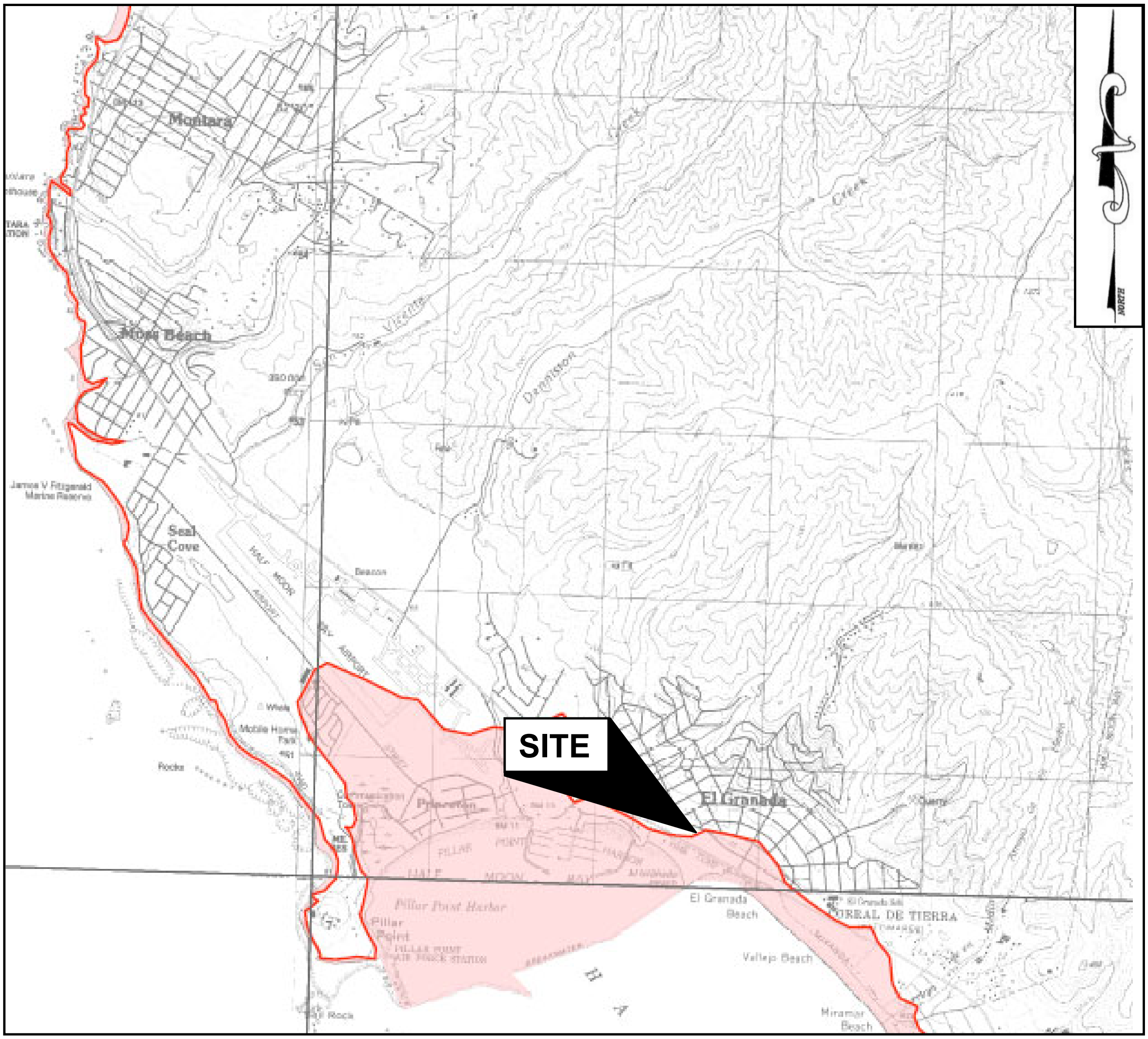
Overlap of Earthquake Fault Zones and Earthquake-Induced Lanslide Zone

0 1000 2000 4000 feet

Scale: 1 inch = 2000 feet
Base is Earthquake Zones of Required Investigation of the Montara Mountain Quadrangle, San Mateo County, California, (Californie Geologic Survey, 2019).

STATE SEISMIC HAZARD ZONES | **FIGURE 4**
GRANADA COMMUNITY CENTER AND BURNHAM PARK | OCTOBER 2022
HALF MOON BAY, CALIFORNIA | PROJECT NO. 4812-4

ROMIG ENGINEERS



LEGEND

Tsunami Inundation Line

Tsunami Inundation Area

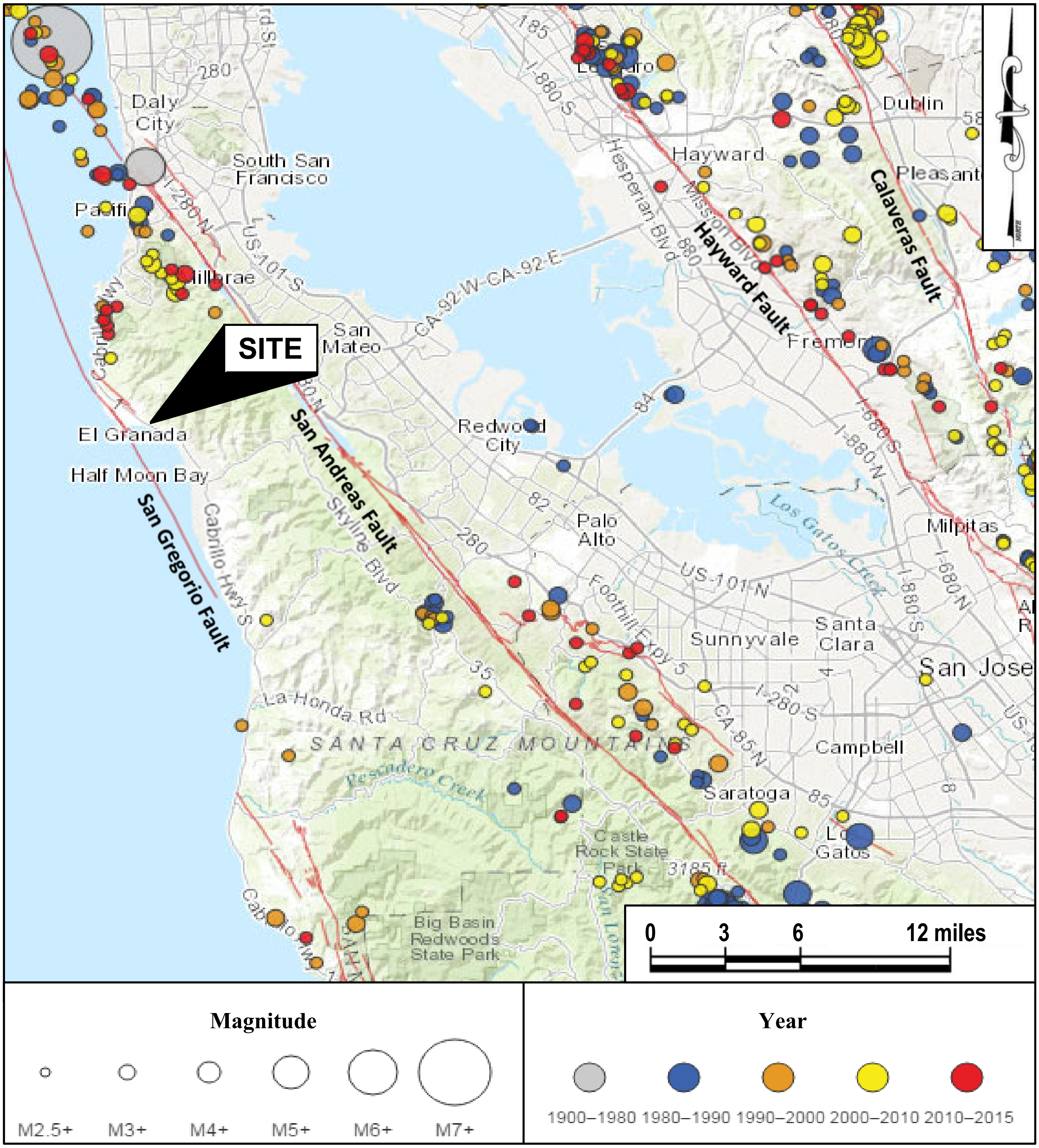
0 1000 2000 4000 feet

Scale: 1 inch = 2000 feet
Base is Tsunami Inundation Map for Emergency Planning of the Montara Mountain Quadrangle, San Mateo County, California, (California Geological Survey, 2009).

TSUNAMI INUNDATION MAP FOR EMERGENCY PLANNING
GRANADA COMMUNITY CENTER AND BURNHAM PARK
HALF MOON BAY, CALIFORNIA

FIGURE 5
OCTOBER 2022
PROJECT NO. 4812-4

ROMIG ENGINEERS



Earthquakes with M5+ from 1900 to 1980, M2.5+ from 1980 to January 2015. Faults with activity in last 15,000 years. Based on data sources from Northern California Earthquake Data Center and USGS Quaternary Fault and Fold Database, accessed May 2015.

REGIONAL FAULT AND SEISMICITY MAP
GRANADA COMMUNITY CENTER AND BURNHAM PARK
HALF MOON BAY, CALIFORNIA

FIGURE 6
OCTOBER 2022
PROJECT NO. 4812-4

ROMIG ENGINEERS

APPENDIX A

FIELD INVESTIGATION

The soils encountered during drilling were logged by our representative and samples were obtained at depths appropriate to the investigation. The samples were taken to our laboratory where they were examined and classified in accordance with the Unified Soil Classification System. The log of our boring, and a summary of the soil classification system (Figure A-1) used on the boring log, are attached.

Several tests were performed in the field during drilling. The standard penetration test resistance was determined by dropping a 140-pound hammer through a 30-inch free-fall and recording the blows required to drive the 2-inch (outside diameter) sampler 18 inches. The standard penetration test (SPT) resistance is the number of blows required to drive the sampler the last 12 inches and is recorded on the boring log at the appropriate depths. Soil samples were also collected using 2.5-inch and 3.0-inch O.D. drive samplers. The blow counts shown on the log for these larger samplers do not represent SPT values and have not been corrected in any way.

The Cone Penetration Test (CPT) probes for this project was performed by Middle Earth Geo Testing, Inc. using an integrated electronic cone system. The CPT sounding was performed in accordance with ASTM D 5778-95. A 30-ton capacity cone was used for the sounding. The electronic cone had a tip area of 15 cm^2 and friction sleeve area of 225 cm^2. The logs of the CPT probes are included in this Appendix.

The locations of our borings and CPT probes were established by pacing using the site plan provided by you, undated. The location of the borings and CPT probes should be considered accurate only to the degree implied by the method used.

The boring and CPT logs and related information depict our interpretation of subsurface conditions only at the specific location and time indicated. Subsurface conditions and ground water levels at other locations may differ from conditions at the locations where sampling was conducted. The passage of time may also result in changes in the subsurface conditions.

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USCS SOIL CLASSIFICATION

PRIMARY DIVISIONS			SOIL TYPE	SECONDARY DIVISIONS
COARSE GRAINED SOILS (< 50 % Fines)	GRAVEL	CLEAN GRAVEL (< 5% Fines)	GW	Well graded gravel, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravel or gravel-sand mixtures, little or no fines.
		GRAVEL with FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SAND	CLEAN SAND (< 5% Fines)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SAND WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS (> 50 % Fines)	SILT AND CLAY Liquid limit < 50%		ML	Inorganic silts and very fine sands, with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, lean clays.
			OL	Organic silts and organic clays of low plasticity.
	SILT AND CLAY Liquid limit > 50%		MH	Inorganic silt, micaceous or diatomaceous fine sandy or silty soil.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.
BEDROCK			BR	Weathered bedrock.

RELATIVE DENSITY

SAND & GRAVEL	BLOWS/FOOT*
VERY LOOSE	0 to 4
LOOSE	4 to 10
MEDIUM DENSE	10 to 30
DENSE	30 to 50
VERY DENSE	OVER 50

CONSISTENCY

SILT & CLAY	STRENGTH^	BLOWS/FOOT*
VERY SOFT	0 to 0.25	0 to 2
SOFT	0.25 to 0.5	2 to 4
FIRM	0.5 to 1	4 to 8
STIFF	1 to 2	8 to 16
VERY STIFF	2 to 4	16 to 32
HARD	OVER 4	OVER 32

GRAIN SIZES

BOULDERS	COBBLES	GRAVEL		SAND			SILT & CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

12 " — 3" — 0.75" — 4 — 10 — 40 — 200

SIEVE OPENINGS — U.S. STANDARD SERIES SIEVE

Classification is based on the Unified Soil Classification System; fines refer to soil passing a No. 200 sieve.

* Standard Penetration Test (SPT) resistance, using a 140 pound hammer falling 30 inches on a 2 inch O.D. split spoon sampler; blow counts not corrected for larger diameter samplers.

^ Unconfined Compressive strength in tons/sq. ft. as estimated by SPT resistance, field and laboratory tests, and/or visual observation.

KEY TO SAMPLERS

}	Modified California Sampler (3-inch O.D.)
|	Mid-size Sampler (2.5-inch O.D.)
{	Standard Penetration Test Sampler (2-inch O.D.)

KEY TO EXPLORATORY BORING LOGS — **FIGURE A-1**
GRANADA COMMUNITY CENTER AND BURNHAM PARK — OCTOBER 2022
HALF MOON BAY, CALIFORNIA — PROJECT NO. 4812-4

ROMIG ENGINEERS

DRILL TYPE: Minuteman with 3-1/4" Continuous Flight Auger　　**LOGGED BY:** AV

DEPTH TO GROUND WATER: Not Encountered　　**SURFACE ELEVATION:** 22 Feet　　**DATE DRILLED:** 9/12/22

CLASSIFICATION AND DESCRIPTION	SOIL CONSISTENCY/ DENSITY or ROCK HARDNESS* (Figure A-2)	SOIL TYPE	SOIL SYMBOL	DEPTH (FEET)	SAMPLE INTERVAL	PEN. RESISTANCE (Blows/ft)	WATER CONTENT (%)	SHEAR STRENGTH (TSF)*	UNCONFIN. COMP. (TSF)*
Fill: Brown, Sandy Lean Clay, moist, fine to coarse grained sand, low plasticity. Concrete from 1-1.5 feet.	Hard	CL		0		97	10 10		
Fill: Light brown, Well-Graded Sand, slightly moist, fine to coarse grained.	Dense	SW							
Fill: Brown, Poorly Graded Sand, fine to medium grained, trace coarse sand, trace to few sub-angular to sub-rounded gravel, lenses of clayey sand. Transitioning to Sandy Fat Clay at 6 feet. ● 24% Passing No. 200 Sieve.	Medium Dense	SP		5	●	35 13	6 10 14		
Bottom of Boring at 6 feet.				10 15 20					

Note: The stratification lines represent the approximate boundary between soil and rock types, the actual transition may be gradual.

*Measured using Torvane and Pocket Penetrometer devices.

DRILL TYPE: Minuteman with 3-1/4" Continuous Flight Auger **LOGGED BY:** AV

DEPTH TO GROUND WATER: Not Encountered **SURFACE ELEVATION:** 22 Feet **DATE DRILLED:** 9/12/22

CLASSIFICATION AND DESCRIPTION	SOIL CONSISTENCY/ DENSITY or ROCK HARDNESS* (Figure A-2)	SOIL TYPE	SOIL SYMBOL	DEPTH (FEET)	SAMPLE INTERVAL	PEN. RESISTANCE (Blows/ft)	WATER CONTENT (%)	SHEAR STRENGTH (TSF)*	UNCONFIN. COMP. (TSF)*
Fill: Brown, Poorly Graded Sand, moist, fine to coarse grained.	Dense	SP		0		30	15		
Native: Dark brown, Fat Clay, very moist, fine to coarse grained sand, high plasticity.	Stiff	CH				14	27		2.3
Brown, Sandy Lean Clay, moist, fine to coarse grained sand, low to moderate plasticity, granite fragments.	Stiff	CL		5		13	18		2.3
Bottom of Boring at 6 feet.				10					
				15					
				20					

Note: The stratification lines represent the approximate boundary between soil and rock types, the actual transition may be gradual.

*Measured using Torvane and Pocket Penetrometer devices.

EXPLORATORY BORING LOG EB-5 **BORING EB-5**

GRANADA COMMUNITY CENTER AND BURNHAM PARK OCTOBER 2022

HALF MOON BAY, CALIFORNIA PROJECT NO. 4812-4

DRILL TYPE: Minuteman with 3-1/4" Continuous Flight Auger **LOGGED BY:** AV

DEPTH TO GROUND WATER: Not Encountered **SURFACE ELEVATION:** 19 Feet **DATE DRILLED:** 9/12/22

CLASSIFICATION AND DESCRIPTION	SOIL CONSISTENCY/ DENSITY or ROCK HARDNESS* (Figure A-2)	SOIL TYPE	SOIL SYMBOL	DEPTH (FEET)	SAMPLE INTERVAL	PEN. RESISTANCE (Blows/ft)	WATER CONTENT (%)	SHEAR STRENGTH (TSF)*	UNCONFIN. COMP. (TSF)*
Fill: Brown, Sandy Lean Clay, moist, fine to coarse grained sand, sub-angular gravel, low plasticity.	Hard	CL		0		41	9		
Fill: Light brown, Poorly Graded Sand, moist, fine to coarse grained. ● 22% Passing No. 200 Sieve.	Medium Dense	SP			●	25			
Native: Dark brown, Lean Clay, very moist, fine to medium grained sand, high plasticity.	Very Stiff	CL		5		16	31		1.3
Light orange mottling at 6.5 feet.						23	19		0.8
Light brown to orange-brown, Sandy Lean Clay, moist to very moist, fine to coarse grained sand, granite fragments, low to moderate plasticity, interbedded sands and silts, black oxidation staining.	Very Stiff to Hard	CL		10		45	17		1.5
						26	18		4.0
						26	19		2.0
				15		48	22		0.8
						23	17		1.5
Increase in sand content at 18 feet.				20		21	18		
Bottom of Boring at 20 feet.									

