Concord
Community Reuse Plan

Appendix 4A

Multi-modal Transportation Service Objectives Tables

Table 4A-1. Freeway and Roadway MTSO Results

	Roadway	Location	DIR	Pk Hr	MTSO Significance Threshold Delay Index	MTSO Significance Threshold Average Speed	Existing Condition	2030 No Project	2030 CV	2030 CC
	Central County									
1	I-680	South of Monument Blvd	NB	AM	4.0	n.a.	1.4	**1.5**	**1.6**	**1.6**
			NB	PM	4.0	n.a.	1.6	**2.1**	**2.0**	**2.1**
			SB	AM	4.0	n.a.	1.6	**2.2**	**2.1**	**2.1**
			SB	PM	4.0	n.a.	1.6	**1.9**	**2.1**	**2.1**
2	I-680	North of Monument Blvd	NB	AM	4.0	n.a.	1.1	**1.2**	**1.3**	**1.3**
			NB	PM	4.0	n.a.	1.4	**2.0**	**2.0**	**2.0**
			SB	AM	4.0	n.a.	1.5	**2.4**	**2.2**	**2.2**
			SB	PM	4.0	n.a.	1.4	**2.0**	**2.3**	**2.3**
3	I-680	North of SR 242	NB	AM	4.0	n.a.	1.5	**1.6**	1.5	1.5
			NB	PM	4.0	n.a.	1.2	**1.4**	1.4	1.4
			SB	AM	4.0	n.a.	1.2	**1.7**	1.7	1.7
			SB	PM	4.0	n.a.	2.0	**2.5**	**2.8**	**2.7**
4	I-680	North of Willow Pass Rd	NB	AM	4.0	n.a.	1.1	1.1	1.1	1.1
			NB	PM	4.0	n.a.	1.1	**1.2**	1.1	**1.2**
			SB	AM	4.0	n.a.	1.2	**1.4**	**1.3**	**1.4**
			SB	PM	4.0	n.a.	1.2	1.2	1.2	1.2
5	I-680	North of Concord Av	NB	AM	4.0	n.a.	1.5	1.5	1.4	1.4
			NB	PM	4.0	n.a.	1.6	**2.1**	**2.1**	**2.1**
			SB	AM	4.0	n.a.	2.1	**2.7**	**2.5**	**2.6**
			SB	PM	4.0	n.a.	1.5	**1.6**	1.5	1.5
6	I-680	North of SR 4	NB	AM	4.0	n.a.	1.4	**1.6**	**1.5**	**1.5**
			NB	PM	4.0	n.a.	1.2	**1.6**	**1.6**	**1.6**
			SB	AM	4.0	n.a.	1.3	**1.6**	**1.8**	**1.8**
			SB	PM	4.0	n.a.	1.4	**1.7**	**1.6**	**1.6**
7	SR 242	North of I-680	NB	AM	3.0	n.a.	1.0	1.0	**1.1**	**1.1**
			NB	PM	3.0	n.a.	1.2	**1.7**	**1.6**	**1.6**
			SB	AM	3.0	n.a.	2.0	**3.7**	**3.2**	**3.0**
			SB	PM	3.0	n.a.	1.1	**1.6**	**2.1**	**2.0**
8	SR 242	North of Willow Pass Rd	NB	AM	3.0	n.a.	1.0	1.0	**1.1**	**1.1**
			NB	PM	3.0	n.a.	1.2	**1.9**	**1.8**	**1.8**
			SB	AM	3.0	n.a.	1.2	**2.3**	**2.0**	**2.0**
			SB	PM	3.0	n.a.	1.0	**1.4**	**1.5**	**1.5**
9	SR 242	North of Concord Av	NB	AM	3.0	n.a.	1.0	**1.1**	**1.3**	**1.3**
			NB	PM	3.0	n.a.	1.7	**3.7**	**3.5**	**3.5**
			SB	AM	3.0	n.a.	1.6	**4.2**	**3.7**	**3.6**
			SB	PM	3.0	n.a.	1.0	**1.3**	**1.5**	**1.4**
10	SR 242	North of Solano Way	NB	AM	3.0	n.a.	1.0	1.0	**1.1**	**1.1**
			NB	PM	3.0	n.a.	1.1	**1.3**	**1.4**	**1.3**
			SB	AM	3.0	n.a.	1.1	**1.3**	**1.3**	**1.3**
			SB	PM	3.0	n.a.	1.0	**1.1**	**1.1**	**1.1**
11	SR 242	North of Olivera Rd	NB	AM	3.0	n.a.	1.0	1.0	1.0	1.0
			NB	PM	3.0	n.a.	1.0	**1.2**	**1.2**	**1.2**
			SB	AM	3.0	n.a.	1.2	**2.0**	**1.8**	**1.8**
			SB	PM	3.0	n.a.	1.0	**1.2**	**1.2**	**1.2**
12	SR 4	East of I-680	EB	AM	5.0	n.a.	1.0	1.0	1.0	1.0
			EB	PM	5.0	n.a.	2.0	1.7	1.6	1.6
			WB	AM	5.0	n.a.	2.1	2.1	1.9	1.9
			WB	PM	5.0	n.a.	1.1	1.0	1.1	1.1
13	SR 4	East of Solano Way	EB	AM	5.0	n.a.	1.0	1.0	1.0	1.0
			EB	PM	5.0	n.a.	1.1	**1.4**	**1.3**	**1.3**
			WB	AM	5.0	n.a.	1.1	**1.7**	**1.6**	**1.6**
			WB	PM	5.0	n.a.	1.0	1.0	1.0	1.0
14	SR 4	East of SR 242	EB	AM	5.0	n.a.	1.0	1.0	1.0	1.0
			EB	PM	5.0	n.a.	1.2	**2.6**	**2.3**	**2.2**
			WB	AM	5.0	n.a.	1.1	**5.0**	**3.2**	**3.4**
			WB	PM	5.0	n.a.	1.0	1.0	1.0	**1.1**
15	SR 4	East of Port Chicago Hwy	EB	AM	5.0	n.a.	1.0	**1.1**	**1.1**	**1.1**
			EB	PM	5.0	n.a.	2.5	**10.5**	**7.5**	**7.3**
			WB	AM	5.0	n.a.	3.5	**24.3**	**11.4**	**11.6**
			WB	PM	5.0	n.a.	1.1	**1.3**	**1.3**	**1.3**

	Roadway	Location	DIR	Pk Hr	MTSO Significance Threshold: Delay Index	MTSO Significance Threshold: Average Speed	Existing Condition	2030 No Project	2030 CV	2030 CC
16	SR 4	East of Willow Pass Rd	EB	AM	5.0	n.a.	1.0	1.0	**1.1**	**1.1**
			EB	PM	5.0	n.a.	1.3	**2.1**	**3.4**	**3.2**
			WB	AM	5.0	n.a.	1.5	**2.9**	**4.9**	**4.9**
			WB	PM	5.0	n.a.	1.0	**1.1**	**1.2**	**1.2**
17	Clayton Rd	East of Treat Blvd	NB	AM	n.a.	15 mph	34	34	34	34
			NB	PM	n.a.	15 mph	35	35	35	35
			SB	AM	n.a.	15 mph	35	35	35	35
			SB	PM	n.a.	15 mph	35	35	35	35
	East County									
18	SR 4	East of San Marco Blvd	EB	AM	2.5	n.a.	1.0	**1.1**	**1.2**	**1.2**
			EB	PM	2.5	n.a.	1.7	**3.1**	**5.8**	**5.8**
			WB	AM	2.5	n.a.	1.8	**5.3**	**8.3**	**7.7**
			WB	PM	2.5	n.a.	1.0	**1.2**	**1.4**	**1.4**
19	SR 4	East of Bailey Rd	EB	AM	2.5	n.a.	1.0	**1.1**	**1.3**	**1.3**
			EB	PM	2.5	n.a.	1.3	**2.4**	**2.9**	**2.9**
			WB	AM	2.5	n.a.	1.4	**4.0**	**5.1**	**5.0**
			WB	PM	2.5	n.a.	1.1	**1.3**	**1.4**	**1.4**
20	SR 4	East of Railroad Ave	EB	AM	2.5	n.a.	1.2	1.1	1.2	1.1
			EB	PM	2.5	n.a.	2.7	1.8	2.0	2.0
			WB	AM	2.5	n.a.	2.5	2.0	2.4	2.4
			WB	PM	2.5	n.a.	1.1	1.1	1.1	1.1

Impact categories*

Grey shading indicates a significant impact in the No Project condition.

Yellow highlighting indicates a project-specific significant impact of the Preferred or Concentration and Concentration Alterntaive that is worse than the No Project condition.

Green highlighting indicates a project-specific significant impact of the Preferred or Concentration and Concentration Alterntaive that improves or does not change the No Project condition.

Orange highlighting indicates a contributing significant impact of the Preferred or Concentration and Concentration Alterntaive that is worse than the No Project condition.

Blue highlighting indicates a contributing significant impact of the Preferred or Concentration and Concentration Alterntaive that improves or does not change the No Project condition.

Bold with no shading or highlighting indicates a less than significant impact.

* Impact categories are described in Section 4.3.

Table 4A-2. Intersection MTSOs

	Intersection	Movement along RRS in Peak Direction	Peak Hour	MTSO Significance Threshold			Existing Condition			2030 No Project			2030 Preferred Alternative			2030 CC Alternative		
				Signal cycles to clear	V/C	LOS	Signal cycles to clear	LOS	v/c	Signal cycles to clear	LOS	v/c	Signal cycles to clear	LOS	v/c	Signal cycles to clear	LOS	v/c
	Central County																	
1	Clayton/Treat/Denkinger	Westbound left-turns from Clayton to Treat	AM	3	n.a.	n.a.	1.05	n.a.	n.a.	0.43	n.a.	n.a.	0.35	n.a.	n.a.	0.37	n.a.	n.a.
		Northbound right-turn from Treat to Clayton	PM	3	n.a.	n.a.	0.24	n.a.	n.a.	**0.76**	n.a.	n.a.	**0.81**	n.a.	n.a.	**0.79**	n.a.	n.a.
2	Treat/Cowell	Westbound through on Treat	AM	5	n.a.	n.a.	0.33	n.a.	n.a.	**0.45**	n.a.	n.a.	**0.35**	n.a.	n.a.	**0.49**	n.a.	n.a.
		Eastbound through on Treat	PM	5	n.a.	n.a.	0.21	n.a.	n.a.	**0.49**	n.a.	n.a.	**0.31**	n.a.	n.a.	**0.27**	n.a.	n.a.
3	Treat/Oak Grove	Westbound through on Treat	AM	5	n.a.	n.a.	1.24	n.a.	n.a.	**1.80**	n.a.	n.a.	**1.85**	n.a.	n.a.	**1.87**	n.a.	n.a.
		Eastbound through on Treat	PM	5	n.a.	n.a.	0.29	n.a.	n.a.	**0.79**	n.a.	n.a.	**0.79**	n.a.	n.a.	**0.84**	n.a.	n.a.
4	Clayton/Kirker Pass/Ygnacio Valley	Westbound through on Kirker Pass	AM	3	n.a.	n.a.	0.19	n.a.	n.a.	**0.24**	n.a.	n.a.	**0.24**	n.a.	n.a.	**0.23**	n.a.	n.a.
		Eastbound through on Ygnacio Valley	PM	3	n.a.	n.a.	0.19	n.a.	n.a.	**0.24**	n.a.	n.a.	**0.24**	n.a.	n.a.	**0.25**	n.a.	n.a.
		Westbound right from Kirker Pass to Clayton	AM	3	n.a.	n.a.	0.34	n.a.	n.a.	0.25	n.a.	n.a.	0.25	n.a.	n.a.	**0.24**	n.a.	n.a.
		Eastbound left from Clayton to Kirker Pass	PM	3	n.a.	n.a.	0.37	n.a.	n.a.	**0.45**	n.a.	n.a.	**0.42**	n.a.	n.a.	**0.43**	n.a.	n.a.
5	Ygnacio Valley/Cowell	Westbound through on Ygnacio Valley	AM	4	n.a.	n.a.	0.12	n.a.	n.a.	0.11	n.a.	n.a.	0.11	n.a.	n.a.	0.09	n.a.	n.a.
		Eastbound through on Ygnacio Valley	PM	4	n.a.	n.a.	0.30	n.a.	n.a.	**0.37**	n.a.	n.a.	**0.36**	n.a.	n.a.	**0.45**	n.a.	n.a.
6	Ygnacio Valley/Alberta Way/Pine Hollow	Westbound through on Ygnacio Valley	AM	4	n.a.	n.a.	0.25	n.a.	n.a.	**0.43**	n.a.	n.a.	**0.33**	n.a.	n.a.	**0.37**	n.a.	n.a.
		Eastbound through on Ygnacio Valley	PM	4	n.a.	n.a.	0.12	n.a.	n.a.	**0.17**	n.a.	n.a.	**0.17**	n.a.	n.a.	**0.17**	n.a.	n.a.
7	Ygnacio Valley/Bancroft Road		AM	n.a.	n.a.	F	n.a.	E	62.8	n.a.	**E**	**76.1**	n.a.	**E**	**76.3**	n.a.	**F**	**80.3**
			PM	n.a.	n.a.	F	n.a.	D	45.9	n.a.	**D**	**52.1**	n.a.	**D**	**51.8**	n.a.	**D**	**52.6**
8	North Main St/Geary Rd		AM	n.a.	n.a.	F	n.a.	D	45.8	n.a.	**E**	**62.8**	n.a.	**E**	**71.8**	n.a.	**E**	**64.2**
			PM	n.a.	n.a.	F	n.a.	E	56.3	n.a.	**F**	**92.1**	n.a.	**F**	**97.2**	n.a.	**F**	**89.9**
9	Treat/Bancroft		AM	n.a.	n.a.	F	n.a.	E	57.2	n.a.	**F**	**89.3**	n.a.	**F**	**92.5**	n.a.	**F**	**91.3**
			PM	n.a.	n.a.	F	n.a.	D	54.6	n.a.	**F**	**130.6**	n.a.	**F**	**122.9**	n.a.	**F**	**130.7**
	East County																	
10	Willow Pass Rd & Evora Rd (East)-SR-4 WB off-ramp [In Pittsburg]		AM	n.a.	≤ 0.85	D	n.a.	A	0.40	n.a.	**F**	**1.02**	n.a.	**F**	**1.01**	n.a.	**F**	**1.04**
			PM	n.a.	≤ 0.85	D	n.a.	A	0.31	n.a.	**A**	**0.59**	n.a.	**D**	**0.83**	n.a.	**D**	**0.83**
11	Willow Pass Rd & Evora Rd (West) [At Project Site]		AM	n.a.	≤ 0.85	D	n.a.	A	0.55	n.a.	**F**	**1.28**	n.a.	**F**	**1.16**	n.a.	**F**	**1.31**
			PM	n.a.	≤ 0.85	D	n.a.	A	0.33	n.a.	**C**	**0.72**	n.a.	**F**	**1.27**	n.a.	**F**	**1.28**
12	Willow Pass Rd & Avila Rd		AM	n.a.	≤ 0.85	D	n.a.	A	0.2	n.a.	**F**	**OVFL**	n.a.	**F**	**1.51**	n.a.	**F**	**1.53**
			PM	n.a.	≤ 0.85	D	n.a.	A	0.1	n.a.	**F**	**OVFL**	n.a.	**F**	**1.49**	n.a.	**F**	**1.49**
13	Bailey Rd & Willow Pass Rd		AM	n.a.	≤ 0.99	E	n.a.	A	0.42	n.a.	**D**	**0.86**	n.a.	**D**	**0.88**	n.a.	**D**	**0.89**
			PM	n.a.	≤ 0.99	E	n.a.	B	0.63	n.a.	**C**	**0.79**	n.a.	**E**	**0.96**	n.a.	**E**	**0.95**
14	San Marco Blvd & W Leland Rd		AM	n.a.	≤ 0.85	D	n.a.	A	0.52	n.a.	**C**	**0.75**	n.a.	**D**	**0.90**	n.a.	**E**	**0.97**
			PM	n.a.	≤ 0.85	D	n.a.	A	0.28	n.a.	**C**	**0.71**	n.a.	**C**	**0.78**	n.a.	**C**	**0.78**
15	Bailey Rd & W Leland Rd		AM	n.a.	≤ 0.99	E	n.a.	B	0.60	n.a.	**E**	**0.93**	n.a.	**D**	**0.89**	n.a.	**D**	**0.88**
			PM	n.a.	≤ 0.99	E	n.a.	A	0.45	n.a.	**D**	**0.87**	n.a.	**E**	**0.92**	n.a.	**D**	**0.89**
16	Railroad Ave & W Leland Rd		AM	n.a.	≤ 0.85	D	n.a.	B	0.63	n.a.	**E**	**0.94**	n.a.	**E**	**0.98**	n.a.	**E**	**0.93**
			PM	n.a.	≤ 0.85	D	n.a.	E	0.98	n.a.	**F**	**1.35**	n.a.	**F**	**1.31**	n.a.	**F**	**1.33**
17	Railroad Ave & Buchanan Rd		AM	n.a.	≤ 0.85	D	n.a.	A	0.54	n.a.	**B**	**0.65**	n.a.	**B**	**0.66**	n.a.	**B**	**0.65**
			PM	n.a.	≤ 0.85	D	n.a.	C	0.70	n.a.	**C**	**0.77**	n.a.	**C**	**0.74**	n.a.	**C**	**0.74**
18	Kirker Pass Rd & James Donlon Blvd [Future extension of James Donlon Blvd]		AM	n.a.	≤ 0.85	D	n.a.	A	0.35	n.a.	**F**	**1.04**	n.a.	**E**	**0.99**	n.a.	**F**	**1.04**
			PM	n.a.	≤ 0.85	D	n.a.	A	0.40	n.a.	**F**	**1.05**	n.a.	**F**	**1.09**	n.a.	**F**	**1.10**
19	San Marco Blvd-Willow Pass Rd & SR-4 EB ramps		AM	n.a.	≤ 0.85	D	n.a.	A	0.30	n.a.	**A**	**0.58**	n.a.	**C**	**0.70**	n.a.	**B**	**0.68**
			PM	n.a.	≤ 0.85	D	n.a.	A	0.39	n.a.	**C**	**0.73**	n.a.	**E**	**0.99**	n.a.	**E**	**0.94**
20	Bailey Rd & SR-4 EB ramps-BART access		AM	n.a.	≤ 0.99	E	n.a.	A	0.44	n.a.	**B**	**0.65**	n.a.	**C**	**0.78**	n.a.	**B**	**0.65**
			PM	n.a.	≤ 0.99	E	n.a.	F	1.12	n.a.	**F**	**1.49**	n.a.	**F**	**1.87**	n.a.	**F**	**1.67**
21	Bailey Rd & SR-4 WB onramp-Canal Rd		AM	n.a.	≤ 0.99	E	n.a.	A	0.54	n.a.	**D**	**0.87**	n.a.	**C**	**0.79**	n.a.	**C**	**0.74**
			PM	n.a.	≤ 0.99	E	n.a.	B	0.60	n.a.	**D**	**0.85**	n.a.	**E**	**0.94**	n.a.	**E**	**0.94**
22	Railroad Ave & SR-4 WB onramp-California Ave		AM	n.a.	≤ 0.85	D	n.a.	A	0.54	n.a.	**B**	**0.68**	n.a.	**C**	**0.71**	n.a.	**B**	**0.68**
			PM	n.a.	≤ 0.85	D	n.a.	A	0.58	n.a.	**C**	**0.71**	n.a.	**B**	**0.64**	n.a.	**B**	**0.67**
23	Railroad Ave & SR-4 EB ramps		AM	n.a.	≤ 0.85	D	n.a.	A	0.53	n.a.	**C**	**0.74**	n.a.	**B**	**0.65**	n.a.	**B**	**0.66**
			PM	n.a.	≤ 0.85	D	n.a.	B	0.60	n.a.	**D**	**0.81**	n.a.	**C**	**0.76**	n.a.	**D**	**0.82**
24	Willow Pass Rd & SR-4 WB ramps		AM	n.a.	≤ 0.85	D	n.a.	C	19.9	n.a.	**F**	**345.0**	n.a.	**E**	**0.98**	n.a.	**E**	**0.93**
			PM	n.a.	≤ 0.85	D	n.a.	B	13.0	n.a.	**F**	**105.3**	n.a.	**B**	**0.70**	n.a.	**C**	**0.71**
25	Willow Pass Rd & SR-4 EB ramps		AM	n.a.	≤ 0.85	D	n.a.	D	26.1	n.a.	**F**	**276.2**	n.a.	**E**	**0.96**	n.a.	**E**	**0.91**
			PM	n.a.	≤ 0.85	D	n.a.	B	14.5	n.a.	**F**	**163.3**	n.a.	**B**	**0.69**	n.a.	B	0.66

Impact categories*

Grey shading indicates a significant impact in the No Project condition.

Yellow highlighting indicates a project-specific significant impact of the Preferred or Concentration and Concentration Alterntaive that is worse than the No Project condition.

Green highlighting indicates a project-specific significant impact of the Preferred or Concentration and Concentration Alterntaive that improves or does not change the No Project condition.

Orange highlighting indicates a contributing significant impact of the Preferred or Concentration and Concentration Alterntaive that is worse than the No Project condition.

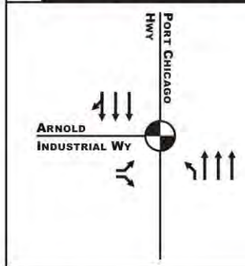
Blue highlighting indicates a contributing significant impact of the Preferred or Concentration and Concentration Alterntaive that improves or does not change the No Project condition.

Bold with no shading or highlighting indicates a less than significant impact.

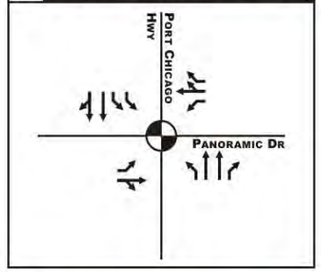
* Impact categories are described in Section 4.3.

Appendix 4B
Intersection Lane Configurations

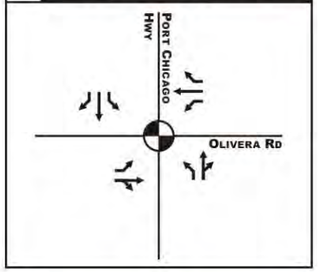
1 Port Chicago Hwy / Arnold Industrial Wy



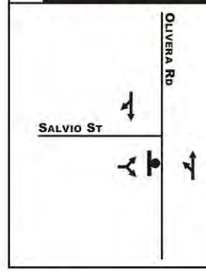
2 Port Chicago Hwy / Panoramic Dr



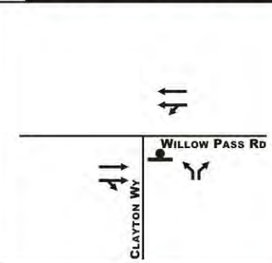
3 Port Chicago Hwy / Olivera Rd



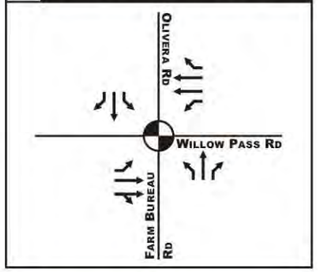
4 Olivera Rd / Salvio St



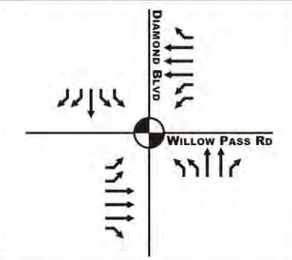
5 Clayton Wy / Willow Pass Rd



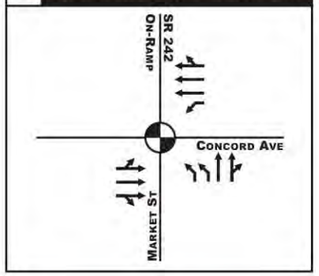
6 Farm Bureau Rd / Willow Pass Rd



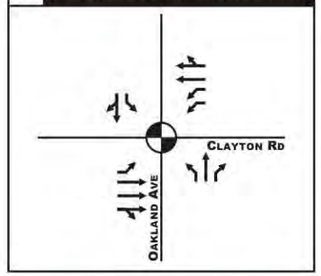
7 Diamond Blvd / Willow Pass Rd



8 Market St / Concord Ave



9 Oakland Ave / Clayton Rd



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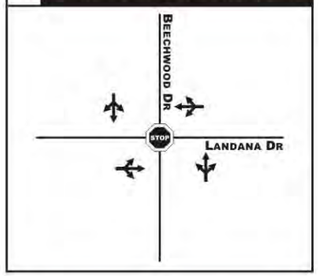
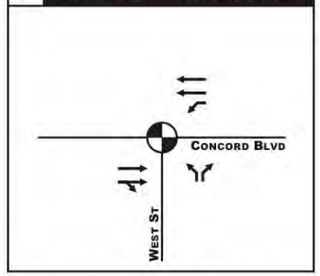


11 West St / Concord Blvd



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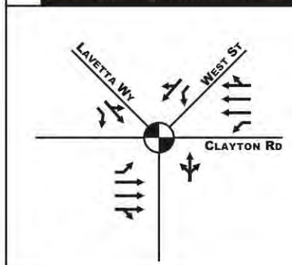

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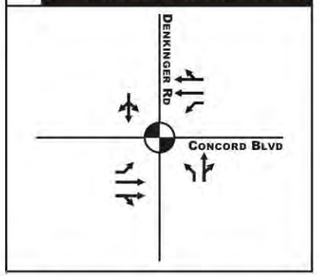
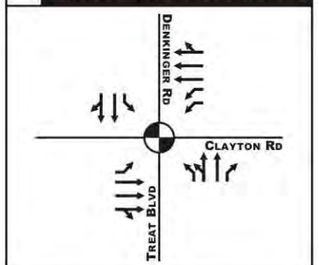
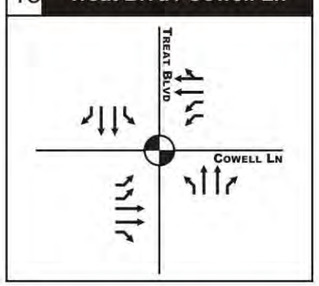


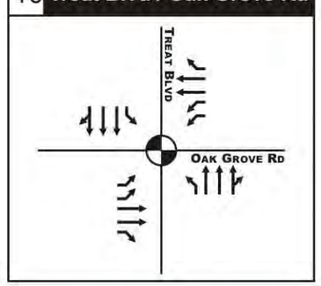
14 Treat Blvd / Clayton Rd



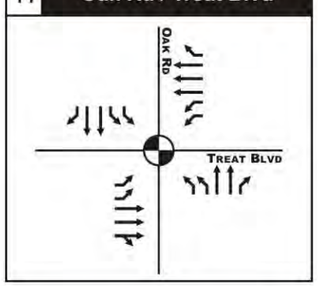
15 Treat Blvd / Cowell Ln



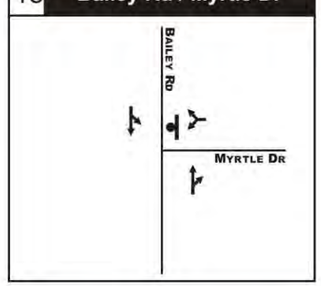
16 Treat Blvd / Oak Grove Rd



17 Oak Rd / Treat Blvd



18 Bailey Rd / Myrtle Dr



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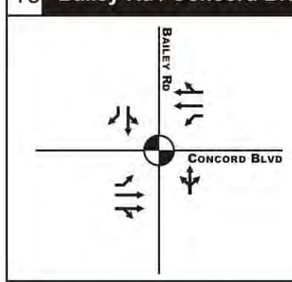
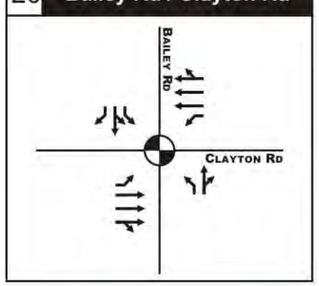
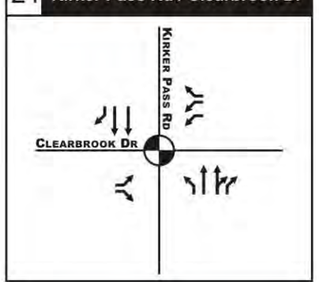


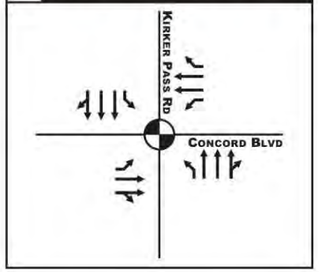
20 Bailey Rd / Clayton Rd



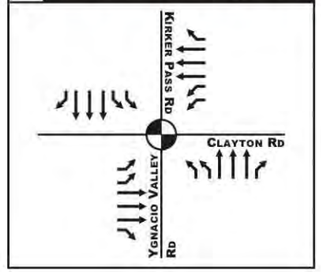
21 Kirker Pass Rd / Clearbrook Dr



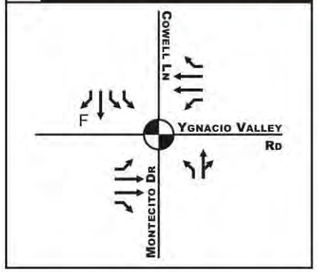
22 Kirker Pass Rd / Concord Blvd



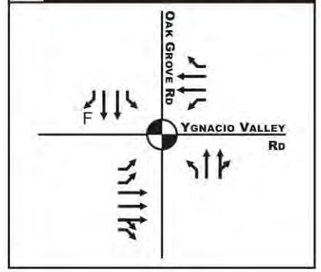
23 Kirker Pass Rd / Clayton Rd



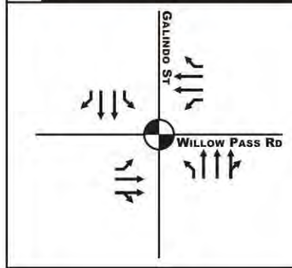
24 Cowell Ln / Ygnacio Valley Blvd



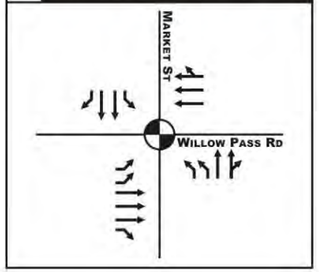
25 Oak Grove Rd / Ygnacio Valley Rd



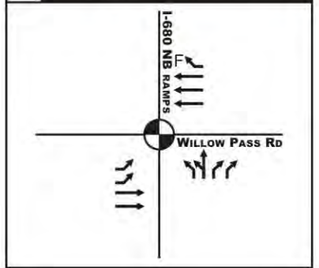
26 Galindo St / Willow Pass Rd



27 Market St / Willow Pass Rd



28 I-680 NB Ramps / Willow Pass Rd



Legend

- Traffic Lanes
- Stop Sign Control
- F Free Right Movement
- All Way Stop
- Signalized Intersection

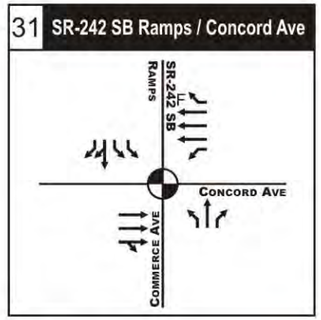
N

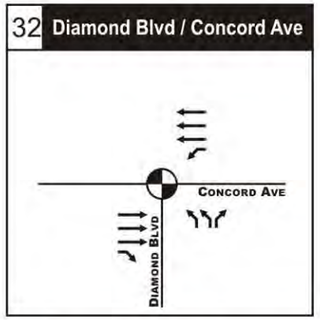
Source: Dowling Associates, Inc., 2009

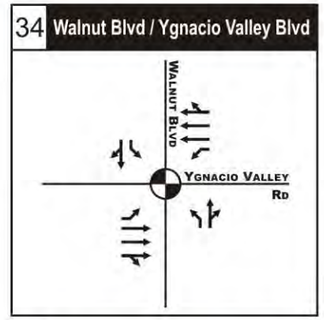
Concord Community Reuse Plan

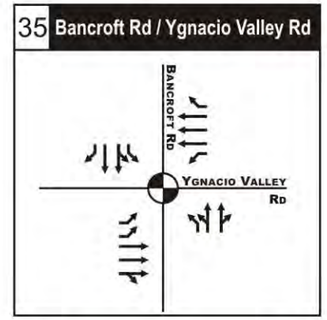
Revised June 10, 2009

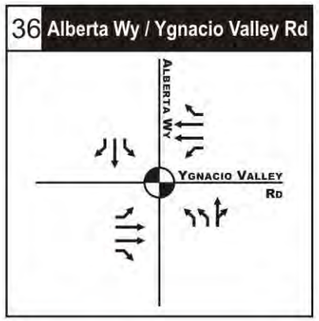
Figure 4B-1
Existing Intersection Lane Configuration

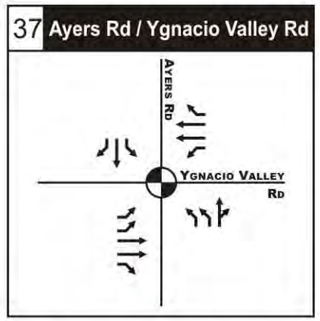


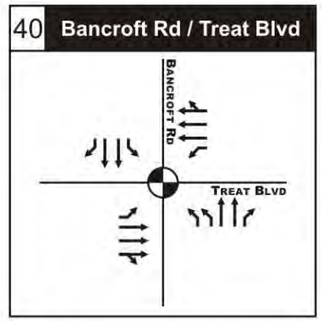


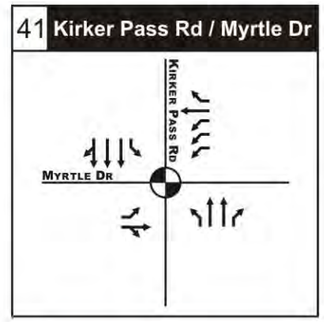


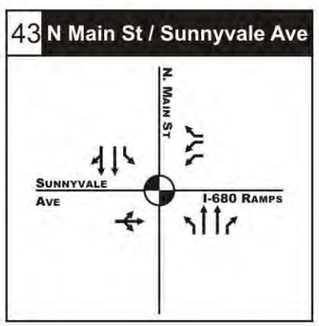


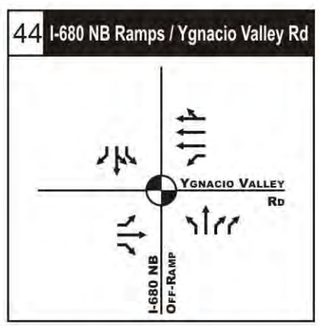


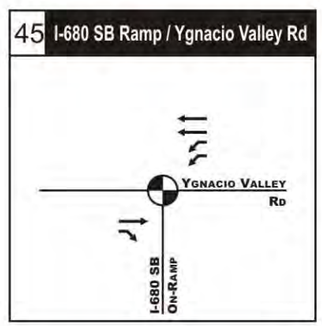


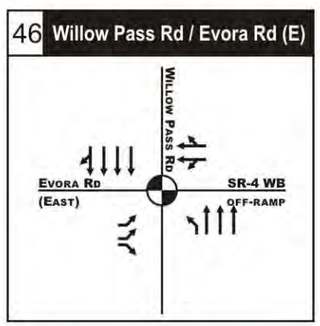


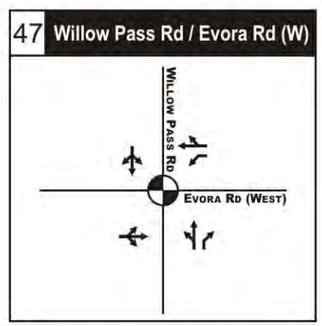


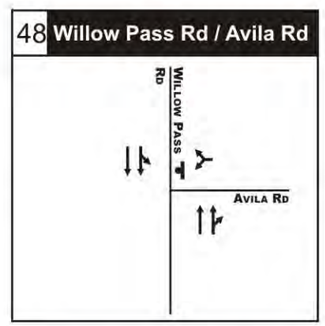


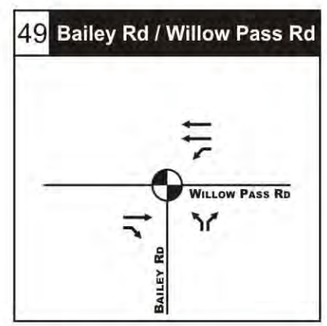


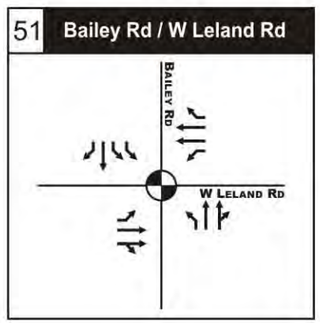


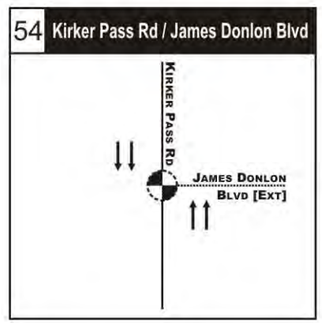


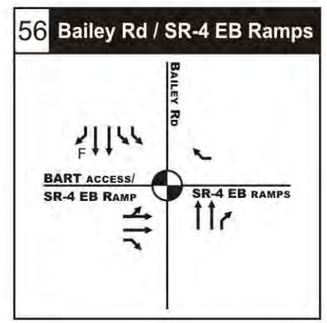












Legend

Traffic Lanes

Stop Sign Control

F Free Right Movement

All Way Stop

Signalized Intersection

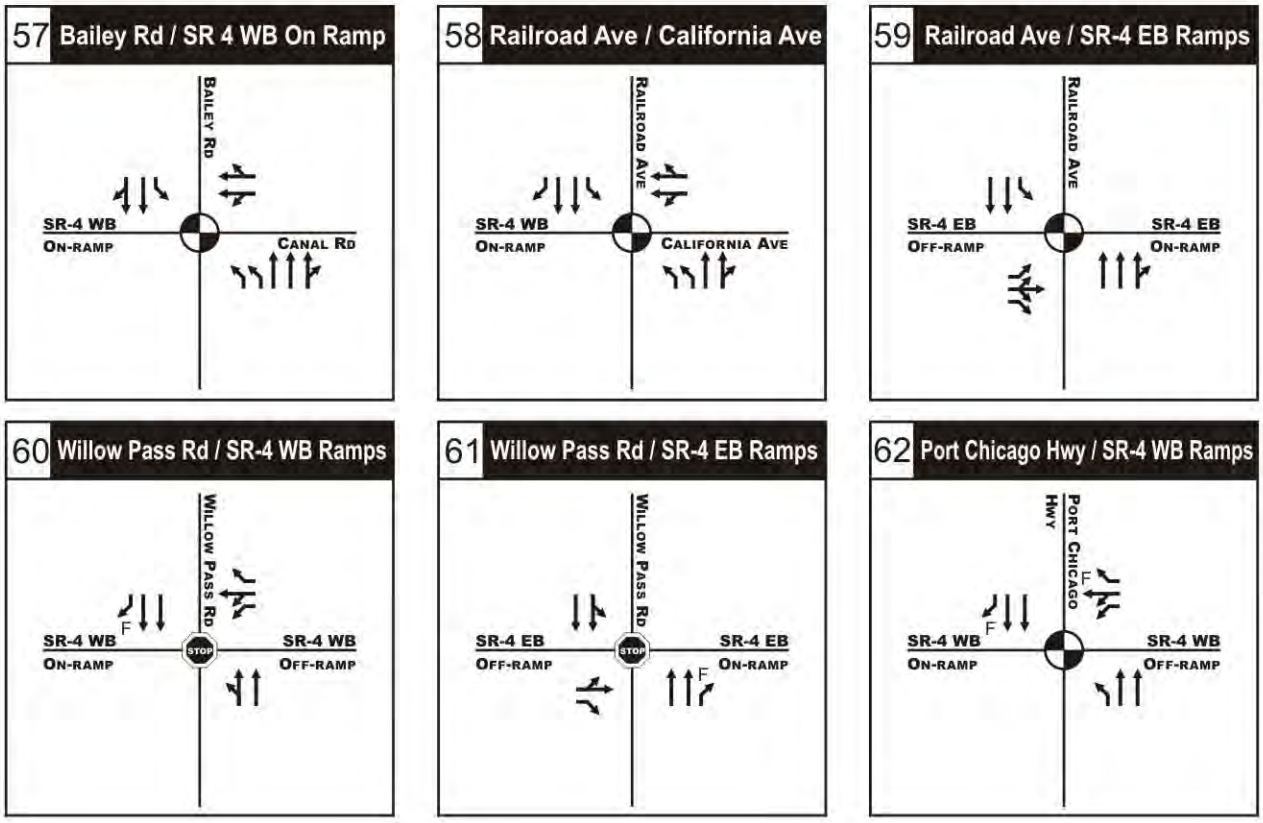
N

Source: Dowling Associates, Inc., 2009

Concord Community Reuse Plan

Revised June 10, 2009

Figure 4B-1, continued
Existing Intersection Lane Configuration



Legend

Source: Dowling Associates, Inc., 2009

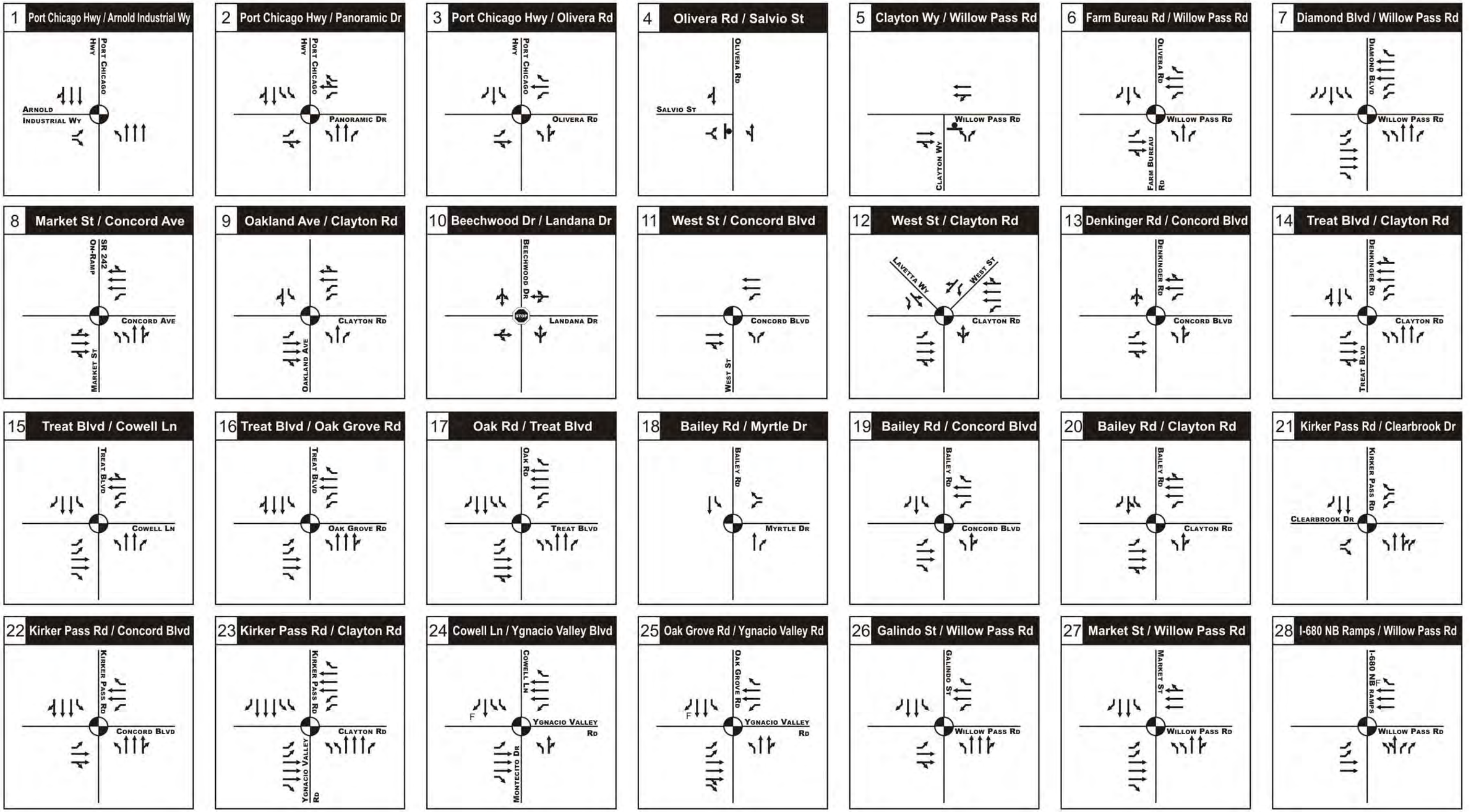
- Traffic Lanes
- Stop Sign Control
- F Free Right Movement
- All Way Stop
- Signalized Intersection

N

Concord Community Reuse Plan

Revised June 10, 2009

Figure 4B-1, continued
Existing Intersection Lane Configuration



Legend

- Traffic Lanes
- Stop Sign Control
- F Free Right Movement
- All Way Stop
- Signalized Intersection

N

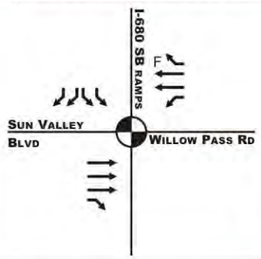
Source: Dowling Associates, Inc., 2009

Concord Community Reuse Plan

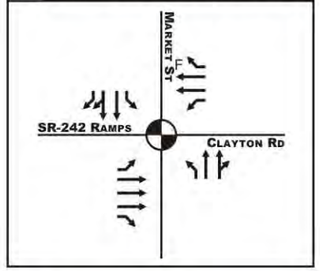
Revised June 10, 2009

Figure 4B-2
2030 No Project
Intersection Lane Configuration

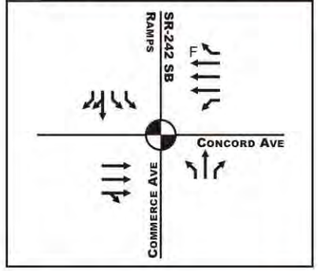
29 I-680 SB Ramps / Willow Pass Rd



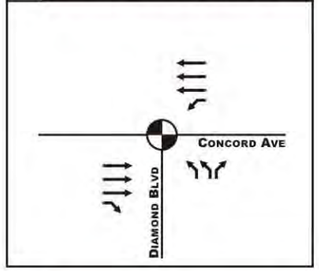
30 Market St / Clayton Rd



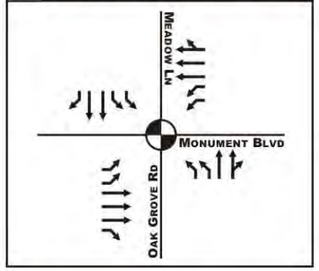
31 SR-242 SB Ramps / Concord Ave



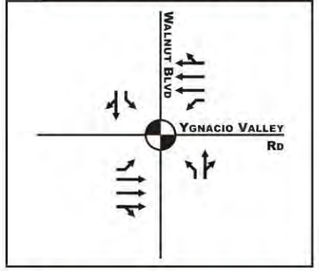
32 Diamond Blvd / Concord Ave



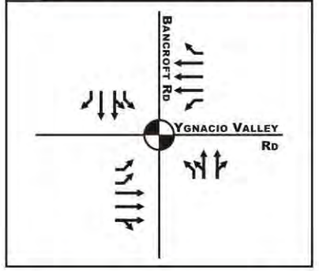
33 Oak Grove Rd / Monument Blvd



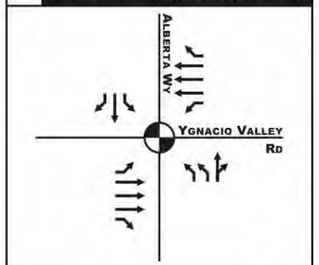
34 Walnut Blvd / Ygnacio Valley Blvd



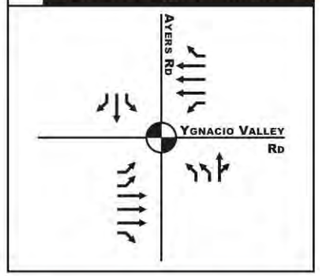
35 Bancroft Rd / Ygnacio Valley Rd



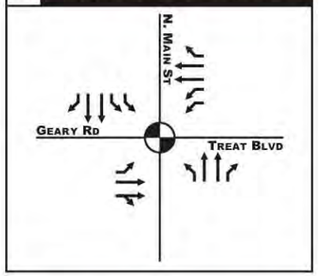
36 Alberta Wy / Ygnacio Valley Rd



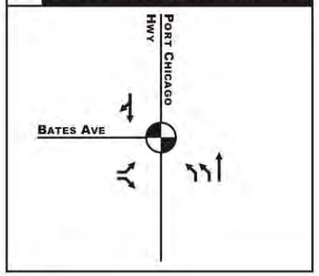
37 Ayers Rd / Ygnacio Valley Rd



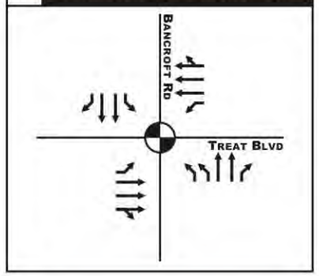
38 N Main St / Geary Rd



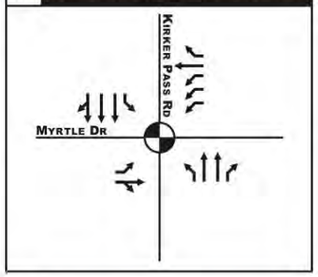
39 Port Chicago Hwy / Bates Ave



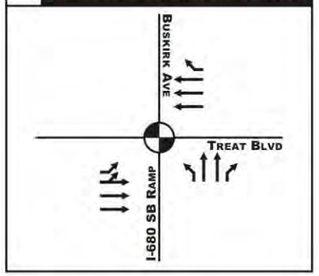
40 Bancroft Rd / Treat Blvd



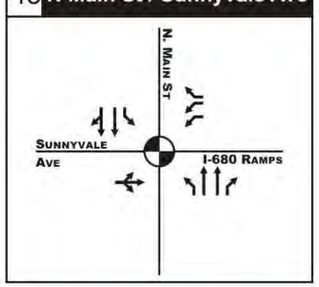
41 Kirker Pass Rd / Myrtle Dr



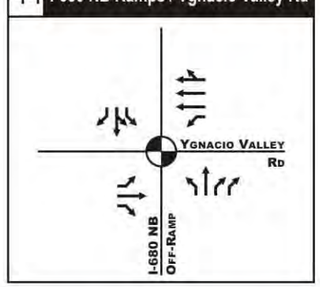
42 Buskirk Ave / Treat Blvd



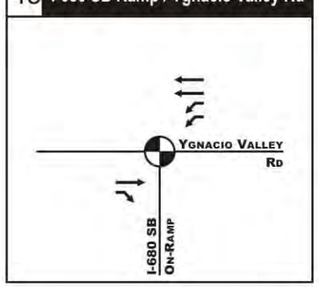
43 N Main St / Sunnyvale Ave



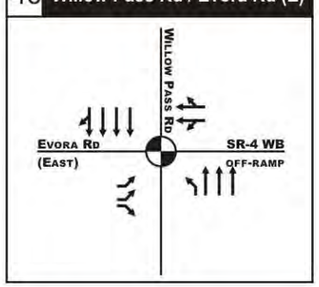
44 I-680 NB Ramps / Ygnacio Valley Rd



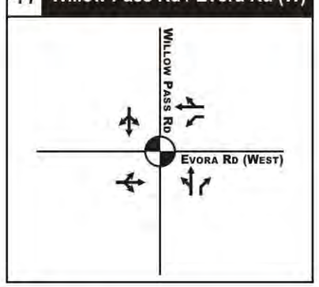
45 I-680 SB Ramp / Ygnacio Valley Rd



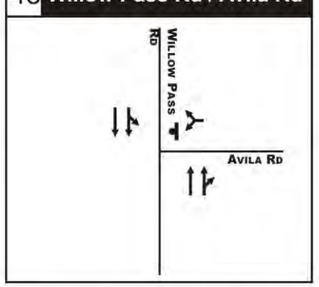
46 Willow Pass Rd / Evora Rd (E)



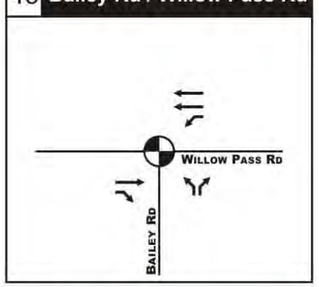
47 Willow Pass Rd / Evora Rd (W)



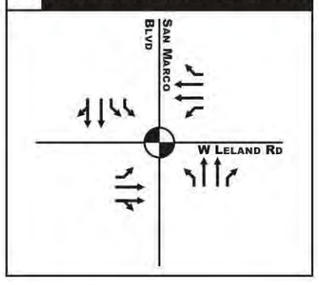
48 Willow Pass Rd / Avila Rd



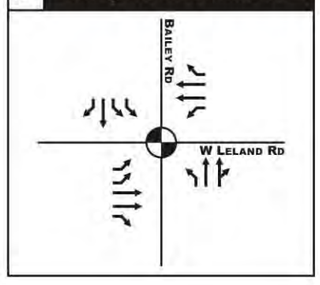
49 Bailey Rd / Willow Pass Rd



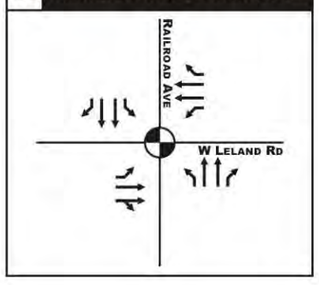
50 San Marco Blvd / W Leland Rd



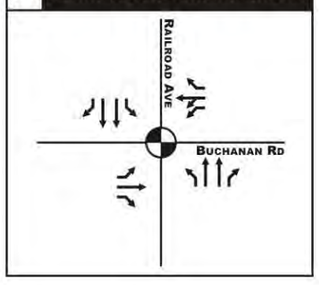
51 Bailey Rd / W Leland Rd



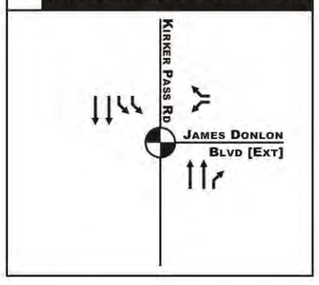
52 Railroad Ave / W Leland Rd



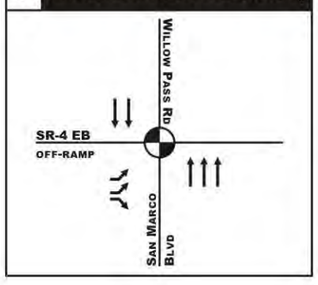
53 Railroad Ave / Buchanan Rd



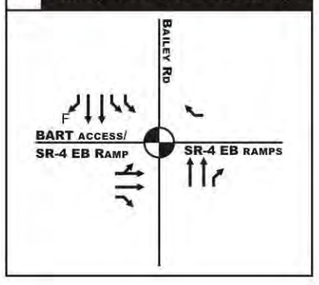
54 Kirker Pass Rd / James Donlon Blvd



55 Willow Pass Rd / SR-4 EB Off-Ramp



56 Bailey Rd / SR-4 EB Ramps



Legend

- Traffic Lanes
- Stop Sign Control
- F Free Right Movement
- All Way Stop
- Signalized Intersection

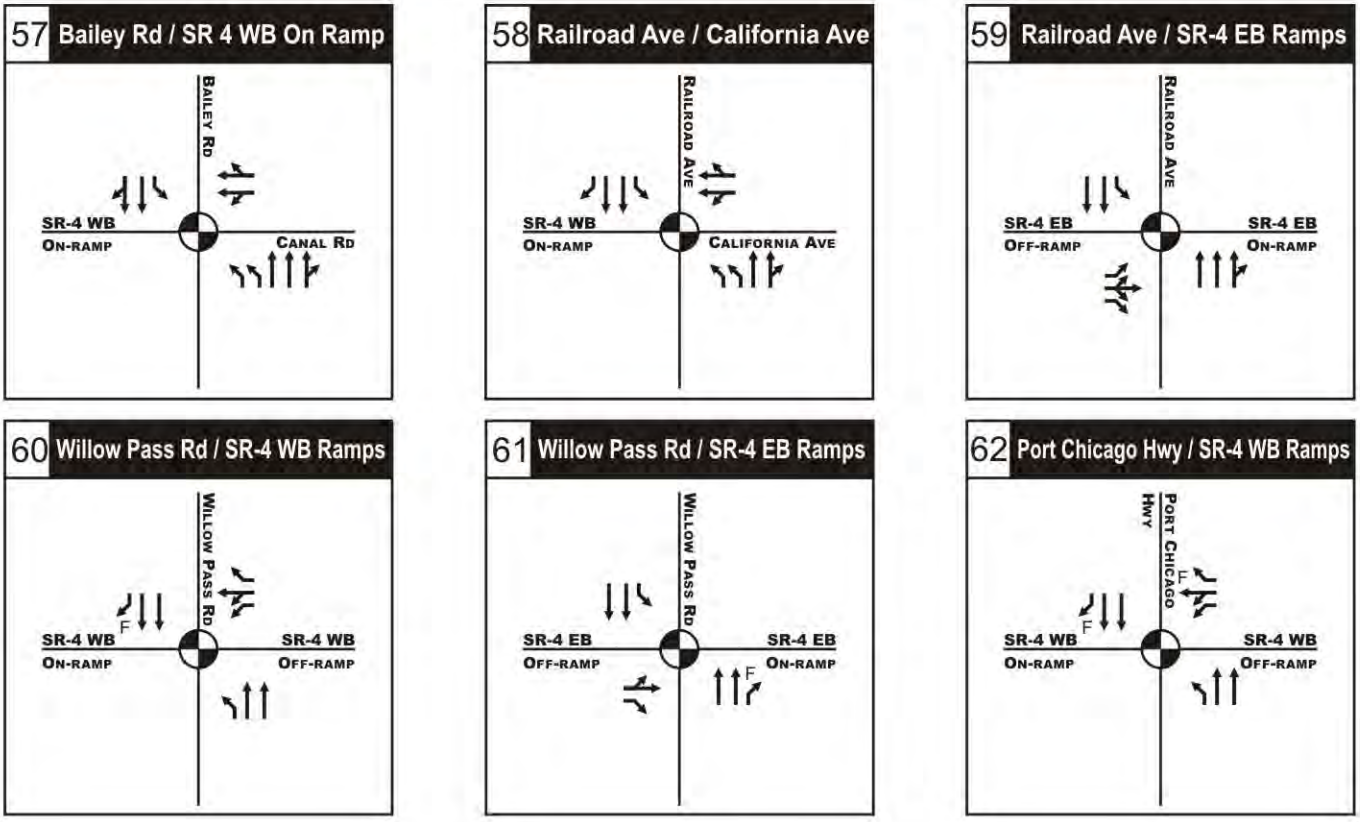
N

Source: Dowling Associates, Inc., 2009

Concord Community Reuse Plan

Revised June 10, 2009

Figure 4B-2, continued
2030 No Project
Intersection Lane Configuration



Legend

Source: Dowling Associates, Inc., 2009

Traffic Lanes

All Way Stop

Stop Sign Control

Signalized Intersection

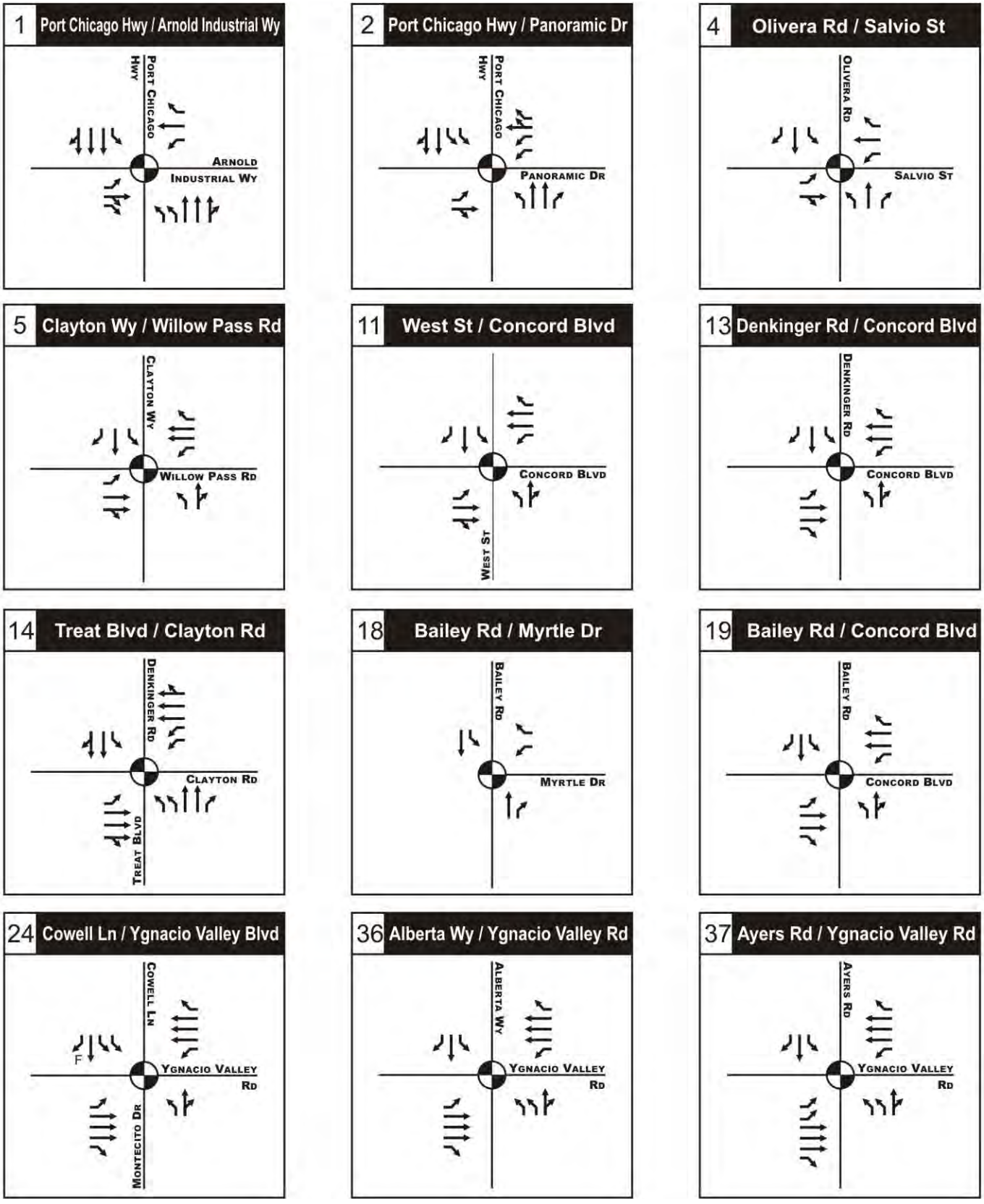
F Free Right Movement

N

Concord Community Reuse Plan

Revised June 10, 2009

Figure 4B-2, continued
2030 No Project
Intersection Lane Configuration



Legend

Source: Dowling Associates, Inc., 2009

Traffic Lanes

All Way Stop

Stop Sign Control

Signalized Intersection

F Free Right Movement

N

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Community Reuse Plan

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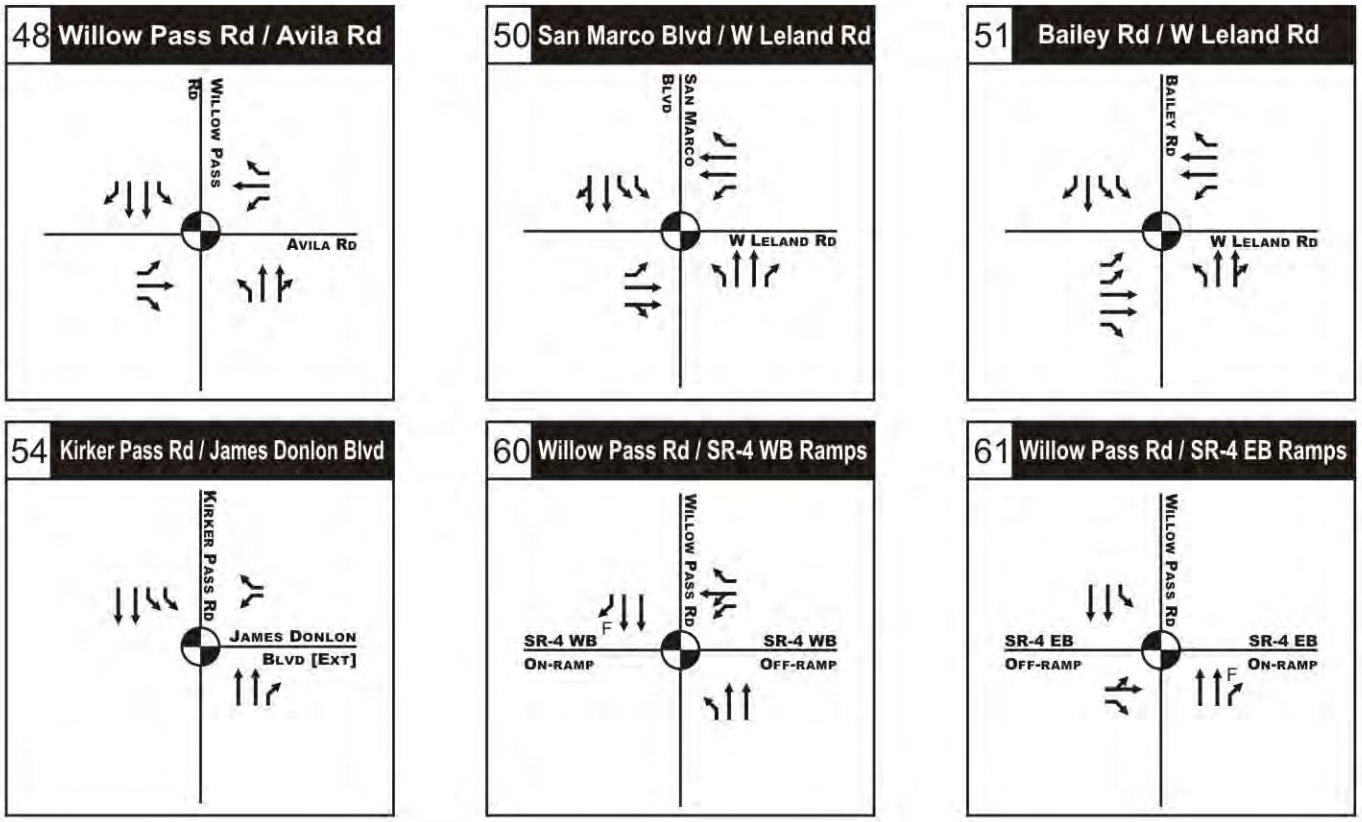
Figure 4B-3
Preferred Alt. Lane Configuration Changes from 2030 No Project