Note: The stratification lines represent the approximate boundary between soil and rock types, the actual transition may be gradual.

*Measured using Torvane and Pocket Penetrometer devices.

EXPLORATORY BORING LOG EB-6 **BORING EB-6**

GRANADA COMMUNITY CENTER AND BURNHAM PARK OCTOBER 2022

HALF MOON BAY, CALIFORNIA PROJECT NO. 4812-4

ROMIG ENGINEERS

DRILL TYPE: Minuteman with 3-1/4" Continuous Flight Auger **LOGGED BY:** AV

DEPTH TO GROUND WATER: Not Encountered **SURFACE ELEVATION:** 32 Feet **DATE DRILLED:** 9/12/22

CLASSIFICATION AND DESCRIPTION	SOIL CONSISTENCY/ DENSITY or ROCK HARDNESS* (Figure A-2)	SOIL TYPE	SOIL SYMBOL	DEPTH (FEET)	SAMPLE INTERVAL	PEN. RESISTANCE (Blows/ft)	WATER CONTENT (%)	SHEAR STRENGTH (TSF)*	UNCONFIN. COMP. (TSF)*
Dark brown, Lean Clay, moist, fine to coarse grained sand, granite fragments, high plasticity, roots.	Very Stiff to Hard	CL		0		30	21		>4.5
■ Liquid Limit = 48, Plasticity Index = 28.						56	18		>4.5
				5		59	14		>4.5
Brown to orange-brown, Sandy Lean Clay, moist to very moist, fine to coarse grained sand, granite fragments, low to moderate plasticity, interbedded sand and silts, orange mottling.	Very Stiff to Hard	CL				66	18		3.3
						22	22		2.0
				10		48	21		3.5
						62	16		4.0
				15		43	17		2.5
Note: The stratification lines represent the approximate boundary between soil and rock types, the actual transition may be gradual.						31	16		2.5
*Measured using Torvane and Pocket Penetrometer devices.						46	18		
				20					
Bottom of Boring at 20 feet.									

EXPLORATORY BORING LOG EB-7 **BORING EB-7**

GRANADA COMMUNITY CENTER AND BURNHAM PARK OCTOBER 2022

HALF MOON BAY, CALIFORNIA PROJECT NO. 4812-4

DRILL TYPE: Minuteman with 3-1/4" Continuous Flight Auger **LOGGED BY:** AV

DEPTH TO GROUND WATER: Not Encountered **SURFACE ELEVATION:** 34 Feet **DATE DRILLED:** 9/12/22

CLASSIFICATION AND DESCRIPTION	SOIL CONSISTENCY/ DENSITY or ROCK HARDNESS* (Figure A-2)	SOIL TYPE	SOIL SYMBOL	DEPTH (FEET)	SAMPLE INTERVAL	PEN. RESISTANCE (Blows/ft)	WATER CONTENT (%)	SHEAR STRENGTH (TSF)*	UNCONFIN. COMP. (TSF)*
Fill: Brown to dark brown, Sandy Lean Clay, moist, fine to coarse grained sand, sub-angular gravel, moderate plasticity, roots.	Hard	CL		0		33	10		>4.5
						31	12		>4.5
Native: Dark brown to brown, Lean Clay, moist, fine to coarse grained sand, high plasticity.	Hard	CL		5		35	16		>4.5
						44	16		>4.5
Brown to reddish brown, Sandy Lean Clay, moist, fine to coarse grained sand, low to moderate plasticity, granite fragments, lenses of sands and silts.	Very Stiff to Hard	CL		10		35	17		>4.5
						50	16		4.0
						39	13		3.8
				15		57	16		3.5
Note: The stratification lines represent the approximate boundary between soil and rock types, the actual transition may be gradual.						39	15		3.5
*Measured using Torvane and Pocket Penetrometer devices.				20		53	19		2.5
Bottom of Boring at 20 feet.									

EXPLORATORY BORING LOG EB-8
GRANADA COMMUNITY CENTER AND BURNHAM PARK
HALF MOON BAY, CALIFORNIA

BORING EB-8
OCTOBER 2022
PROJECT NO. 4812-4

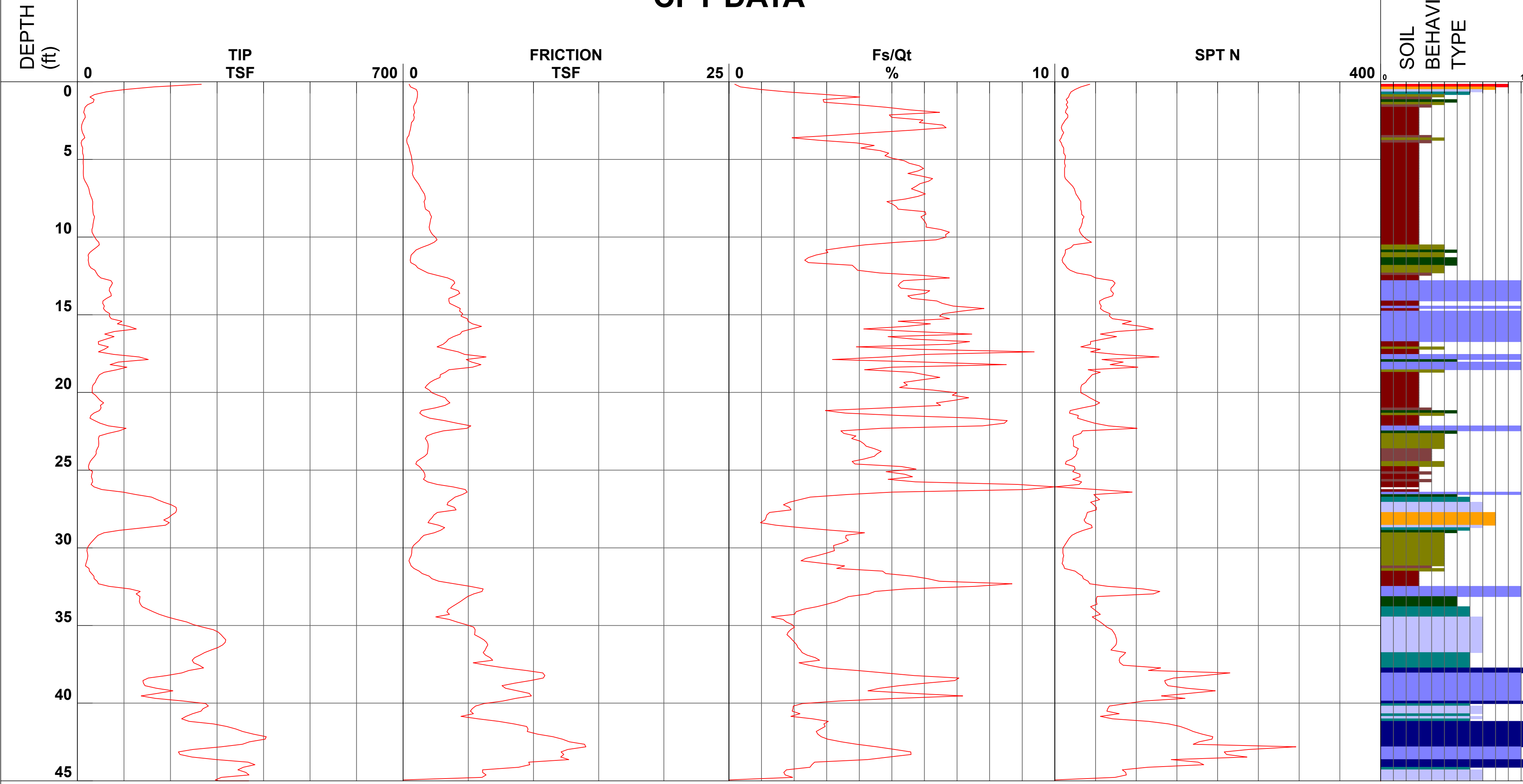
ROMIG ENGINEERS

Romig Engineers, Inc.

Project	Granada Community Center and Burnham F	Operator	AJ-BH	Filename	SDF(160).cpt
Job Number	4812-4	Cone Number	DPG1556	GPS	
Hole Number	CPT-01	Date and Time	9/12/2022 9:46:54 AM	Maximum Depth	45.28 ft
EST GW Depth During Test			15.50 ft		

Net Area Ratio .8

CPT DATA



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 15cm squared

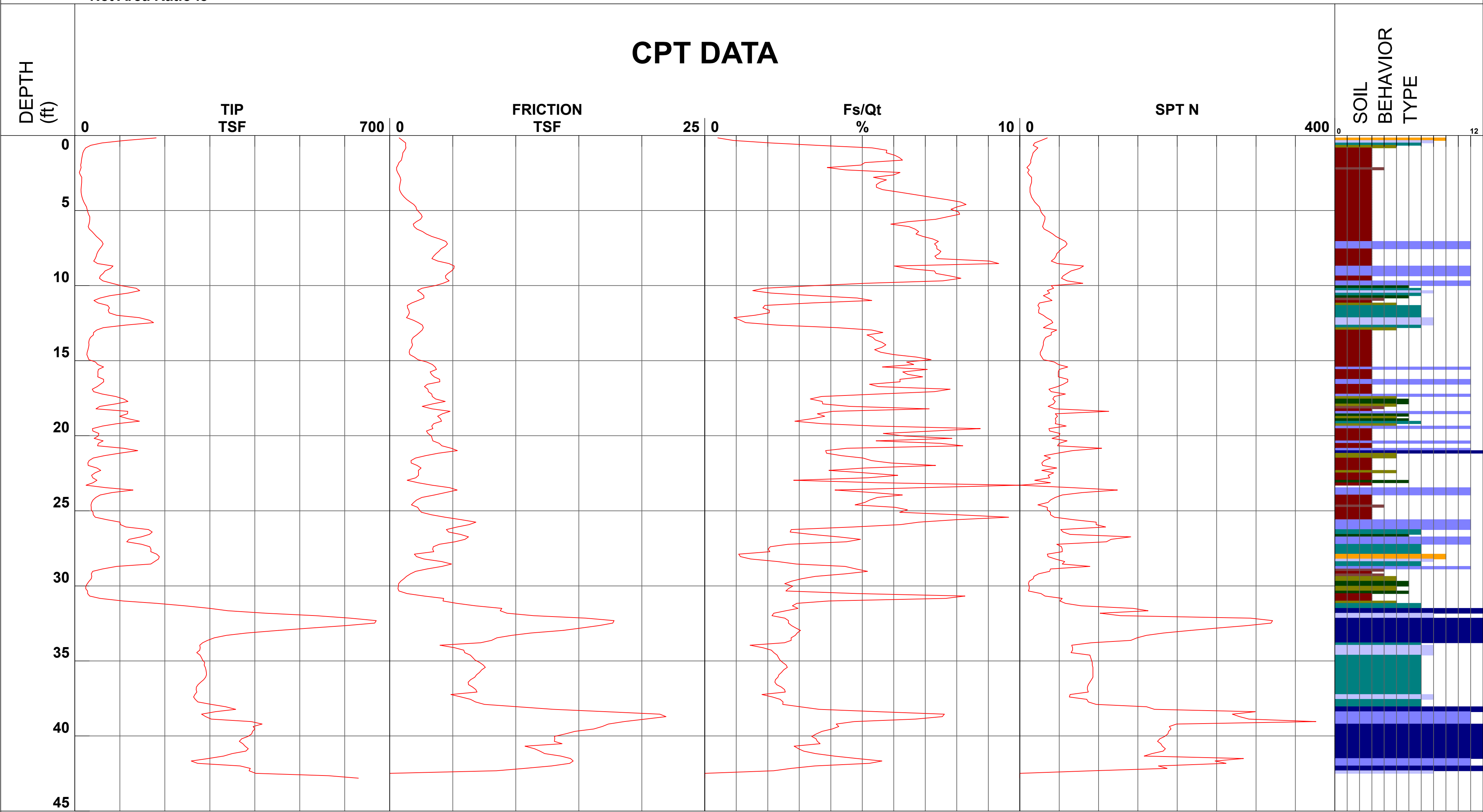
S*Soil behavior type and SPT based on data from UBC-1983

Romig Engineers, Inc.

Middle Earth GEO TESTING INC.

Project	Granada Community Center and Burnham F	Operator	AJ-BH	Filename	SDF(161).cpt
Job Number	4812-4	Cone Number	DPG1556	GPS	
Hole Number	CPT-02	Date and Time	9/12/2022 10:40:21 AM	Maximum Depth	42.81 ft
EST GW Depth During Test			16.20 ft		

Net Area Ratio .8



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 15cm squared

S*Soil behavior type and SPT based on data from UBC-1983

APPENDIX B

LABORATORY TESTS

Samples from subsurface exploration were selected for tests to help evaluate the physical and engineering properties of the soils that were encountered. The tests that were performed are briefly described below.

The natural moisture content was determined in accordance with ASTM D2216 on most of the soil samples recovered from the boring. This test determines the moisture content, representative of field conditions, at the time the samples were collected. The results are presented on the boring log at the appropriate sample depths.

The Atterberg Limits were determined on one sample in accordance with ASTM D 4318. The Atterberg limits are the moisture content within which the soil is workable or plastic. The result of this test is presented in Figure B-1 and on Boring EB-7 at the appropriate sample depth.

The amount of silt and clay-sized material present was determined on two samples of soils in accordance with ASTM D422. The results of these test are presented on the logs of Boring EB-4 and EB-6 at the appropriate sample depths.

❖ ❖ ❖ ❖ ❖

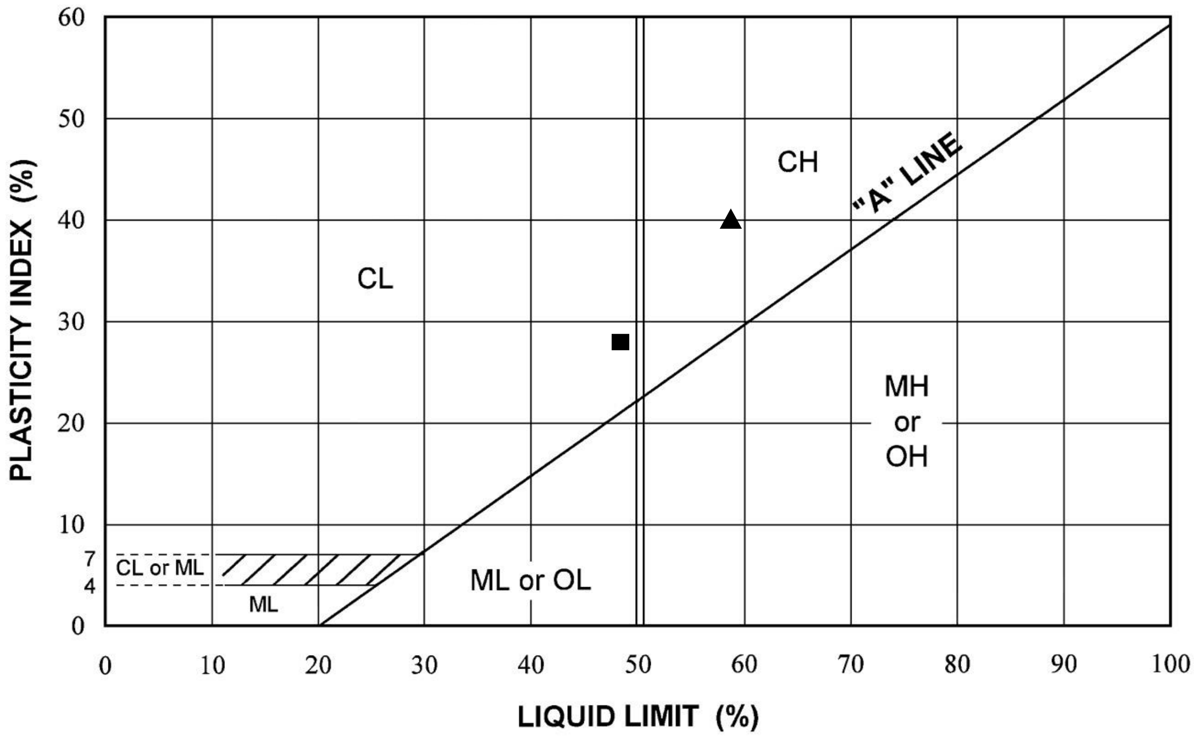


Chart Symbol	Boring Number	Sample Depth (feet)	Water Content (percent)	Liquid Limit (percent)	Plasticity Index (percent)	Liquidity Index (percent)	Passing No. 200 Sieve (percent)	USCS Soil Classification
▲	EB-2	2-4	30	59	40			CH
■	EB-4	2-4	18	48	28			CL

PLASTICITY CHART **FIGURE B-1**
GRANADA COMMUNITY CENTER AND BURNHAM PARK OCTOBER 2022
HALF MOON BAY, CALIFORNIA PROJECT NO. 4812-4

ROMIG ENGINEERS

APPENDIX C

LIQUEFACTION EVALUATION

To evaluate the potential for earthquake-induced liquefaction of the soils at the site, we performed a liquefaction analysis of the CPT data using the program CLiq, developed by GeoLogismiki. The program applied several published methodologies, including Robertson 2009 and Idriss and Boulanger 2014. The results of our liquefaction evaluation and the details regarding the potentially liquefiable layers are presented on the attached Figures C-1 and C-2.

❖ ❖ ❖ ❖ ❖

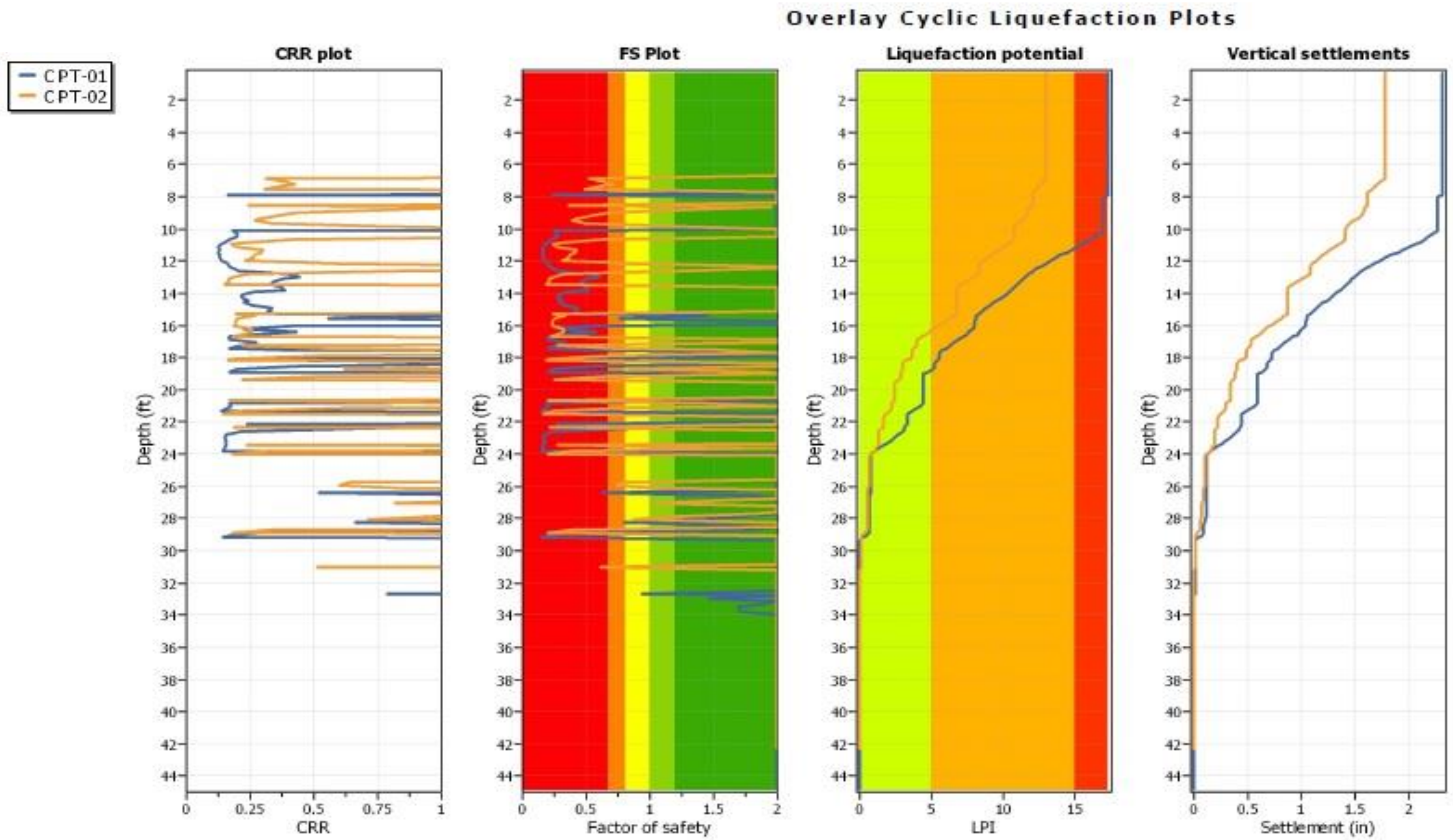


FIGURE C-1 LIQUEFACTION ANALYSIS USING IDRISS AND BOULANGER 2014

GRANADA COMMUNITY CENTER AND BURNHAM PARK — OCTOBER 2022

HALF MOON BAY, CALIFORNIA — PROJECT NO. 4812-4

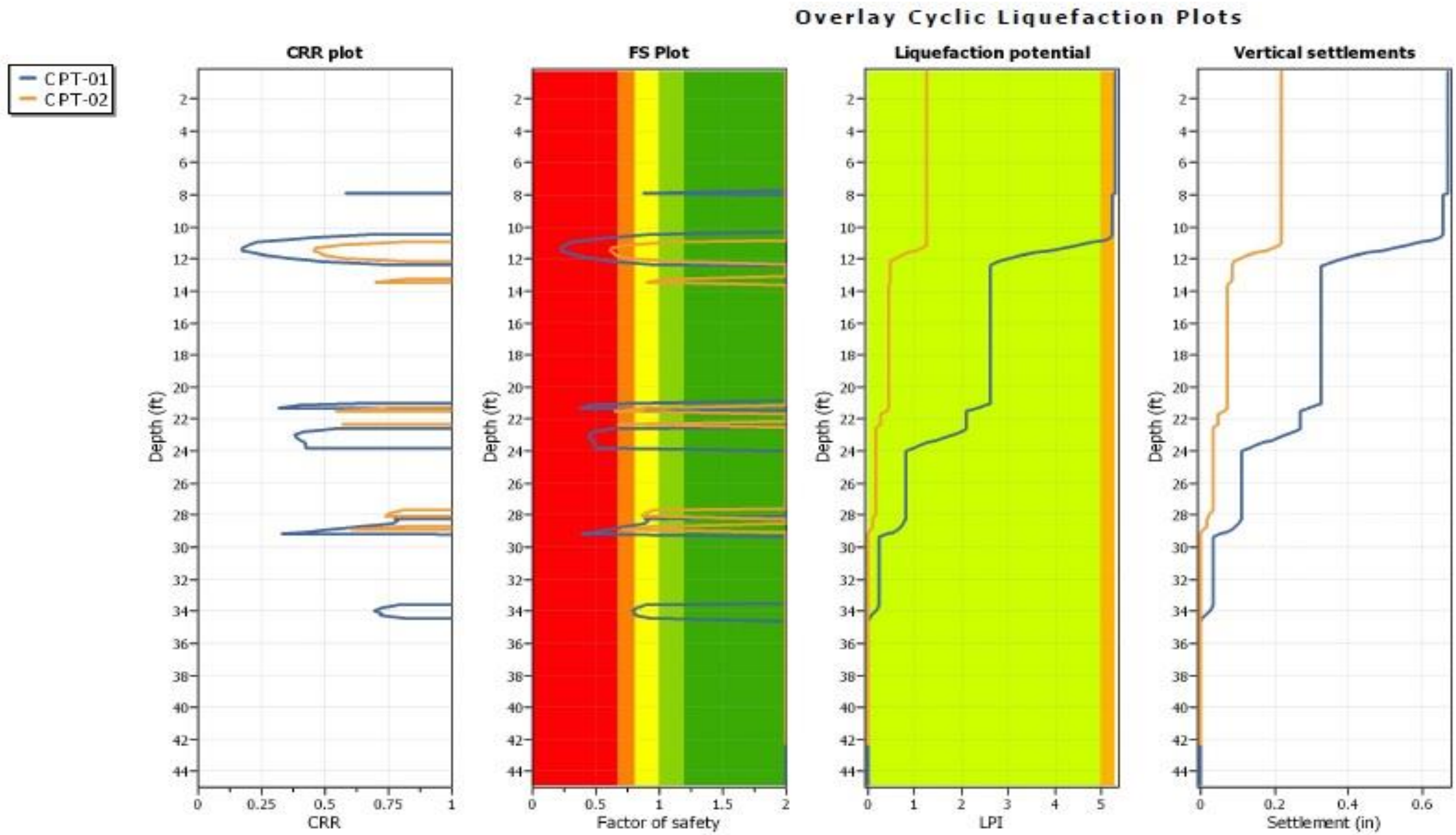


FIGURE C-2 LIQUEFACTION ANALYSIS USING ROBERTSON 2009

GRANADA COMMUNITY CENTER AND BURNHAM PARK
HALF MOON BAY, CALIFORNIA

OCTOBER 2022
PROJECT NO. 4812-4

APPENDIX D

PREVIOUS EXPLORATION LOGS

Exploration Boring Logs EB-1 through EB-3 (Romig Engineers, 2009)

❖ ❖ ❖ ❖ ❖

DRILL TYPE: Minuteman with 3-1/4" Continuous Flight Auger **LOGGED BY:** TWP

DEPTH TO GROUND WATER: 7.5 Feet. **SURFACE ELEVATION:** 20 Feet. **DATE DRILLED:** 8/7/09

CLASSIFICATION AND DESCRIPTION	SOIL CONSISTENCY/ DENSITY or ROCK HARDNESS* (Figure A-2)	SOIL TYPE	SOIL SYMBOL	DEPTH (FEET)	SAMPLE INTERVAL	SPT RESISTANCE (Blows/ft)	WATER CONTENT (%)	SHEAR STRENGTH (TSF)*	UNCONFIN. COMP. (TSF)*
Brown to dark brown, Sandy Lean Clay, slightly moist, fine to medium sand, orange mottling.	Hard	CL		0		44	8		>4.5
							10		
Brown, Clayey Sand, moist, fine to medium sand.	Medium Dense	SC				36			3.5
							13		
				5					
						12	20		
							15		
Dark brown, Sandy Fat Clay, very moist, high plasticity.	Stiff	CH		▼		13			1.5
▼ Ground water encountered during drilling at 7.5 Feet.							35		
							22		
						11			
Brown, Poorly Graded Sand/Clayey Sand, moist, fine to coarse sand.	Medium Dense	SP/SC		10			17		
● 15% Passing No. 200 Sieve.					●	16	18		
						12	17		
				15					
Note: Low blow count from 14 to 16 feet due to sand sluff.						8	20		
Gray, Clayey Sand, moist, fine to coarse sand, white mottling.	Very Dense	SC							
*Measured using Torvane and Pocket Penetrometer devices.						58	14		
Bottom of Boring at 18 Feet.									
				20					
Note: The stratification lines represent the approximate boundary between soil and rock types, the actual transition may be gradual.									

DRILL TYPE: Minuteman with 3-1/4" Continuous Flight Auger **LOGGED BY:** TWP

DEPTH TO GROUND WATER: 6.5 Feet. **SURFACE ELEVATION:** 18 Feet. **DATE DRILLED:** 8/7/09

CLASSIFICATION AND DESCRIPTION	SOIL CONSISTENCY/ DENSITY or ROCK HARDNESS* (Figure A-2)	SOIL TYPE	SOIL SYMBOL	DEPTH (FEET)	SAMPLE INTERVAL	SPT RESISTANCE (Blows/ft)	WATER CONTENT (%)	SHEAR STRENGTH (TSF)*	UNCONFIN. COMP. (TSF)*
Dark brown, Sandy Fat Clay, very moist, high plasticity, fine sands.	Stiff To Very Stiff	CH		0		12	29		3.5
■ Liquid Limit = 59, Plasticity Index = 40.						19	30		2.0
▽ Ground water measured at 6.5 Feet after drilling.				5		15	43		1.5
Olive brown, Sandy Lean Clay, very moist, low to moderate plasticity, fine to coarse sand. 8-inch layer of poorly graded sand.	Stiff to Hard	CL		▽		14	14		2.0
							16		
Becoming gray, fine white gravel. ▽ Ground water encountered during drilling at 10 Feet.				▽		21	17		4.0
						41	23 19		
Brown to orange brown, Clayey Sand, very moist, fine to coarse sand. ● 34% Passing No. 200 Sieve.	Medium Dense to Very Dense	SC				26	17		
Becoming brown to gray, poorly graded sand.				15		25	12		
● 18% Passing No. 200 Sieve.						63	13		
Note: The stratification lines represent the approximate boundary between soil and rock types, the actual transition may be gradual.						72	15		
*Measured using Torvane and Pocket Penetrometer devices.				20					
Bottom of Boring at 20 Feet.									

EXPLORATORY BORING LOG EB-2
UNDERGROUND STORM WATER STORAGE FACILITY
EL GRANADA, CALIFORNIA

BORING EB-2
SEPTEMBER 2009
PROJECT NO. 2327-1

DRILL TYPE: Minuteman with 3-1/4" Continuous Flight Auger **LOGGED BY:** TWP

DEPTH TO GROUND WATER: Not Encountered. **SURFACE ELEVATION:** 25 Feet. **DATE DRILLED:** 8/7/09

CLASSIFICATION AND DESCRIPTION	SOIL CONSISTENCY/ DENSITY or ROCK HARDNESS* (Figure A-2)	SOIL TYPE	SOIL SYMBOL	DEPTH (FEET)	SAMPLE INTERVAL	SPT RESISTANCE (Blows/ft)	WATER CONTENT (%)	SHEAR STRENGTH (TSF)*	UNCONFIN. COMP. (TSF)*
Dark brown, Sandy Fat Clay, very moist, fine sand, high plasticity.	Very Stiff	CH		0		21	23		4.0
						33	18		>4.5
Brown, Sandy Lean Clay, very moist, fine to coarse sand, low to moderate plasticity, orange mottling.	Very Stiff	CL		5		30	18		>4.5
						35	19		>4.5
Orange brown, Clayey Sand, moist, fine to coarse sand.	Dense	SC				34	19		3.9
				10					
Bottom of Boring at 10 Feet.									
				15					
				20					

Note: The stratification lines represent the approximate boundary between soil and rock types, the actual transition may be gradual.

*Measured using Torvane and Pocket Penetrometer devices.

EXPLORATORY BORING LOG EB-3
UNDERGROUND STORM WATER STORAGE FACILITY
EL GRANADA, CALIFORNIA

BORING EB-3
SEPTEMBER 2009
PROJECT NO. 2327-1

ROMIG ENGINEERS, INC.
1390 El Camino Real, 2nd Floor
San Carlos, California 94070
Phone: (650) 591-5224
www.romigengineers.com

Appendix F

Noise Technical Memorandum

BASELINE
ENVIRONMENTAL CONSULTING

MEMORANDUM

Date: January 30, 2024 **Job No.:** 23225-00

To: Kimberly Asbury, Environmental Planner, Montrose Environmental

From: Yilin Tian, Project Environmental Engineer, Baseline Environmental Consulting

Subject: **Noise and Vibration Technical Study, Granada Community Park and Recreation Center Project, El Granada, San Mateo County, California**

Baseline Environmental Consulting (Baseline) has prepared this technical study to evaluate the potential noise and vibration impacts associated with implementation of the Granda Community Park and Recreation Center Project (Project) proposed by the Granada Community Services District (District) in the unincorporated community of El Granada in San Mateo County (County), California (**Figure 2-1** of the Mitigated Negative Declaration). This technical memorandum includes an overview of fundamental noise and vibration concepts, a description of the existing noise conditions in the Project vicinity, and an analysis of the potential noise and vibration impacts associated with the implementation of the Project. This study will be used to support environmental review of the proposed Project under the California Environmental Quality Act (CEQA).

PROJECT DESCRIPTION

The Project would be located northeast of Highway 1 on a collection of parcels known locally as the Burnham Strip (APNs: 047-262-010, 047-251-100, and 047-251-110) in the unincorporated community of El Granada in San Mateo County (**Figure 2-2** of the Mitigated Negative Declaration). The Project site is undeveloped with the exception of an approximately 3,000 square foot building at the northwestern corner of the Project site, an underground sanitary sewer overflow containment system, and a gravel lot. The Project would develop the site for recreational uses, which would include active and passive recreational zones, walking paths, fitness stations, park restrooms, outdoor showers, a dog park, small and large group picnic areas, kids' play structures, a skate ramp and related skate feature, parking areas, and a renovated and expanded Community Recreation Center. The site would be accessed via Obispo Road. The new park would consist of three areas: the Burnham Creek Riparian Zone, an Active Recreation Zone, and a Community Recreation Center and Passive Recreation Zone. Additional details relevant to operational noise are provided below:

- **Burnham Creek Riparian Zone.** The District proposes to install a permeable trail extending from the Coronado Street crosswalk to Obispo Road, and along the Obispo Road shoulder until it meets the central portion of the site. It is important to note that there are no sidewalks on either side of the roadway along this portion of Obispo Road and the trail would serve to safely direct pedestrians to the existing dedicated pedestrian Highway 1 crossing.

- **Active Recreation Zone.** In the southeastern portion of the Project site, the District proposes a "Village Green" passive lawn and adjacent paved plaza to serve as a central gathering area, providing opportunities for small groups to meet and community events to be held. Further to the northwest, the District proposes a family and large group picnic area with age-specific playgrounds and a large active play lawn. At the northernmost end of the Active Recreation Zone would be an enclosed dog park, with separate areas for small and large dogs, featuring water stations, pet waste facilities, benches, and a community bulletin board. All of the above active areas are buffered on all sides by new planting areas to screen and provide a sense of enclosure to the play spaces.

- **Community Recreation Center and Passive Recreation Zone.** This area maintains most of the existing ruderal grassland. These "passive grassland" areas would be encircled by mounded landforms and include trail and pathways. In the northwestern most section of the proposed park, the District would renovate and expand the existing building to develop a new Community Recreation Center. The proposed Community Recreation Center would include two buildings: the existing 3,000 square foot building that would be renovated for classroom and staff space, and a new 3,000 square foot building that would house a new community room and associated spaces. The renovated building would include a central lobby from the entry though the building, which would lead to a central outdoor "community living room" for both informal and formal programming. The renovated building would also include a small conference room and two classrooms. Each classroom would have a dedicated patio directly adjacent to the indoor space that expands the programmable space to the outdoors. The new building will house a large community room. A dedicated community room courtyard would be located adjacent to the indoor space, with sliding glass doors for indoor-outdoor programming.

Hours of operation for the proposed park would be daily from dawn to dusk. Use of the park outside of open hours would be prohibited and would be enforced in the same manner as other District facilities. The dog park would be open daily from dawn to dusk to match operations of the park overall and would be closed intermittently for regularly scheduled and/or special maintenance activities as necessary. The Village Green area may occasionally hold special events with amplified sound, such as small concerts, craft markets, movie nights, etc. Permits for these events will require District approval. Special events will typically occur no more than 2 times per month, with increased frequency in the summer, up to 3 or 4 times per month.

The Community Recreation Center, parking lot, and adjacent patio areas would be open during normal business hours, typically from 8:00 am to 5:00 pm, for District operations, public gatherings, and use of the classrooms and patios for District programming. After-hours and weekend activities would occur at the Community Recreation Center for both private rentals and public events, potentially including events such as book readings, receptions, or community meetings. The District anticipates after hours use to be as follows:

- Monday-Thursday: 5:00 pm – 11:00 pm for government or community use. Frequency is anticipated to be two to three times per week.