Legend

Source: Dowling Associates, Inc., 2009

Traffic Lanes

All Way Stop

Stop Sign Control

Signalized Intersection

F Free Right Movement

N

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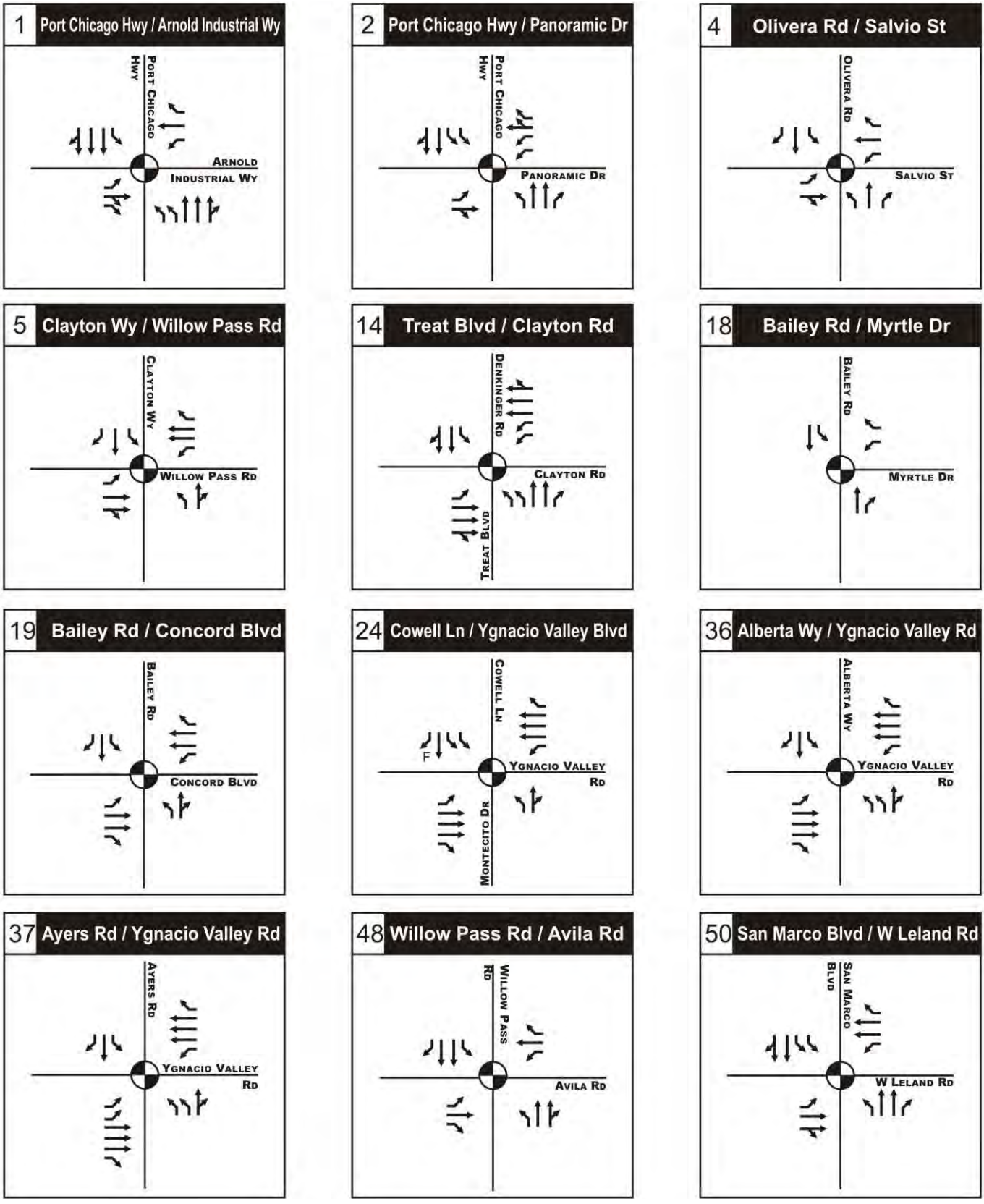
Community Reuse Plan

Revised June 10, 2009

Figure 4B-3, continued
Preferred Alt. Lane Configuration
Changes from 2030 No Project



Legend

Source: Dowling Associates, Inc., 2009

Traffic Lanes

All Way Stop

Stop Sign Control

Signalized Intersection

F Free Right Movement

N

Concord
Community Reuse Plan

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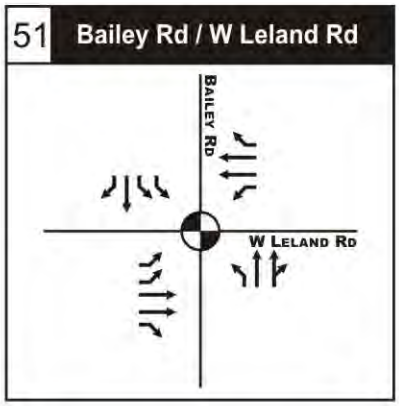
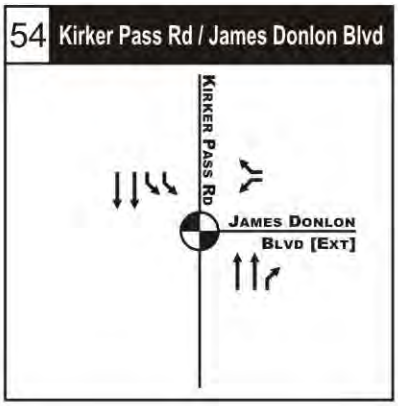
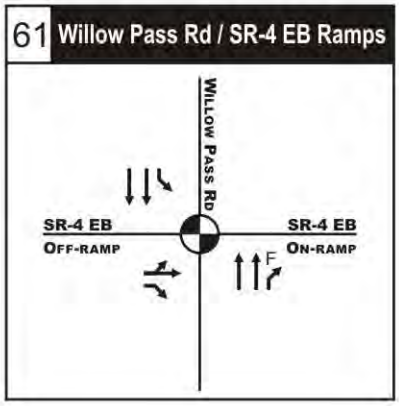
Figure 4B-4
CC Lane Configuration Changes from 2030 No Project







Legend

Source: Dowling Associates, Inc., 2009

Traffic Lanes

Stop Sign Control

F Free Right Movement

All Way Stop

Signalized Intersection

N

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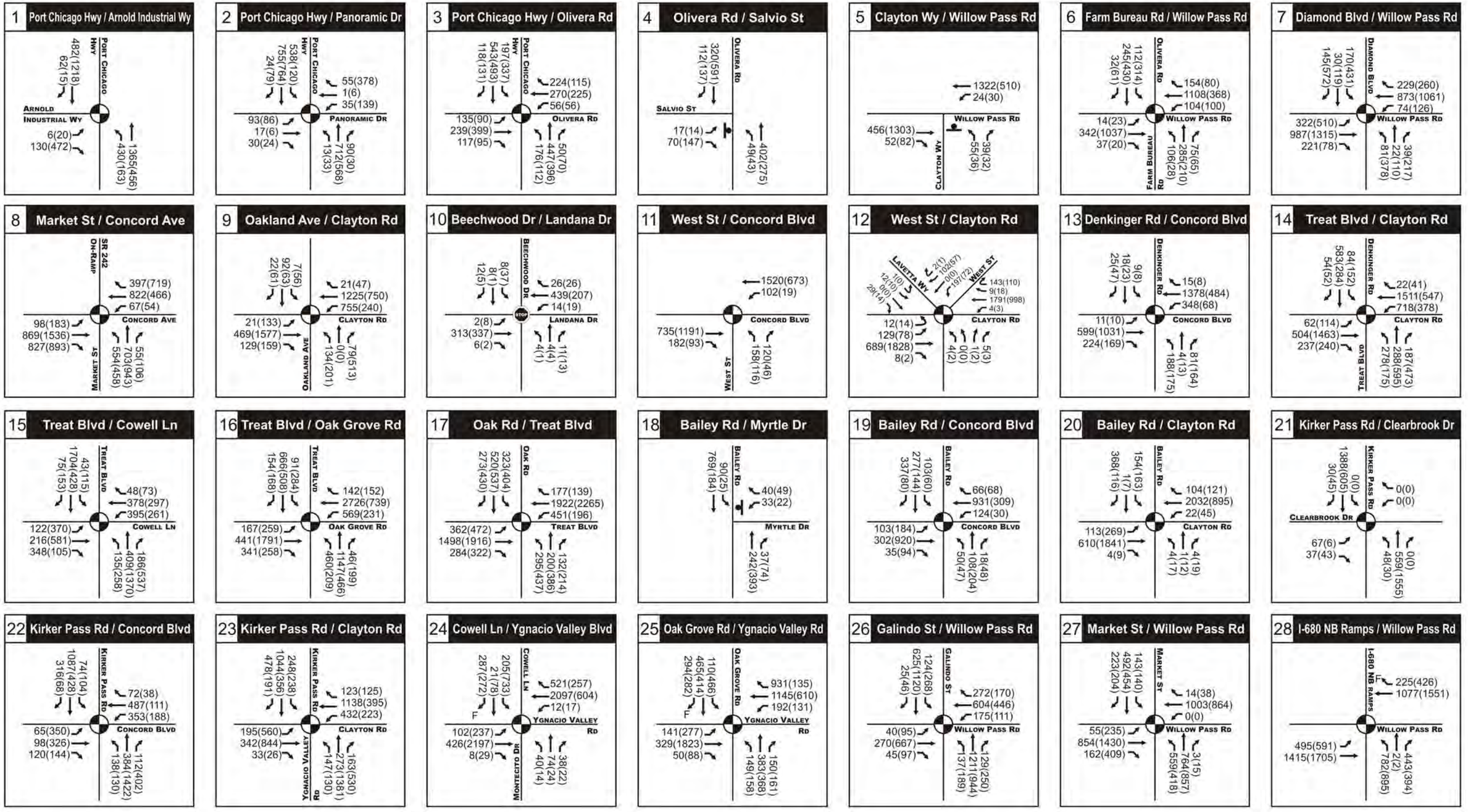
Figure 4B-4, continued
CC Lane Configuration Changes from 2030 No Project

Appendix 4C
Peak Hour Volumes



Legend

- Traffic Lanes
- Stop Sign Control
- AM (PM) Peak Hour Volume
- All Way Stop
- Signalized Intersection
- F Free Right Movement

N

Source: Dowling Associates, Inc., 2009

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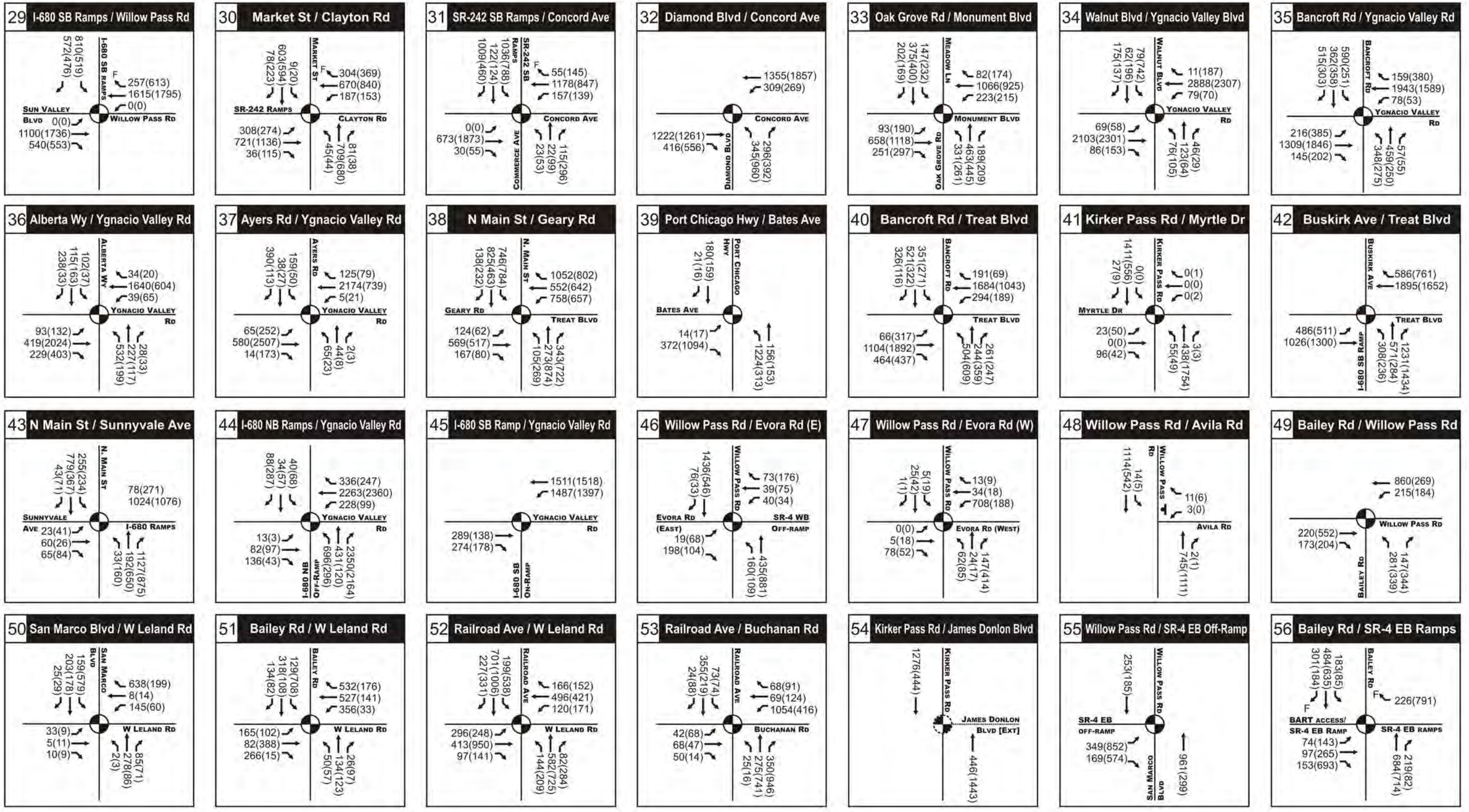
Figure 4C-1
Existing Intersection Peak Hour Volume



Legend

- Traffic Lanes
- Stop Sign Control
- AM (PM) Peak Hour Volume
- All Way Stop
- Signalized Intersection
- F Free Right Movement

N

Source: Dowling Associates, Inc., 2009

Concord Community Reuse Plan

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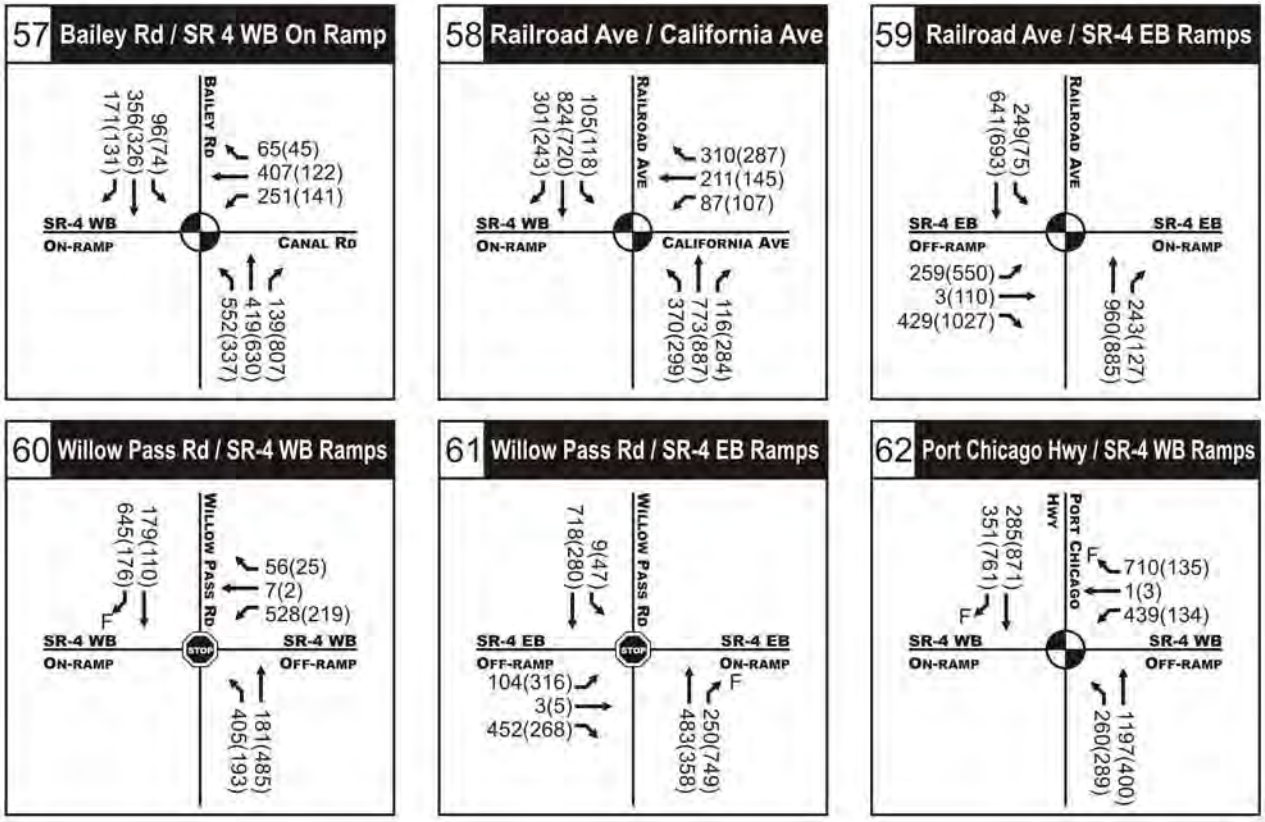
Figure 4C-1, continued
Existing Intersection Peak Hour Volume



Legend

Source: Dowling Associates, Inc., 2009

- Traffic Lanes
- Stop Sign Control
- **AM (PM)** Peak Hour Volume
- All Way Stop
- Signalized Intersection
- F Free Right Movement

N

Concord
Community Reuse Plan

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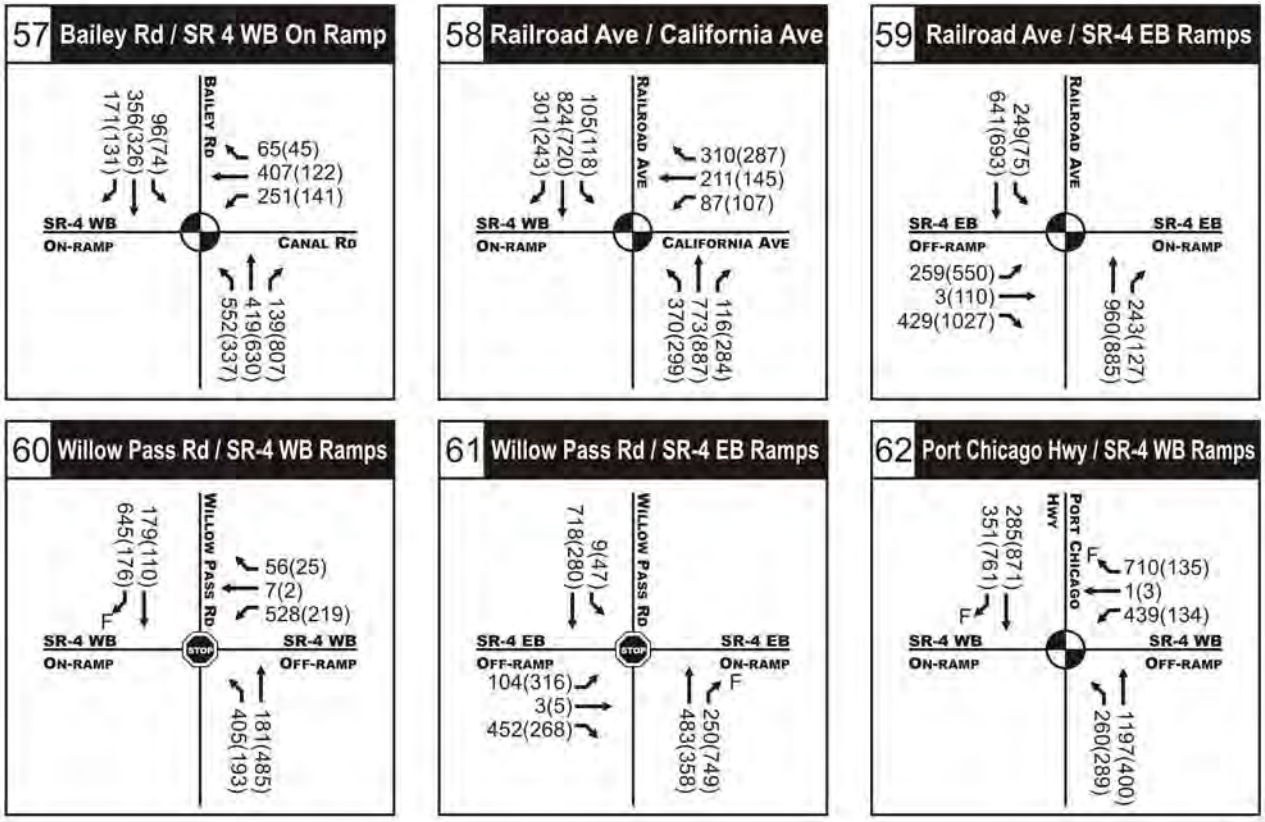
Figure 4C-2, continued
2030 No Project
Intersection Peak Hour Volume



Legend

Source: Dowling Associates, Inc., 2009

- Traffic Lanes
- Stop Sign Control
- AM (PM) Peak Hour Volume
- All Way Stop
- Signalized Intersection
- F Free Right Movement

N

Concord Community Reuse Plan

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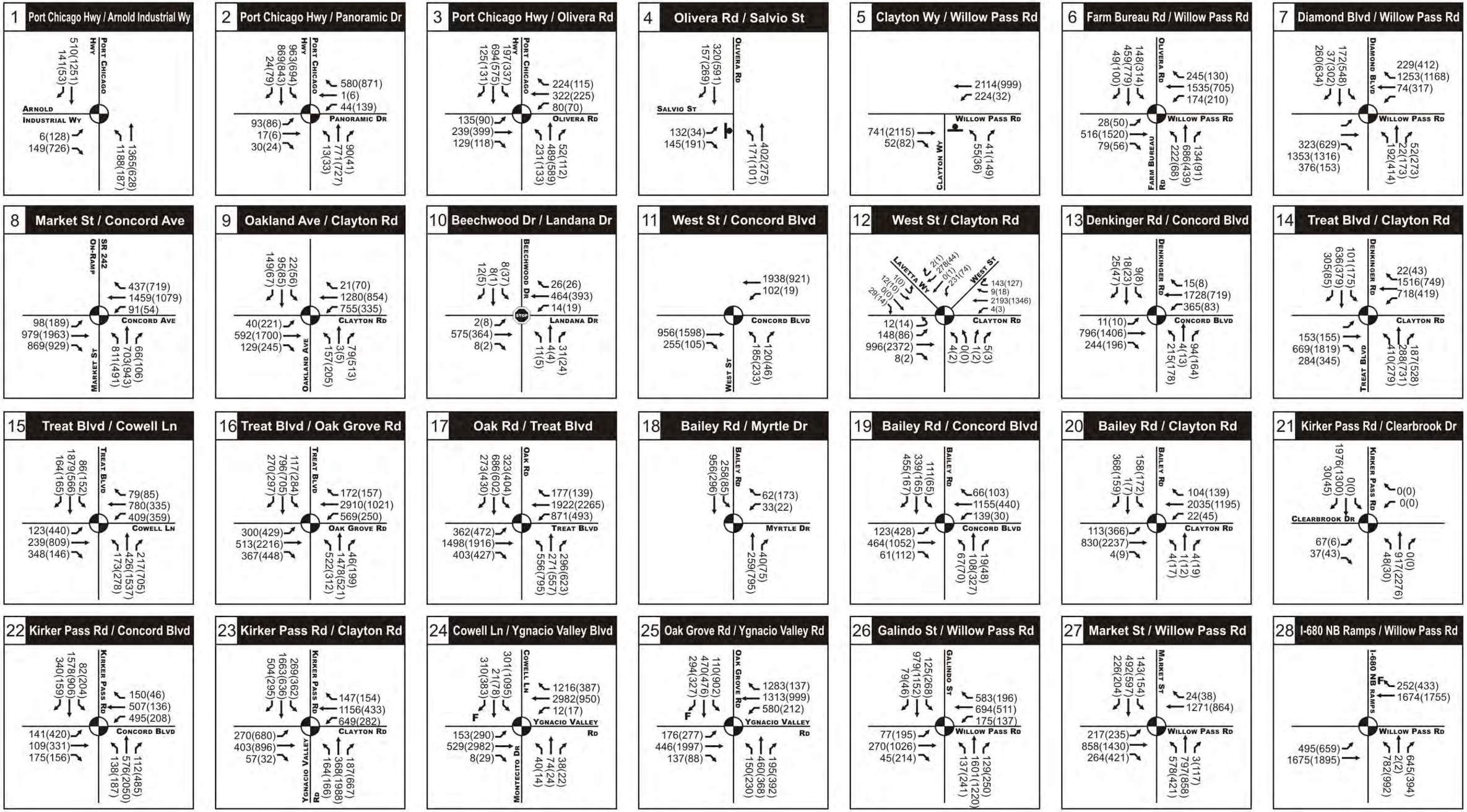
Figure 4C-1, continued
Existing Intersection Peak Hour Volume



Legend

- Traffic Lanes
- Stop Sign Control
- AM (PM) Peak Hour Volume
- All Way Stop
- Signalized Intersection
- F Free Right Movement

N

Source: Dowling Associates, Inc., 2009

Concord Community Reuse Plan

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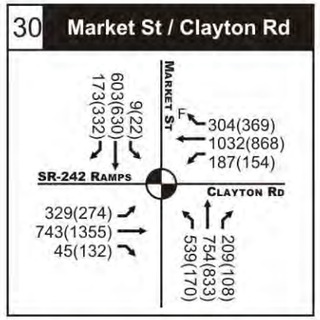
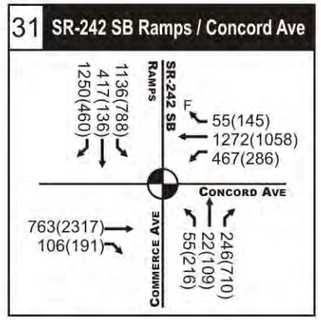
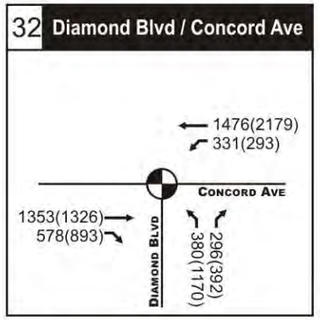
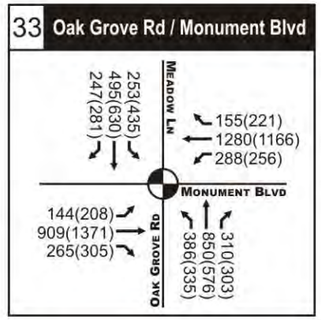
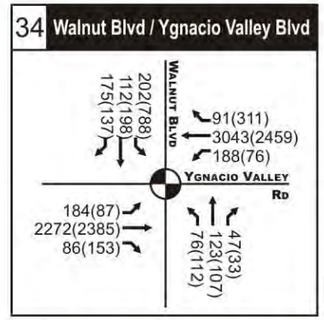
Figure 4C-2
2030 No Project
Intersection Peak Hour Volume