- Friday: 5:00 pm – 11:00 pm for special events, community meetings, rentals, and District use. Frequency is anticipated to be up to three to four times per month. All amplified sound shall be required to stop by 10:00 pm.

- Saturday: 8:00 am – 11:00 pm for special events, community meetings, rentals, and District use. Frequency is anticipated to be up to three to four times per month. All amplified sound shall be required to stop by 10:00 pm.

- Sunday: 9:00 am – 9:00 pm for special events, community meetings, rentals, and District use. Frequency is anticipated to be two to three times per month. All amplified sound shall be required to stop by 9:00 pm.

Environmental Setting

Noise and Vibration Concepts

Noise is commonly defined as unwanted sound that annoys or disturbs people and can have an adverse psychological or physiological effect on human health. Sound is measured in decibels (dB), which is a logarithmic scale. Decibels describe the purely physical intensity of sound based on changes in air pressure, but they cannot accurately describe sound as perceived by the human ear since the human ear is only capable of hearing sound within a limited frequency range. For this reason, a frequency-dependent weighting system is used and monitoring results are reported in A-weighted decibels (dBA). Decibels and other acoustical terms are defined in **Table 1**.

Table 1. Definition of Acoustical Terms

Term	Definition
Frequency (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure.
Decibel (dB)	A unit describing the amplitude of sound on a logarithmic scale. Sound described in decibels is usually referred to as sound or noise "level." This unit is not used in this analysis because it includes frequencies that the human ear cannot detect.
A-Weighted Sound Level (dBA)	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound, in a manner similar to the frequency response of the human ear, and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
Maximum Sound Levels (Lmax)	The maximum sound level measured during a given measurement period.
Equivalent Noise Level (Leq)	The average A-weighted noise level during the measurement period. For this CEQA evaluation, Leq refers to a 1-hour period unless otherwise stated.
Day/Night Noise Level (Ldn)	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to sound levels during the night between 10:00 pm and 7:00 am.
Ambient Noise Level	The existing level of environmental noise at a given location from all sources near and far.
Vibration Decibel (VdB)	A unit describing the amplitude of vibration on a logarithmic scale.
Peak Particle Velocity (PPV)	The maximum instantaneous peak of a vibration signal.
Root Mean Square (RMS) Velocity	The average of the squared amplitude of a vibration signal.

Sources:
Charles M. Salter Associates, Inc., 1998. Acoustics – Architecture, Engineering, the Environment, William Stout Publishers.
Federal Transit Administration, 2018. Transit Noise and Vibration Impact Assessment Manual, FTA Report No.0123, September.

A typical method for determining a person's subjective reaction to a new noise is by comparing it to existing conditions. The following describes the general effects of noise on people:[1]

- A 1-dBA increase cannot typically be perceived.
- A 3-dBA increase is considered just-perceivable.
- A 5-dBA increase is required before a noticeable change in community response.
- A 10-dBA increase is perceived as an approximate doubling in loudness.

[1] Charles M. Salter Associates, Inc., 1998. Acoustics – Architecture, Engineering, the Environment, William Stout Publishers.

Traffic noise levels are often expressed in terms of the hourly dBA. The noise levels generated by vehicular sources mainly depend on traffic volume, the speed, and the percent of trucks within the fleet. Increases in these three factors will lead to higher noise levels. Doubling the number of sources, such as traffic volume, increases the noise level by approximately 3 dBA due to the logarithmic nature of noise levels.

In an unconfined space, such as outdoors, noise attenuates with distance. Noise levels at a known distance from a point source are reduced by 6 dBA for every doubling of that distance for hard surfaces (e.g., asphalt) and by 7.5 dBA for every doubling of distance for soft surfaces (e.g., vegetative areas).

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Several different methods are used to quantify vibration. Typically, groundborne vibration generated by human activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors to vibration include structures (especially older masonry structures) and people (especially residents, the elderly, and sick). Vibration amplitudes are usually expressed as either Peak Particle Velocity (PPV) or as Root Mean Square (RMS) velocity. PPV is appropriate for evaluating potential damage to buildings, but it is not suitable for evaluating human response to vibration because it takes the human body time to respond to vibration signals. The response of the human body to vibration is dependent on the average amplitude of a vibration event. Thus, RMS is more appropriate for evaluating human response to vibration. PPV and RMS are described in units of inches per second (in/sec), and RMS is also described in vibration decibels (VdB).

Sensitive Receptors

Noise-sensitive land uses typically include residences, motels and hotels, schools, libraries, houses of worship, hospitals, convalescent homes, and parks and outdoor recreation areas. Noise-sensitive receptors near the Project site boundary include: single-family homes as close as 70 feet to the north along Avenue Alhambra; multi-family apartments as close as 200 feet to the northeast along Avenue Alhambra; and the Wilkinson School about 160 feet to the east across Coronado Street.

Existing Ambient Noise Conditions

Traffic along nearby roadways, such as Highway 1, Avenue Alhambra, Obispo Road, and Coronado Street, is the primary source of noise in the vicinity of the Project site. Airport operations at the Half Moon Bay Airport located about 1 mile northwest of the Project site also contribute to the ambient noise levels.

The existing ambient noise environment in the vicinity of Project site was characterized by a noise monitoring survey conducted by Baseline from January 11 to January 12, 2024. The survey consisted of one long-term (24-hour) measurement (LT-1) and three short-term (15-minute) measurements (ST-1 through ST-3). The noise measurement locations are illustrated in **Figure 3**. The existing ambient noise levels near the Project site are represented by:

- LT-1 and ST-1 along Avenue Alhambra and Obispo Road;
- ST-2 along Highway 1; and
- ST-3 along Coronado Street.

Ambient noise level measurements were conducted using a Type 1 sound level meter with slow response and "A" weighting that was field calibrated immediately prior to use. The long-term measurement (LT-1) was collected by installing the sound meter on a tree about 11 feet above ground level, while the short-term measurements (ST-1 through ST-3) were collected by installing the sound meter on a tripod about 5 feet above ground level. The microphone attached to the sound level meter was protected from the effects of wind noise. The ambient noise measurement locations, monitoring periods, and corresponding results are summarized in **Table 2**.

Table 2. Summary of Existing Ambient Noise Level Measurements

ID	Location	Monitoring Period	Noise Level
LT-1	About 60 feet east of the intersection of Avenue Alhambra and Obispo Road	8:30 am 1/11/2024 to 8:30 am 1/12/2024	65.5 dBA, Daytime 66.7 dBA, Ldn
ST-1	About 155 feet east of the intersection of The Alameda and Avenue Alhambra	9:01 am 1/12/2024 to 9:16 am 1/12/2024	66.5 dBA, Leq
ST-2	Above 15 feet south of the fog line of eastbound Highway 1 outside the Beach House parking lot	9:26 am 1/12/2024 to 9:42 am 1/12/2024	77.3 dBA, Leq
ST-3	About 30 feet east of the intersection of Coronado Street and Avenue Alhambra	9:48 am 1/12/2024 to 10:03 am 1/12/2024	61.9 dBA, Leq

Notes: Daytime = 7:00 am to 10:00 pm; Nighttime = 10:00 pm to 7:00 am.
Source: **Attachment A**.

Regulatory Regulations and Guidance

Federal Transit Administration

The Federal Transit Administration (FTA) has developed a general construction noise threshold of 90 dBA Leq at the nearest noise-sensitive receptor.[2] According to the FTA, if the combined noise level in 1 hour from the two noisiest pieces of equipment exceeds the 90 dBA threshold at a residential land use (or other noise-sensitive receptors), then there may be a substantial adverse reaction.

The FTA has developed vibration thresholds to prevent disturbances to (i.e., annoyance of) building occupants based on the frequency of a vibration event.[3] Vibrations that are equal to or exceed the vibration thresholds could result in potential disturbance to people or activities. The FTA thresholds of 80 VdB and 83 VdB are used in this analysis to evaluate disturbance to residences and buildings where people normally sleep and to institutional land uses with primarily daytime use (such as schools), respectively.

California Department of Transportation

The California Department of Transportation (Caltrans) has developed vibration thresholds based on PPV values to evaluate the potential impact of construction vibration on structures.[4] Construction vibrations that are equal to or exceed the vibration thresholds could result in potential damage to structures. For frequent intermittent vibratory sources during construction (e.g., vibratory compaction equipment), Caltrans recommends a threshold of 0.3 in/sec for older residential structures.

California Noise Control Act

Sections 46000 to 46080 of the California Health and Safety Code codify the California Noise Control Act of 1973. The Act established the Office of Noise Control under the California Department of Health Services. It requires that the Office of Noise Control adopt, in coordination with the Office of Planning and Research, guidelines for the preparation of noise elements for general plans. The most recent guidelines are contained in the California Governor's Office of Planning and Research (OPR) General Plan Guidelines. [5] The document provides land use compatibility guidelines for cities and counties to use in general plans to reduce conflicts between land use and noise, as shown below.

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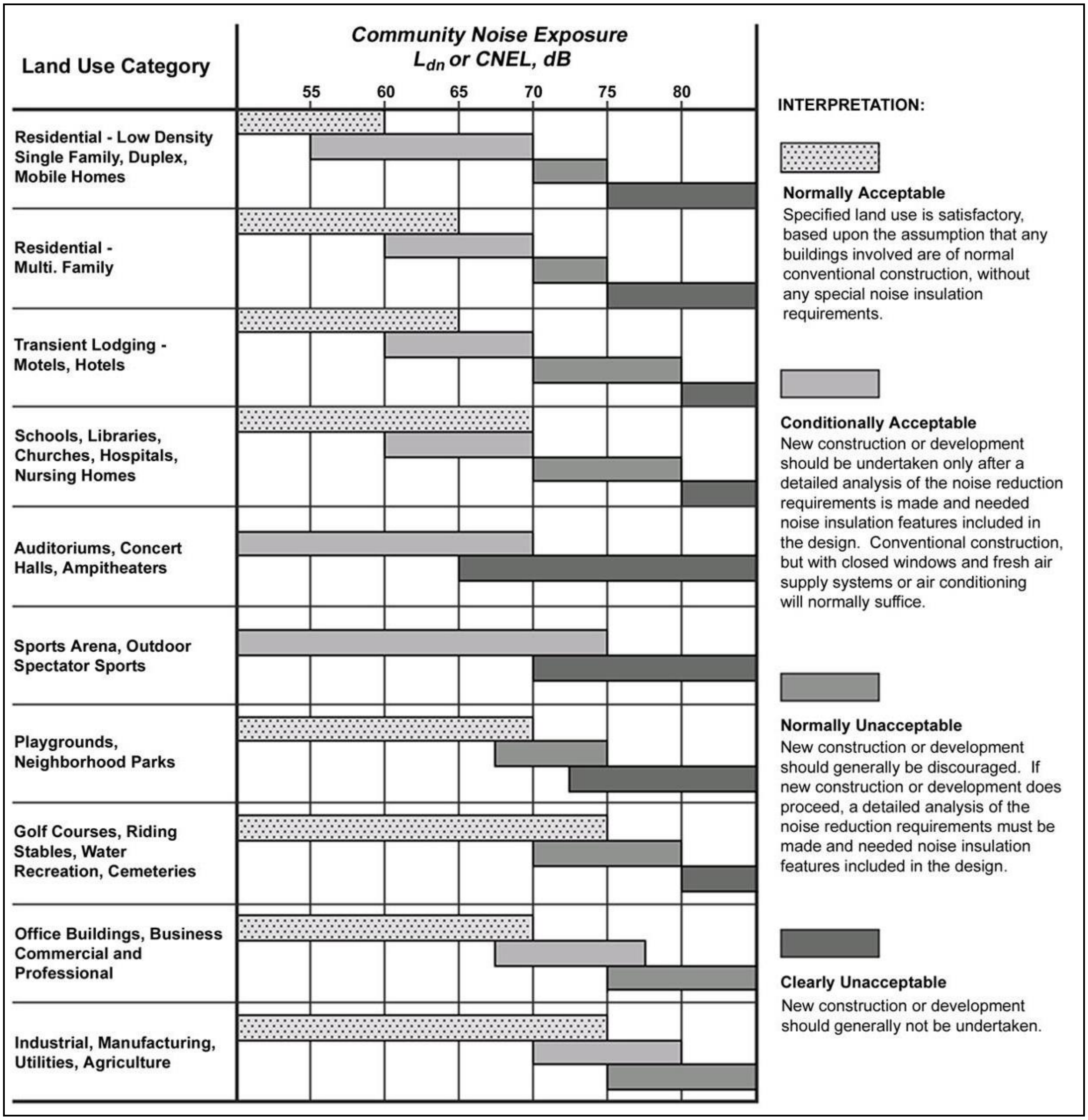
[2] [2] Federal Transit Administration (FTA), 2018. Transit Noise and Vibration Impact Assessment Manual, FTA Report No.0123, September.
[3] Ibid.
[4] California Department of Transportation (Caltrans), 2020. Transportation and Construction Vibration Guidance Manual.
[5] California Office of Planning and Research (OPR), 2017. State of California General Plan Guidelines.



San Mateo County Noise Ordinance

San Mateo County regulates noise via Municipal Code Chapter 4.88 Noise Control (Noise Ordinance), which was designed to control unnecessary, excessive, and annoying noise in the

County. Chapter 4.88.330 establishes exterior noise level standards based on receiving land use, as shown in **Table 3**.

Table 3. San Mateo County Exterior Noise Level Standards (dBA)

Cumulative Number of Minutes in any One Hour Time Period	Daytime (7 am to 10 pm)	Nighttime (10 pm to 7 am)
Receiving land use: Single- or multiple-family residence, school, hospital, church, or public library		
30	55	50
15	60	55
5	65	60
1	70	65
0	75	70

Notes:
In the event the measured background noise level exceeds the applicable noise level standard in any category above, the applicable standard shall be adjusted in five (5) dBA increments so as to encompass the background noise level.
Each of the noise level standards specified above shall be reduced by 5 dBA for simple tone noises, consisting primarily of speech or music, or for recurring or intermittent impulsive noises.
If the intruding noise source is continuous and cannot reasonably be stopped for a period of time whereby the background noise level can be measured, the noise level measured while the source is in operation shall be compared directly to the noise level standards in Table 3.
Source: San Mateo County Municipal Code Chapter 4.88.330.

San Mateo County Municipal Code Chapter 4.88.360 identifies activities that are exempt from the provisions of the Noise Ordinance. The exempt activities that are relevant to the Project are listed below:

- Outdoor gatherings, public dances, shows and sporting and entertainment events providing said events are conducted pursuant to all County regulations.

- Activities conducted on parks, public playgrounds and school grounds provided such parks, playgrounds and school grounds are owned and operated by a public entity.

- Noise sources associated with demolition, construction, repair, remodeling, or grading of any real property, provided said activities do not take place between the hours of 6:00 pm and 7:00 am weekdays, 5:00 pm and 9:00 am on Saturdays or at any time on Sundays, Thanksgiving and Christmas.

SIGNIFICANCE CRITERIA

Based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines, implementation of the Project would result in a significant impact related to noise and vibration if it would:

1) Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

2) Generate excessive groundborne vibration or groundborne noise levels; or

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

For construction noise, the Project would be exempt from the County's Noise Ordinance requirements because the construction hours would generally be scheduled between 7:00 am to 6:00 pm Monday through Friday and between 9:00 am to 5:00 pm on Saturdays (Municipal Code Chapter 4.88.360). To evaluate potential noise impacts to nearby noise-sensitive receptors during Project construction, the FTA's threshold of 90 dBA Leq is used in this analysis.

For operation noise associated outdoor activities (e.g., public playgrounds), the Project would be exempt from the County's Noise Ordinance requirements (Municipal Code Chapter 4.88.360). The loudest source of noise associated with Project operation would likely be from the intermittent use of amplified sound systems for special events (e.g., small concerts and movie nights). Operation of fixed mechanical equipment such as heating/ventilation/air conditioning (HVAC) systems and increase vehicle traffic generated by the Project could also contribute substantial noise levels in the Project vicinity. To evaluate potential noise impacts to nearby noise-sensitive receptors from the use of amplified sound systems and HVAC systems, the County's daytime exterior noise level standard for 30 cumulative minutes of noise exposure (**Table 3**) is used in this analysis. In accordance with the Noise Ordinance, the daytime exterior noise level standard was increased in five (5) dBA increments so as to encompass the existing ambient noise level. To evaluate potential noise impacts from increased vehicle traffic generated by the Project, an increase existing ambient noise levels by approximately 3 dBA (a just-perceivable change) was used in this analysis.

For construction vibration, the Caltrans threshold of 0.3 in/sec for older residential buildings is used to evaluate potential structural impacts at nearby vibration-sensitive receptors. The FTA threshold of 83 VdB is used to evaluate potential disturbance to institutional land uses (e.g., schools). The evaluation of potential vibration disturbance to buildings where people normally sleep is not included in this analysis because nighttime construction is not anticipated for the Project. For Project operation, there would be no sources of vibration.

NOISE AND VIBRATION ANALYSIS

Noise from Project Construction

The primary source of noise during construction would be off-road equipment activities on the Project site. Construction noise levels would vary from day-to-day, depending on the number and type of equipment being used, the types and duration of activity being performed, the distance between the noise source and the receptor, and the presence or absence of barriers, if any, between the noise source and receptor. Pile driving, which can generate extreme levels of noise, is not proposed as part of the Project.

Construction of the Project is anticipated to begin in Summer 2025 and be completed by Summer 2028, lasting approximately 36 months. To evaluate noise levels during Project construction, the types of construction equipment that would be used on the Project site were generated by the most recent version of the California Emissions Estimator Model (CalEEMod, version 2022.1.1), and then refined using Project-specific construction equipment usage information. A copy of the CalEEMod report including the changes made to the default data is provided in **Attachment B**.