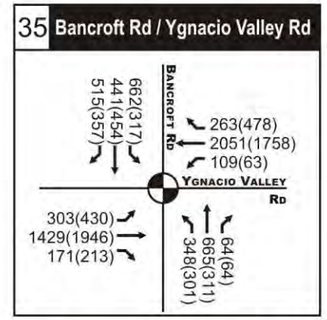


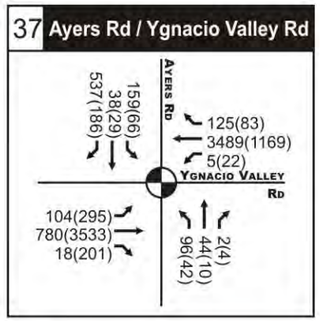


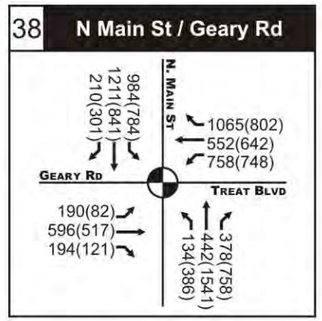


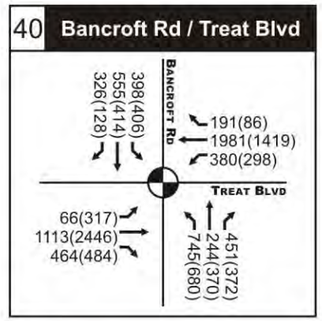


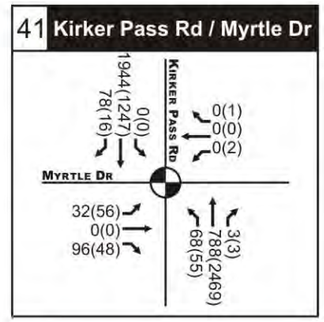


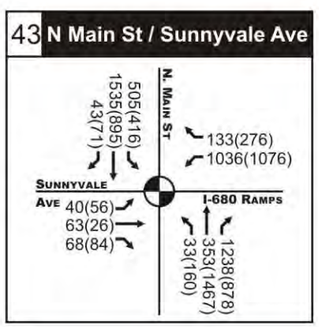


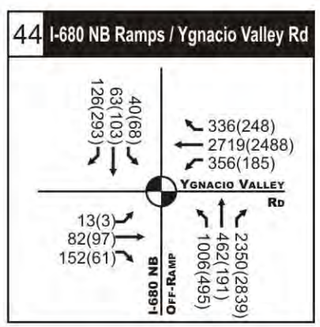


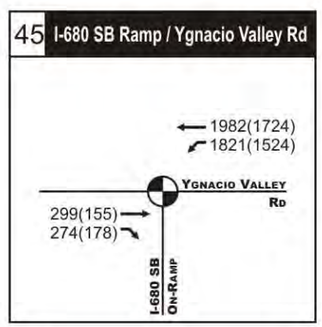


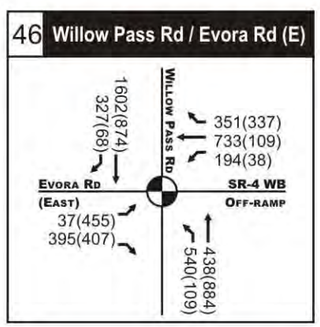


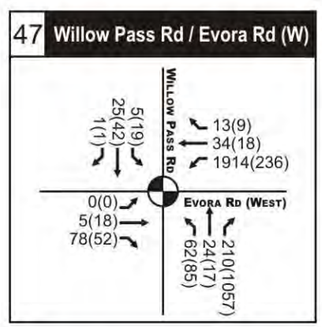


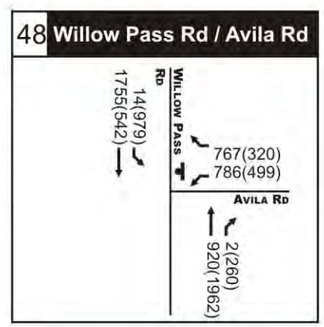


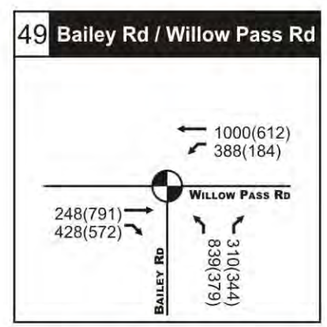


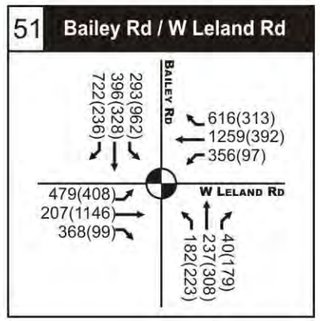


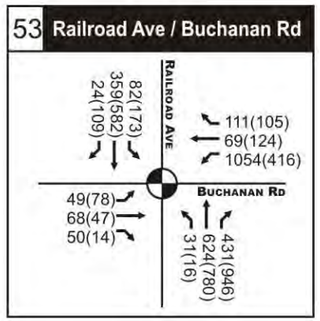


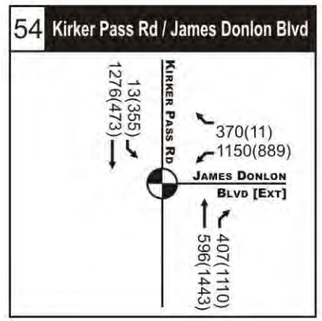


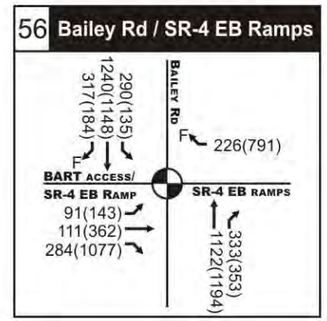












Legend

- Traffic Lanes
- Stop Sign Control
- AM (PM) Peak Hour Volume
- All Way Stop
- Signalized Intersection
- F Free Right Movement

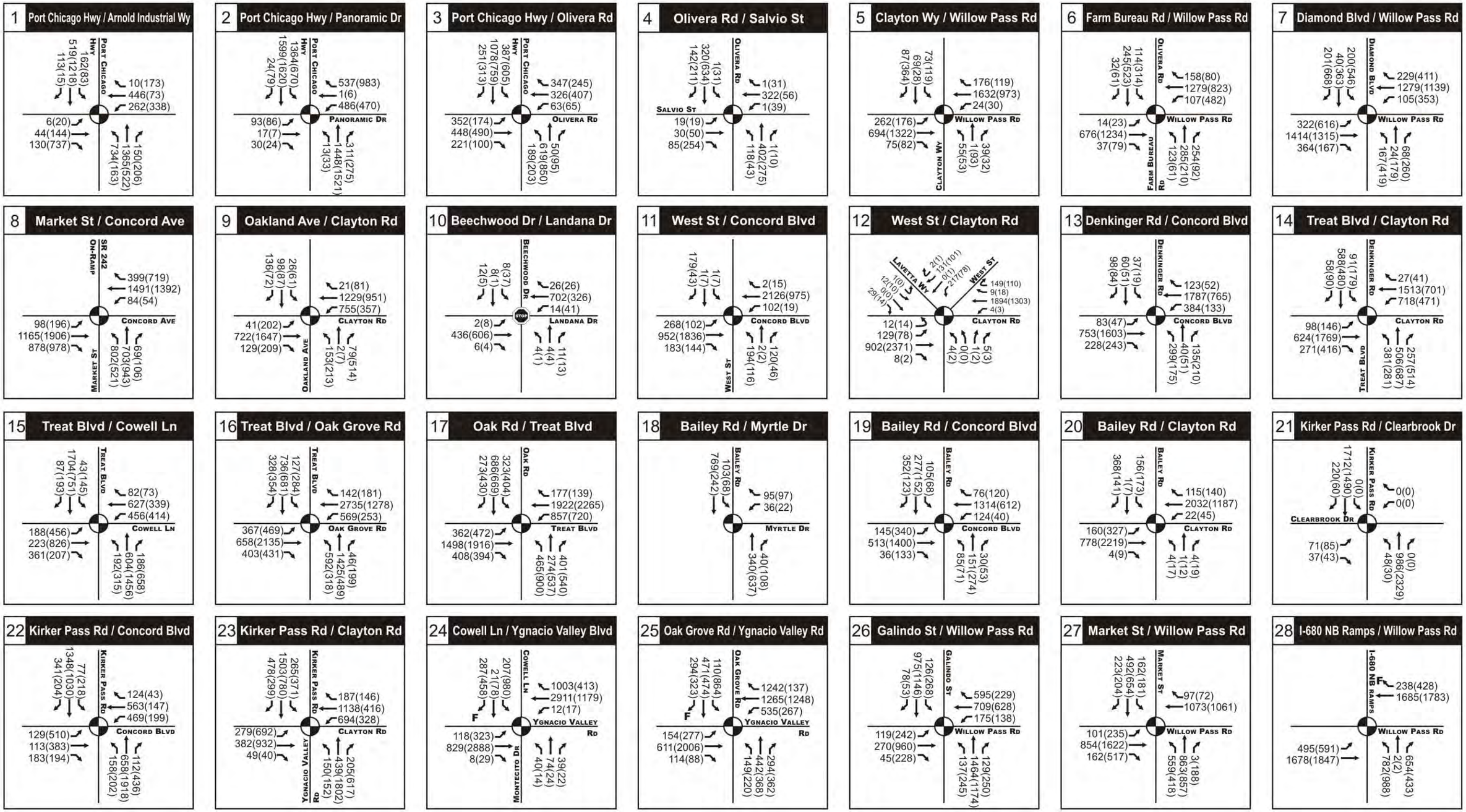
N

Source: Dowling Associates, Inc., 2009

Concord Community Reuse Plan

Revised June 10, 2009

Figure 4C-2, continued
2030 No Project
Intersection Peak Hour Volume



Legend

- Traffic Lanes
- Stop Sign Control
- AM (PM) Peak Hour Volume
- All Way Stop
- Signalized Intersection
- F Free Right Movement

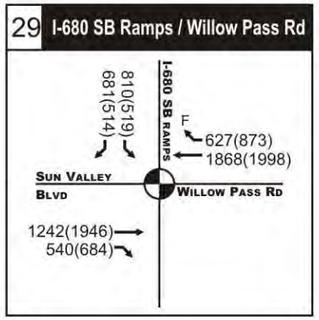
N

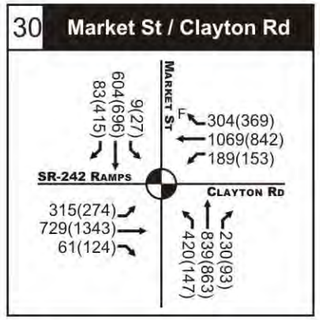
Source: Dowling Associates, Inc., 2009

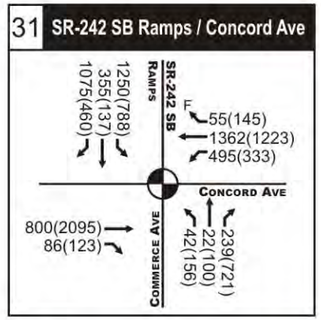
Concord Community Reuse Plan

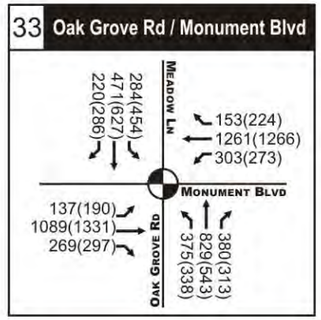
Revised June 10, 2009

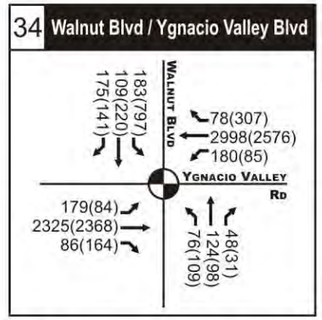
Figure 4C-3
Preferred Alternative
Intersection Peak Hour Volume

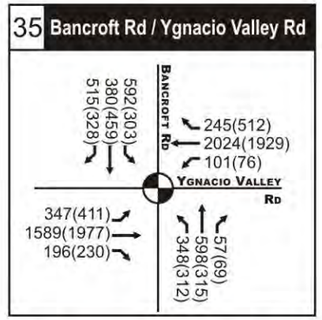


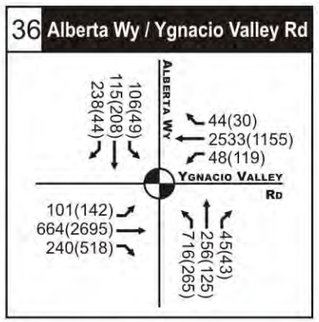


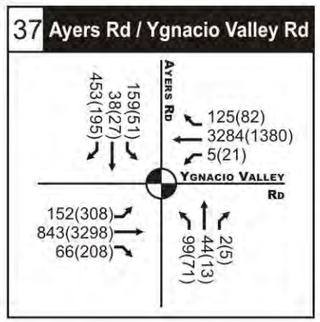


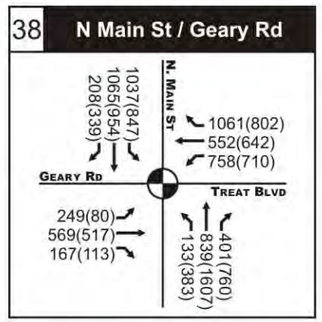


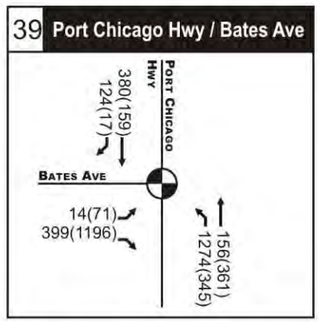


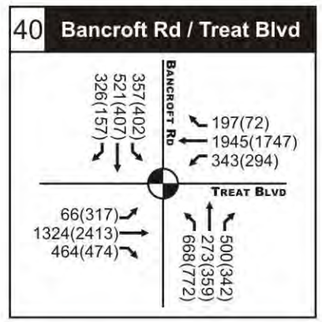


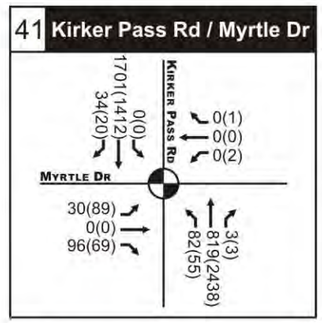


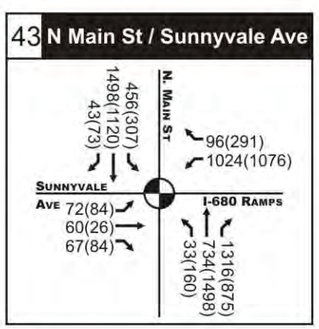


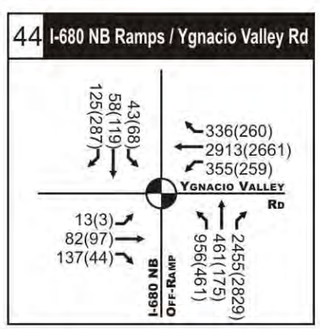


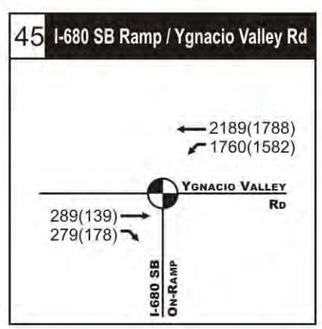


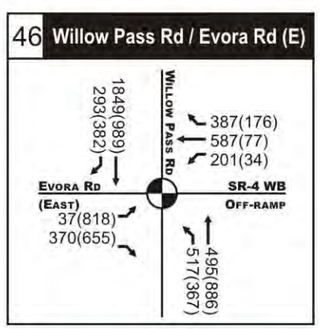


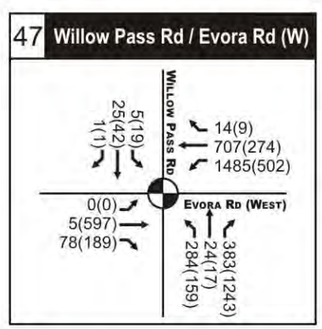


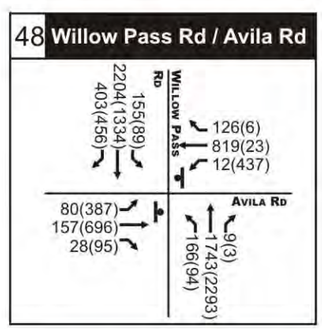


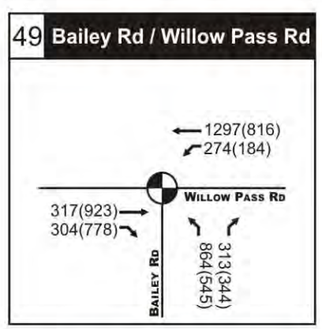


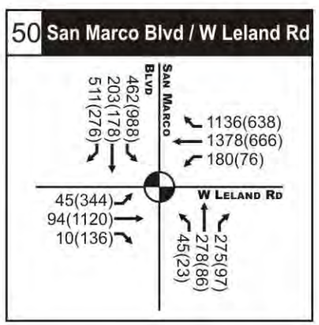


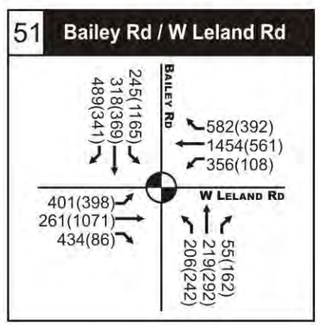


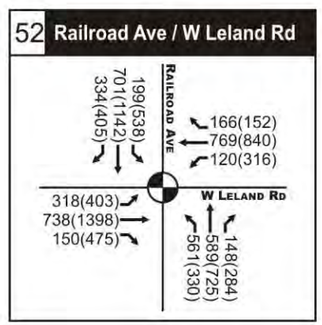


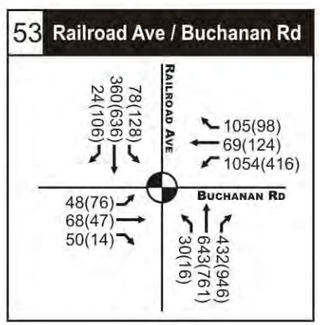


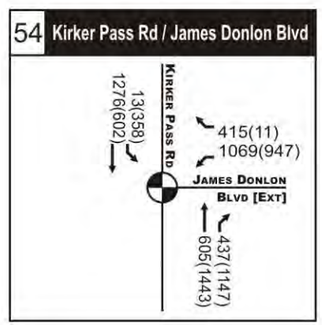


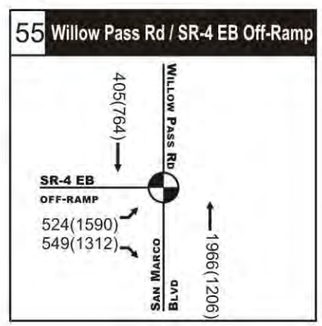


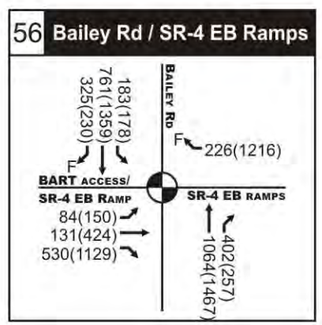












Legend

- Traffic Lanes
- Stop Sign Control
- AM (PM) Peak Hour Volume
- All Way Stop
- Signalized Intersection
- F Free Right Movement

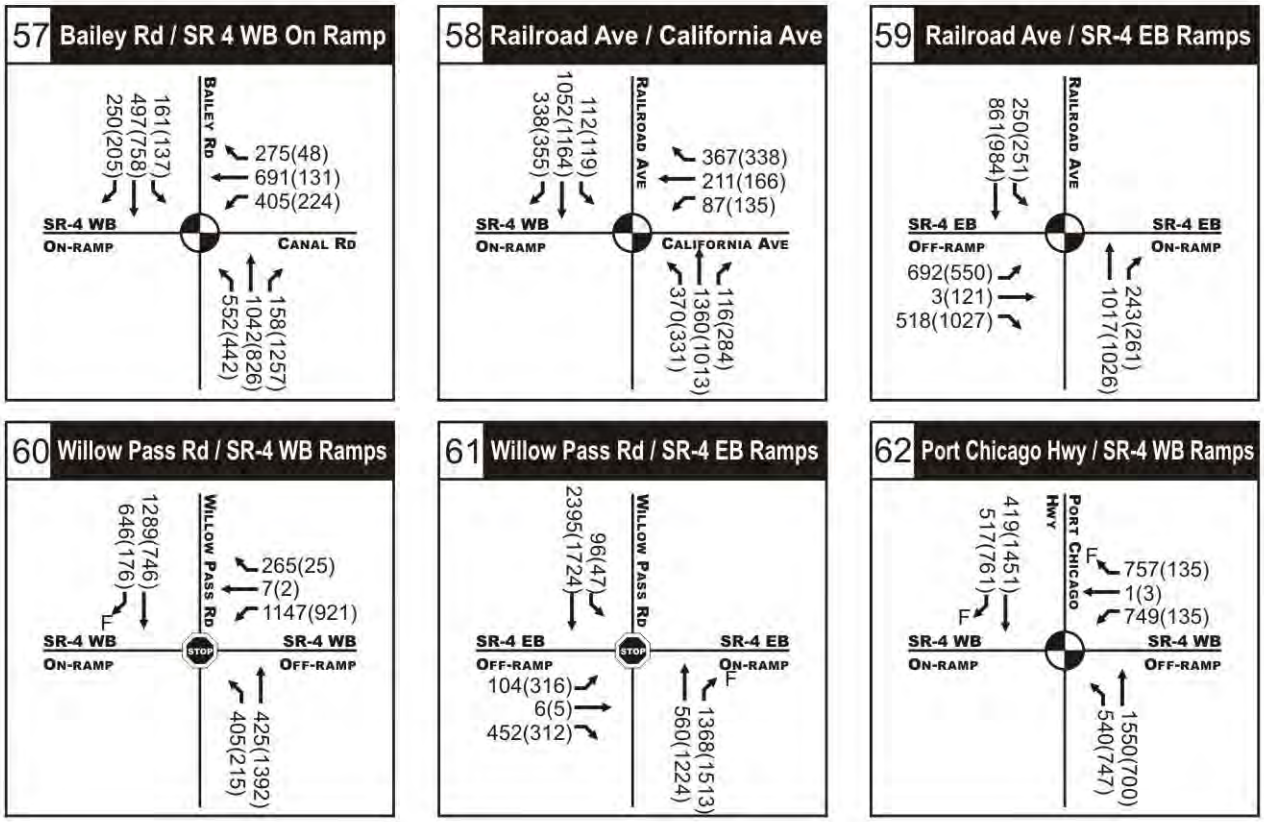
N

Source: Dowling Associates, Inc., 2009

Concord Community Reuse Plan

Revised June 10, 2009

Figure 4C-3, continued
Preferred Alternative
Intersection Peak Hour Volume



Legend

Source: Dowling Associates, Inc., 2009

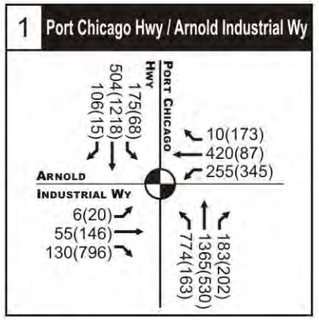
- Traffic Lanes
- Stop Sign Control
- **AM (PM)** Peak Hour Volume
- All Way Stop
- Signalized Intersection
- F Free Right Movement

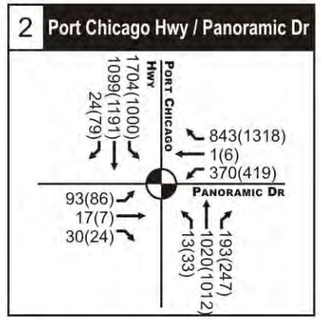
N

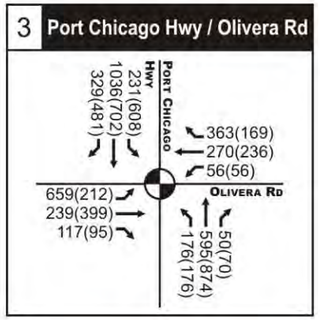
Concord Community Reuse Plan

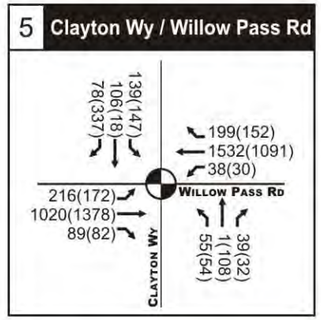
Revised June 10, 2009

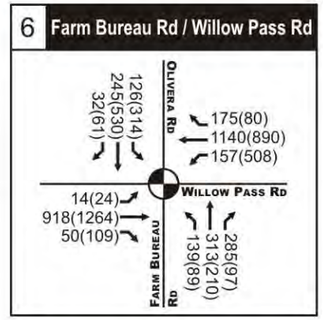
Figure 4C-3, continued
Preferred Alternative
Intersection Peak Hour Volume

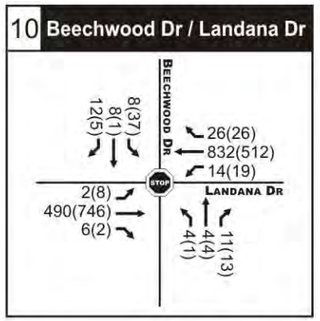


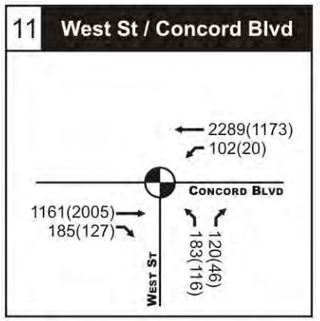


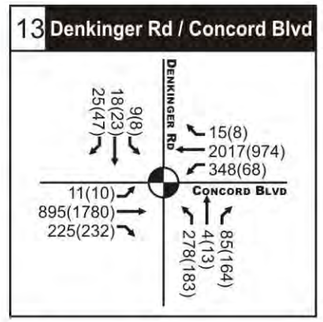


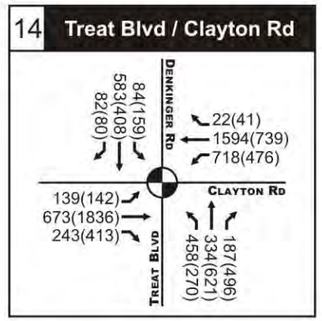


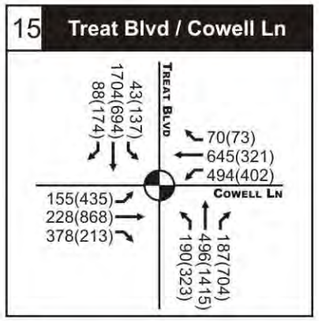


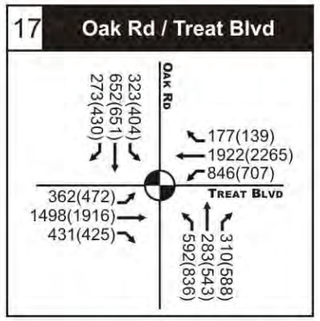


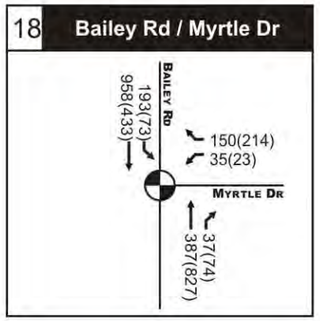


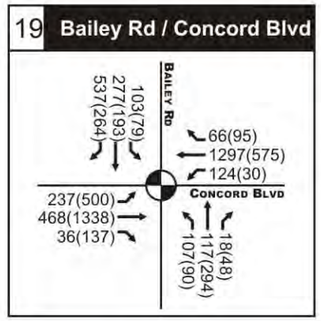


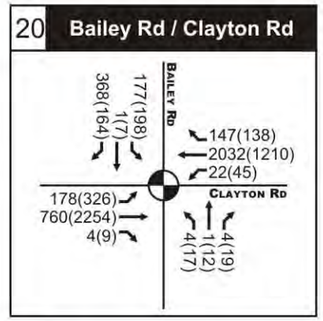


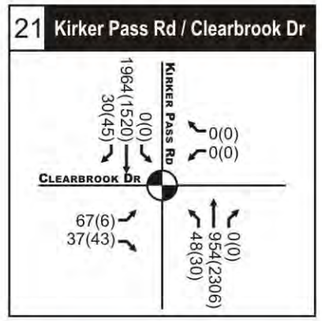


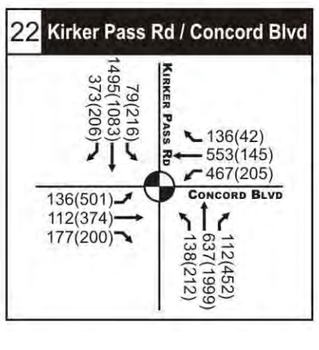


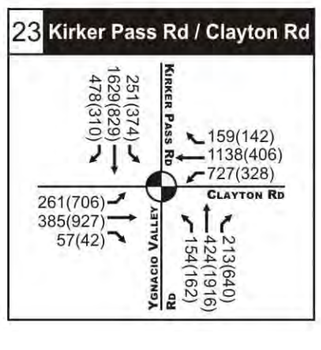


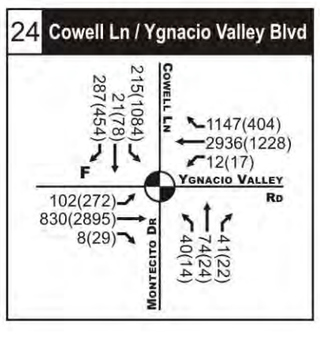


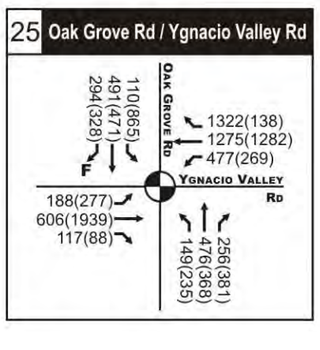


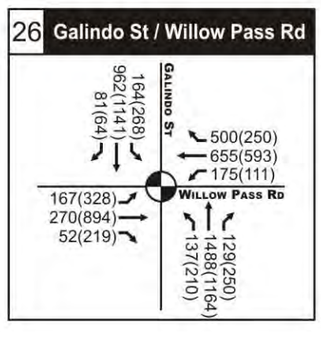


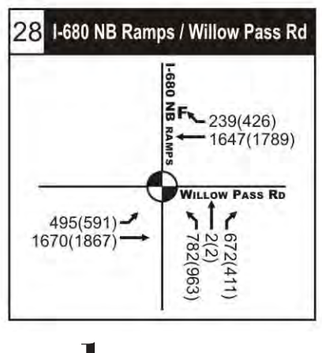












Legend

- Traffic Lanes
- Stop Sign Control
- AM (PM) Peak Hour Volume
- All Way Stop
- Signalized Intersection
- F Free Right Movement