In accordance with guidance from FTA, daytime construction noise impacts were evaluated by quantifying the maximum noise levels that would result from the simultaneous operation of the two noisiest pieces of equipment near the perimeter of the Project site closest to a sensitive receptor. [6] The Project's construction noise levels were estimated at the nearest residence about 70 feet to the north of the Project site for all construction phases. Construction noise levels were also estimated for the Wilkinson School for the following construction phases:

1) Site preparation and grading about 160 feet from the Wilkinson School for the permeable trail extending to Obispo Road.

2) Trenching, building construction, paving, and architectural coatings about 850 feet from the Wilkinson school for the Active Recreation Zone.

As shown in **Table 4**, Project construction would not generate noise levels that could potentially exceed the FTA 90 dBA Leq noise threshold at the nearby noise sensitive receptors.

[6] Federal Transit Administration (FTA), 2018. Transit Noise and Vibration Impact Assessment Manual, FTA Report No.0123, September.

Table 4. Potential Noise Impacts from Project Construction (dBA Leq)

Construction Phase	Nearest Residence	Wilkinson School
Site Preparation	81	74
Grading	82	74
Trenching	81	59
Building Construction	80	58
Paving	82	60
Architectural Coating	79	57
Exceed the 90 dBA Threshold?	**No**	**No**

Source: Detailed calculations are provided in **Attachment B**.

Noise from Project Operation

The primary operation period noise generation sources from the Project would include general park operation (e.g. recreational activities at the skate area, picnic areas, playgrounds, active play lawn, and the dog park); occasional special events held at the Village Green area with amplified sound; District programming associated with the use of the Community Recreation Center and after-hours and weekend activities at the Community Recreation Center for both private rentals and public events; fixed mechanical equipment such as HVAC systems for the Community Recreation Center; and vehicle trips generated by the Project. Noise impacts associated with these sources are discussed in the sections below, and detailed calculations are provided in **Attachment B**.

General Park Operation Noise

The park would be open daily between dawn to dusk, and park use outside of the open hours would be prohibited. According to Municipal Code Chapter 4.88.360, activities conducted on parks owned and operated by a public entity are exempt from the County's Noise Ordinance requirements. General park recreational activities (e.g., picnics, exercise, small gatherings) that do not require the use of amplified sound systems would not be expected to substantially contribute to the existing ambient noise environment outside of the Project site, which is dominated by traffic-generated noise. In addition, the proposed active recreational areas, such as the playgrounds and the enclosed dog park, would be buffered on all sides by new planting areas to screen and provide a sense of enclosure to the spaces. Overall, general park operations associated with the Project would not substantially contribute to the existing ambient noise environment at nearby sensitive receptors.

Amplified Sound System Noise

The Village Green area and Community Recreation Center would occasionally hold special events requiring the use of amplified sound systems. Special events at the Village Green area that may require the use of amplified sounds systems include small concerts, craft markets, and movie nights. The frequency of the special events for the Village Green area is expected to be less than two times per month, with increased frequency in the summer, which are expected to be up to three or four times per month. Special events at the Community Recreation Center would occur after-hours and on the weekend for both private rentals and public events, such as book readings, receptions, or community meetings. The anticipated frequency of special events at the Community Recreation Center would be up to three to four times per month.

Special events would require permits with District approval. The use of amplified sound systems is required to stop by 10:00 pm, Monday through Saturday, and by 9:00 pm on Sunday. The use of amplified sound systems during more sensitive hours when people sleep (nighttime between 10:00 pm to 7:00 am) would not occur. According to Municipal Code Chapter 4.88.360, outdoor gatherings, public dances, shows and sporting and entertainment events that would be conducted pursuant to all County regulations are exempt from the County's Noise Ordinance requirements. Although exempt from the County's Noise Ordinance requirements, the outdoor use of amplified sound systems have the potential to generate substantial noise levels in the vicinity of the Project site.

The nearest noise-sensitive receptors to the Village Green area and Community Recreation Center are residences located about 220 feet and 170 feet to the north, respectively, along Avenue Alhambra. As presented in **Table 2**, the existing daytime noise level along Avenue Alhambra is 65.5 dBA. Therefore, the County's applicable daytime exterior noise level standard for evaluating noise levels from the use of amplified sounds systems is 70 dBA.[7] Conservatively assuming the speakers systems are located along the northern boundary of the Village Green area and Community Recreation Center (closest to the noise-sensitive receptors), the sound systems would need to generate noise levels greater than 109 dBA and 106 dBA, respectively, at 5 feet from the boundary of the special event area to potentially exceed the daytime exterior noise level standard of 70 dBA at the nearest noise-sensitive receptors to the north (see **Attachment B**). To be conservative, Baseline recommends operating the amplified sound systems at or below 105 dBA at 5 feet from the boundary of the special event area by implementing **Control Measure Noise-1**.

<u>Control Measure Noise-1: Amplified Sound Systems</u>

The District shall require permit applications for the use of amplified sound systems during special events at the Village Green area and Community Recreation Center to include a provision to operate the speaker system at or below 105 dBA at 5 feet from the boundary of the special event area. The permit applications shall also acknowledge that

[7] In accordance with Municipal Code Chapter 4.88.360, the daytime exterior noise level standard for 30 cumulative minutes of noise exposure (55 dBA) was increased in five (5) dBA increments to 70 dBA, so as to encompass the existing ambient noise level (65.5 dBA).

speaker systems will be positioned and angled away from residences to the north of the Village Green area and Community Recreation Center to the extent feasible.

Alternatively, the District shall consult a qualified acoustical engineer to prepare a refined acoustical analysis for operation of amplified sound systems that account for the system design (e.g., speaker position and angles) and the presence of barriers (e.g., building walls) based on the final building designs to determine the maximum noise level allowed for operating the speaker system without exceeding San Mateo County's Noise Ordinance standards (Municipal Code Chapter 4.88 Noise Control) at nearby noise-sensitive receptors.

Implementation of **Control Measure Noise-1** would ensure that the use of amplified sound systems at the Village Green area do not substantially contribute to the existing ambient noise environment at nearby sensitive receptors.

HVAC System Noise

It was conservatively assumed that the Community Recreation Center would include an HVAC system. Although the noise-generating characteristics and location of the HVAC system for the project was not available at the time of preparation of this analysis, noise from a typical commercial-scale HVAC system can range from approximately 65 to 75 dBA at 50 feet. The nearest residence is located about 170 feet north of the proposed Community Recreation Center. The estimated noise levels at the nearest residence from the HVAC system would range from 52 to 62 dBA. Combined with the existing ambient noise level of 65.5 dBA, operation of the HVAC system would increase the noise level at the nearest receptor up to about 67 dBA. Because the combined noise level is below the County's applicable daytime exterior noise level standard of 70 dBA at the nearest residence, the Project would not result in a substantial permanent increase in ambient noise levels from operation of HVAC systems.

Vehicle Traffic Noise

Noise levels near the Project site would potentially increase due to the additional vehicle trips contributed by the Project. As discussed under *Noise and Vibration Concepts*, the Project would need to double the existing traffic volume on nearby roadways to increase the ambient noise level by approximately 3 dBA. Operation of the Project would generate up to 15.5 trips per day (see the CalEEMod report in **Attachment B**). Since the Project would not double the amount of traffic on nearby roadways, the Project would not result in a substantial permanent increase in ambient noise levels from project-generated traffic trips, and this impact would be less than significant.

Vibration from Project Construction

Construction can result in varying degrees of ground vibration depending on the type of equipment and activity. To evaluate the Project's potential vibration effects on nearby sensitive receptors, a buffer distance that would be needed to avoid exceeding the FTA and Caltrans construction vibration thresholds listed above was estimated for each type of equipment. It was conservatively assumed that the equipment that could generate substantial ground vibration would be used near the Project site perimeter. The estimated buffer distances for potential disturbance and building damage are summarized in **Table 5**. The primary types of equipment that could generate substantial ground vibration during Project construction, reference vibration levels, and the associated vibration calculations are included in **Attachment B**.

Table 5. Buffer Distances for Potential Vibration Impacts from Project Construction Equipment

Construction Equipment	Buffer Distance for Potential Vibration Impacts (feet)	
	Human Disturbance Impacts[1]	Building Damage Impacts[2]
Vibratory Roller	58	20
Large Bulldozer	34	11
Loaded Trucks	31	10
Small Bulldozer	4	1

Notes:
[1] The FTA thresholds of 83 VdB for institutional land uses from infrequent construction events was used to calculate the buffer distances from construction equipment.
[2] To be conservative, the Caltrans vibration threshold of 0.3 in/sec for older residential structures was used to calculate the buffer distances from construction equipment.
Source: Detailed calculations are provided in **Attachment B**.

As shown in **Table 5**, the construction equipment that would require the largest buffer distance to avoid generating vibration levels that could disturb institutional land uses with primarily daytime use is the vibratory roller. Vibration from a vibratory roller could exceed the 83 VdB threshold at institutional land uses located within 58 feet. The closest institutional land use (Wilkinson School) is located at least 160 feet east of the Project construction activities, which is well outside of the 58-foot buffer distance. Therefore, Project construction activities would not generate excessive vibration levels that could potentially disturb normal school operations. As nighttime work is not anticipated, vibration annoyance impacts on people within residential buildings related to nighttime construction would not occur. Therefore, Project construction activities would not be expected to generate excessive vibration levels that would disturb nearby residents and institutional land uses.

As shown in **Table 5**, vibration from a vibratory roller could exceed the 0.3 in/sec PPV threshold for potential structural impacts to older residential buildings located within 20 feet. As described under *Sensitive Receptors*, all receptors near the Project site would be located outside of the 20-foot buffer where a vibratory roller could exceed the 0.3 in/sec PPV threshold. Therefore, Project construction activities would not generate excessive vibration levels with the potential to damage adjacent buildings.

Airport Noise

The Half Moon Bay Airport is located about 1 mile northwest of the Project site. According to the Final Airport Land Use Compatibility Plan (ALUCP) for the Environs of Half Moon Bay Airport Exhibit 2G, [8] the project site is located outside the 60 dBA CNEL aircraft noise contour. Both the FAA and the State of California provide guidance for acceptable noise levels for a variety of land uses. According to the OPR General Plan Guidelines, [9] recreational land uses are acceptable in areas below 70 CNEL. Therefore, the project would have no impact related to the exposure of people to excess noise levels from aircraft noise.

CONCLUSIONS

Project construction would not result in excessive noise and vibration levels at nearby sensitive receptors. Project operation would not result in excessive noise levels at nearby sensitive receptors due to general park activities, HVAC systems, or increase vehicle traffic; however, Project operation could potentially generate excessive noise levels at nearby sensitive receptors due to the use of amplified sound systems. Implementation of **Control Measure Noise-1** for amplified sound systems would ensure project operation would not result in excessive noise levels at nearby sensitive receptors.

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[8] Coffman Associates, Inc., 2014. Final Airport Land Use Compatibility Plan for the Environs of Half Moon Bay Airport. September.
[9] California Office of Planning and Research (OPR), 2017. State of California General Plan Guidelines.

FIGURES

Based on the Master Plan dated May 19, 2022

Legend

- Noise Measurement Location
- Project Boundary
- Burnham Creek Riparian Zone
- Active Recreation Zone
- Community Recreation Center and Passive Recreation Zone

0 500 Feet

N

BASELINE ENVIRONMENTAL CONSULTING

Figure 3
Noise Measurement Locations

ATTACHMENT A
Noise Monitoring Results

Measurement Report

Report Summary

Meter's File Name	LxT_Data.001.s	Computer's File Name	LxT_0006386-20240111 074336-LxT_Data.001.ldbin
Meter	LxT1 0006386		
Firmware	2.404		
User		Location	
Job Description			
Note			

Start Time	2024-01-11 07:43:36	Duration	24:53:41.6		
End Time	2024-01-12 08:37:18	Run Time	24:53:41.2	Pause Time	0:00:00.4

Results

Overall Metrics

LA_{eq}	64.9 dB		
LAE	114.4 dB	SEA	139.6 dB
EA	30.5 mPa²h		
EA8	9.8 mPa²h		
EA40	49.1 mPa²h		
LAS_{peak}	125.9 dB	2024-01-12 08:35:20	
LAS_{max}	99.0 dB	2024-01-12 08:35:20	
LAS_{min}	38.8 dB	2024-01-11 21:40:12	
LA_{eq}	64.9 dB		
LC_{eq}	69.6 dB	LC_{eq} - LA_{eq}	4.7 dB
LAI_{eq}	69.6 dB	LAI_{eq} - LA_{eq}	4.7 dB

Exceedances	Count	Duration
LAS > 85.0 dB	12	0:00:32.6
LAS > 115.0 dB	0	0:00:00.0
LASpeak > 135.0 dB	0	0:00:00.0
LASpeak > 137.0 dB	0	0:00:00.0
LASpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight	
	67.2 dB	66.4 dB	0.0 dB	
	LDEN	LDay	LEve	LNight
	67.6 dB	67.0 dB	62.4 dB	58.2 dB

Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	64.9 dB		--- dB		--- dB	
$Ls_{(max)}$	99.0 dB	2024-01-12 08:35:20	--- dB		--- dB	
$LS_{(min)}$	38.8 dB	2024-01-11 21:40:12	--- dB		--- dB	
$L_{Peak(max)}$	125.9 dB	2024-01-12 08:35:20	--- dB		--- dB	

Overloads	Count	Duration
	0	0:00:00.0

Statistics

LAS 5.0	69.5 dB
LAS 10.0	68.0 dB
LAS 33.3	64.1 dB
LAS 50.0	61.9 dB
LAS 66.6	58.3 dB
LAS 90.0	48.0 dB

Modified Results

Overall Metrics

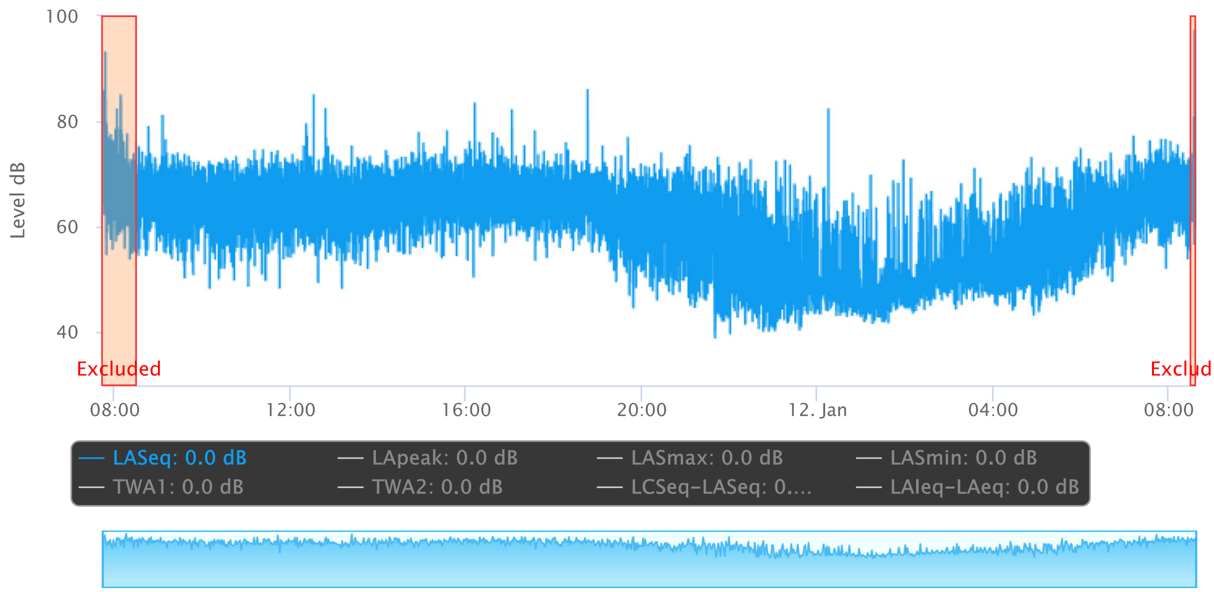
Modified Results: Data collected during noise meter set up (before 01-11-2024 8:30 am) and removal (after 01-12-2024 8:30 am) periods were excluded

LA_{eq}	63.9 dB			
LAE	113.3 dB			
EA	23.6 mPa²h			
EA8	7.9 mPa²h			
EA40	39.3 mPa²h			
LAS_{peak}	99.8 dB	2024-01-11 17:02:51		
LAS_{max}	19.4 dB	2024-01-11 18:46:16		
LAS_{min}	15.9 dB	2024-01-11 21:40:11		
LA_{eq}	63.9 dB			
LC_{eq}	--- dB		LC_{eq} - LA_{eq}	--- dB

Community Noise	LDN	LDay	LNight	
	66.7 dB	65.5 dB	0.0 dB	
	LDEN	LDay	LEve	LNight
	67.1 dB	66.0 dB	62.4 dB	58.2 dB

Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	18.1 dB		--- dB		--- dB	
$Ls_{(max)}$	19.4 dB	2024-01-11 18:46:16	--- dB		--- dB	
$LS_{(min)}$	15.9 dB	2024-01-11 21:40:11	--- dB		--- dB	
$L_{Peak(max)}$	20.0 dB	2024-01-11 17:02:51	--- dB		--- dB	

Time History



Measurement Report

Report Summary

Meter's File Name	LxT_Data.003.s	Computer's File Name	LxT_0006386-20240112 090142-LxT_Data.003.ldbin
Meter	LxT1 0006386		
Firmware	2.404		
User		Location	
Job Description			
Note			

Start Time	2024-01-12 09:01:42	Duration	0:15:08.8		
End Time	2024-01-12 09:16:51	Run Time	0:15:08.8	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	66.5 dB		
LAE	96.1 dB	SEA	--- dB
EA	454.6 µPa²h		
EA8	14.4 mPa²h		
EA40	72.0 mPa²h		
LAS_{peak}	94.3 dB	2024-01-12 09:13:51	
LAS_{max}	80.0 dB	2024-01-12 09:10:43	
LAS_{min}	50.7 dB	2024-01-12 09:07:22	
LA_{eq}	66.5 dB		
LC_{eq}	72.0 dB	LC_{eq} - LA_{eq}	5.5 dB
LAI_{eq}	68.5 dB	LAI_{eq} - LA_{eq}	2.0 dB