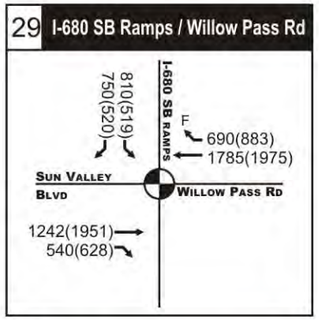
N

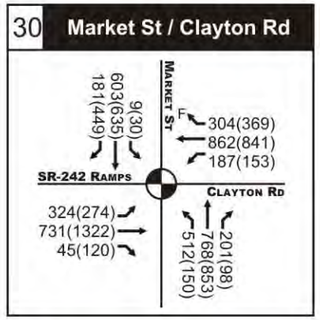
Source: Dowling Associates, Inc., 2009

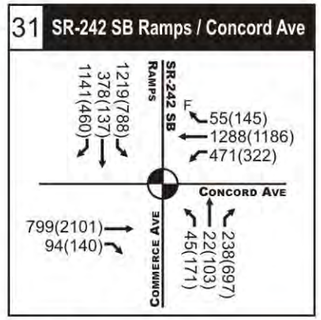
Concord Community Reuse Plan

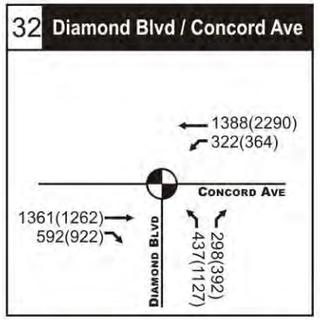
Revised June 10, 2009

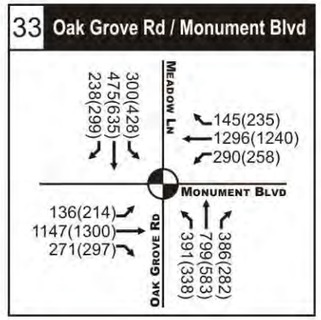
Figure 4C-4
Concentration and Conservation Intersection Peak Hour Volume

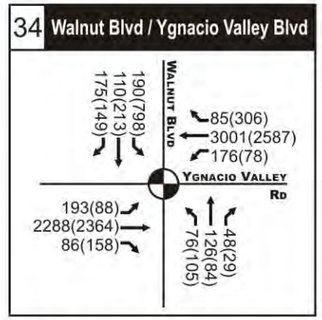


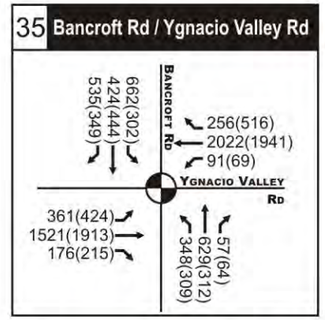


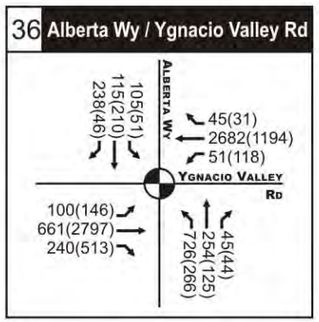


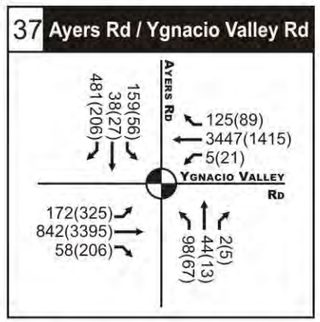


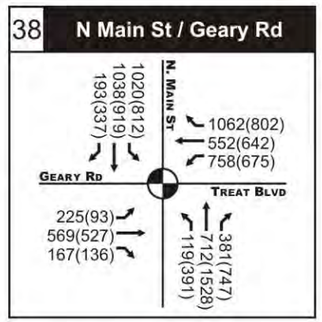


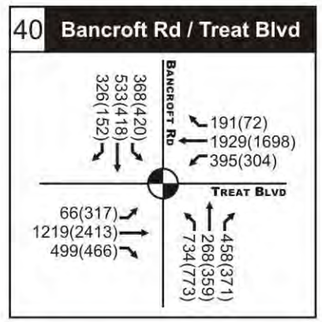


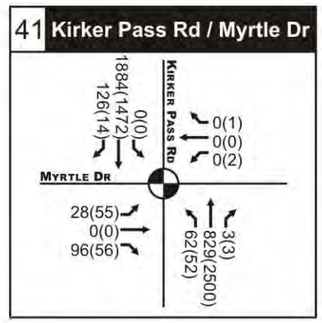


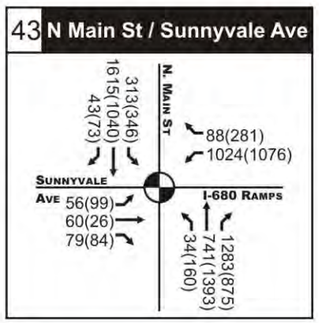


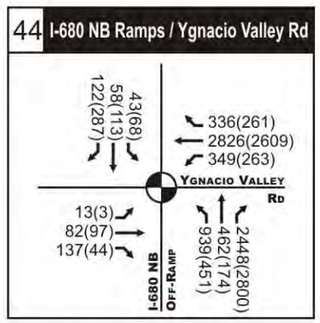


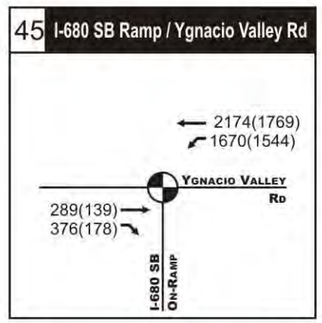


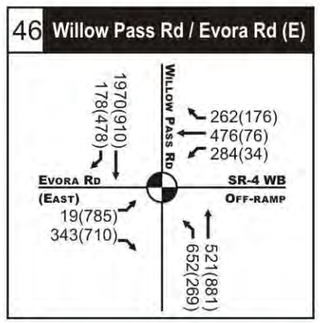


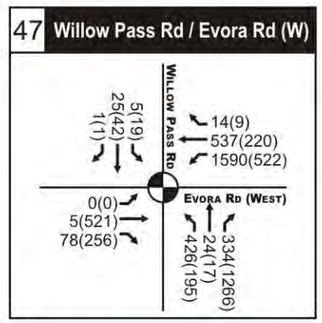


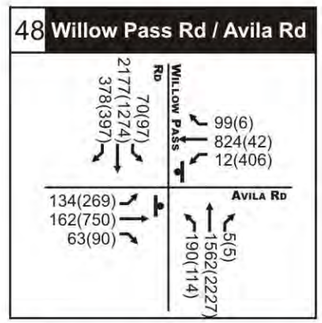


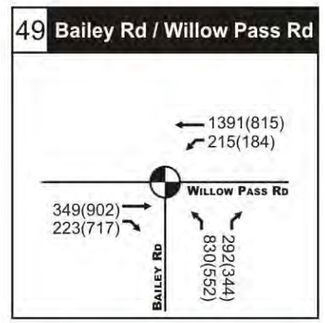


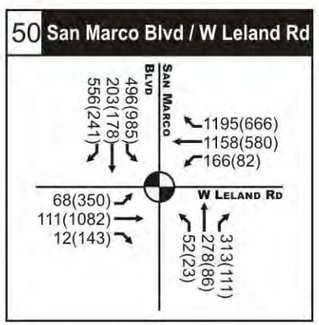


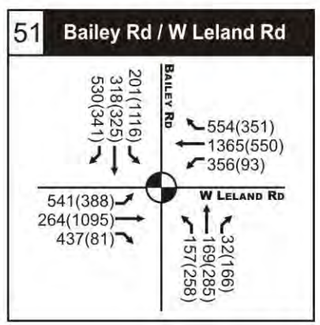


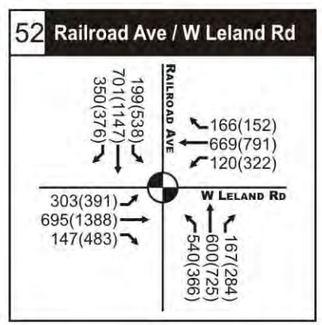


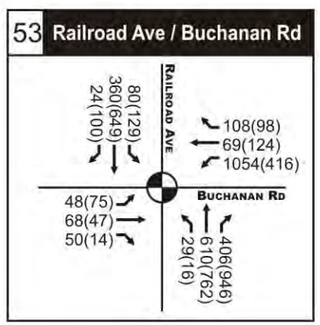


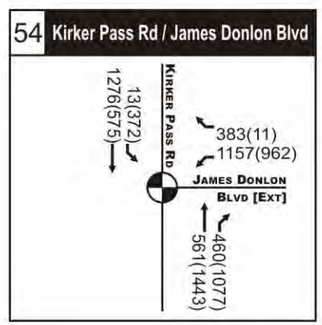


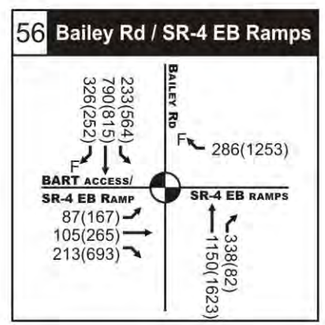












Legend

- Traffic Lanes
- Stop Sign Control
- AM (PM) Peak Hour Volume
- All Way Stop
- Signalized Intersection
- F Free Right Movement

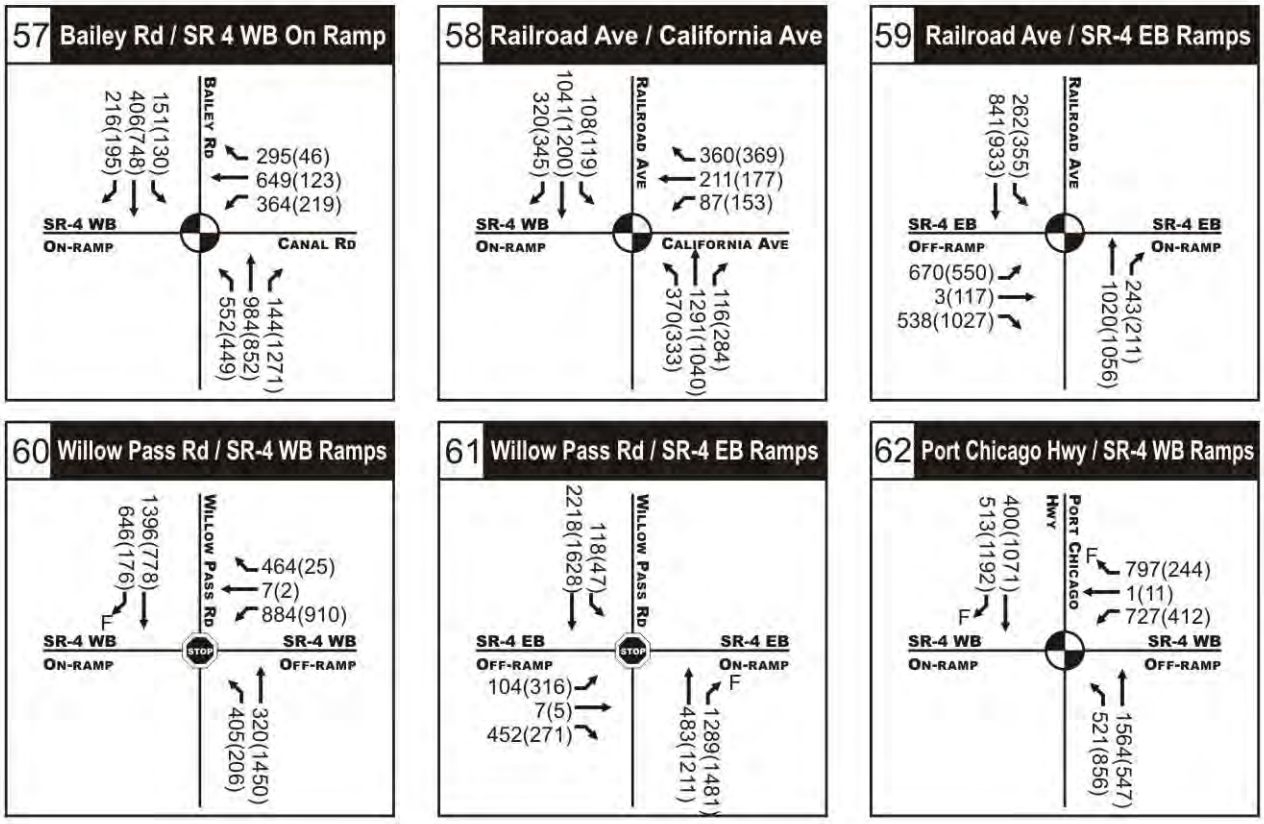
N

Source: Dowling Associates, Inc., 2009

Concord Community Reuse Plan

Revised June 10, 2009

Figure 4C-4, continued
Concentration and Conservation
Intersection Peak Hour Volume



Legend

Source: Dowling Associates, Inc., 2009

Traffic Lanes

Stop Sign Control

AM (PM) Peak Hour Volume

All Way Stop

Signalized Intersection

F Free Right Movement

N

Concord
Community Reuse Plan

Revised June 10, 2009

Figure 4C-4, continued
Concentration and Conservation
Intersection Peak Hour Volume

Appendix 4D
Urbemis Results

Appendix 4D: URBEMIS results

The URBEMIS 9.2.4 model was run for both the Preferred Alternative and the Concentration and Conservation Alternative using the same land uses as the CCTA Decennial Model runs. In addition to running the URBEMIS model for the entire CNWS site for both alternatives, the URBEMIS model was run for the four Transportation Analysis Zones (TAZ) that comprise the North Concord BART station TOD in the Preferred Alternative.

The primary purpose of the URBEMIS model is to quantify air quality and climate change (CO_2) impacts of development, which includes the operational (i.e., transportation) emissions. The URBEMIS model is most appropriate for smaller projects (approximately 1 mile diameter), making the URBEMIS results for the North Concord TOD more meaningful than the URBEMIS results for the entire site.

The results for all URBEMIS model runs reflect the applicable mitigations including a double counting adjustment for internal trips. The correction of passby trips was NOT included because this reduces the VMT disproportionately when compared to the CCTA model. The CCTA model results include VMT for the entire length of trips with at least one end on the site, while the URBEMIS passby reduction would include only a portion of the VMT for certain trips.

See Figures 4D-1: Preferred Alternative, 4D-2: North Concord BART TOD in the Preferred Alternative, and 4D-3: Concentration and Conservation Alternative for the detailed URBEMIS inputs and results, which are summarized in Table 4D-1.

Table 4D-1

Figure	URBEMIS model run	Daily vehicle trips	Daily vehicle miles traveled
Figure 4D-1	Preferred Alternative	213,489	1,669,115
Figure 4D-2	North Concord BART TOD in the Preferred Alternative	53,886	429,564
Figure 4D-3	Concentration and Conservation Alternative	169,227	1,336,208

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Mitigated Emissions (Tons/Year)

File Name: C:\Documents and Settings\shannon.cairns\Application Data\Urbemis\Version9a\Projects\Clustered Villages Total Land Uses_2009_05_14.urb924

Project Name: Clustered Villages -- Total Land Uses

Project Location: Contra Costa County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Mitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	10.77	13.20	122.19	0.09	0.88	0.55	9,320.14
Apartments low rise	56.53	67.12	621.21	0.47	4.45	2.77	47,381.28
Apartments mid rise	2.14	2.43	22.48	0.02	0.16	0.10	1,714.33
Apartments high rise	25.49	28.70	265.62	0.20	1.90	1.19	20,259.44
Day-care center	3.03	4.28	38.20	0.03	0.28	0.17	2,977.74
Elementary school	1.81	2.37	21.36	0.02	0.16	0.10	1,655.85
Junior high school	1.11	1.44	13.00	0.01	0.09	0.06	1,007.81
High school	1.46	1.89	16.90	0.01	0.12	0.08	1,315.14
University/college (4 yrs)	33.54	29.90	266.72	0.21	1.96	1.22	20,794.14
Library	1.40	1.97	17.55	0.01	0.13	0.08	1,368.22
Place of worship	0.08	0.10	0.91	0.00	0.01	0.00	71.19
City park	1.55	1.16	10.35	0.01	0.08	0.05	807.12
Hotel	1.68	2.05	18.31	0.01	0.13	0.08	1,427.63
Regnl shop. center	97.75	136.12	1,211.43	0.94	8.90	5.53	94,557.99

Home improvement superstore	0.68	0.93	8.26	0.01	0.06	0.04	644.87
Supermarket	10.59	15.03	133.79	0.10	0.98	0.61	10,442.92
General office building	33.38	42.63	387.77	0.30	2.81	1.75	29,904.43
Office park	17.24	22.14	202.96	0.16	1.46	0.91	15,587.48
Medical office building	0.40	0.55	4.89	0.00	0.04	0.02	381.14
Community Facilities	6.19	8.68	77.25	0.06	0.57	0.35	6,029.80
First Responder Training Facility	16.00	22.90	203.79	0.16	1.50	0.93	15,907.20
TOTALS (tons/year, mitigated)	322.82	405.59	3,664.94	2.82	26.67	16.59	283,555.86

Does not include correction for passby trips

Includes the following double counting adjustment for internal trips:

Residential Trip % Reduction: 15.75 Nonresidential Trip % Reduction: 5.96

Analysis Year: 2010 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Operational Mitigation Options Selected

Residential Mitigation Measures

Residential Mix of Uses Mitigation

Percent Reduction in Trips is 7.79% (calculated as a % of 9.57 trips/day))

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The number of housing units within a 1/2 mile radius of the project, plus the

number of residential units included in the project are 12707.

The employment for the study area (within a 1/2 mile radius of the project) is 23344.

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Operational Mitigation Options Selected

Residential Mitigation Measures

Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 2% (calculated as a % of 9.57 trips/day)))

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The Presence of Local-Serving Retail checkbox was selected.

Residential Transit Service Mitigation

Percent Reduction in Trips is 9.26% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The Number of Daily Weekday Buses Stopping Within 1/4 Mile of Site is 124

The Number of Daily Rail or Bus Rapid Transit Stops Within 1/2 Mile of Site is 244

The Number of Dedicated Daily Shuttle Trips is 0

Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 7.35% (calculated as a % of 9.57 trips/day)

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Operational Mitigation Options Selected

Residential Mitigation Measures

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The Number of Intersections per Square Mile is 975

The Percent of Streets with Sidewalks on One Side is 20%

The Percent of Streets with Sidewalks on Both Sides is 80%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 80%

Residential Affordable Housing Mitigation

Percent Reduction in Trips is 0.4% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The Percent of Housing Units that are Deed-Restricted Below Market Rate Housing is 10%

Nonresidential Mitigation Measures

Non-Residential Mix of Uses Mitigation

Percent Reduction in Trips is 7.79%

Inputs Selected:

The number of housing units within a 1/2 mile radius of the project, plus the

Nonresidential Mitigation Measures

number of residential units included in the project are 12707.

The employment for the study area (within a 1/2 mile radius of the project) is 23344.

Non-Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 2%

Inputs Selected:

The Presence of Local-Serving Retail checkbox was selected.

Non-Residential Transit Service Mitigation

Percent Reduction in Trips is 9.26%

Inputs Selected:

The Number of Daily Weekday Buses Stopping Within 1/4 Mile of Site is 124

The Number of Daily Rail or Bus Rapid Transit Stops Within 1/2 Mile of Site is 244

The Number of Dedicated Daily Shuttle Trips is 0

Non-Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 7.35%

Inputs Selected:

The Number of Intersections per Square Mile is 975

The Percent of Streets with Sidewalks on One Side is 20%

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Nonresidential Mitigation Measures

The Percent of Streets with Sidewalks on Both Sides is 80%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 80%

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	282.80	5.64	dwelling units	1,131.00	6,374.70	54,501.77
Apartments low rise	596.80	4.53	dwelling units	7,150.00	32,407.41	277,073.62
Apartments mid rise	8.32	3.52	dwelling units	333.00	1,172.55	10,024.95
Apartments high rise	82.40	3.39	dwelling units	4,093.00	13,856.87	118,472.04
Day-care center		54.86	1000 sq ft	43.00	2,358.87	17,591.30
Elementary school		10.03	1000 sq ft	125.00	1,253.60	9,753.04
Junior high school		9.54	1000 sq ft	80.00	762.99	5,936.10
High school		8.92	1000 sq ft	115.00	1,025.97	7,761.43
University/college (4 yrs)		1.65	students	10,000.00	16,472.48	122,843.54
Library		37.37	1000 sq ft	29.00	1,083.86	8,082.90
Place of worship		6.31	1000 sq ft	9.00	56.75	420.75
City park		1.10	acres	581.00	639.37	4,768.14
Hotel		5.65	rooms	200.00	1,130.93	8,433.88
Regnl shop. center		29.72	1000 sq ft	2,544.00	75,606.86	558,961.51
Home improvement superstore		20.63	1000 sq ft	25.00	515.63	3,812.05
Supermarket		70.76	1000 sq ft	118.00	8,349.97	61,731.33

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
General office building		7.62	1000 sq ft	2,845.00	21,679.62	175,659.12
Office park		7.90	1000 sq ft	1,379.00	10,899.65	91,360.84
Medical office building		25.01	1000 sq ft	12.00	300.08	2,250.72
Community Facilities		37.37	1000 sq ft	129.00	4,821.32	35,643.98
First Responder Training Facility		159.19	acres	79.90	12,719.11	94,032.37
					213,488.59	1,669,115.38

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	50.9	1.4	98.2	0.4
Light Truck < 3750 lbs	13.3	2.3	93.9	3.8
Light Truck 3751-5750 lbs	20.3	0.5	99.5	0.0
Med Truck 5751-8500 lbs	7.7	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.1	0.0	72.7	27.3
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	0.7	0.0	14.3	85.7
Heavy-Heavy Truck 33,001-60,000 lbs	0.4	0.0	0.0	100.0
Other Bus	0.0	0.0	0.0	0.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.7	67.6	32.4	0.0
School Bus	0.4	0.0	0.0	100.0
Motor Home	0.8	0.0	87.5	12.5

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Day-care center				5.0	2.5	92.5
Elementary school				20.0	10.0	70.0
Junior high school				20.0	10.0	70.0
High school				10.0	5.0	85.0
University/college (4 yrs)				5.0	2.5	92.5
Library				5.0	2.5	92.5
Place of worship				3.0	1.5	95.5
City park				5.0	2.5	92.5
Hotel				5.0	2.5	92.5
Regnl shop. center				2.0	1.0	97.0
Home improvement superstore				2.0	1.0	97.0
Supermarket				2.0	1.0	97.0
General office building				35.0	17.5	47.5
Office park				48.0	24.0	28.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Medical office building				7.0	3.5	89.5
Community Facilities				2.0	1.0	97.0
First Responder Training Facility				2.0	1.0	97.0

Operational Changes to Defaults

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Mitigated Emissions (Tons/Year)

File Name: C:\Documents and Settings\shannon.cairns\Application Data\Urbemis\Version9a\Projects\Clustered Villages BART TOD.urb924

Project Name: Clustered Villages -- Total Land Uses

Project Location: Contra Costa County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Mitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Apartments high rise	24.73	28.54	264.16	0.20	1.89	1.18	20,148.43
City park	0.04	0.03	0.28	0.00	0.00	0.00	21.75
Regnl shop. center	24.01	33.50	298.16	0.23	2.19	1.36	23,273.26
General office building	32.85	42.23	384.19	0.29	2.78	1.73	29,628.25
TOTALS (tons/year, mitigated)	81.63	104.30	946.79	0.72	6.86	4.27	73,071.69

Does not include correction for passby trips

Includes the following double counting adjustment for internal trips:

Residential Trip % Reduction: 6.47 Nonresidential Trip % Reduction: 2.33

Analysis Year: 2010 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Operational Mitigation Options Selected

Residential Mitigation Measures

Residential Mix of Uses Mitigation

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Operational Mitigation Options Selected

Residential Mitigation Measures

Percent Reduction in Trips is 4.04% (calculated as a % of 9.57 trips/day))

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The number of housing units within a 1/2 mile radius of the project, plus the

number of residential units included in the project are 3582.

The employment for the study area (within a 1/2 mile radius of the project) is 12942.

Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 2% (calculated as a % of 9.57 trips/day)))

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The Presence of Local-Serving Retail checkbox was selected.

Residential Transit Service Mitigation

Percent Reduction in Trips is 9.94% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

Operational Mitigation Options Selected

Residential Mitigation Measures

The Number of Daily Weekday Buses Stopping Within 1/4 Mile of Site is 124

The Number of Daily Rail or Bus Rapid Transit Stops Within 1/2 Mile of Site is 244

The Number of Dedicated Daily Shuttle Trips is 0

Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 8.55% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The Number of Intersections per Square Mile is 1300

The Percent of Streets with Sidewalks on One Side is 10%

The Percent of Streets with Sidewalks on Both Sides is 90%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 90%

Residential Affordable Housing Mitigation

Percent Reduction in Trips is 0.4% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

Operational Mitigation Options Selected

Residential Mitigation Measures

The Percent of Housing Units that are Deed-Restricted Below Market Rate Housing is 10%

Nonresidential Mitigation Measures

Non-Residential Mix of Uses Mitigation

Percent Reduction in Trips is 4.04%

Inputs Selected:

The number of housing units within a 1/2 mile radius of the project, plus the

number of residential units included in the project are 3582.

The employment for the study area (within a 1/2 mile radius of the project) is 12942.

Non-Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 2%

Inputs Selected:

The Presence of Local-Serving Retail checkbox was selected.

Non-Residential Transit Service Mitigation

Percent Reduction in Trips is 9.94%

Inputs Selected:

The Number of Daily Weekday Buses Stopping Within 1/4 Mile of Site is 124

The Number of Daily Rail or Bus Rapid Transit Stops Within 1/2 Mile of Site is 244

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Nonresidential Mitigation Measures

The Number of Dedicated Daily Shuttle Trips is 0

Non-Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 8.55%

Inputs Selected:

The Number of Intersections per Square Mile is 1300

The Percent of Streets with Sidewalks on One Side is 10%

The Percent of Streets with Sidewalks on Both Sides is 90%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 90%

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Apartments high rise	71.50	3.85	dwelling units	3,582.00	13,780.93	117,822.85
City park		1.17	acres	14.70	17.23	128.47
Regnl shop. center		31.65	1000 sq ft	588.00	18,608.88	137,575.44
General office building		8.11	1000 sq ft	2,647.00	21,479.40	174,036.83
					53,886.44	429,563.59

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	50.9	1.4	98.2	0.4
Light Truck < 3750 lbs	13.3	2.3	93.9	3.8

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck 3751-5750 lbs	20.3	0.5	99.5	0.0
Med Truck 5751-8500 lbs	7.7	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.1	0.0	72.7	27.3
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	0.7	0.0	14.3	85.7
Heavy-Heavy Truck 33,001-60,000 lbs	0.4	0.0	0.0	100.0
Other Bus	0.0	0.0	0.0	0.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.7	67.6	32.4	0.0
School Bus	0.4	0.0	0.0	100.0
Motor Home	0.8	0.0	87.5	12.5

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Regnl shop. center				2.0	1.0	97.0
General office building				35.0	17.5	47.5

Operational Changes to Defaults

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Mitigated Emissions (Tons/Year)

File Name: C:\Documents and Settings\shannon.cairns\Application Data\Urbemis\Version9a\Projects\Concentration and Conservation Total Land Uses.urb924

Project Name: Concentration and Conservation

Project Location: Contra Costa County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Mitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	4.77	5.90	54.65	0.04	7.66	1.47	4,168.16
Apartments low rise	50.03	60.04	555.61	0.42	77.85	14.95	42,378.31
Apartments mid rise	4.77	5.49	50.79	0.04	7.12	1.37	3,874.24
Apartments high rise	22.26	25.42	235.25	0.18	32.96	6.33	17,942.90
Elementary school	1.42	1.87	16.81	0.01	2.41	0.46	1,303.22
Junior high school	0.87	1.14	10.27	0.01	1.47	0.28	796.35
High school	1.14	1.48	13.28	0.01	1.91	0.37	1,032.92
University/college (4 yrs)	34.51	31.30	279.15	0.22	40.37	7.74	21,763.03
City park	1.37	1.05	9.33	0.01	1.35	0.26	727.39
Hotel	1.75	2.15	19.17	0.01	2.77	0.53	1,494.15
Free-standing discount superstore	1.54	2.16	19.25	0.01	2.79	0.53	1,502.38
Regnl shop. center	50.53	70.47	627.16	0.49	90.87	17.42	48,952.89
Home improvement superstore	0.55	0.75	6.68	0.01	0.97	0.19	521.04

Supermarket	10.19	14.48	128.87	0.10	18.67	3.58	10,058.85
General office building	17.97	23.06	209.76	0.16	29.85	5.73	16,176.96
Office park	32.99	42.57	390.20	0.30	55.17	10.59	29,968.13
Community Facilities	8.18	11.48	102.16	0.08	14.80	2.84	7,974.05
First Responder Training Facility	16.62	23.79	211.69	0.16	30.67	5.88	16,523.37
TOTALS (tons/year, mitigated)	261.46	324.60	2,940.08	2.26	419.66	80.52	227,158.34

Does not include correction for passby trips

Includes the following double counting adjustment for internal trips:

Residential Trip % Reduction: 12.98 Nonresidential Trip % Reduction: 5.41

Analysis Year: 2010 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Operational Mitigation Options Selected

Residential Mitigation Measures

Residential Mix of Uses Mitigation

Percent Reduction in Trips is 6.74% (calculated as a % of 9.57 trips/day))

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The number of housing units within a 1/2 mile radius of the project, plus the

number of residential units included in the project are 10530.

The employment for the study area (within a 1/2 mile radius of the project) is 23126.

Residential Local-Serving Retail Mitigation

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Operational Mitigation Options Selected

Residential Mitigation Measures

Percent Reduction in Trips is 2% (calculated as a % of 9.57 trips/day)))

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The Presence of Local-Serving Retail checkbox was selected.

Residential Transit Service Mitigation

Percent Reduction in Trips is 7.33% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The Number of Daily Weekday Buses Stopping Within 1/4 Mile of Site is 124

The Number of Daily Rail or Bus Rapid Transit Stops Within 1/2 Mile of Site is 180

The Number of Dedicated Daily Shuttle Trips is 0

Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 7.35% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

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Operational Mitigation Options Selected

Residential Mitigation Measures

Inputs Selected:

The Number of Intersections per Square Mile is 975

The Percent of Streets with Sidewalks on One Side is 20%

The Percent of Streets with Sidewalks on Both Sides is 80%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 80%

Residential Affordable Housing Mitigation

Percent Reduction in Trips is 0.4% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The Percent of Housing Units that are Deed-Restricted Below Market Rate Housing is 10%

Nonresidential Mitigation Measures

Non-Residential Mix of Uses Mitigation

Percent Reduction in Trips is 6.74%

Inputs Selected:

The number of housing units within a 1/2 mile radius of the project, plus the

number of residential units included in the project are 10530.

The employment for the study area (within a 1/2 mile radius of the project) is 23126.

Nonresidential Mitigation Measures

Non-Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 2%

Inputs Selected:

The Presence of Local-Serving Retail checkbox was selected.