Exceedances	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LASpeak > 135.0 dB	0	0:00:00.0
LASpeak > 137.0 dB	0	0:00:00.0
LASpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight	
	66.5 dB	66.5 dB	0.0 dB	
	LDEN	**LDay**	**LEve**	**LNight**
	66.5 dB	66.5 dB	--- dB	--- dB

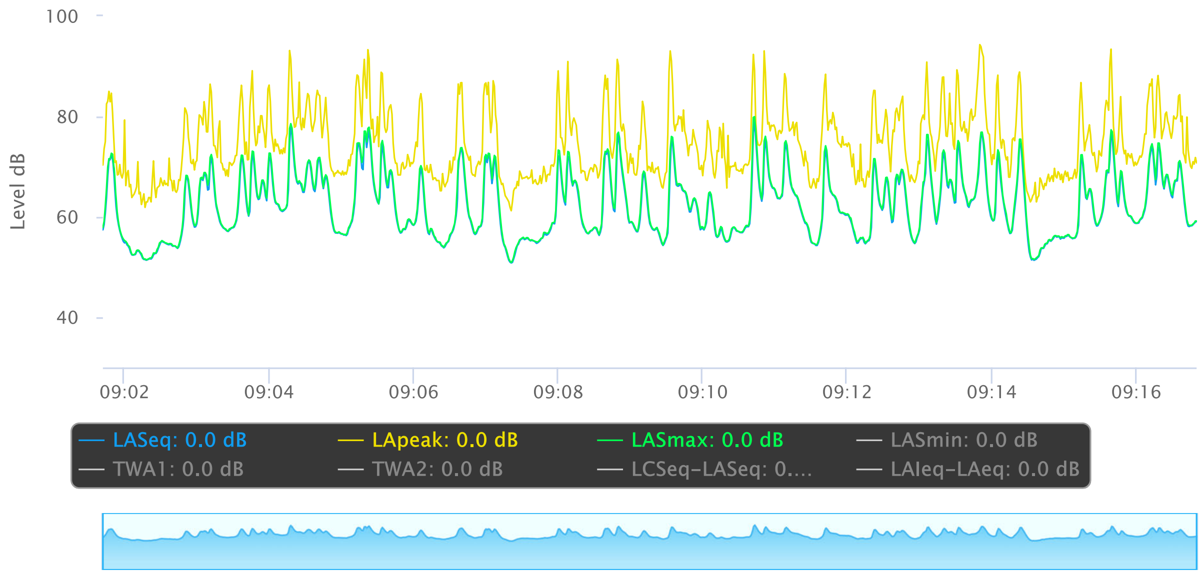
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	66.5 dB		--- dB		--- dB	
$Ls_{(max)}$	80.0 dB	2024-01-12 09:10:43	--- dB		--- dB	
$LS_{(min)}$	50.7 dB	2024-01-12 09:07:22	--- dB		--- dB	
$L_{Peak(max)}$	94.3 dB	2024-01-12 09:13:51	--- dB		--- dB	

Overloads	Count	Duration
	0	0:00:00.0

Statistics

LAS 5.0	73.0 dB
LAS 10.0	71.0 dB
LAS 33.3	64.9 dB
LAS 50.0	61.2 dB
LAS 66.6	57.9 dB
LAS 90.0	54.8 dB

Time History



Measurement Report

Report Summary

Meter's File Name	LxT_Data.004.s	Computer's File Name	LxT_0006386-20240112 092622-LxT_Data.004.ldbin
Meter	LxT1 0006386		
Firmware	2.404		
User		Location	
Job Description			
Note			

Start Time	2024-01-12 09:26:22	Duration	0:15:59.9		
End Time	2024-01-12 09:42:22	Run Time	0:15:59.9	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	77.3 dB		
LAE	107.1 dB	SEA	--- dB
EA	5.8 mPa²h		
EA8	172.8 mPa²h		
EA40	863.8 mPa²h		
LAS_{peak}	99.4 dB	2024-01-12 09:34:00	
LAS_{max}	85.0 dB	2024-01-12 09:34:01	
LAS_{min}	55.5 dB	2024-01-12 09:26:48	
LA_{eq}	77.3 dB		
LC_{eq}	79.5 dB	LC_{eq} - LA_{eq}	2.2 dB
LAI_{eq}	78.8 dB	LAI_{eq} - LA_{eq}	1.4 dB

Exceedances	Count	Duration
LAS > 85.0 dB	1	0:00:01.8
LAS > 115.0 dB	0	0:00:00.0
LASpeak > 135.0 dB	0	0:00:00.0
LASpeak > 137.0 dB	0	0:00:00.0
LASpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight	
	77.3 dB	77.3 dB	0.0 dB	
	LDEN	LDay	LEve	LNight
	77.3 dB	77.3 dB	--- dB	--- dB

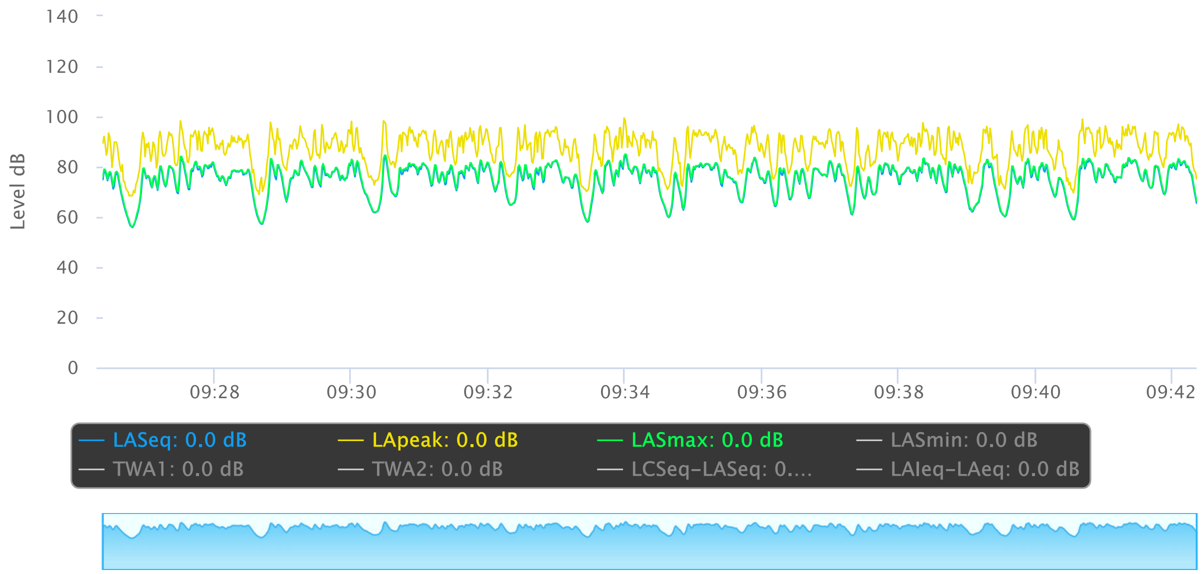
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	77.3 dB		--- dB		--- dB	
$Ls_{(max)}$	85.0 dB	2024-01-12 09:34:01	--- dB		--- dB	
$LS_{(min)}$	55.5 dB	2024-01-12 09:26:48	--- dB		--- dB	
$L_{Peak(max)}$	99.4 dB	2024-01-12 09:34:00	--- dB		--- dB	

Overloads	Count	Duration
	0	0:00:00.0

Statistics

LAS 5.0	81.6 dB
LAS 10.0	80.8 dB
LAS 33.3	78.2 dB
LAS 50.0	76.2 dB
LAS 66.6	73.8 dB
LAS 90.0	65.4 dB

Time History



Measurement Report

Report Summary

Meter's File Name	LxT_Data.005.s	Computer's File Name	LxT_0006386-20240112 094844-LxT_Data.005.ldbin
Meter	LxT1 0006386		
Firmware	2.404		
User		Location	
Job Description			
Note			

Start Time	2024-01-12 09:48:44	Duration	0:15:09.7		
End Time	2024-01-12 10:03:54	Run Time	0:15:09.7	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	61.9 dB		
LAE	91.5 dB	SEA	--- dB
EA	156.8 μPa²h		
EA8	5.0 mPa²h		
EA40	24.8 mPa²h		
LAS_{peak}	97.6 dB	2024-01-12 09:52:28	
LAS_{max}	80.8 dB	2024-01-12 09:52:28	
LAS_{min}	51.6 dB	2024-01-12 09:55:28	
LA_{eq}	61.9 dB		
LC_{eq}	72.3 dB	LC_{eq} - LA_{eq}	10.4 dB
LAI_{eq}	64.1 dB	LAI_{eq} - LA_{eq}	2.2 dB

Exceedances	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LASpeak > 135.0 dB	0	0:00:00.0
LASpeak > 137.0 dB	0	0:00:00.0
LASpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight	
	61.9 dB	61.9 dB	0.0 dB	
	LDEN	LDay	LEve	LNight
	61.9 dB	61.9 dB	--- dB	--- dB

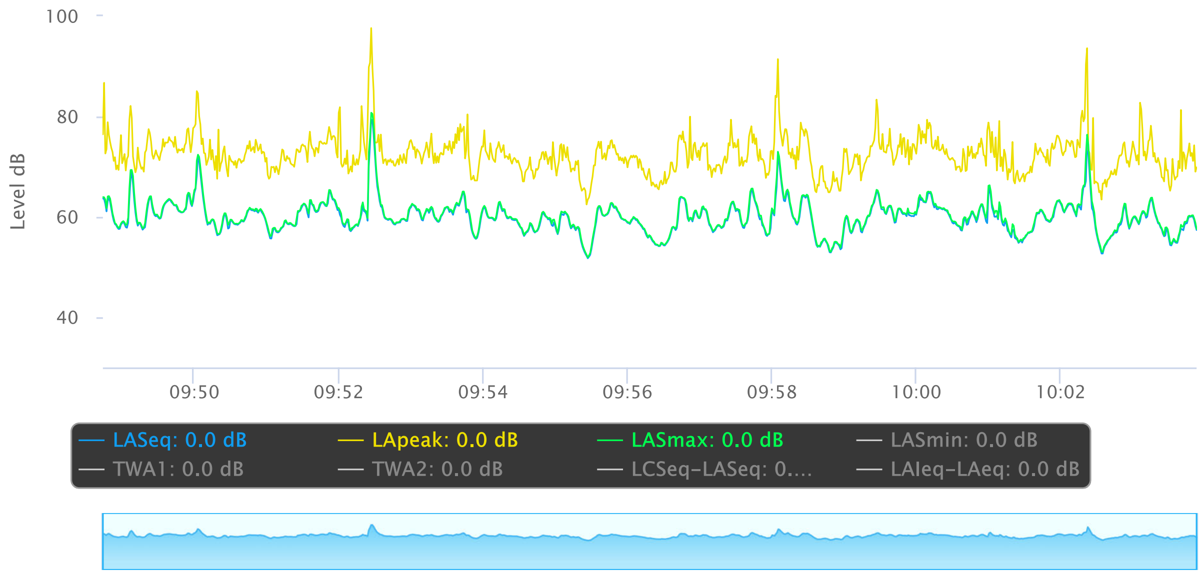
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	61.9 dB		--- dB		--- dB	
$Ls_{(max)}$	80.8 dB	2024-01-12 09:52:28	--- dB		--- dB	
$LS_{(min)}$	51.6 dB	2024-01-12 09:55:28	--- dB		--- dB	
$L_{Peak(max)}$	97.6 dB	2024-01-12 09:52:28	--- dB		--- dB	

Overloads	Count	Duration
	0	0:00:00.0

Statistics

LAS 5.0	64.6 dB
LAS 10.0	63.2 dB
LAS 33.3	61.0 dB
LAS 50.0	59.7 dB
LAS 66.6	58.7 dB
LAS 90.0	56.1 dB

Time History



ATTACHMENT B
Noise and Vibration Calculations

Burnham Custom Report

Table of Contents

5.17. User Defined

8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Burnham
Construction Start Date	1/1/2025
Operational Year	2028
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	4.60
Precipitation (days)	41.0
Location	37.50307686096275, -122.47381754029335
County	San Mateo
City	Unincorporated
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	1226
EDFZ	1
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.21

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

City Park	7.10	Acre	7.10	0.00	6.70	6.70	—	—
Parking Lot	0.20	Acre	0.20	0.00	0.00	—	—	—
Other Non-Asphalt Surfaces	0.41	Acre	0.41	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

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

Un/Mit.	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.	4.02	3.36	32.0	30.9	0.05	1.37	37.3	38.6	1.26	6.92	8.18	—	5,627	5,627	0.24	0.10	1.25	5,656
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.02	11.0	32.0	30.9	0.05	1.37	37.3	38.6	1.26	6.92	8.18	—	5,619	5,619	0.25	0.11	0.04	5,649
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.72	2.27	21.7	20.9	0.04	0.92	23.8	24.8	0.85	4.49	5.33	—	3,874	3,874	0.17	0.07	0.34	3,896
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.50	0.41	3.95	3.82	0.01	0.17	4.35	4.52	0.15	0.82	0.97	—	641	641	0.03	0.01	0.06	645

2.2. Construction Emissions by Year, Unmitigated

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

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	4.02	3.36	32.0	30.9	0.05	1.37	37.3	38.6	1.26	6.92	8.18	—	5,627	5,627	0.24	0.07	0.86	5,656
2026	2.13	1.73	16.8	17.3	0.03	0.65	32.2	32.9	0.60	4.31	4.91	—	3,948	3,948	0.21	0.10	1.25	3,984
2027	1.32	1.08	9.96	13.5	0.03	0.35	29.5	29.9	0.32	2.96	3.28	—	2,719	2,719	0.13	0.06	0.61	2,740
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	4.02	3.36	32.0	30.9	0.05	1.37	37.3	38.6	1.26	6.92	8.18	—	5,619	5,619	0.25	0.11	0.04	5,649
2026	2.13	1.73	16.8	17.2	0.03	0.65	32.2	32.9	0.60	4.31	4.91	—	3,941	3,941	0.21	0.10	0.03	3,977
2027	1.32	11.0	9.98	13.5	0.03	0.35	29.6	29.9	0.32	2.98	3.28	—	2,717	2,717	0.13	0.06	0.02	2,737
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	2.72	2.27	21.7	20.9	0.04	0.92	23.8	24.8	0.85	4.49	5.33	—	3,874	3,874	0.17	0.06	0.28	3,896
2026	1.41	1.15	11.1	11.5	0.02	0.43	20.2	20.6	0.40	2.61	3.01	—	2,568	2,568	0.13	0.07	0.34	2,591
2027	0.84	1.29	6.39	8.69	0.02	0.23	18.6	18.8	0.21	1.86	2.07	—	1,730	1,730	0.08	0.04	0.18	1,744
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.50	0.41	3.95	3.82	0.01	0.17	4.35	4.52	0.15	0.82	0.97	—	641	641	0.03	0.01	0.05	645
2026	0.26	0.21	2.02	2.10	< 0.005	0.08	3.69	3.76	0.07	0.48	0.55	—	425	425	0.02	0.01	0.06	429
2027	0.15	0.24	1.17	1.59	< 0.005	0.04	3.39	3.43	0.04	0.34	0.38	—	286	286	0.01	0.01	0.03	289

2.4. 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.	0.07	0.55	0.26	0.63	< 0.005	0.02	0.14	0.15	0.02	0.03	0.05	12.4	503	515	1.32	0.04	0.33	560
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.07	0.55	0.26	0.61	< 0.005	0.02	0.14	0.15	0.02	0.03	0.05	12.4	497	509	1.32	0.04	0.01	553
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.05	0.53	0.24	0.40	< 0.005	0.02	0.07	0.09	0.02	0.02	0.03	12.4	416	429	1.31	0.03	0.08	472
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.01	0.10	0.04	0.07	< 0.005	< 0.005	0.01	0.02	< 0.005	< 0.005	0.01	2.06	68.9	71.0	0.22	0.01	0.01	78.1

2.5. 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	0.05	0.04	0.03	0.44	< 0.005	< 0.005	0.14	0.14	< 0.005	0.03	0.03	—	140	140	< 0.005	< 0.005	0.33	141
Area	—	0.49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.02	0.01	0.22	0.19	< 0.005	0.02	—	0.02	0.02	—	0.02	—	341	341	0.04	< 0.005	—	342
Water	—	—	—	—	—	—	—	—	—	—	—	12.1	22.9	35.0	1.25	0.03	—	75.1
Waste	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.15
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	0.07	0.55	0.26	0.63	< 0.005	0.02	0.14	0.15	0.02	0.03	0.05	12.4	503	515	1.32	0.04	0.33	560
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.05	0.04	0.04	0.42	< 0.005	< 0.005	0.14	0.14	< 0.005	0.03	0.03	—	133	133	< 0.005	< 0.005	0.01	135

Area	—	0.49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.02	0.01	0.22	0.19	< 0.005	0.02	—	0.02	0.02	—	0.02	—	341	341	0.04	< 0.005	—	342
Water	—	—	—	—	—	—	—	—	—	—	—	12.1	22.9	35.0	1.25	0.03	—	75.1
Waste	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.15
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	0.07	0.55	0.26	0.61	< 0.005	0.02	0.14	0.15	0.02	0.03	0.05	12.4	497	509	1.32	0.04	0.01	553
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.02	0.02	0.02	0.21	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	70.2	70.2	< 0.005	< 0.005	0.08	71.1
Area	—	0.49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.02	0.01	0.22	0.19	< 0.005	0.02	—	0.02	0.02	—	0.02	—	323	323	0.03	< 0.005	—	324
Water	—	—	—	—	—	—	—	—	—	—	—	12.1	22.9	35.0	1.25	0.03	—	75.1
Waste	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.15
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	0.05	0.53	0.24	0.40	< 0.005	0.02	0.07	0.09	0.02	0.02	0.03	12.4	416	429	1.31	0.03	0.08	472
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	< 0.005	< 0.005	< 0.005	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	11.6	11.6	< 0.005	< 0.005	0.01	11.8
Area	—	0.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	< 0.005	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	53.5	53.5	0.01	< 0.005	—	53.7
Water	—	—	—	—	—	—	—	—	—	—	—	2.01	3.79	5.79	0.21	< 0.005	—	12.4
Waste	—	—	—	—	—	—	—	—	—	—	—	0.05	0.00	0.05	0.01	0.00	—	0.19
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	0.01	0.10	0.04	0.07	< 0.005	< 0.005	0.01	0.02	< 0.005	< 0.005	0.01	2.06	68.9	71.0	0.22	0.01	0.01	78.1