Non-Residential Transit Service Mitigation

Percent Reduction in Trips is 7.33%

Inputs Selected:

The Number of Daily Weekday Buses Stopping Within 1/4 Mile of Site is 124

The Number of Daily Rail or Bus Rapid Transit Stops Within 1/2 Mile of Site is 180

The Number of Dedicated Daily Shuttle Trips is 0

Non-Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 7.35%

Inputs Selected:

The Number of Intersections per Square Mile is 975

The Percent of Streets with Sidewalks on One Side is 20%

The Percent of Streets with Sidewalks on Both Sides is 80%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

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Nonresidential Mitigation Measures

Direct Parallel Routes Exist is 80%

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	117.00	6.05	dwelling units	471.00	2,850.90	24,374.32
Apartments low rise	486.90	4.85	dwelling units	5,981.00	28,985.52	247,817.50
Apartments mid rise	17.50	3.79	dwelling units	700.00	2,649.87	22,655.57
Apartments high rise	67.50	3.63	dwelling units	3,378.00	12,272.42	104,925.49
Elementary school		10.50	1000 sq ft	94.00	986.64	7,676.03
Junior high school		9.98	1000 sq ft	60.40	602.90	4,690.58
High school		9.34	1000 sq ft	86.30	805.79	6,095.84
University/college (4 yrs)		1.72	students	10,000.00	17,240.01	128,567.39
City park		1.15	acres	500.30	576.22	4,297.16
Hotel		5.92	rooms	200.00	1,183.62	8,826.85
Free-standing discount superstore		35.65	1000 sq ft	33.70	1,201.28	8,881.06
Regnl shop. center		31.10	1000 sq ft	1,258.40	39,141.85	289,375.69
Home improvement superstore		21.59	1000 sq ft	19.30	416.61	3,080.03
Supermarket		74.06	1000 sq ft	108.60	8,042.87	59,460.96
General office building		7.98	1000 sq ft	1,470.50	11,727.70	95,023.71
Office park		8.27	1000 sq ft	2,533.20	20,955.41	175,648.25
Community Facilities		39.12	1000 sq ft	163.00	6,375.91	47,137.08

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
First Responder Training Facility		166.61	acres	79.30	13,211.79	97,674.76
					169,227.31	1,336,208.27

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	50.9	1.4	98.2	0.4
Light Truck < 3750 lbs	13.3	2.3	93.9	3.8
Light Truck 3751-5750 lbs	20.3	0.5	99.5	0.0
Med Truck 5751-8500 lbs	7.7	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.1	0.0	72.7	27.3
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	0.7	0.0	14.3	85.7
Heavy-Heavy Truck 33,001-60,000 lbs	0.4	0.0	0.0	100.0
Other Bus	0.0	0.0	0.0	0.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.7	67.6	32.4	0.0
School Bus	0.4	0.0	0.0	100.0
Motor Home	0.8	0.0	87.5	12.5

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6

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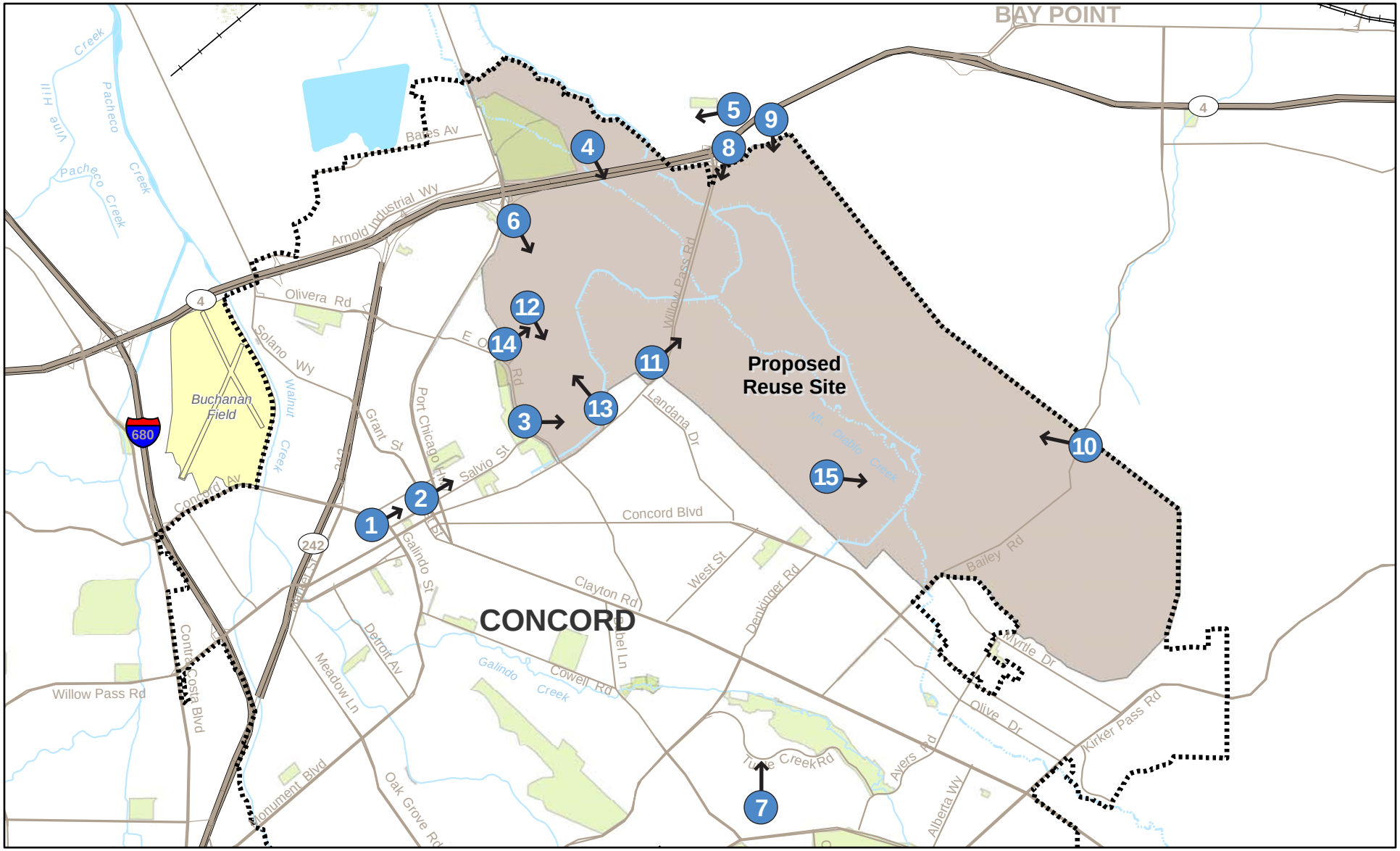
Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Elementary school				20.0	10.0	70.0
Junior high school				20.0	10.0	70.0
High school				10.0	5.0	85.0
University/college (4 yrs)				5.0	2.5	92.5
City park				5.0	2.5	92.5
Hotel				5.0	2.5	92.5
Free-standing discount superstore				2.0	1.0	97.0
Regnl shop. center				2.0	1.0	97.0
Home improvement superstore				2.0	1.0	97.0
Supermarket				2.0	1.0	97.0
General office building				35.0	17.5	47.5
Office park				48.0	24.0	28.0
Community Facilities				2.0	1.0	97.0
First Responder Training Facility				2.0	1.0	97.0

Operational Changes to Defaults

Appendix 5A
Pictorial Views Analysis



Legend

5 Pictorial Views

1. From downtown Concord on Salvio Street toward the site
2. From Willow Pass Road at Port Chicago Highway toward site
3. From Encima Drive near intersection with Salvio Street toward the central part of the site
4. From SR 4 toward Mt. Diablo
5. From Avila Road, above SR 4 toward Diablo Creek Golf Course and the Avon Refinery
6. From North Concord BART Station toward Mt. Diablo
7. From Lime Ride Open Space toward the site
8. From Willow Pass Road looking south
9. From SR 4 toward Mt Diablo
10. From Bailey Road in the Los Medanos Hills looking across site
11. From San Vicente Drive toward the site
12. From Haleakala Street, in the Coast Guard Housing complex, toward Mt. Diablo
13. From Willow Pass Road looking toward the site
14. From Willow Pass Community Park toward the site
15. From Concord High School across the site

Base Map

- Concord City Limit
- Site Area
- Airport
- Park or Open Space
- Mt. Diablo Creek
- Canal
- Other Creek or Stream

Concord
Community Reuse Plan

Revised April 23, 2008

Pictorial Analysis

1. From downtown Concord on Salvio Street toward the sit

2. From Willow Pass Road at Port Chicago Highway toward site

3. From Encima Drive near intersection with Salvio Street toward the central part of the site

4. From SR 4 toward Mt. Diablo

Concord
Community Reuse Plan

Revised April 22, 2008

Pictorial Analysis

5. From Avila Road, above SR 4 toward Diablo Creek Golf Course and the Avon Refinery

6. From North Concord BART Station toward Mt. Diablo

7. From Lime Ride Open Space toward the site

8. From Willow Pass Road looking south

Concord
Community Reuse Plan

Revised April 23, 2008

Pictorial Analysis

11. From San Vicente Drive toward the site

12. From Haleakala Street, in the Coast Guard Housing complex, toward Mt. Diablo

14. From Willow Pass Community Park toward the site

15. From Concord High School across the site

Concord
Community Reuse Plan

Revised April 23, 2008

Pictorial Analysis

7. From Lime Ride Open Space toward the site

10. From Bailey Road in the Los Medanos Hills looking across site

13. From Willow Pass Road looking toward the site

Concord
Community Reuse Plan

Revised April 23, 2008

Pictorial Analysis

Appendix 8A

Special-status Wildlife and Plant Species

Table 8A-1

Special-Status Wildlife Species Considered for Potential Occurrence on the CCRP Site

Scientific Name	Common Name	Federal/State Status	Habitat Description	Documentation of Species within the CNWS Site	Suitable Habitat Present Within the Potential Impact Area	Potential for Species to Occur in Potential Impact Area
Invertebrates						
Branchinecta conservatio	conservancy fairy shrimp	FE/None	Vernal pools in grasslands.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Determined to be absent by surveys
Branchinecta longiantenna	longhorn fairy shrimp	FE/None	Vernal pools in grasslands.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Determined to be absent by surveys
Branchinecta lynchi	vernal pool fairy shrimp	FT/None	Vernal pools in grasslands.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Determined to be absent by surveys
Callophrys mossii bayensis	San Bruno elfin butterfly	FE/None	Inhabits coastal mountains near San Francisco bay, in the fog-belt of steep north facing slopes that receive little direct sunlight, near larval host plant. Stonecrop (*Sedum spathulifolium*), which occurs between elevations 900-1075 feet, known on Mount Diablo in Contra Costa County, but not identified during general plant surveys at CNWS (Downard et al., 1999).	There are no CNDDB records within 5 miles of the site.	It is unknown if suitable host plants occur	Unlikely to occur
Danaus plexippus	monarch butterfly	None	Winter roosts along the coast of Mendocino to Baja, California, Mexico. Roosts located in wind-protected groves (eucalyptus, Monterey pine, cypress) with water and nectar sources nearby.	There are no CNDDB records within 5 miles of the site	Suitable Habitat Present	May potentially occur, but no roost sites observed on-site
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	FT/None	Occurs only in Central Valley, including portions of Contra Costa County, of California in association with blue elderberry (*Sambucus mexicana*). Site to the west of known range.	There are no CNDDB records within 5 miles of the site	Suitable Habitat Present (out of range)	Unlikely to occur
Euphydryas editha bayensis	Bay checkerspot butterfly	FT/None	Native grasslands on serpentine outcrops around the San Francisco Bay. *Plantago erecta* is the host plant. Host plant not identified during general surveys (Downard et al., 1999).	There are no CNDDB records within 5 miles of the site	No Suitable Habitat Present	Unlikely to occur
Lepidurus packardi	vernal pool tadpole shrimp	FE/None	Vernal pools and swales in Central Valley, westernmost population in San Francisco Bay National Wildlife Refuge in Alameda County.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Determined to be absent by surveys
Linderiella occidentalis	California fairy shrimp	None	Seasonal pools with unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Present on site
Microcina leei	Lee's micro-blind harvestman	None	Xeric habitats in the San Francisco Bay region. Found under sandstone rocks in open oak grassland. Known from limited locations.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Potentially Present	Unlikely to occur
Syncaris pacifica	California freshwater shrimp	FE/SE	Found in Napa, Sonoma, and Marin Counties in low elevation, low gradient streams where riparian cover is moderate to heavy.	There are no CNDDB records within 5 miles of the site.	Out of range	Unlikely to occur
Tryonia imitator	mimic tryonia (California brackishwater snail)	None	Inhabits coastal lagoons, estuaries and salt marshes, from Sonoma County South to San Diego County.	There are no CNDDB records within 5 miles of the site.	No Suitable Habitat Present	Unlikely to occur
Fish – See Table 8-4 in Section 8.2.4.3						
Reptiles/Amphibians						
Actinemys marmorata	western pond turtle	None/CSC	Thoroughly aquatic turtle found in freshwater ponds, marshes, lakes, rivers, streams and irrigation ditches with aquatic vegetation. Associated with permanent or nearly permanent water bodies in a variety of habitats.	There are multiple CNDDB records within the site, and there are additional occurrences from previous studies.	Suitable Habitat Present	Present on site
Ambystoma californiense	California tiger salamander	FT/SCE	Need underground refuges in valley and foothill grasslands in mammal burrows and vernal pools or other seasonal waters for breeding.	There are 5 CNDDB records within 5 miles of the site. Known to occur from previous studies.	Suitable Habitat Present	Present on site
Anniella pulchra pulchra	silvery legless lizard	None/CSC	A burrowing species, prefers loose soils associated with drainages and valley bottoms, but also occurs on hillsides.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Potentially Present	Unlikely to occur
Masticophis lateralis euryxanthus	Alameda whipsnake	FT/ST	Restricted valley-hardwood habitat within the Coast Ranges from Monterey to the San Francisco Bay. Inhabits south-facing slopes and ravines where shrubs form a mosaic with oaks and grasses. Critical Habitat units for this species are located approximately 1 mile to the south of the site.	There are CNDDB records in the vicinity, however because the sensitivity of the species, location is not disclosed.	Suitable Habitat Present	May potentially occur
Phrynosoma coronatum frontale	coast horned lizard	None/CSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes, known from several locations in Contra Costa County.	There are CNDDB records within 5 miles of the site.	Suitable Habitat Present	May potentially occur

Table 8A-1

Special-Status Wildlife Species Considered for Potential Occurrence on the CCRP Site

Scientific Name	Common Name	Federal/State Status	Habitat Description	Documentation of Species within the CNWS Site	Suitable Habitat Present Within the Potential Impact Area	Potential for Species to Occur in Potential Impact Area
Rana draytonii	California red-legged frog	FT/CSC	Lowlands and foothills in or near permanent sources of deep water with dense and shrubby or emergent riparian vegetation.	There are 5 CNDDB records within 5 miles of the site. Known to occur from previous studies.	Suitable Habitat Present	Present on site
Rana boylii	foothill yellow-legged frog	None/CSC	Partly shaded shallow streams and riffles with rocky substrate in various habitats bordered by native or non-native grasses. Riparian habitats with trees including oak, willow and bay.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Unlikely to occur
Spea hammondii	western spadefoot toad	None/CSC	Grassland habitats and vernal pools for breeding and egg-laying.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Unlikely to occur
Thamnophis gigas	giant garter snake	FT/ST	Aquatic species foraging on fish in and along streams, marshes or sloughs with slow-moving creeks in the Central Valley.	There are no CNDDB records within 5 miles of the site. Out of known range.	Suitable Habitat Present	Unlikely to occur
Birds						
Agelaius tricolor	tricolored blackbird	None /CSC	Cattail or tule marshes, fields, farms	There are no CNDDB record within 5 miles of the site. Known to occur from previous studies.	Suitable Breeding Habitat Present	Present on site
Aquila chrysaetos	golden eagle	FPS/CSC	Rolling foothills, mountain areas, sage-juniper flats, desert.	There are no CNDDB records within 5 miles of the site. Known to occur from previous studies.	Suitable Breeding Habitat Present	Present on site
Asio flammeus	short-eared owl	None /CSC	Usually found in open areas with few trees, such as annual and perennial grasslands, prairies, dunes, meadows, irrigated lands, and saline and fresh emergent wetlands. Occasionally still breeds in northern California, including Suisun Bay marshes.	There are no CNDDB records within 5 miles of the site. Known to occur from previous studies.	Suitable Habitat Present	May potentially occur
Athene cunicularia	burrowing owl	None/CSC	Open grass, prairie, farm, and abandoned airfields	There are 2 CNDDB records within 5 miles of the site. Known to occur from previous studies.	Suitable Breeding Habitat Present	Present on site
Buteo swainsoni	Swainson's hawk	None/ST	Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley. Forages in adjacent grasslands or suitable grain or alfalfa fields, or livestock pastures.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Unlikely to occur
Charadrius alexandrinus nivosus	western snowy plover	FT/CSC	(Nesting) Federal listing applies only to Pacific coastal population. Sandy beaches, salt pond levees & shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	There are no CNDDB records within 5 miles of the site.	No Suitable Habitat Present	Unlikely to occur
Circus cyaneus	northern harrier	None/CSC	Meadows, grasslands, open rangelands, desert sinks, fresh and saltwater emergent wetlands; seldom found in wooded areas.	There are no CNDDB records within 5 miles of the site.	Suitable Breeding Habitat Present	Present on site
Dendroica petechia brewsteri	yellow warbler	None/CSC	Riparian deciduous habitats in summer: cottonwoods, willows, alders, and other small trees and shrubs typical of low, open-canopy riparian woodland.	Dendroica petechia known to occur from previous studies.	Suitable Habitat Present	Present on site
Elanus leucurus	white-tailed kite	None/CFPS	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodlands.	Known to occur from previous studies.	Suitable Habitat Present	Present on site
Falco peregrinus anatum	American peregrine falcon	None/ SE	Open country, cliffs, cities and man-made structures. Near wetlands, lakes and other waters.	There is one CNDDB record however, because the sensitivity of the species, location is not disclosed.	Suitable Habitat Present	Present on site
Geothlypis trichus sinuosa	San Francisco common yellowthroat	None/CSC	Resident of salt, brackish, and fresh marshes around the San Francisco Bay area.	There is one CNDDB record within 5 miles of the site. Known to occur from previous studies (Tidal area).	No Suitable Breeding Habitat Present	Present on site
Haliaeetus leucocephalus	bald eagle	None/SE	Requires large bodies of water, or free flowing rivers with abundant fish, and adjacent snags or other perches. Nests in large, old-growth, or dominant live tree with open branchwork, especially ponderosa pine.	There are no CNDDB records within 5 miles of the site. Known to occur from previous studies.	No Suitable Breeding Habitat Present	May potentially occur
Lanius ludovicianus	Loggerhead shrike	None/CSC	Broken woodlands, savannah, Pinyon-Juniper, riparian woodlands, desert oases, scrubs and washes.	Known to occur from previous studies.	Suitable Habitat Present	Present on site
Laterallus jamaicensis coturniculus	California black rail	None/ ST	Inhabits freshwater marshes, shallow margins of saltwater marshes bordering large bays and wet meadows. Needs dense vegetation for nesting habitat.	There are no CNDDB records within 5 miles of the site. Known to occur from previous studies.	No Suitable Breeding Habitat Present	Unlikely to occur

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Scientific Name	Common Name	Federal/State Status	Habitat Description	Documentation of Species within the CNWS Site	Suitable Habitat Present Within the Potential Impact Area	Potential for Species to Occur in Potential Impact Area
Melospiza melodia maxillaris	Suisun song sparrow	None/CSC	Inhabits brackish waters of Suisun Bay. Inhabits cattails, tule and other sedges.	There are two CNDDB records within 5 miles of the site. Known to occur from previous studies (Tidal area). No Suitable Habitat Present (Inland area)	No Suitable Habitat Present	Unlikely to occur
Melospiza melodia pusillula	Alameda song sparrow	None/CSC	Resident of salt marshes along south shores of the San Francisco Bay.	There are no CNDDB records within 5 miles of the site.	No Suitable Habitat Present. Out of range.	Unlikely to occur
Melospiza melodia samuelis	San Pablo song sparrow	None/CSC	Resident of salt marshes along north shores of the San Francisco and San Pablo Bays. Inhabits tidal sloughs in salicornia marshes; nests in grindelia bordering sloughs.	There are no CNDDB records within 5 miles of the site.	No Suitable Habitat Present	Unlikely to occur
Pelecanus erythrorhynchos	American white pelican	None/CSC	Feeds in water of various depths, from August to December common on salt ponds of San Francisco Bay. Wintering, but not breeding, range includes the site.	Known to occur from previous studies (Tidal area).	No Suitable Habitat	Unlikely to occur
Rallus longirostris obsoletus	California clapper rail	FE/SE	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.	There are no CNDDB records within 5 miles of the site. Known to occur from previous studies (Tidal area).	No Suitable Habitat Present	Unlikely to occur
Sternula antillarum browni	California least tern	FE/SE	Nests along the California coast from San Francisco Bay South down to Northern Baja California. Colonial breeder on bare or sparsely vegetated flat substrates, alkali flats, and sand beaches.	There are no CNDDB records within 5 miles of the site.	No Suitable Habitat Present	Unlikely to occur
Vireo bellii pusillus	least Bell's vireo	FE/SE	Low riparian areas in vicinity of water or in dry river bottoms, preferential to willow and baccharis microhabitats.	There are no CNDDB records within 5 miles of the site.	Out of historic and current range	Unlikely to occur
Mammals						
Antrozous pallidus	pallid bat	None/CSC	Deserts, grasslands, shrub-lands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting.	Bat species known to occur on CNWS, species not identified. There is a CNDDB record within 1 miles of the site.	Suitable Habitat Present	May potentially occur
Corynorhinus townsendii	townsend's big-ear bat	None/CSC	A variety of mesic habitats throughout California.	There are no CNDDB records within 5 miles of the site. See above.	Suitable Habitat Present	May potentially occur
Dipodomis heermanii berkeleyensis	Berkeley kangaroo rat	None	Open grassy hilltops and open spaces in blue oak and gray pine woodlands and chaparral. Needs well-drained soil for burrowing.	There are no CNDDB records within 5 miles of the site. Previously thought to be extinct. Recently discovered in East Bay Regional Park	Suitable Habitat Present	Unlikely to occur
Microtus californicus sanpabloensis	San Pablo vole	None	Salt marshes of San Pablo creek and south shore of San Pablo Bay. Constructs burrows in soft soils, feeds on grasses sedges and herbs.	There are no CNDDB records within 5 miles of the site.	No Suitable Habitat Present	Unlikely to occur
Perognathus inornatus inornatus	San Joaquin pocket mouse	None	Typically found in grasslands and blue oak savannas.	There are multiple CNDDB records within 5 miles of the site.	Suitable Habitat Present	Unlikely to occur
Puma (=Felis) concolor	mountain lion	None – specially protected species under Prop 117	Generally speaking, mountain lions can be found wherever deer are present, since deer are a mountain lion's main food source. Foothills and mountains and most suitable mountain lion habitat, while valleys and deserts are considered unsuitable.	Mountain Lions are unknown at the Site.	Out of Range	Unlikely to occur
Reithrodontomys raviventris	salt marsh harvest mouse	FE/SE	Found only in the saline emergent wetlands of San Francisco Bay and its tributaries. Pickleweed is primary habitat. They do not burrow, but build loosely organized nests. Require higher areas for flood escape.	There are no CNDDB records within 5 miles of the site. Known to occur outside the site from previous studies (Tidal area).	No Suitable Habitat Present	Unlikely to occur
Scapanus latimanus parvus	Alameda island mole	None/CSC	Only known from Alameda Island, found in a variety of habitats especially annual and perennial grasslands.	There are no CNDDB records within 5 miles of the site. Out of Range	Out of range	Unlikely to occur
Sorex ornatus sinuosus	ornate shrew	None/CSC	Tidal marshes of the northern shores of San Pablo and Suisun Bay. Require dense low-lying cover and driftweed for nests.	There are no CNDDB records within 5 miles of the site.	No Suitable Habitat Present	Unlikely to occur
Taxidea taxus	American badger	None/CSC	Most abundant in drier stages of most shrub, forest, and herbaceous habitats with friable soils	There are CNDDB records within 5 miles of the site. Known to occur from previous studies.	Suitable Habitat Present	Present on site
Vulpes macrotis mutica	San Joaquin kit fox	FE/SE	Annual grassland or grassy open stages with scattered shrubs Need loose-textured, sandy soils for burrowing and appropriate prey base.	There are CNDDB records within 5 miles of the site.	Suitable Habitat Present	Unlikely to occur

TABLE 8A-2

Special-Status Plant Species Considered for Potential Occurrenceon the CCRP Site

Scientific Name	Common Name	Federal/State Status	Habitat Description	Documentation of Species within the CNWS Site	Suitable Habitat Present Within the Potential Impact Area	Potential for Species to Occur in Potential Impact Area
Amsinckia grandiflora	large-flowered fiddleneck	FE/SE/1B.1	Cismontane woodland, valley and foothill grassland from 270-550m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Not observed during 2008 surveys.
Amsinckia lunaris	bent-flowered fiddleneck	None/None/1B.2	Cismontane woodland, valley and foothill grassland from 50-500m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.
Anomobryum julaceum	slender silver moss	None/None/2.2	Broad-leaf upland forest, lower montane coniferous forest, closed-cone coniferous forest from 100-1000m.	There are no CNDDB records within 5 miles of the site.	No Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.
Arctostaphylos auriculata	Mt. Diablo manzanita	None/None/1B.3	Chaparral (sandstone) from 135-650m.	There are no CNDDB records within 5 miles of the site.	No Suitable Habitat Present	Not observed during 2008 surveys.
Arctostaphylos manzanita ssp. *laevigata*	Contra Costa manzanita	None/None/1B.2	Chaparral (rocky) from 500-1100m.	There are no CNDDB records within 5 miles of the site.	No Suitable Habitat Present	Not observed during 2008 surveys.
Arctostaphylos pallida	pallid manzanita	FT/SE/1B.1	Broad-leaf upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub from 186-485m. May require fire.	There are no CNDDB records within 5 miles of the site.	No Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.
Astragalus tener var. *tener*	alkali milk-vetch	None/None/1B.2	Alkali playa, vernal pools, valley and foothill grassland from 1-170m.	There are no CNDDB records within 5 miles of the site. Non- confirmed CNPS occurrence in the quad.	No Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.
Atriplex cordulata	heartscale	None/None/1B.2	Chenopod scrub, valley and foothill grassland, and alkali meadow from 1-375m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Not observed during 2008 surveys.
Atriplex depressa	brittlescale	None/None/1B.2	Valley and foothill grassland, vernal pools, meadows and seeps 1-320m)	There are no CNDDB records within 5 miles of the site. Non- confirmed CNPS occurrences	Suitable Habitat Present	Not observed during 2008 surveys.
Atriplex joaquiniana	San Joaquin spearscale	None/None/1B.2	Chenopod scrub, valley and foothill grassland, and alkali meadow from 1-835m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Not observed during 2008 surveys.
Balsamohiza macrolepis var. *macrolepis*	big-scale balsamroot	None/None/1B.2	Chaparral, cismontane woodland, valley and foothill grassland/sometimes serpentinite from 90-1400m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Not observed during 2008 surveys.
Blepharizonia plumosa	big tarplant	None/None/1B.1	Valley and foothill grassland 30-505m.	There is one CNDDB record within 5 miles of the site; record is from 1937.	Suitable Habitat Present	May potentially occur
California macrophylla (=*Erodium macrophylla*)	round-leaved filaree	None/None/1B.1	Cismontane woodland, valley and foothill grassland from 15-1200m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	May potentially occur; last record is from 1862
Calochortus pulchellus	Mt. Diablo fairy lantern	None/None/1B.2	Chaparral, cismontane woodland, riparian woodland, valley and foothill grassland from 30-840m.	There is one CNDDB record within 5 miles of the site.	Suitable Habitat Present	Not observed during 2008 surveys.
Calystegia atriplicifolia ssp. *buttensis*	Butte County morning glory	None/None/1B.2	Coastal scrub and dunes from 15-105m.	There are no CNDDB records within 5 miles of the site. Non- confirmed CNPS occurrence in the quad.	No Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.
Campanula exigua	chaparral harebell	None/None/1B.2	Chaparral (rocky) from 275-1250m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Not observed during 2008 surveys.
Centromadia parryi ssp. *congdonii*	Congdon's tarplant	None/None/1B.2	Valley and foothill grassland on alkaline soils, from 1-250m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Not observed during 2008 surveys.
Chorizanthe robusta var. robusta	robust spineflower	FE/1B.1	Chaparral (maritime), cismontane woodland (openings), coastal dunes, coastal scrub from 3-300m.	There are no CNDDB records within 5 miles of the site. Non- confirmed CNPS occurrence in the quad.	No Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.
Cirsium andrewsii	Franciscan thistle	None/ None/1B.2	Coastal bluff scrub and broad-leaved forest from 0-135m.	There are no CNDDB records within 5 miles of the site.	No Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.
Clarkia franciscana	Presidio clarkia	FE/SE/1B.1	Coastal scrub, valley and foothill grassland from 25-335m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	May potentially occur. Not observed during 2008 surveys.
Cordylanthus maritimus ssp. *palustris*	Point Reye's birds-beak	None/None/1B.2	Coastal salt marshes and swamps from 0-10m.	There are no CNDDB records within 5 miles of the site. Unconfirmed CNPS occurrence in the quad.	No Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.
Cordylanthus mollis ssp. *mollis*	soft birds-beak	FE/Rare/1B.2	Coastal salt marsh, from 1-10m.	There is one CNDDB record within 5 miles of the site. Known to occur from previous studies (Tidal area).	No Suitable Habitat Present.	Unlikely to occur. Not observed during 2008 surveys.