3. Construction Emissions Details

3.1. Site Preparation (2025) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.94	3.31	31.6	30.2	0.05	1.37	—	1.37	1.26	—	1.26	—	5,295	5,295	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—	—
Onsite truck	0.02	< 0.005	0.14	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	80.3	80.3	0.01	0.01	0.16	84.6
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.94	3.31	31.6	30.2	0.05	1.37	—	1.37	1.26	—	1.26	—	5,295	5,295	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—	—
Onsite truck	0.02	< 0.005	0.14	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	80.3	80.3	0.01	0.01	< 0.005	84.4
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.48	2.09	19.9	19.0	0.03	0.86	—	0.86	0.79	—	0.79	—	3,337	3,337	0.14	0.03	—	3,348
Dust From Material Movement	—	—	—	—	—	—	4.83	4.83	—	2.48	2.48	—	—	—	—	—	—	—
Onsite truck	0.01	< 0.005	0.09	0.06	< 0.005	< 0.005	16.5	16.5	< 0.005	1.64	1.64	—	50.6	50.6	0.01	0.01	0.04	53.2

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.45	0.38	3.64	3.47	0.01	0.16	—	0.16	0.14	—	0.14	—	552	552	0.02	< 0.005	—	554
Dust From Material Movement	—	—	—	—	—	—	0.88	0.88	—	0.45	0.45	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	3.01	3.01	< 0.005	0.30	0.30	—	8.37	8.37	< 0.005	< 0.005	0.01	8.82
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.03	0.55	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	144	144	< 0.005	< 0.005	0.48	145
Vendor	< 0.005	< 0.005	0.04	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	28.8	28.8	< 0.005	< 0.005	0.07	30.1
Hauling	0.01	< 0.005	0.12	0.08	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	78.6	78.6	0.01	0.01	0.16	82.8
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.04	0.50	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	136	136	< 0.005	0.01	0.01	138
Vendor	< 0.005	< 0.005	0.04	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	28.8	28.8	< 0.005	< 0.005	< 0.005	30.1
Hauling	0.01	< 0.005	0.13	0.08	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	78.6	78.6	0.01	0.01	< 0.005	82.7
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.02	0.31	0.00	0.00	0.09	0.09	0.00	0.02	0.02	—	86.1	86.1	< 0.005	< 0.005	0.13	87.3
Vendor	< 0.005	< 0.005	0.03	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	18.1	18.1	< 0.005	< 0.005	0.02	19.0
Hauling	0.01	< 0.005	0.08	0.05	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	49.5	49.5	0.01	0.01	0.04	52.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	< 0.005	< 0.005	0.06	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	14.3	14.3	< 0.005	< 0.005	0.02	14.5
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.00	3.00	< 0.005	< 0.005	< 0.005	3.14
Hauling	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	8.20	8.20	< 0.005	< 0.005	0.01	8.63

3.3. Grading (2025) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.10	1.76	17.2	16.8	0.03	0.71	—	0.71	0.65	—	0.65	—	3,366	3,366	0.14	0.03	—	3,377
Dust From Material Movement	—	—	—	—	—	—	2.56	2.56	—	1.31	1.31	—	—	—	—	—	—	—
Onsite truck	0.02	< 0.005	0.14	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	80.3	80.3	0.01	0.01	< 0.005	84.4
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	0.15	1.45	1.41	< 0.005	0.06	—	0.06	0.05	—	0.05	—	283	283	0.01	< 0.005	—	284
Dust From Material Movement	—	—	—	—	—	—	0.22	0.22	—	0.11	0.11	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	2.20	2.20	< 0.005	0.22	0.22	—	6.75	6.75	< 0.005	< 0.005	0.01	7.11
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.26	0.26	< 0.005	0.01	—	0.01	0.01	—	0.01	—	46.9	46.9	< 0.005	< 0.005	—	47.1

Dust From Material Movement	—	—	—	—	—	—	0.04	0.04	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.40	0.40	< 0.005	0.04	0.04	—	1.12	1.12	< 0.005	< 0.005	< 0.005	1.18
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.04	0.43	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	117	117	< 0.005	< 0.005	0.01	118
Vendor	< 0.005	< 0.005	0.04	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	28.8	28.8	< 0.005	< 0.005	< 0.005	30.1
Hauling	0.06	0.01	0.58	0.38	< 0.005	< 0.005	0.08	0.09	< 0.005	0.02	0.03	—	360	360	0.05	0.06	0.02	379
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.85	9.85	< 0.005	< 0.005	0.01	9.99
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.42	2.42	< 0.005	< 0.005	< 0.005	2.53
Hauling	0.01	< 0.005	0.05	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.3	30.3	< 0.005	< 0.005	0.03	31.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.63	1.63	< 0.005	< 0.005	< 0.005	1.65
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.40	0.40	< 0.005	< 0.005	< 0.005	0.42
Hauling	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.02	5.02	< 0.005	< 0.005	< 0.005	5.28

3.5. Grading (2026) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.01	1.69	16.0	16.3	0.03	0.65	—	0.65	0.59	—	0.59	—	3,368	3,368	0.14	0.03	—	3,379
Dust From Material Movement	—	—	—	—	—	—	2.56	2.56	—	1.31	1.31	—	—	—	—	—	—	—
Onsite truck	0.01	< 0.005	0.13	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	78.5	78.5	0.01	0.01	0.15	82.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.01	1.69	16.0	16.3	0.03	0.65	—	0.65	0.59	—	0.59	—	3,368	3,368	0.14	0.03	—	3,379
Dust From Material Movement	—	—	—	—	—	—	2.56	2.56	—	1.31	1.31	—	—	—	—	—	—	—
Onsite truck	0.01	< 0.005	0.14	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	78.5	78.5	0.01	0.01	< 0.005	82.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.10	0.92	8.76	8.92	0.02	0.35	—	0.35	0.32	—	0.32	—	1,839	1,839	0.07	0.01	—	1,845
Dust From Material Movement	—	—	—	—	—	—	1.40	1.40	—	0.72	0.72	—	—	—	—	—	—	—
Onsite truck	0.01	< 0.005	0.07	0.05	< 0.005	< 0.005	14.3	14.3	< 0.005	1.42	1.43	—	42.9	42.9	0.01	0.01	0.03	45.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.20	0.17	1.60	1.63	< 0.005	0.06	—	0.06	0.06	—	0.06	—	304	304	0.01	< 0.005	—	305

Dust From Material Movement	—	—	—	—	—	—	0.25	0.25	—	0.13	0.13	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	2.60	2.60	< 0.005	0.26	0.26	—	7.10	7.10	< 0.005	< 0.005	0.01	7.46
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.03	0.43	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	121	121	< 0.005	< 0.005	0.36	122
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	28.2	28.2	< 0.005	< 0.005	0.07	29.6
Hauling	0.06	0.01	0.53	0.37	< 0.005	< 0.005	0.08	0.09	< 0.005	0.02	0.03	—	352	352	0.05	0.06	0.68	371
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.03	0.40	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	114	114	< 0.005	< 0.005	0.01	116
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	28.2	28.2	< 0.005	< 0.005	< 0.005	29.5
Hauling	0.06	0.01	0.55	0.37	< 0.005	< 0.005	0.08	0.09	< 0.005	0.02	0.03	—	352	352	0.05	0.06	0.02	370
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.21	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	62.6	62.6	< 0.005	< 0.005	0.08	63.5
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	15.4	15.4	< 0.005	< 0.005	0.02	16.1
Hauling	0.03	< 0.005	0.30	0.20	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.01	—	192	192	0.03	0.03	0.16	202
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.4	10.4	< 0.005	< 0.005	0.01	10.5
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.55	2.55	< 0.005	< 0.005	< 0.005	2.67
Hauling	0.01	< 0.005	0.05	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	31.8	31.8	< 0.005	0.01	0.03	33.5

3.7. Building Construction (2026) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.31	1.10	10.1	13.1	0.02	0.39	—	0.39	0.36	—	0.36	—	2,425	2,425	0.10	0.02	—	2,434
Onsite truck	0.01	< 0.005	0.14	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	78.5	78.5	0.01	0.01	< 0.005	82.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.45	0.59	< 0.005	0.02	—	0.02	0.02	—	0.02	—	109	109	< 0.005	< 0.005	—	110
Onsite truck	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	1.18	1.18	< 0.005	0.12	0.12	—	3.53	3.53	< 0.005	< 0.005	< 0.005	3.72
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.08	0.11	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	18.1	18.1	< 0.005	< 0.005	—	18.1
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.21	0.21	< 0.005	0.02	0.02	—	0.59	0.59	< 0.005	< 0.005	< 0.005	0.62
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.01	0.17	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	49.3	49.3	< 0.005	< 0.005	< 0.005	49.9
Vendor	0.01	< 0.005	0.13	0.08	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01	—	93.5	93.5	0.01	0.01	0.01	97.7

Hauling	0.01	< 0.005	0.12	0.08	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	76.9	76.9	0.01	0.01	< 0.005	80.8
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.22	2.22	< 0.005	< 0.005	< 0.005	2.26
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.21	4.21	< 0.005	< 0.005	< 0.005	4.40
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.46	3.46	< 0.005	< 0.005	< 0.005	3.64
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.37	0.37	< 0.005	< 0.005	< 0.005	0.37
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.70	0.70	< 0.005	< 0.005	< 0.005	0.73
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.57	0.57	< 0.005	< 0.005	< 0.005	0.60

3.9. Building Construction (2027) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.26	1.06	9.60	13.1	0.02	0.34	—	0.34	0.32	—	0.32	—	2,425	2,425	0.10	0.02	—	2,434
Onsite truck	0.01	< 0.005	0.12	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	76.6	76.6	0.01	0.01	0.14	80.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.26	1.06	9.60	13.1	0.02	0.34	—	0.34	0.32	—	0.32	—	2,425	2,425	0.10	0.02	—	2,434
Onsite truck	0.01	< 0.005	0.13	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	76.6	76.6	0.01	0.01	< 0.005	80.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.74	0.62	5.62	7.66	0.01	0.20	—	0.20	0.19	—	0.19	—	1,419	1,419	0.06	0.01	—	1,424
Onsite truck	0.01	< 0.005	0.07	0.05	< 0.005	< 0.005	15.3	15.3	< 0.005	1.53	1.53	—	44.8	44.8	0.01	0.01	0.03	47.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	1.02	1.40	< 0.005	0.04	—	0.04	0.03	—	0.03	—	235	235	0.01	< 0.005	—	236
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	2.79	2.79	< 0.005	0.28	0.28	—	7.42	7.42	< 0.005	< 0.005	0.01	7.81
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.17	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	51.1	51.1	< 0.005	< 0.005	0.14	51.4
Vendor	0.01	< 0.005	0.12	0.08	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01	—	91.4	91.4	0.01	0.01	0.20	95.7
Hauling	0.01	< 0.005	0.11	0.08	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	74.9	74.9	0.01	0.01	0.14	79.0
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.16	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	48.3	48.3	< 0.005	< 0.005	< 0.005	48.5
Vendor	0.01	< 0.005	0.13	0.08	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01	—	91.4	91.4	0.01	0.01	0.01	95.5
Hauling	0.01	< 0.005	0.12	0.08	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	74.9	74.9	0.01	0.01	< 0.005	78.8
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.09	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	28.4	28.4	< 0.005	< 0.005	0.03	28.5
Vendor	0.01	< 0.005	0.07	0.05	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	53.5	53.5	0.01	0.01	0.05	55.9
Hauling	0.01	< 0.005	0.07	0.05	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	43.9	43.9	0.01	0.01	0.03	46.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	4.70	4.70	< 0.005	< 0.005	0.01	4.72
Vendor	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	8.86	8.86	< 0.005	< 0.005	0.01	9.26
Hauling	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	7.26	7.26	< 0.005	< 0.005	0.01	7.64

3.11. Paving (2027) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.88	0.74	6.94	9.95	0.01	0.30	—	0.30	0.27	—	0.27	—	1,511	1,511	0.06	0.01	—	1,516
Paving	—	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	< 0.005	0.13	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	76.6	76.6	0.01	0.01	< 0.005	80.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.48	0.68	< 0.005	0.02	—	0.02	0.02	—	0.02	—	104	104	< 0.005	< 0.005	—	104
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	1.79	1.79	< 0.005	0.18	0.18	—	5.24	5.24	< 0.005	< 0.005	< 0.005	5.52
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.09	0.12	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	17.1	17.1	< 0.005	< 0.005	—	17.2
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.33	0.33	< 0.005	0.03	0.03	—	0.87	0.87	< 0.005	< 0.005	< 0.005	0.91
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.38	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	112	112	< 0.005	< 0.005	0.01	113
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	27.6	27.6	< 0.005	< 0.005	< 0.005	28.8
Hauling	0.01	< 0.005	0.12	0.08	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	74.9	74.9	0.01	0.01	< 0.005	78.8
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.71	7.71	< 0.005	< 0.005	0.01	7.74
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.89	1.89	< 0.005	< 0.005	< 0.005	1.98
Hauling	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.13	5.13	< 0.005	< 0.005	< 0.005	5.40
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.28	1.28	< 0.005	< 0.005	< 0.005	1.28
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.31	0.31	< 0.005	< 0.005	< 0.005	0.33
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.85	0.85	< 0.005	< 0.005	< 0.005	0.89

3.13. Architectural Coating (2027) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	0.11	0.83	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	10.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.01	< 0.005	0.13	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	76.6	76.6	0.01	0.01	< 0.005	80.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.05	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.32	7.32	< 0.005	< 0.005	—	7.34
Architectural Coatings	—	0.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	1.43	1.43	< 0.005	0.14	0.14	—	4.20	4.20	< 0.005	< 0.005	< 0.005	4.42
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.21	1.21	< 0.005	< 0.005	—	1.22
Architectural Coatings	—	0.11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.26	0.26	< 0.005	0.03	0.03	—	0.69	0.69	< 0.005	< 0.005	< 0.005	0.73
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.65	9.65	< 0.005	< 0.005	< 0.005	9.68
Vendor	< 0.005	< 0.005	0.03	0.02	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	18.2	18.2	< 0.005	< 0.005	< 0.005	19.0
Hauling	0.01	< 0.005	0.12	0.08	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	74.9	74.9	0.01	0.01	< 0.005	78.8
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.53	0.53	< 0.005	< 0.005	< 0.005	0.53
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.00	1.00	< 0.005	< 0.005	< 0.005	1.04

Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.11	4.11	< 0.005	< 0.005	< 0.005	4.32
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.09	0.09	< 0.005	< 0.005	< 0.005	0.09
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.17	0.17	< 0.005	< 0.005	< 0.005	0.17
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.68	0.68	< 0.005	< 0.005	< 0.005	0.72

3.15. Trenching (2026) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.49	1.25	11.5	11.9	0.02	0.48	—	0.48	0.44	—	0.44	—	2,122	2,122	0.09	0.02	—	2,129
Onsite truck	0.01	< 0.005	0.14	0.09	< 0.005	< 0.005	29.4	29.4	< 0.005	2.94	2.94	—	78.5	78.5	0.01	0.01	< 0.005	82.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	0.15	1.41	1.47	< 0.005	0.06	—	0.06	0.05	—	0.05	—	262	262	0.01	< 0.005	—	262
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	3.22	3.22	< 0.005	0.32	0.32	—	9.68	9.68	< 0.005	< 0.005	0.01	10.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.26	0.27	< 0.005	0.01	—	0.01	0.01	—	0.01	—	43.3	43.3	< 0.005	< 0.005	—	43.5
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.59	0.59	< 0.005	0.06	0.06	—	1.60	1.60	< 0.005	< 0.005	< 0.005	1.69

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.02	0.02	0.27	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	76.2	76.2	< 0.005	< 0.005	0.01	77.3
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	28.2	28.2	< 0.005	< 0.005	< 0.005	29.5
Hauling	0.01	< 0.005	0.12	0.08	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	76.9	76.9	0.01	0.01	< 0.005	80.8
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.43	9.43	< 0.005	< 0.005	0.01	9.57
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.48	3.48	< 0.005	< 0.005	< 0.005	3.64
Hauling	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	9.48	9.48	< 0.005	< 0.005	0.01	9.97
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.56	1.56	< 0.005	< 0.005	< 0.005	1.58
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.58	0.58	< 0.005	< 0.005	< 0.005	0.60
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.57	1.57	< 0.005	< 0.005	< 0.005	1.65

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. 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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	0.05	0.04	0.03	0.44	< 0.005	< 0.005	0.14	0.14	< 0.005	0.03	0.03	—	140	140	< 0.005	< 0.005	0.33	141
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.05	0.04	0.03	0.44	< 0.005	< 0.005	0.14	0.14	< 0.005	0.03	0.03	—	140	140	< 0.005	< 0.005	0.33	141
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	0.05	0.04	0.04	0.42	< 0.005	< 0.005	0.14	0.14	< 0.005	0.03	0.03	—	133	133	< 0.005	< 0.005	0.01	135
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.05	0.04	0.04	0.42	< 0.005	< 0.005	0.14	0.14	< 0.005	0.03	0.03	—	133	133	< 0.005	< 0.005	0.01	135
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	< 0.005	< 0.005	< 0.005	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	11.6	11.6	< 0.005	< 0.005	0.01	11.8
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	< 0.005	< 0.005	< 0.005	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	11.6	11.6	< 0.005	< 0.005	0.01	11.8