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Cordylanthus nidularius	Mt. Diablo bird's-beak	None/Rare/1B.1	Chaparral from 600-800m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present.	Not observed during 2008 surveys.
Dirca occidentalis	western leatherwood	None/None/1B.2	Broad-leafed upland forest, chaparral, close-cone coniferous forest, north coast coniferous forest, cismontane woodland, riparian forest, and riparian woodland from 30-550m.	There is one CNDDB record within 5 miles of the site.	No Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.
Delphinium californicum ssp. *interius*	Hospital Canyon larkspur	None/None/1B.2	Chaparral (openings) and cismontane woodland on mesic soils from 230-1095m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present.	Not observed during 2008 surveys.
Delphinium recurvatum	Recurved larkspur	None/None/1B.2	Subalkaline soils in annual grassland, saltbush scrub, oak woodland, vernal pools 3-750m.	There are no CNDDB records within 5 miles of the site. Unconfirmed CNPS occurrence in the quad.	Suitable Habitat Present.	Not observed during 2008 surveys.
Didymodon norrisii	Norris' beard-moss	None/None/2.2	Cismontane woodland, lower montane coniferous forest on intermittently mesic, rock from 600-1700m.	There are no CNDDB records within 5 miles of the site.	No Suitable Habitat Present.	Unlikely to occur. Not observed during 2008 surveys.
Eriastrum sp. nov	Lime Ridge wooly star	None/None/None	Chaparral (sandy edges); 200-300m.	Newly described species from Lime Ridge.	No Suitable Habitat Present.	Unlikely to occur. Not observed during 2008 surveys.
Eriastrum brandegeeae	Brandegee's eriastrum	None/None/1B.2	Chaparral and cismontane woodland; found on volcanic, sandy soils from 305-1030m.	There are no CNDDB records within 5 miles of the site. Unconfirmed CNPS occurrence in the quad.	Suitable Habitat Present.	Not observed during 2008 surveys.
Eriogonum luteolum var. *caninum*	Tiburon buckwheat	None/None/1B.2	Chaparral, coastal prairie, valley and foothill grassland from 10500m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Not observed during 2008 surveys.
Eriogonum truncatum	Mt. Diablo buckwheat	None/None/1B.1	Dry chaparral, coastal scrub, valley and foothill grassland from 100-600m.	There are no CNDDB records within 5 miles of the site. Unconfirmed CNPS occurrence in the quad.	Suitable Habitat Present.	Not observed during 2008 surveys.
Eryngium racemosum	Delta-button celery	None/SE/1B.1	Riparian scrub 3-30m.	There are no CNDDB records within 5 miles of the site. Unconfirmed CNPS occurrences in the quad.	Suitable Habitat Present.	Not observed during 2008 surveys.
Eschscholzia rhombipetala	Diamond-petaled California poppy	None/None/1B.1	Grassland, chenopod scrub, on clay soils where grass cover is sparse 0-975m.	There are no CNDDB records within 5 miles of the site. Unconfirmed CNPS occurrence in the quad.	Suitable Habitat Possibly Present.	Not observed during 2008 surveys.
Fritillaria liliacea	fragrant fritillary	None/None/1B.2	Valley foothill grassland, coastal scrub, and coastal prairie from 3-410m.	There is one CNDDB record within 5 miles of the site.	Suitable Habitat Present.	Not observed during 2008 surveys.
Helianthella castanea	Diablo's helianthella	None/None/1B.2	Broad-leaved upland forest, cismontane woodland, chaparral, coastal scrub, valley and foothill grassland from 25-1150m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present.	Not observed during 2008 surveys.
Hoita strombilina	Loma Prieta hoita	None/None/1B.1	Chaparral, cismontane woodland, riparian woodland, serpentine and mesic soils 30-860m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present.	Not observed during 2008 surveys.
Hesperolinon breweri	Brewer's western flax	None/None/1 B.2	Chaparral, cismontane woodland, valley and foothill grassland on usually serpentinite from 30-900m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present.	Not observed during 2008 surveys.
Holocarpha macradenia	Santa Cruz tarplant; Critical Habitat	FT/SE/ 1B. 1	Coastal prairie, valley and foothill grassland from 10-260m.	There is one CNDDB record within 5 miles of the site.	Suitable Habitat Present.	May potentially occur
Horkelia cuneata ssp. *sericea*	Kellogg's horkelia	None/None/1 B.1	Closed-cone coniferous forest, chaparral (maritime), coastal dunes, coastal scrub on sandy or gravelly soil from 10-200m.	There are no CNDDB records within 5 miles of the site. Unconfirmed CNPS occurrence in the quad.	No Suitable Habitat Present.	Unlikely to occur. Not observed during 2008 surveys.
Isocoma arguta	Carquinez goldenbush	None/None/1 B.1	Chaparral, vertical banks and cliffs 1-20m.	There are no CNDDB records within 5 miles of the site. Unconfirmed CNPS occurrence in the quad.	Suitable Habitat Present.	Unlikely to occur. Not observed during 2008 surveys.
Juglans hindsii	Northern California black walnut	None/None/1 B.1	Riparian forest and riparian woodland from 0-440m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present.	Not observed during 2008 surveys.
Lasthenia conjugens	Contra Costa goldfields; Critical Habitat	FE/None/1B.1	Valley foothill grassland, vernal pools, swales, low depressions, cismontane woodland, and in open grassy areas from 1-445m.	There are no CNDDB records within 5 miles of the site.	No Suitable Habitat Present.	Not observed during 2008 surveys.
Lathyrus jepsonii var. *jepsonii*	Delta tule pea	None/None/1B.2	Freshwater and brackish marshes often found with cattails 0-4m.	There are two CNDDB records within 5 miles of the site. Known to occur from previous studies (tidal area).	No Suitable Habitat Present.	Unlikely to occur. Not observed during 2008 surveys.
Lilaeopsis masonii	Mason's lilaeopsis	None/Rare/1B.1	Freshwater and brackish marshes, riparian scrub from 0-10m.	There is one CNDDB record within 5 miles of the site.	No Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.

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Special-Status Plant Species Considered for Potential Occurrenceon the CCRP Site

Scientific Name	Common Name	Federal/State Status	Habitat Description	Documentation of Species within the CNWS Site	Suitable Habitat Present Within the Potential Impact Area	Potential for Species to Occur in Potential Impact Area
Limosella subulata	Delta mudwort	None/None/2.1	Marshes and swamps from 0-3m.	There are no CNDDB records within 5 miles of the site	Suitable Habitat Present	Not observed during 2008 surveys.
Madia radiata	Showy madia	None/None/1B.1	Valley and foothill grassland, oak woodland 25-900m.	There are no CNDDB records within 5 miles of the site. Non- confirmed CNPS occurrences in the quad.	Suitable Habitat Present	Not observed during 2008 surveys.
Meconella oregana	Oregon meconella	None/None/1B.1	Coastal prairie and scrub in moist places from 250-500m.	There are no CNDDB records within 5 miles of the site.	No Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.
Malacothamnus hallii	Hall's bush mallow	None/None/1B.2	Chaparral, some populations on serpentine from 10-550m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.
Micropus amphibolus	Mt. Diablo cottonweed	None/None/3.2	Broadleafed upland forest, chaparral, cismontane woodland, valley and foothill grassland from 45-825m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Not observed during 2008 surveys.
Monardella antonina ssp. *antonina*	San Antonio Hills monardella	None/None/3	Chaparral and cismontane woodland from 500-1000m.	There are no CNDDB records within 5 miles of the site.	No Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.
Monardella villosa ssp. *globosa*	robust monardella	None/None/1 B.2	Broad-leafed upland forest, chaparral, cismontane woodland, valley and foothill grassland from 30-300m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Not observed during 2008 surveys.
Navarretia gowenii	Lime Ridge navarretia	None/None/1B.1	Chaparral from 200-350m.	Newly described species from Lime Ridge.	No Suitable Habitat Present.	Not observed during 2008 surveys.
Navarretia nigelliformis ssp. *nigelliformis*	Adobe navarretia	None/None/4.2	Valley and foothill grasslands and vernal pools 100-1000m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Not observed during 2008 surveys.
Oenothera deltoides ssp. *howellii*	Atioch Dunes evening- primrose	FE/SE/1B.1	Inland dunes from 0-30m.	There are no CNDDB records within 5 miles of the site.	No Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.
Phacelia phacelioides	Mt. Diablo phacelia	None/None/1B.2	Chaparral and cismontane woodland on rocky soils from 500-1370m.	There are no CNDDB records within 5 miles of the site	Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.
Plagiobothyrs hystriculus	Bearded popcorn-flower	None/None/1B.1	Valley and foothill grassland (mesic), vernal pool margins, often vernal swales. 0-60m.	Rediscovered in 2005, known only from Montezuma Hills (across Suisun Bay).	Suitable Habitat Present.	Not observed during 2008 surveys.
Plagiobothrys diffusus	San Francisco popcorn-flower	None/SE/1B.1	Coastal prairie, valley and foothill grassland from 60-360m.	There are no CNDDB records within 5 miles of the site	Suitable Habitat Present	Not observed during 2008 surveys.
Potamogeton filiformis	slender-leaved pondweed	None/None/2.2	Marshes and swamps (assorted shallow freshwater) from 300-1250m.	There are no CNDDB records within 5 miles of the site	No Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.
Sanicula maritima	adobe sanicle	None/Rare/1B.1	Chaparral, coastal prairie, meadows and seeps, valley and foothill grassland on clay soils and serpentinite from 30-240m.	There are no CNDDB records within 5 miles of the site	Suitable Habitat Present	Not observed during 2008 surveys.
Sanicula saxatilis	rock sanicle	None/Rare/1B.2	Broadleafed upland forest, chaparral, valley and foothill grassland on rocky soils from 620-1175m.	There are no CNDDB records within 5 miles of the site	Suitable Habitat Present	Not observed during 2008 surveys.
Senecio aphanactis	rayless ragwort	None/None/2.2	Cismontane woodland, coastal scrub, and dry alkali flats from 20-575m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.
Streptanthus albidus ssp. *peramoenus*	Most beautiful jewel-flower	None/None/1B.2	Chaparral, cismontane woodland, valley and foothill grassland from 110-1000m.	There are no CNDDB records within 5 miles of the site.	No Suitable Habitat Present	Not observed during 2008 surveys.
Streptanthus hispidus	Mt. Diablo jewel-flower	None/None/1B.3	Valley and foothill grassland 365-1200m.	There are no CNDDB records within 5 miles of the site	Suitable Habitat Present	Not observed during 2008 surveys.
Symphyotrichum lentus (= *Aster lentus*)	Suisun marsh aster	None/None/1B.2	Marshes and swamps (freshwater and brackish) 0-3m.	There are no CNDDB records within 5 miles of the site. Known from previous studies (Tidal area).	No Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.
Triquetrella californica	coastal triquetrella	None/None/1B. 2	Coastal scrub and bluff 10-100m.	There are no CNDDB records within 5 miles of the site	No Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.
Trifolium depauperatum var. *hydrophilum*	saline clover	None/None/1B. 2	Valley and foothill grasslands, vernal pools, marshes and swamps 0-300m.	There are no CNDDB records within 5 miles of the site	Suitable Habitat Present	Not observed during 2008 surveys.

TABLE 8A-2

Special-Status Plant Species Considered for Potential Occurrenceon the CCRP Site

Scientific Name	Common Name	Federal/State Status	Habitat Description	Documentation of Species within the CNWS Site	Suitable Habitat Present Within the Potential Impact Area	Potential for Species to Occur in Potential Impact Area
Tropidocarpum capparideum	caper-fruited tropidocarpum	None/None/1B. 1	Dunes 1-455m.	There are no CNDDB records within 5 miles of the site. Unconfirmed CNPS occurrence in the quad.	No Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.
Viburnum ellipticum	oval-leaved viburnum	None/None/2.3	Chaparral, cismontane woodland, lower montane coniferous forest 215-1400m.	There are no CNDDB records within 5 miles of the site.	Suitable Habitat Present	Unlikely to occur. Not observed during 2008 surveys.

Notes:
Table compiles data on special-status plant species potentially occurring within Walnut Creek and Surrounding Eight Quadrangles.

Status Codes:

Federal Status
FE – Federally listed as endangered
FT – Federally listed as threatened

State Status
SE – State listed as endangered
ST – State listed as threatened
SCE – State candidate endangered
CSC – State Species of Special Concern

California Native Plant Society (CNPS) Status Codes
1A – Plants presumed extinct in California
1B – Plants rare, threatened, or endangered in California, but more common elsewhere
2 – Plants rare, threatened, or endangered in California, but more common elsewhere
3 – Plants about which we need more information – a review list
4 – Plants of limited distribution – a watch list

Sources:

California Natural Diversity Database. 2009. Rarefind 3.1.0. California Department of Fish and Game. Sacramento, California
California Native Plant Society (CNPS). 2009. Inventory of Rare and Endangered Plants of California. Online edition, v7-09b. California Native Plant Society. Quads searched: Vine Hill, Honker Bay, Walnut Creek, Clayton, Benicia, Briones Valley, Oakland East, Las Trampas Ridge, Diablo, Tassajara, Antioch South, and Antioch North. Available at: http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi
Contra Costa County. 2006. Final East Contra Costa County Habitat Conservation Plan and Natural Community Conservation Plan. Chapter 3: Physical and Biological Resources. October.
U. S. Fish and Wildlife Service. On-line species list. Sacramento Fish and Wildlife Office. Quads searched: Vine Hill, Honker Bay, Walnut Creek, Clayton, Benicia, Briones Valley, Oakland East, Las Trampas Ridge, Diablo, Tassajara, Antioch South, and Antioch North. Available at: http://www.fws.gov/sacramento/es/spp_list.htm

Appendix 9A

Final Report for Concord Inland BRAC Disposal Archeological Survey, Naval Weapons Stations, Seal Beach, Detachment Concord, Contra Costa County California

FINAL REPORT

for

CONCORD INLAND BRAC DISPOSAL ARCHAEOLOGICAL SURVEY, NAVAL WEAPONS STATION, SEAL BEACH, DETACHMENT CONCORD, CONTRA COSTA COUNTY, CALIFORNIA

Contract No. N68711-04-D-3620
Task Order 0015

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USGS 7.5-minute Quadrangles: Clayton, Honker Bay, Vine Hill, Walnut Creek

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ABSTRACT

A baseline archaeological inventory was conducted in support of the Concord Inland Base Realignment and Closure (BRAC) Survey Project (Project) at Naval Weapons Station Seal Beach Detachment Concord (NWSSB DET Concord, or the "base"), located in Contra Costa County, California. The survey was conducted by ASM Affiliates, Inc., in compliance with Section 106 of the National Historic Preservation Act. This inventory included a records search and pedestrian survey. Of the 5,197, acres included in the project area, approximately 4,158 acres (about 80 percent) were intensively surveyed and approximately 1,039 acres (about 20 percent) situated within steeply sloped (>30 percent) upland regions were subjected to a mixed strategy survey focusing on ridges, mid-slope terraces, and along watercourses. The goals of the survey were to document all previously unrecorded historic and prehistoric archaeological sites and artifacts and to revisit previously recorded archaeological sites.

The pedestrian survey resulted in the relocation of five previously recorded sites (three historic, two prehistoric), and the discovery of 17 previously unrecorded archaeological sites (16 historic, one prehistoric). Four isolated artifacts were also found. While this survey was not intended to provide formal significance evaluations, preliminary significance assessments for listing on the National Register of Historic Places (NRHP) are provided, along with management recommendations for the sites. Four archaeological sites (two historic, two prehistoric) located within the project area are considered potentially eligible for the NRHP based on unique characteristics, integrity, or the presence of materials that can contribute to the understanding of the regional culture history. Seven other sites (six historic, one prehistoric), require further research and have an indeterminate eligibility recommendation. All other archaeological resources documented during this survey (n = 11, all historic), are not considered eligible for NRHP listing due to lack of integrity, uniqueness, or other defining elements.

1. INTRODUCTION

This report documents an archaeological investigation of 5,197.09 acres of the Concord Inland Base Realignment and Closure (BRAC) Survey Project (Project) at Naval Weapons Station Seal Beach Detachment Concord (NWSSB DET Concord, or the "base"), located in Contra Costa County, California (Figures 1.1 and 1.2). The base spans several USGS 7.5-minute topographic maps including: Clayton, Honker Bay, Vine Hill, and Walnut Creek.

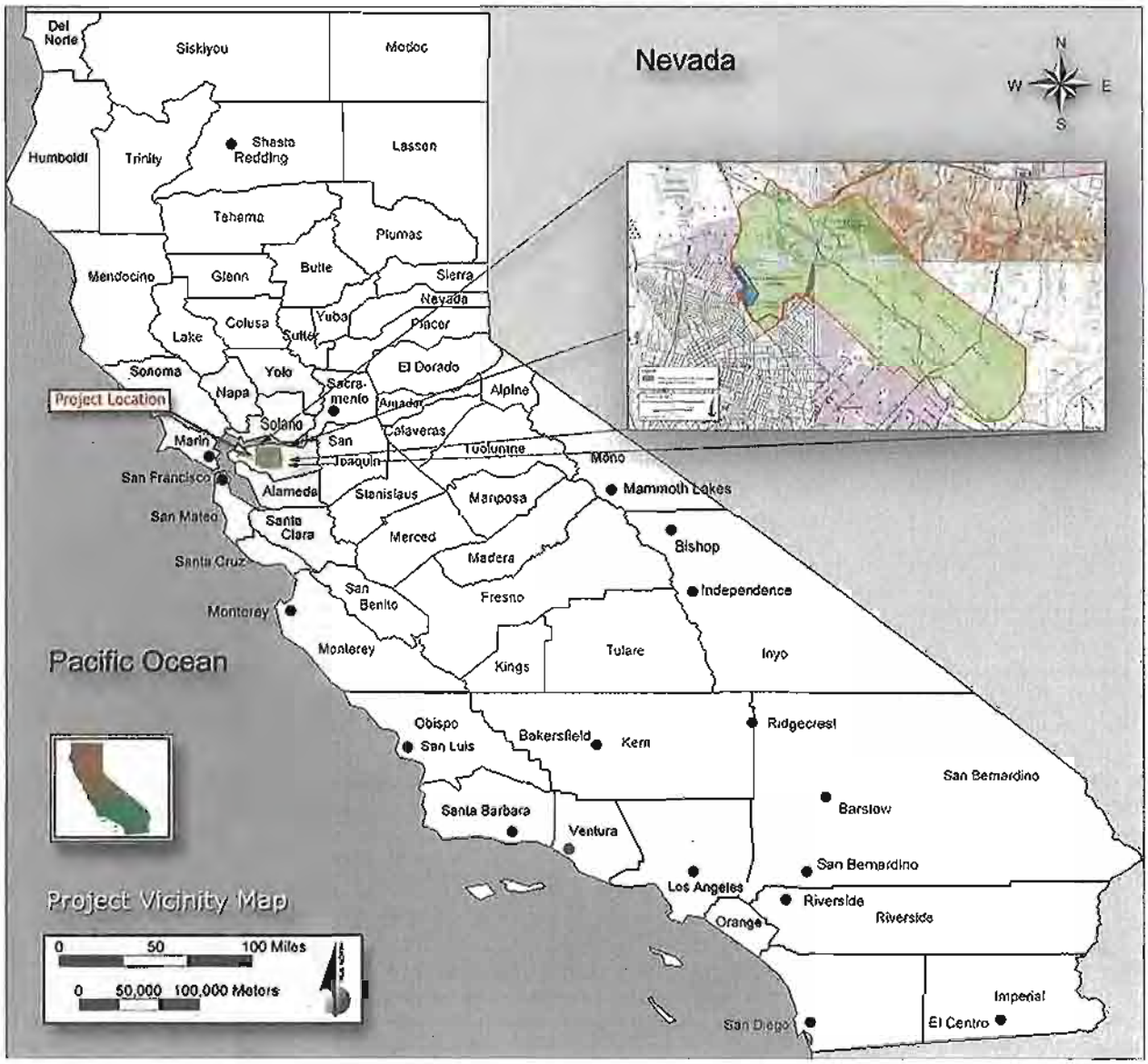

Figure 1.1 Project vicinity map.

Figure 1.2 Project location map.

PROJECT DESCRIPTION AND REGULATORY CONTEXT

This survey was conducted by ASM Affiliates, Inc. (ASM) as part of Contract No. N68711-04-D-3620, Task Order 0015, for Naval Facilities Engineering Command Southwest (NAVFAC SW) on behalf of BRAC PMO west. The Navy plans to transfer approximately 5,032 acres of property at NWSSB DET Concord from federal ownership. This parcel was deactivated in 1999 and declared surplus property by the Navy in March 2007. The Inland Area of the base is being closed in accordance with the enacted 2005 BRAC recommendations and primarily comprises of the disposal and reuse of the property. The undertaking could also include layaway, caretaker maintenance and potential interim leases.

This undertaking and its effects are being considered under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and implementing regulations 36 CFR 800. The City of Concord, within which the parcel is entirely located, is preparing a redevelopment plan and an associated Environmental Impact Report (EIR) in accordance with the California Environmental Quality Act (CEQA) to analyze the potential environmental impacts of alternative development plans. The Navy is preparing an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA) to be completed after the City of Concord completes its EIR.

This archaeological survey is being conducted to satisfy federal and state regulations governing archaeological resources. The results of this survey, as presented in this report, will be incorporated into the City of Concord's EIR and the Navy's EIS and will facilitate future management plans concerning cultural resources and potential development alternatives. In conjunction with the archaeological survey, the Navy initiated Section 106 consultation with federally recognized Native American tribes affiliated with the region and with potential interested parties (i.e. Concord Historical Society).

The project area includes approximately 5,197.09 acres of which 4157.67 acres (approximately 80 percent) were intensively surveyed. Approximately 1,039.42 acres (or 20 percent of the project area) are located within steeply sloped (>30 percent) upland regions and were subjected to a mixed strategy survey focusing on ridges, mid-slope terraces, and along watercourses. Within the intensively surveyed area, ASM used systematic vegetation clearance to improve ground visibility and overall pedestrian survey effectiveness. No artifacts were collected, although diagnostic artifacts were documented in the field. Hazardous materials areas (Installation Restoration [IR] and Military Munitions Response Program [MMRP] areas) were surveyed by qualified archaeological personnel and no vegetation clearance was conducted in these areas.

PROJECT PERSONNEL

The following persons were instrumental in conducting the investigations and producing the project final report:

Susan M. Hector, ASM Senior Archaeologist (Ph.D., University of California, Los Angeles; meets the Secretary of the Interior's Professional Qualifications Standards for Archaeology [36 CFR 61]), served as the project manager.

Arleen Garcia-Herbst, ASM Senior Archaeologist (M.A., University of California, Santa Barbara; meets the Secretary of the Interior's Professional Qualifications Standards for Archaeology [36 CFR 61]), served as the principal investigator.

Micah J. Hale, ASM Senior Archaeologist (M.A., California State University, Sacramento; meets the Secretary of the Interior's Professional Qualifications Standards for Archaeology [36 CFR 61]), served as the field director.

Sarah Stringer-Bowsher, ASM Historian (M.A., Arizona State University, Tempe) conducted archival research for historic resources documented during fieldwork.

REPORT ORGANIZATION

This report is divided into six chapters. Following this introduction, Chapter 2 provides a project setting reviewing the natural environment, cultural chronology, and a brief history of historic and military occupation. Chapter 3 describes field methods used during the pedestrian survey. Chapter 4 summarizes the pedestrian survey results, including fieldwork conditions, cultural resources found during the survey, and field descriptions of the various hazardous materials survey areas. Management considerations for the archaeological sites documented during the survey are provided in Chapter 5 and a report summary is given in Chapter 6. Relevant appendices include State Historic Preservation Office (SHPO) and Native American Heritage Commission (NAHC) correspondence (Appendix A), resumes of key personnel (Appendix B), surface and subsurface archaeological potential maps (Appendix C-1 and C-2), records search results (Appendix D), and site forms (Appendix E).

2. PROJECT SETTING

An Integrated Cultural Resources Management Plan (ICRMP) was developed for NWSSB DET Concord (Engineering Field Activity 2002). The ICRMP details the history of archaeological research, cultural chronology, major research issues, current survey status and areas with the potential for surface and buried cultural resources in and around NWSSB DET Concord. The following discussion of the cultural chronology is taken directly from the ICRMP. Archaeological investigations on and around NWSSB DET Concord indicate that there was a diverse range of human occupation extending over the past 10,000 years, until the time of European contact.

Tierra Data, Inc., prepared a wetlands delineation and aquatic habitat report specifically for NWSSB DET Concord. The reader is referred to the report by Tierra Data, Inc. (Kellogg 2007) for a more detailed description of the local natural environment, including maps of vegetation communities, soils, and hydrology.

NATURAL SETTING

The local environment at NWSSB DET Concord is characterized by a Mediterranean climate with warm, dry summers and cool, wet winters. Annual temperatures are generally moderate, with an average range of 41 to 67 ^{0}F, and precipitation averages 17.7 inches (Kellogg 2007), with January typically having the most precipitation (about 4 inches). The local climate is primarily influenced by winter storms generated in the north Pacific and strong northeasterly winds during the summer and fall. East Bay regions, including the base, tend to lack summer fog that characterizes areas located to the west near San Francisco. Tule fog typical of the Central Valley in California is kept away from the local region by prevailing winds. These conditions are responsible for a moderated climate and tend to produce very dry summers, though low lying areas can remain quite cool (Kellogg 2007).

The Inland Area of NWSSB DET Concord is characterized by the Mt. Diablo Creek drainage system encompassed in a south-north sloping valley. This valley is bordered on the east by hills that rise abruptly some 600 feet above sea level, reaching a maximum elevation of approximately 1,000 feet in the Inland Area, to the south. The geology of the Concord region is complex with many different types of clay and rock. On the base, the Great Valley Sequence composed of shale, siltstone, and sandstone from the Cretaceous Period, underlies most sediments (Graymer et al. 1996). The Great Valley Sequence is interspersed with exposed patches of chert and basalt from the Jurassic age Franciscan formation, and basalt and diabase from the Jurassic age Coast Range Ophiolite complex (Graymer et al. 1996). Chert and basalt from the Franciscan formation were commonly exploited by local Native American groups for tool manufacturing. Sediments that cap these formations comprise mixtures of clay and other Quaternary (Pleistocene) alluvial deposits (Graymer et al. 1996; ICRMP). Kellogg (2007:21) provides the following summary of valley floor sediments at NWSSB DET Concord:

About 22 percent of the Mt. Diablo Creek watershed consists of the valley between Clayton and Hastings Slough. The very deep Capay clay, Clear Lake clay, Omni silty clay loam, and Zamora silty clay loam cover the majority of these valleys, including NAVWPNSTA Seal Beach Detachment Concord. The soils are poorly to well-drained and are nearly level to moderately sloping. Permeability is moderately slow to slow, available water holding capacity is moderate to very high, and runoff is slow to very slow. The Clear Lake soils may flood frequently.

Vegetation and animal communities on the base are typical for the greater region. However, rare, threatened, and endangered plant and animal species are known to occur on base. Refer to Kellogg (2007), Tables 3-2 and 3-3, for exhaustive lists of these species. Generally, the hills and valleys in the region are defined by open grassland and oak savannah with riparian and marsh communities occurring along major watercourses. Kellogg (2007:25) cites the 2006 Integrated Natural Resource Management Plan (INRMP) summary of vegetation communities on the base by acreage with grasslands comprising approximately 87 percent of the total acreage; riparian communities amount to three percent and Valley Oak Woodland equal one percent. The distribution of these communities has been modified by Euro-American occupation. Agricultural development beginning in the early 1800's leveled much of the valley floor in the Inland Area undoubtedly disturbing the upper surface of native soils, cutting trees, and diverting water (see Chapter 3). Recently, a Tule Elk Reserve in the Tidal Area of NWSSB DET Concord was closed in 2006, although the marsh area is still frequented by numerous species of waterfowl. Animals in the Inland Area are generally small, given that the base is fenced along its perimeter. However, without the base enclosure, numerous animals were known historically in the area including deer, coyote, bobcat, and rodents, along with hawks, ravens, and other birds and several species of reptiles (see Kellogg 2007). Ranching on base has temporarily introduced cattle and horses for grazing in the Inland Area. Cattle cause a significant impact to the landscape in terms of soil disturbance, vegetation removal, and waste.

CULTURAL SETTING

Cultural Chronology

This section was taken from the NWSSB DET Concord ICRMP. The discussion focuses on cultural assemblages from a sequence of time periods in Contra Costa County. In accordance with recent findings by Meyer and Rosenthal (1997), the time periods were modified from those of Fredrickson (1974).

Lower Archaic (10,000 to 6000 B.P.)

The oldest archaeological component found so far in the bay-delta region derives from the Los Vaqueros Reservoir area in eastern Contra Costa County. Two cultural resources at the reservoir (CA-CCO-637 and CA-CCO-696) have recently produced artifact assemblages and human burials dating between 9,870 and 6,600 years before present (B.P.) (Meyer and

Rosenthal 1997, 1998). These cultural deposits were buried at depths between 2 and 4 m below the surface in alluvial fan/floodplain sediments located along Kellogg Creek.

The combined Lower Archaic assemblage at Los Vaqueros included hand stones and milling slabs, cobble-core tools, and a wide-stemmed obsidian projectile point. At least three human burials are known to date to this time period, one of which was buried under a stone cairn. Small but diverse floral and faunal assemblages indicate that a variety of animal and plant species were utilized. Large nuts, wild cucumber, and berries (manzanita) were the dominant plant resources. Overall, the Lower Archaic assemblage from Contra Costa County appears to have affinities with assemblages assigned to the Borax Lake Pattern in the North Coast Ranges and "Milling Stone Horizon" assemblages to the south.

Initial Middle Archaic (6000 to 4500 B.P.)

With the exception of isolated human burials (Henn et al. 1972), extensive early Middle Archaic deposits were not encountered in the bay-delta region until 1996 when Meyer and Rosenthal (1997, 1998) identified them during the Los Vaqueros Reservoir project. Cultural resource CA-CCO-637, located in a small valley, included deeply buried components found in an alluvial fan adjacent Kellogg Creek. The site was contained in a buried soil and included a diverse assortment of habitation debris, several human burials, and residential and resource processing features.

Several characteristics of this important deposit, including exclusive use of the mortar and pestle, suggest that this assemblage may be affiliated with the Berkeley Pattern, previously placed no further back in time than the Terminal Middle Archaic or Early period (Frederickson 1973). Among the distinctive artifacts associated with this component was one of the oldest dated shell bead lots in Central California (4160 B.P.) and a unique type of pestle apparently used with a wooden mortar (Meyer and Rosenthal 1997).

Terminal Middle Archaic (4500 to 2500 B.P.)

A number of buried cultural resources in Contra Costa and Solano counties date to the Terminal Middle Archaic period, including CA-CCO-637 and CA-CCO-696 at Los Vaqueros Reservoir (Meyer and Rosenthal 1997, 1998), CA-CCO-308 in the San Ramon Valley (Frederickson 1966), CA-SOL-315 (Wiberg 1992) and CA-SOL-391 (Wohlgemuth and Rosenthal 1999) in Green Valley, as well as CA-ALA-483 in the Pleasanton area of Livermore Valley (Wiberg 1996). A surface site dated to this period sits on a hillside overlooking San Pablo Bay (CA-CCO-474/H). Initial use of the shell mound cultural resources along San Francisco Bay also appears to have begun during the Terminal Middle Archaic (Banks and Orlins 1985; Broughton 1997; Lightfoot 1997). The Terminal Middle Archaic is equivalent to the Early period in Dating Scheme B, the earliest time period covered by that scheme.

All of the Terminal Middle Archaic cultural resources in Contra Costa County have produced human remains and most contain intact burials. A variety of artifacts are associated with this time period including side-notched and stemmed projectile points, rectangular abalone

ornaments, shaped and unshaped mortars and pestles, and rectangular *Olivella* shell beads (Frederickson 1966; Meyer and Rosenthal 1997). Of interest, the vibrant Windmiller Culture is well dated in the lower Sacramento Valley during this period, but no evidence of its distinctive mortuary pattern has been discovered in Contra Costa or Solano counties.

Obsidian from the North Coast Ranges and eastern Sierra was utilized (Jackson 1974; Meyer and Rosenthal 1997; Waechter 1992; Wiberg 1996); however, cryptocrystalline stone was used to make the majority of tools and formed the bulk of the manufacturing residue from these components (Frederickson 1969; Meyer and Rosenthal 1997). Nut and berry crops (i.e., acorn, manzanita, and pine nut) appear to be the primary plant resources targeted during this time period. Along the bayshore, marine shellfish species were an important subsistence resource (Banks and Orlins 1985; Waechter 1992), as were marine fishes and mammals (Broughton 1997; Simons 1992). Interior cultural resources include a similar assortment of faunal resources, although freshwater fish and shellfish species and terrestrial mammals were used exclusively.

Upper Archaic (2500 to 1300 B.P.)

Upper Archaic deposits are found throughout the lowland valleys and along the shores of San Francisco and Suisun bays. These cultural resources are typically found near freshwater streams and, with the exception of the shell mounds, most have been found in buried contexts (Banks and Orlins 1979, 1981, 1985; Cook and Elsasser 1956; Frederickson 1966, 1968; Hammel 1956; Heizer 1950; Holman and Clark 1982; Lightfoot 1997; Meyer and Rosenthal 1997; Waechter et al. 1995). The Upper Archaic is equivalent to the Early/Middle Transition and the Middle period in Dating Scheme B of Bennyhoff and Hughes (1987).

Upper Archaic cultural resources are typically composed of well-developed midden deposits containing hundreds of human burials and residential features, connoting long-term residential villages. The earliest Upper Archaic cultural resources contain classic Berkeley Pattern assemblages, characterized by a well-developed bone tool and ornament industry, numerous saucer and saddle-shaped *Olivella* shell beads, abalone ornaments and pendants, and unshaped and well-shaped mortars and pestles. Projectile points are typically shouldered lanceolate forms, although side-notched and stemmed points also occur, along with large lanceolate shaped bifaces. Burials are typically placed in a flexed position with strict orientation patterns identified at different cultural resources (cf. Fredrickson 1973). Chert appears to have remained the dominant tool stone in Contra Costa County, although obsidian from the North Coast Ranges and at least three different eastern Sierran sources was utilized during this time period.