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	70.5	70.5	0.01	< 0.005	—	71.2
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	4.27	4.27	< 0.005	< 0.005	—	4.31
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	74.8	74.8	0.01	< 0.005	—	75.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	70.5	70.5	0.01	< 0.005	—	71.2
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	4.27	4.27	< 0.005	< 0.005	—	4.31
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	74.8	74.8	0.01	< 0.005	—	75.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	8.78	8.78	< 0.005	< 0.005	—	8.86
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	0.71	0.71	< 0.005	< 0.005	—	0.71
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	9.48	9.48	< 0.005	< 0.005	—	9.57

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	0.02	0.01	0.22	0.19	< 0.005	0.02	—	0.02	0.02	—	0.02	—	266	266	0.02	< 0.005	—	267
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.02	0.01	0.22	0.19	< 0.005	0.02	—	0.02	0.02	—	0.02	—	266	266	0.02	< 0.005	—	267
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	0.02	0.01	0.22	0.19	< 0.005	0.02	—	0.02	0.02	—	0.02	—	266	266	0.02	< 0.005	—	267
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.02	0.01	0.22	0.19	< 0.005	0.02	—	0.02	0.02	—	0.02	—	266	266	0.02	< 0.005	—	267
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	< 0.005	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.1
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	< 0.005	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.1

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	—	0.43	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.43	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	12.1	22.9	35.0	1.25	0.03	—	75.1
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	12.1	22.9	35.0	1.25	0.03	—	75.1
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	12.1	22.9	35.0	1.25	0.03	—	75.1
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	12.1	22.9	35.0	1.25	0.03	—	75.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	2.01	3.79	5.79	0.21	< 0.005	—	12.4
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	2.01	3.79	5.79	0.21	< 0.005	—	12.4

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.15
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.15
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.15
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.15
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

City Park	—	—	—	—	—	—	—	—	—	—	—	0.05	0.00	0.05	0.01	0.00	—	0.19
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.05	0.00	0.05	0.01	0.00	—	0.19

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	1/01/2025	11/18/2025	5.00	230	—
Grading	Grading	11/19/2025	10/6/2026	5.00	230	—
Building Construction	Building Construction	12/09/2026	10/26/2027	5.00	230	—
Paving	Paving	10/27/2027	11/30/2027	5.00	25.0	—

Architectural Coating	Architectural Coating	12/01/2027	12/28/2027	5.00	20.0	—
Trenching	Trenching	10/07/2026	12/8/2026	5.00	45.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Other Construction Equipment	Diesel	Average	1.00	8.00	249	0.42
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Cement and Mortar Mixers	Diesel	Average	1.00	4.00	10.0	0.56
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48
Trenching	Trenchers	Diesel	Average	1.00	8.00	40.0	0.50

Trenching	Skid Steer Loaders	Diesel	Average	1.00	8.00	71.0	0.37
Trenching	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Trenching	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	1.00	8.40	HHDT,MHDT
Site Preparation	Hauling	1.00	20.0	HHDT
Site Preparation	Onsite truck	2.00	10.0	HHDT
Grading	—	—	—	—
Grading	Worker	15.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	1.00	8.40	HHDT,MHDT
Grading	Hauling	4.58	20.0	HHDT
Grading	Onsite truck	2.00	10.0	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	6.46	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	3.31	8.40	HHDT,MHDT
Building Construction	Hauling	1.00	20.0	HHDT
Building Construction	Onsite truck	2.00	10.0	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	1.00	8.40	HHDT,MHDT
Paving	Hauling	1.00	20.0	HHDT

Paving	Onsite truck	2.00	10.0	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	1.29	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	0.66	8.40	HHDT,MHDT
Architectural Coating	Hauling	1.00	20.0	HHDT
Architectural Coating	Onsite truck	2.00	10.0	HHDT
Trenching	—	—	—	—
Trenching	Worker	10.0	11.7	LDA,LDT1,LDT2
Trenching	Vendor	1.00	8.40	HHDT,MHDT
Trenching	Hauling	1.00	20.0	HHDT
Trenching	Onsite truck	2.00	10.0	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	0.00	0.00	30,300	10,100	1,594

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)
Site Preparation	0.00	0.00	345	0.00	—
Grading	4,790	3,640	115	0.00	—

Paving	0.00	0.00	0.00	0.00	0.61

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
City Park	0.00	0%
Parking Lot	0.20	100%
Other Non-Asphalt Surfaces	0.41	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2025	0.00	204	0.03	< 0.005
2026	0.00	204	0.03	< 0.005
2027	0.00	204	0.03	< 0.005

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
City Park	5.54	13.9	15.5	2,980	68.5	172	192	36,881
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

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	0.00	30,300	10,100	1,594

5.10.3. Landscape Equipment

Equipment Type	Fuel Type	Number Per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
Lawn Mowers	Electric	1.00	8.00	416	3.86	0.36
Leaf Blowers/Vacuums	Electric	1.00	8.00	416	1.79	0.94
Riding Mowers	Electric	1.00	8.00	416	21.4	0.38
Trimmers/Edgers/Brush Cutters	Electric	2.00	8.00	416	1.13	0.91
Other Lawn & Garden Equipment	Electric	1.00	8.00	416	6.09	0.58

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
City Park	89,635	204	0.0330	0.0040	829,430
Parking Lot	7,632	204	0.0330	0.0040	0.00
Other Non-Asphalt Surfaces	0.00	204	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
City Park	6,320,378	123
Parking Lot	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
City Park	0.61	—
Parking Lot	0.00	—
Other Non-Asphalt Surfaces	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
City Park	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
City Park	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00

5.17. User Defined

Equipment Type	Fuel Type

8. User Changes to Default Data

Screen	Justification
Characteristics: Project Details	Site Specific information on construction and operation start dates
Construction: Construction Phases	Construction schedule is anticipated to be 36 months. Extended site preparation and grading time.
Construction: Off-Road Equipment	Added equipment for trenching, added cement and mortar mixers to building construction, added compactor (other construction equipment) to grading and remove grader.
Operations: Energy Use	used value for day care with 20,200 sqft to represent the building.
Operations: Water and Waste Water	assumed indoor water use was same as daycare center for 20,200 sqft building
Construction: Trips and VMT	Based workers and vendors for building construction on community center sqft. Assumed 1 vendor and 1 hauling for any phase without other defaults. Assumed 2 onsite trucks with 10 miles per day.

Construction Noise Calculations - Nearest Residence

Construction Phase	Equipment Type[1]	USDOT Equipment Type[2]	No. Equipment[1]	Acoustical Usage Factor[2]	Maximum Noise Level @ 50 feet (Lmax)[3]	Typical Noise Level @ 50 feet (dBA_1)	Reference Distance (D_1)	Distance to Receptor (D_2)	Ground Absorption Constant (G)	Noise Level at Receptor (dBA_2)	Two Noisiest Equipment
			Unit:	%	dBA Lmax	dBA Leq	feet	feet	unitless	dBA Leq	dBA Leq
Site Preparation	Rubber Tired Dozers	Dozer	3	40	85	81	50	70	0	78	81
	Dump Truck	Dump Truck	1	40	84	80	50	70	0	77	
	Tractors/Loaders/Backhoes	Backhoe	4	40	80	76	50	70	0	73	
Grading	Excavator	Excavator	1	40	85	81	50	70	0	78	82
	Rubber Tired Dozers	Dozer	1	40	85	81	50	70	0	78	
	Tractors/Loaders/Backhoes	Backhoe	3	40	80	76	50	70	0	73	
	Dump Truck	Dump Truck	1	40	84	80	50	70	0	77	
	Other Construction Equipment	All other Equipment>5 HP	1	50	85	82	50	70	0	79	
Trenching	Trencher	Excavator	1	40	85	81	50	70	0	78	81
	Skid Steer Loader	Front End Loader	1	40	80	76	50	70	0	73	
	Rubber Tired Dozers	Dozer	1	40	85	81	50	70	0	78	
	Dump Truck	Dump Truck	1	40	84	80	50	70	0	77	
	Tractors/Loaders/Backhoes	Backhoe	1	40	80	76	50	70	0	73	
Building Construction	Cement and Mortar Mixers	Vibratory Concrete Mixer	1	20	76	69	50	70	0	66	80
	Cranes	Crane	1	16	88	80	50	70	0	77	
	Generator Sets	Generator (<25 KVA, VMS Signs)	1	50	82	79	50	70	0	76	
	Welders	Welder/Torch	1	40	73	69	50	70	0	66	
	Dump Truck	Dump Truck	1	40	84	80	50	70	0	77	
	Tractors/Loaders/Backhoes	Backhoe	3	40	80	76	50	70	0	73	
Paving	Pavers	Paver	2	50	85	82	50	70	0	79	82
	Paving Equipment	Paver	2	50	85	82	50	70	0	79	
	Dump Truck	Dump Truck	1	40	84	80	50	70	0	77	
	Rollers	Roller	2	20	85	78	50	70	0	75	
Architectural Coating	Dump Truck	Dump Truck	1	40	84	80	50	70	0	77	79
	Air Compressors	Compressor (air)	1	40	80	76	50	70	0	73	

Notes:

Noise level at the receptor calculated based on the following equation:[4]

$dBA_2 = dBA_1 + 10 * \log_{10}(D_1/D_2)^{2+G}$

Where:

dBA_2 = Noise level at receptor

dBA_1 = Noise level at reference distance

D_1 = Reference distance

D_2 = Receptor distance

G = Ground absorption constant (0 for hard surface, 0.5 for soft surface)

Combined noise levels at receptor calculated for two noisiest equipment using decibel addition:

$L = 10 * \log_{10} (10\text{^}(L_1/10)+10\text{^}(L_2/10))$

L = Combined noise level

L_1 = Noise level for first noisiest piece of equipment

L_2 = Noise level for second noisiest piece of equipment

[1] The type of construction equipment is based on construction equipment list provided by the applicant.

[2] U.S. Department of Transportation, 2006. FHWA Highway Construction Noise Handbook, Table 9.1. August.

[3] Federal Transit Administration, 2018. Transit Noise and Vibration Impact Assessment Manual, Table 7-1. September.

[4] California Department of Transportation, 1998. Technical Noise Supplement (TeNS). Equation N-2141.2. October.

Construction Noise Calculations - Nearest School

Construction Phase	Equipment Type[1]	USDOT Equipment Type[2]	No. Equipment[1]	Acoustical Usage Factor[2]	Maximum Noise Level @ 50 feet (Lmax)[3]	Typical Noise Level @ 50 feet (dBA_1)	Reference Distance (D_1)	Distance to Receptor (D_2)	Ground Absorption Constant (G)	Noise Level at Receptor (dBA_2)	Two Noisiest Equipment
			Unit:	%	dBA Lmax	dBA Leq	feet	feet	unitless	dBA Leq	dBA Leq
Site Preparation	Rubber Tired Dozers	Dozer	3	40	85	81	50	160	0	71	74
	Dump Truck	Dump Truck	1	40	84	80	50	160	0	70	
	Tractors/Loaders/Backhoes	Backhoe	4	40	80	76	50	160	0	66	
Grading	Excavator	Excavator	1	40	85	81	50	160	0	71	74
	Rubber Tired Dozers	Dozer	1	40	85	81	50	160	0	71	
	Tractors/Loaders/Backhoes	Backhoe	3	40	80	76	50	160	0	66	
	Dump Truck	Dump Truck	1	40	84	80	50	160	0	70	
	Other Construction Equipment	All other Equipment>5 HP	1	50	85	82	50	160	0	72	
Trenching	Trencher	Excavator	1	40	85	81	50	850	0	56	59
	Skid Steer Loader	Front End Loader	1	40	80	76	50	850	0	51	
	Rubber Tired Dozers	Dozer	1	40	85	81	50	850	0	56	
	Dump Truck	Dump Truck	1	40	84	80	50	850	0	55	
	Tractors/Loaders/Backhoes	Backhoe	1	40	80	76	50	850	0	51	
Building Construction	Cement and Mortar Mixers	Vibratory Concrete Mixer	1	20	76	69	50	850	0	44	58
	Cranes	Crane	1	16	88	80	50	850	0	55	
	Generator Sets	Generator (<25 KVA, VMS Signs)	1	50	82	79	50	850	0	54	
	Welders	Welder/Torch	1	40	73	69	50	850	0	44	
	Dump Truck	Dump Truck	1	40	84	80	50	850	0	55	
	Tractors/Loaders/Backhoes	Backhoe	3	40	80	76	50	850	0	51	
Paving	Pavers	Paver	2	50	85	82	50	850	0	57	60
	Paving Equipment	Paver	2	50	85	82	50	850	0	57	
	Dump Truck	Dump Truck	1	40	84	80	50	850	0	55	
	Rollers	Roller	2	20	85	78	50	850	0	53	
Architectural Coating	Dump Truck	Dump Truck	1	40	84	80	50	850	0	55	57
	Air Compressors	Compressor (air)	1	40	80	76	50	850	0	51	

Notes:

Noise level at the receptor calculated based on the following equation:[4]

$dBA_2 = dBA_1 + 10 * \log_{10}(D_1/D_2)^{2+G}$

Where:

dBA_2 = Noise level at receptor

dBA_1 = Noise level at reference distance

D_1 = Reference distance

D_2 = Receptor distance

G = Ground absorption constant (0 for hard surface, 0.5 for soft surface)

Combined noise levels at receptor calculated for two noisiest equipment using decibel addition:

$L = 10 * \log_{10} (10^\wedge(L_1/10)+10^\wedge(L_2/10))$

L = Combined noise level

L_1 = Noise level for first noisiest piece of equipment

L_2 = Noise level for second noisiest piece of equipment

[1] The type of construction equipment is based on construction equipment list provided by the applicant.

[2] U.S. Department of Transportation, 2006. FHWA Highway Construction Noise Handbook, Table 9.1. August.

[3] Federal Transit Administration, 2018. Transit Noise and Vibration Impact Assessment Manual, Table 7-1. September.

[4] California Department of Transportation, 1998. Technical Noise Supplement (TeNS). Equation N-2141.2. October.

Operational Noise Calculation

Amplified Sound System

Source	Distance to Receptor (D_1)	Existing Ambient Daytime Noise Level	Noise Threshold at Receptor	Contribution from the Amplified Sound System (dB_1)	Distance to Footprint (D_2)	Ground Absorption Constant (G)	Source Noise Level @ 5 feet (dB_2)
Unit:	**(feet)**	**(dBA)**	**(dBA)**	**(dBA)**	**(feet)**	**unitless**	**(dBA)**
Village Green Area	220	65.5	70.0	68.1	5	0.5	109
Community Recreation Center	170	65.5	70.0	68.1	5	0.5	106

Note: The existing ambient noise levels are based on the noise measurements presented in Table 2. Daytime noise level measured at LT-1 was used to represent existing ambient noise levels at the nearest receptors.

Stationary Source - HVAC

Source	Typical Noise Level @ 50 feet (dB_1)	Reference Distance (D_1)	Distance to Receptor (D_2)	Ground Absorption Constant (G)	Noise Level from the Source at Receptor (dB_2)	Existing Ambient Daytime Noise Level	Combined Noise Level at Receptor
Unit:	**(dBA)**	**(feet)**	**(feet)**	**unitless**	**(dBA)**	**(dBA)**	**(dBA)**
HVAC - upper bound	75	50.0	170	0.5	62	65.5	67
HVAC - lower bound	65	50.0	170	0.5	52	65.5	66

Noise level at the receptor calculated based on the following equation:

$dB_2 = dB_1 + 10 * \log_{10}(D_1/D_2)^{2+G}$

Where:

dB_2 = Noise level at receptor

dB_1 = Noise level at reference distance

D_1 = Reference distance

D_2 = Receptor distance

G = Ground absorption constant (0 for hard surface, 0.5 for soft surface)

[1] California Department of Transportation, 1998. Technical Noise Supplement. Equation N-2141.2. October.

Noise levels at receptor that are attributable to the amplified sound systems are calculated using decibel addition:

$L_1 = 10 * \log_{10} (10\text{^}(L/10)-10\text{^}(L_2/10))$

L = Combined noise level

L_1 = Noise level from the source

L_2 = Ambient noise level

Construction Vibration Calculations for Potential Disturbance

Equipment[1]	Typical Vibration Level @ 25 Feet[2] (RMS_1)	Annoyance Vibration Threshold (RMS_2)	Reference Distance (D_1)	Buffer Distance to Annoyance Threshold (D_2)
Unit	VdB	VdB	feet	feet
Vibratory Roller	94	83	25	58
Large bulldozer	87	83	25	34
Loaded trucks	86	83	25	31
Small bulldozer	58	83	25	4

Notes:

Buffer distance to vibration threshold for human annoyance calculated based on the following equation:[3]

$D_2 = D_1 * 10\text{^} ((RMS_1 - RMS_2) / 30)$

Where:

RMS_1 = Vibration level at reference distance

RMS_2 = Vibration threshold for human disturbance

D_1 = Reference distance

D_2 = Buffer distance to vibration threshold for human annoyance

Construction Vibration Calculations for Potential Building Damage

Equipment[1]	Typical Vibration Level @ 25 Feet[2] (PPV_1)	Building Damage Vibration Threshold (PPV_2)	Reference Distance (D_1)	Buffer Distance to Damage Threshold (D_2)
Unit	in/sec	in/sec	feet	feet
Vibratory Roller	0.210	0.3	25	20
Large bulldozer	0.089	0.3	25	11
Loaded trucks	0.076	0.3	25	10
Small bulldozer	0.003	0.3	25	1

Notes:

Buffer distance to vibration threshold for building damage calculated based on the following equation:[3]

$D_2 = (PPV_1 / PPV_2)\text{^} (1 / 1.5) * D_1$

Where:

PPV_1 = Vibration level at reference distance

PPV_2 = Vibration threshold for building damage

D_1 = Reference distance

D_2 = Buffer distance to vibration threshold for building damage

[1] Demolition equipment provided by project applicant, and other equipment based on the CalEEMod default generated for the project. Only equipment that generates substantial vibration is shown.

[2] Federal Transit Administration, 2018. Transit Noise and Vibration Impact Assessment Manual, Table 7-4. September.

[3] Federal Transit Administration, 2018. Transit Noise and Vibration Impact Assessment Manual, Equations 7-2 and 7-3. September.