Subsistence remains indicate that acorns and other large nuts and seeds were an important part of the diet, with a growing emphasis on small seeded resources (Meyer and Rosenthal 1997). Faunal assemblages reflect either marine or terrestrial taxa, depending on the location of the cultural resource (Broughton 1997; Frederickson 1966, 1968; Meyer and Rosenthal 1997). However, during the Upper Archaic, marine shellfish first occur in appreciable amounts in interior valley sites (Frederickson 1966, 1968).

Bennyhoff (1968; Bennyhoff and Hughes 1987) has suggested that beginning around 2500 B.P., a cultural group originating in the San Joaquin Delta began to intrude into Contra Costa County and other parts of the Bay Area. Bennyhoff (1968) referred to this culture as the Meganos Aspect of the Berkeley Pattern, and argued that the Meganos were a melding of bay and delta populations. He distinguished the Meganos culture by their distinctive mortuary complex that featured few to no burial accompaniments, and a nonstandardized mode of burial, including a mix of ventrally and dorsally extended and tightly flexed interments. As early as 1700 B.P., the Meganos culture appears to have reached Suisun Bay, incorporating a territory that included the modern locations of Walnut Creek, Concord, Pittsburgh, and Martinez, as well as the area of NWSSB DET Concord.

Emergent Period (1300 to 200 B.P.)

The Emergent period is equivalent to the Middle/Late Transition and the Late period in the Dating Scheme B chronology. As the Emergent period began, the Meganos culture appears to have retreated to the southern Delta region (Bennyhoff 1968). The distinctive cultural pattern of the Emergent period, the Augustine Pattern, is marked by the first appearance of small arrow-sized projectile points, beautifully trimmed show mortars, flanged pestles, flanged steatite pipes, and chevron-designed bird-bone tubes.

Emergent period deposits have been documented from most interior valleys and bayshore locations, as well as from upland contexts, where habitation and task-specific cultural resources have been reported (Atchley 1994; Baker 1987; Banks and Orlins 1979; Bramlette 1989; Frederickson 1966, 1968; Holson et al. 1993; Lillard et al. 1939; Meyer and Rosenthal 1997; Wills 1994). Buried cultural resources dating to the Emergent period have been found in some of the interior valleys (Frederickson 1966; Meyer and Rosenthal 1997; Wiberg 1996), although most of the recorded cultural resources have surface manifestations. Typically these cultural resources are well-developed midden deposits containing both cremated and intact human burials, and residential features, including house floors.

It was also during the Emergent period that bedrock mortar milling stations were first established in the Bay Area, beginning around 1,300 years ago (Meyer and Rosenthal 1997). Portable mortars and pestles continued to be used, although smaller specimens were preferred. Changes in the size of these tools may have been in response to the dramatic increase in the use of small-seeded plant resources (Meyer and Rosenthal 1997). *Olivella* and clam shell disc beads are frequently found with Emergent period burials and in midden deposits. Manufacturing debris has been found, suggesting that at least some of these beads were made on site (Meyer and Rosenthal 1997). Obsidian from the Napa Valley was used almost exclusively, arriving in the form of small, unmodified pebbles or large flake blanks that were later made into serrated arrow points (Meyer and Rosenthal 1997; Wiberg 1996).

Large mammals appear to have taken a more prominent role in the diet, as did small-seeded resources, as mentioned above. Marine shellfish and marine fishes were transported inland in much larger quantities during the Emergent period (Baker 1987; Frederickson 1968; Meyer and Rosenthal 1997). Large villages composed of hundreds of people are thought to have been

located in the Delta region (i.e., CA-CCO-138) while smaller hamlets composed of one or two extended families were located in some of the smaller valleys (i.e., CA-CCO-458).

Ethnographic Bay Miwok

At the time of European contact, NWSSB DET Concord was situated within the territory of the Chupcan, a group of 300 to 400 people who inhabited the lower Diablo Valley, including the present cities of Concord, Clayton, Pacheco, Walnut Creek, and perhaps eastward to Bay Point south (Milliken 1995, 1997). The Chupcan were one of several linguistically related groups known collectively as the Bay Miwok (Bennyhoff 1977; Levy 1978). Other Bay Miwok tribelets were the Saclan of Lafayette-Walnut Creek, the Tatcan of Danville, the Volvon of Marsh Creek, and the Julpun of Oakley-Brentwood. The Chupcan and their neighbors were tribelets; each local tribelet had 1 to 5 semi-permanent villages and numerous temporary camping spots within a fixed territory some 6 to 10 miles in diameter.

No Chupcan vocabulary was ever recorded, and the language is now long extinct. Only the Saclan, of the presumed Bay Miwok tribelets, ever provided a vocabulary for modern linguistic study, and that vocabulary consisted of only 60 words (Beeler 1955). Callahan (1971) shows that the Saclan vocabulary is more similar to Plains Miwok (of the Lodi-Walnut Grove area to the east) than to any other language. The Chupcan and other tribelets mentioned above are brought together with the Saclan under the heading Bay Miwok only because of the similarity of their personal names as recorded in Catholic mission baptismal records (Bennyhoff 1977:40; Milliken 1997:30).

Although Levy (1978) has suggested that the Bay Miwok tribelets were a single people, culturally speaking, only archaeological evidence can determine if that is the case. Their regional intermarriage pattern indicates that their strongest ties were to other riverine tribelets, regardless of language. Most mission period marriages were with the Patwin-speaking Suisun to the north. Next strongest marriages ties were to the Ohlone (Costanoan)-speaking Carquin of Benicia and Martinez. Two marriages occurred with the Bay Miwok Saclan of Lafayette, and one each with the Bay Miwok Tatcan of Danville, and Ohlone Souyen of the Livermore Valley. No marriages are evidenced in the early records between the Chupcan and the Julpun to the east or Volvon to the southeast, despite their common Bay Miwok language.

Among better-documented Central California Miwok-speaking tribelets, the principal village was the home to the male tribelet chief who had political authority over the surrounding hamlets (Levy 1978). The office of male chief was hereditary, passing through the male line in the most powerful extended family in the tribelet, from father to son. The chief seems to have been charged with preventing trespass in hunting and collecting territories belonging to the tribelet, and determining the best time to harvest acorns and other plant crops. The chief also acted as principal arbitrator in disputes, and organized religious ceremonies with other chiefs from neighboring tribelets (Levy 1978). Little is known about the powers and responsibilities of female leaders in ethnographic Central California. Kelly (1991) indicates that they were responsible for feeding visitors at dances and that they had influence in other areas of decision-making.

The Chupcan probably had two types of dwellings, either a semi-subterranean pit-house used in the winter months or a pole-framed house, thatched with tule or other brushy plants. Large semi-subterranean ceremonial houses were common in villages located to the north and east of Contra Costa County, but have not been documented in the local area. Also, the Chupcan would have constructed thatch and earth-covered sweathouses and acorn granaries in each permanent village. Tule balsas would have been used for crossing Suisun Bay and fishing and hunting in the backwater sloughs. Nets, snares, and traps would have all been employed in hunting as well as the bow and arrow. Harpoons, nets, and line-and-hook were used for fishing in the bay and inland waterways. Bedrock and portable mortars and pestles would have been used to process a variety of nut and berry crops, while baskets would have served as containers for boiling meat and cooking pulverized grains and nuts. The bayshore marshland and inland valley at NWSSB DET Concord were probably important environments for the Chupcan, where nut and seed crops, forbs, bulbs, and roots would have been collected. Deer and rabbits were probably hunted in the interior valley and uplands, while elk and pronghorn would have been most abundant on the lowland plains along Mt. Diablo Creek and bordering the marsh.

In the spring of 1772, a Spanish expedition under Pedro Fages passed through Chupcan territory on its way east from San Francisco Bay, then south through the San Ramon Valley and home to the new settlement at Monterey; the expedition was met by friendly Chupcan. When the next Spanish group came through, in April of 1776, Spanish leader Juan Bautista de Anza reported that the Chupcan were quite hostile. Many of the Chupcan moved to Mission San Francisco or Mission San Jose between 1795 and 1804. The majority of the Chupcans seem to have moved north across Suisun Bay in 1804 or 1805 in order to evade Spanish soldiers in search of mission escapees, at which time the name Monte del Diablo was applied to their main village on Pacheco Creek, north of Concord (Milliken 1995:184-185). This last large group was baptized at the missions in 1810 and 1811, following the military defeat of the Suisuns by Gabriel Moraga in 1810 (Milliken 1995:204-211).

At Mission San Jose during the 1810s and 1820s, Chupcans married Patwin-speaking Napas and Ululatos from areas farther north, as well as Plains Miwok-speaking Ompins and Anizumnes from eastern Solano County. At Mission San Francisco more of their marriages were to other Bay Miwok groups, the Saclan, Tatcan, and Volvon, but they also married Suisuns and Napas from the north bay there. Death rates were high at the missions. By 1820, only 9 percent of the people at the two missions were tribally born Bay Miwok speakers. When the missions were closed as Indian agricultural communes in 1836, surviving Chupcans and their descendants probably went to work for Mexican ranch owners throughout the east bay.

No present-day Indian person traces his or her ancestry back to the Chupcan people. The closest living genetic relatives are the descendants of other Bay Miwok groups, as well as adjacent Patwin and Ohlone groups, who went to missions San Jose, San Francisco, and San Francisco Solano during the mission period.

Historic Occupation Sequence

This section reviews historic use and occupation of the NWSSB DET Concord area and includes discussions of influential historical events and details outside the base. This information largely derives from the Concord ICRMP.

The area now occupied by NWSSB DET Concord was explored by Europeans in the 1770s, settled by Mexican ranchers in the 1830s, and used for industrial, agricultural, and commercial purposes by citizens of the United States from the 1840s to the early 1940s. Since 1942, it has been used by the Navy, chiefly to store and maintain munitions, although some parts of NWSSB DET Concord are leased for agriculture and the California Department of Fish and Game maintained a tule elk herd on the facility until it was discontinued in 2006. The area has never been intensively settled. The fact that it was purchased by the Federal government for an ammunition depot in 1942 attests to some degree of the generally isolated character of the area at that time. In discussing the history of NWSSB DET Concord, it is useful to maintain the Tidal Area-Inland Area distinction, (i.e., the Tidal Area was used for commercial, residential, and industrial purposes after 1900, while the Inland Area was used chiefly for grazing).

Euro-American Occupation, Exploration, and Initial Settlement Period (1769-1845)

Although Spain first settled California in 1769, the Spanish did not explore the San Francisco Bay area until the 1770s. Permanent settlements in the Bay Area effectively date to the 1776 founding of a mission and presidio in San Francisco. Mission San Jose was not established until 1789. There is some indication that the land at or near NWSSB DET Concord was used by Mission San Jose for cattle grazing, although the mission was located a considerable distance to the south (McLeod 1996). The missions were closed in the 1820s, and by the late 1820s various individuals began to petition for land grants in what is now Contra Costa County. Much of the land that is now NWSSB DET Concord was included within two large ranchos: the Monte Del Diablo, granted to Salvio Pacheco in 1834, and Rancho Los Maganos, granted to Jose Noriega in 1835 (McLeod 1996). Neither Pacheco nor Noriega resided on land that is now part of NWSSB DET Concord, and no Spanish-Mexican-era buildings or historic archaeological sites have been identified at the facility.

Early American Mining and Farming Period (1846-1880)

The American takeover of California in 1846, combined with the Gold Rush, dramatically accelerated the pace of settlement in California. The rate and character of settlement, however, differed considerably from one part of the state to the next. Contra Costa County, for example, was settled chiefly for agriculture, although the area was influenced by mining activities at Mt. Diablo and military uses in nearby Solano County. In terms of military development, the Navy Station at Mare Island (established in 1854) and the Army's arsenal at Benicia (established in 1851) would influence the development pattern for much of northern Contra Costa County. The Benicia Arsenal in particular would help anchor the economies of Benicia in Solano County and Martinez in Contra Costa County, and helped to establish the Benicia-Martinez crossing as a major shipping point for goods going to and from inland areas.

The port development in Benicia and Martinez indirectly helped spur the development of Port Chicago, located a short distance east of Martinez. In 1853, Major Robert Allen, attached to the Benicia Arsenal, purchased much of Pacheco's Monte Del Diablo rancho. Although he would call his holdings the "Government Ranch," it was a private holding and was in no way related to the operations of the Benicia Arsenal or any other government activity (McLeod 1996). Various settlers laid claim to land that was in the public domain, scattered throughout what is now NWSSB DET Concord, through the Homestead Act, Swamp and Overflow land, and other legal devices (McLeod 1996).

In 1848, coal deposits were discovered in the Mt. Diablo area, setting up a "boom" in town-building, mining, and industrial development in northern Contra Costa County. Although the mines were located some distance from NWSSB DET Concord, coal mining activities indirectly added to the viability of the Tidal Area for commercial and industrial development. In the late 1870s, various parties began to build wharves and warehouses along Suisun Bay in an area called Seal Bluff, essentially the area that would later be called Bay Point and still later Port Chicago. The Seal Bluff wharves were used chiefly to ship wheat and other grains grown in the region.

Era of Transportation and Industry (1880-1940)

Between the late 1870s and World War I, the area that is now NWSSB DET Concord was fitted with major transportation improvements that would ultimately ensure that the Tidal Area could be developed for industrial purposes. In the late 1870s, the Southern Pacific railroad completed two major lines in the area: a north-south connection through Benicia and Port Costa (near Martinez) and an east-west connector along the edge of Suisun Bay. The east-west line extended from Richmond to the Southern Pacific's main line through the San Joaquin Valley and ultimately to southern California and the company's southern transcontinental line to New Orleans (McAfee 1973:99). The north-south line connected the Bay Area to the Central Pacific transcontinental terminal in Sacramento, via a ferry crossing between Benicia and Martinez. The ferries were in service until 1928, when they were replaced by the existing steel railroad bridge between Benicia and Martinez. The alignment of the east-west Southern Pacific line passes through NWSSB DET Concord. At the turn of the century, the Atchison, Topeka, and Santa Fe Railroad (now the Burlington Northern-Santa Fe Railroad) built a connector line between Stockton and Richmond; this line, too, passes through NWSSB DET Concord, a short distance from the Southern Pacific line.

In addition to the main line Santa Fe and Southern Pacific railroads, the area was served by the short line Bay Point & Clayton Railroad, as well as the Sacramento Northern Railroad. During World War II, the Navy built its own rail system, to link its port and magazine facilities with the Santa Fe and Southern Pacific. The road system located in and near NWSSB DET Concord was greatly improved during the early years of the twentieth century. In the 1910s, the State of California began to improve the state highway along Suisun Bay, the route that would ultimately be called State Route 4. County roads were greatly improved during the same period. The use of the Tidal Area of NWSSB DET Concord for industrial purposes dates to the early years of the twentieth century. In 1903, the Copper King Smelting Company, a British

firm, built a copper smelter at Seal Bluff Landing. The company invested an estimated $1.3 million in this operation but went bankrupt before the smelter reached full operation (Historic Records Company 1926:159).

In 1907, C. A. Smith, a native of Minneapolis, purchased much of the waterfront area of what is now NWSSB DET Concord for the purpose of establishing a large lumber mill. The company also laid out a community adjacent the mill that it called Bay Point; that community would later be called Port Chicago. Various stores and residences were built in Bay Point to support the lumber mill. The lumber mill was in operation from 1907 through the early 1930s. The mill suffered disastrous fires in 1913 and again in 1932; it was not reopened following the 1932 fire (Purcell 1940:733). The name of the community was changed from Bay Point to Port Chicago in 1931 (Self et al. 1993:10).

In 1918, as an emergency war measure, the Pacific Coast Shipbuilding Company constructed yards at Bay Point to build 10 ships for the Navy. Four hundred men were employed for about two years to fulfill these contracts. To house these workers and their families, the company built the town of Clyde. After the end of the war, the buildings at Clyde were used to provide housing for workers at the Shell oil refinery at Martinez (Historic Records Company 1926:160).

The communities of Bay Point (Port Chicago) and Clyde were affected adversely by the closing of the lumber mill at Port Chicago and the general economic malaise associated with the Great Depression of the 1930s. This economic downturn would persist until the United States became involved in World War II.

The Military and Recent Past (1941-present)

At the time of the attack on Pearl Harbor in December 1941, the Navy had limited munitions storage capabilities on the West Coast. The principal Naval Ammunition Depot was in Hawthorne, Nevada, which was a safe location for storing and manufacturing munitions, but inconvenient for loading ammunition on ships from the various San Francisco Bay Navy stations. There was also an ammunition depot at Mare Island. The utility of the Mare Island facility, however, was limited by its size and by the fact that many of the larger Navy ships could not dock there, owing to the shallowness of the waters in the Mare Island Strait.

As early as 1940, the Navy began looking for a Bay Area site for a new and larger ammunition depot to serve Navy stations in northern California. Navy planners were aware of the Port Chicago site, owing to the ship manufacturing that had been accomplished there during World War I. Navy planners judged that most of the infrastructure – railroad tracks, wharf facilities, and so forth – at the site would need to be replaced. As one observer noted, however: "The great value of this site lies in its complete isolation from habitation and industrial activity" (Self et al. 1993:11).

In January 1942, the Navy acquired 640 acres of land in what is now the Tidal Area and commenced a rapid construction of docks, barricaded railroad sidings, and residential and

administrative buildings. In 1944 and 1945, the Navy expanded the facility by acquiring the Inland Area, which includes more than 5,000 acres. It was here that the Navy built the bulk of its munitions magazines as well as a small air facility. During the same period, the Navy further expanded the Tidal Area in order to construct new housing and recreational and administrative structures. The ammunition depot at Port Chicago was one of the busiest such facilities in the United States and was described as "the principal ammunition loading port and storage point for ammunition and high explosives on the Pacific Coast" (JRP 1998).

The most notable event of the war era occurred on July 17, 1944, when two massive explosions ripped through the Tidal Area. Two ships, a pier, and most of the Navy's base in the Tidal Area were destroyed, and 320 people were killed and 390 injured. Most of those killed were "colored enlisted personnel," who had been assigned the dangerous duty of loading explosives on waiting ships. The surviving personnel were subsequently relocated to Mare Island Naval Shipyard and ordered to load ships there. Their refusal to handle more explosives until safety precautions had been taken resulted in an incident that is commonly called the "Port Chicago Mutiny." The tragedy resulted in a major period of construction at the port to repair damage and to provide a higher level of safety for the workers (Self et al. 1993:13).

In the years since 1945, NWSSB DET Concord has continued to function in much the same manner as it did during World War II. Its command structure, however, has changed repeatedly. In 1945, the facility was still a sub-installation, or annex, to the Naval Ammunition Depot at Mare Island. In 1946, it was redesignated the "Naval Magazine Port Chicago," and established as a separate facility, independent of Mare Island. In time, the depot at Mare Island would be designated as an annex to the Concord facility. More recently, the Concord depot has been designated as an annex, or "detachment" to the Naval Weapons Station, Seal Beach (JRP 1998:11-26).

During the Cold War, the Concord facility experienced three periods of rapidly accelerated activity: during the Korean War of the late 1940s and early 1950s, during the Vietnam War of the 1960s and early 1970s, and during the general military build up of the 1980s. Although it was busy during the Korean War years, the Concord facility made due, for the most part, with World War II-era buildings and structures. During the Vietnam War years, however, the Navy began to replace and/or supplement the World War II-era facilities with new buildings and structures, ranging from new housing and new administrative buildings to new magazines.

During the late 1960s, the Navy condemned the buildings from the old town of Port Chicago and demolished them to provide a buffer area for the munitions-handling operations. A third major phase of new construction occurred during the 1980s, a time of accelerated military construction throughout the United States. New buildings at NWSSB DET Concord from this period range from housing units to administrative buildings to magazines. Arguably the most important addition from the 1980s was "Area Q," a facility for storing and maintaining special weapons.

Since that time, the Tidal Area has been the primary focus of new development, with the upgrade of explosives Pier 3, the addition of a rail and truck explosives holding yard, and construction of the new Concord Port Terminal Operations Building for use by the Army.

Historic Site Thematic Groups

The overwhelming majority of historic resources – buildings, structures, sites, objects – found at NWSSB DET Concord today were built by the Navy in the years since 1942. Scattered evidence does exist, however, to document uses that preceded acquisition of the area by the Navy.

Mining Sites

Although the general area of Contra Costa was mined extensively, a paucity of mining-related sites have been identified at NWSSB DET Concord. Only one mining adit has been identified. The adit was located and recorded by JRP (1998). It was described as a prospect pit either for copper or coal and may date to the 1863 coal mining boom in the local area.

Farming/Ranching

The Inland Area of NWSSB DET Concord was used for agricultural purposes – primarily cattle ranching – until the area was acquired by the Navy during World War II. Prior to the current study, only one pre-Navy agricultural structure had been identified at the facility. This property is a stone building that encloses a cistern. The building was constructed between 1932 and 1935 for Ralph Bollman who farmed that area (Campbell et al. 1999).

Linear Transportation Sites

The NWSSB DET Concord is laced with linear transportation sites. Chief among these are the Southern Pacific (now Union Pacific) Railroad line and the line of the Santa Fe (now Burlington Northern-Union Pacific) Railroad line. These are very busy industrial main lines and have been modernized on a regular basis. State Highway 4 is a major freeway traversing NWSSB DET Concord; it too has been modernized repeatedly.

A 1993 inventory by William Self & Associates identified some remains from the Bay Point and Clayton Short Line Railroad, including concrete bridge abutments and a loading berm (Self et al. 1993:272). The bulk of the short line has been reused as part of the Navy's railroad system.

Industrial

Although the Tidal Area has been used for industrial purposes since the beginning of the twentieth century, few industrial properties have been identified, other than those associated with the Navy ammunition depot. Building A3 is a warehouse left over from the Bay Point Lumber Company (built ca. 1916). The building was found ineligible for listing on the NRHP due to a loss of integrity (Self et al. 1993).

The homes of Port Chicago may be seen as indirectly related to the industrial theme in that they were occupied chiefly by workers. Most of Port Chicago was demolished in the late

1960s. Buildings 200, 247, 248, and 250 were saved and moved to the NWSSB DET Concord housing area to serve as officers' quarters. The buildings were found ineligible for the NRHP because they have been moved (Self et al. 1993).

Military

Nearly all historic-era resources at NWSSB DET Concord – buildings, structures, objects, and sites – were built by the Navy in support of the ammunition depot function. Nearly 1,000 numbered buildings and structures were identified in two separate inventory efforts: one by William Self & Associates in 1993, and one by JRP Historical Consulting Services in 1998. Military bases have been likened to self-contained cities and often include a wide range of building types, from housing to administrative and recreational to industrial buildings. NWSSB DET Concord is actually less complex than many other military bases. The old Naval Shipyard at Mare Island, for example, included more than 1,000 buildings and was practically a self-sufficient community. The NWSSB DET Concord facility is much less self-contained, relying upon the surrounding communities for such services as schools, retail, and housing for most of the workers. The NWSSB DET Concord does include a few housing units and a small group of administrative buildings. The vast majority of buildings, however, are specifically industrial in nature, with magazines being the most common building type.

3. RESEARCH ISSUES, GOALS, AND METHODOLOGY

This chapter reviews research issues and goals relevant to the current archaeological inventory and describes the methods used to complete the study, including a pedestrian survey and records search.

RESEARCH ISSUES AND GOALS

Pedestrian surveys have the potential to contribute to regional perspectives of human occupation by documenting archaeological resources on the surface. Surveys provide the first level of information that directs further archaeological investigation. In fact, models that predict the occurrence of buried archaeological sites are typically based on assumptions that associate particular landforms with a scaled potential for association with archaeological material (e.g., early Holocene archaeological materials are not likely to be found in original association with intact late Holocene sediments). Associations of particular landforms/ surfaces with various degrees of archaeological potential derive from survey results. While pedestrian surveys are limited in the amount of data that can be obtained concerning the structure of archaeological deposits, survey results are critical for developing initial inferences that direct further work. Thus, pedestrian survey methods must address very basic but important research issues including differential archaeological sensitivity, landscape changes, and the probability of discoveries. It is also important to consider traditional properties, cultural sites and materials sensitive to local Native American communities.

Archaeological Sensitivity

The ICRMP (Engineering Field Activity 2002) prepared for NWSSB DET Concord presented a comprehensive review of archaeological sensitivity based on geologic maps that identified soils and other natural formations of different age. The potential for surface and subsurface archaeological material was scaled from low to high based on soil age and integrity. Maps identifying surface potential for archaeological remains are provided in Appendix C-1 and maps identifying subsurface potential are provided in Appendix C-2. These maps served as a baseline for predicting where archaeological material might be discovered and directed more intensive survey efforts such as increased intervals of vegetation clearance (see Surface Survey and Mapping, below).

Landscape Modification

The current project area has been extensively modified during historic and modern times such that the natural landscape is virtually non-existent in low-lying areas. Only the steep hills bordering the eastern and southern base limits and some of the low-lying hills in the northwest retain some integrity of natural deposits. Much of the level terrain, which contains deposits with the highest potential for archaeological material, has been completely altered. Alterations

include the diversion of Mt. Diablo Creek, agricultural farming, dairy farming, mining, and base development.

The 2002 ICRMP for NWSSB DET Concord notes early Spanish accounts of vast wetlands during the late 1700's. Apparently, marshy conditions extended as far south as Willow Pass Road, where the Spanish travelers were able to bypass the marsh. This carries significant implications for the discovery of archaeological sites; there are vast areas that are not likely to contain archaeological evidence in areas of previous marshland, while areas bordering the old marshland or creek channel should have a high potential for archaeological sites.

Following early Spanish contact, ranching and farming activities were common in the Inland Area of the base. These early settlements were probably restricted to homesteads with orchards and small farm plots without modifying much of the landscape.

The first significant alteration of the landscape within the vicinity of the base was the diversion of Mt. Diablo Creek from its original channel. Kellogg (2007) conducted a comprehensive review of historic maps compiled by Dean McLeod (1996) to document changes in hydrology. Her research indicated that as late as 1885, Mt. Diablo was still following its original course which took it through what is now Area 22, off base to the west, then turning back north into the Walnut Creek watershed (Figures 3.1 and 3.2). A later map dated to 1915 clearly shows that Mt. Diablo Creek was diverted into what is now the current channel of Seal Creek, cutting off the original course of Mt. Diablo Creek that took it through the northwestern corner of the base (i.e., the old airfield area) (Figure 3.3).

Channelization of Mt. Diablo Creek altered natural drainage patterns and vegetation (Kellogg 2007). It is likely that the creek was channelized to facilitate more intensive agriculture and to prevent flooding of nearby towns (Kellogg 2007). A 1939 aerial photo of the Inland Area shows that extensive agricultural development (i.e., intensive farming) had occurred since diversion of the creek; nearly the entire Inland Area excluding the eastern hills has been modified by agriculture (Figure 3.4). Intensified farming in the area leveled low lying areas and disturbed any prehistoric and early historic archaeological material present in surface and near surface deposits.

Diversion of Mt. Diablo Creek has significant implications for the potential discovery of archaeological resources, particularly since ethnographic and archaeological evidence indicate that aboriginal occupants of the region were settling in locations near reliable water sources, increasing the probability that archaeological deposits may be buried near the original creek channel. After construction of the airfield between 1944 and 1945, very little evidence of the original creek channel remained (Figure 3.5).

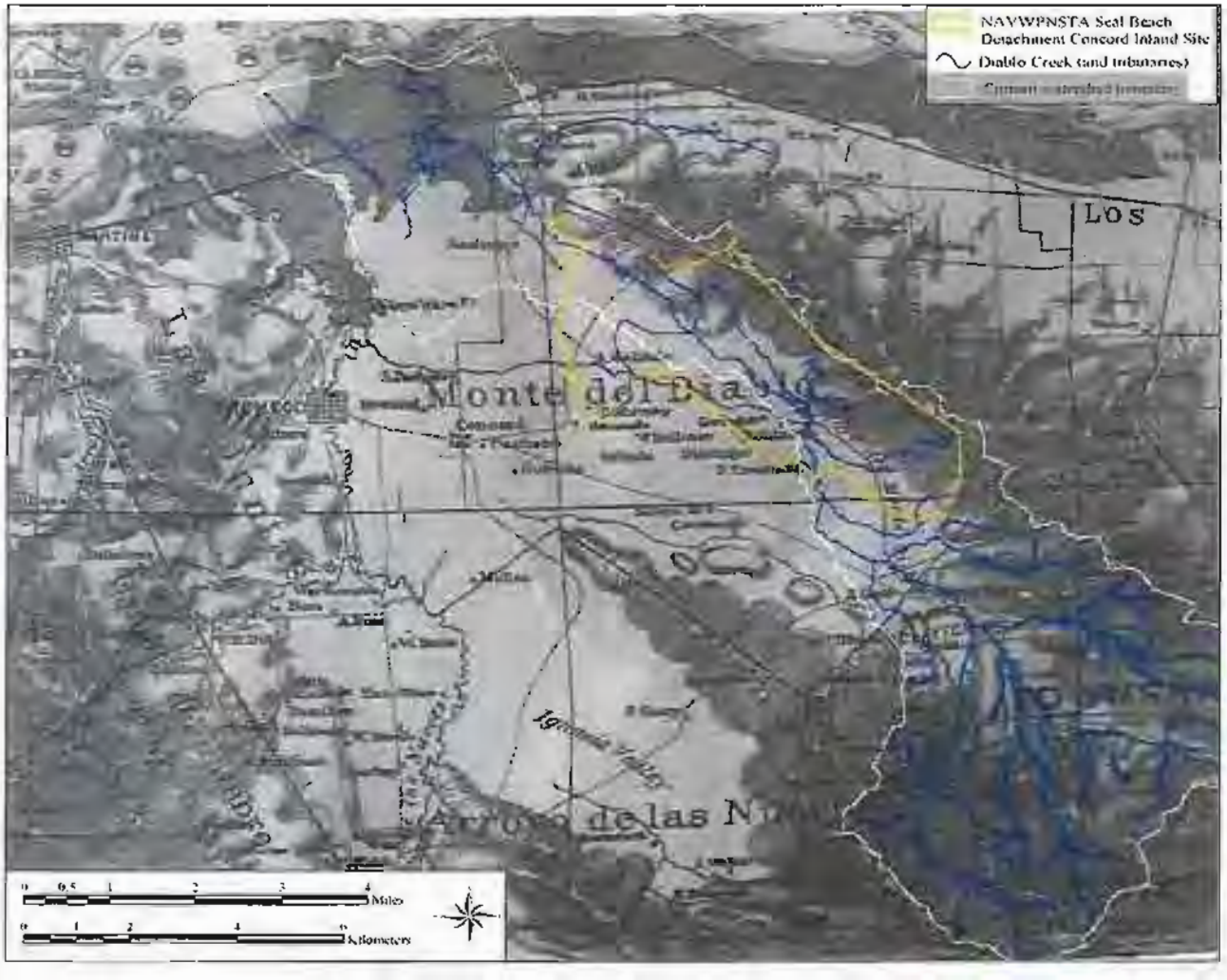

Figure 3.1 Map and caption from Kellogg (2007) Map 5-1.

"Geological Survey of California map (Hoffman 1873) shows Mt. Diablo Creek heading west, outside its current watershed boundary, into the Walnut Creek Watershed. Map photo by Dean McLeod; watershed map overlay by Rich Walkling, Natural Heritage Institute. Blue lines show modern hydrology. Green line is the Inland Area NAVWPNSTA Seal Beach Detachment Concord boundary."

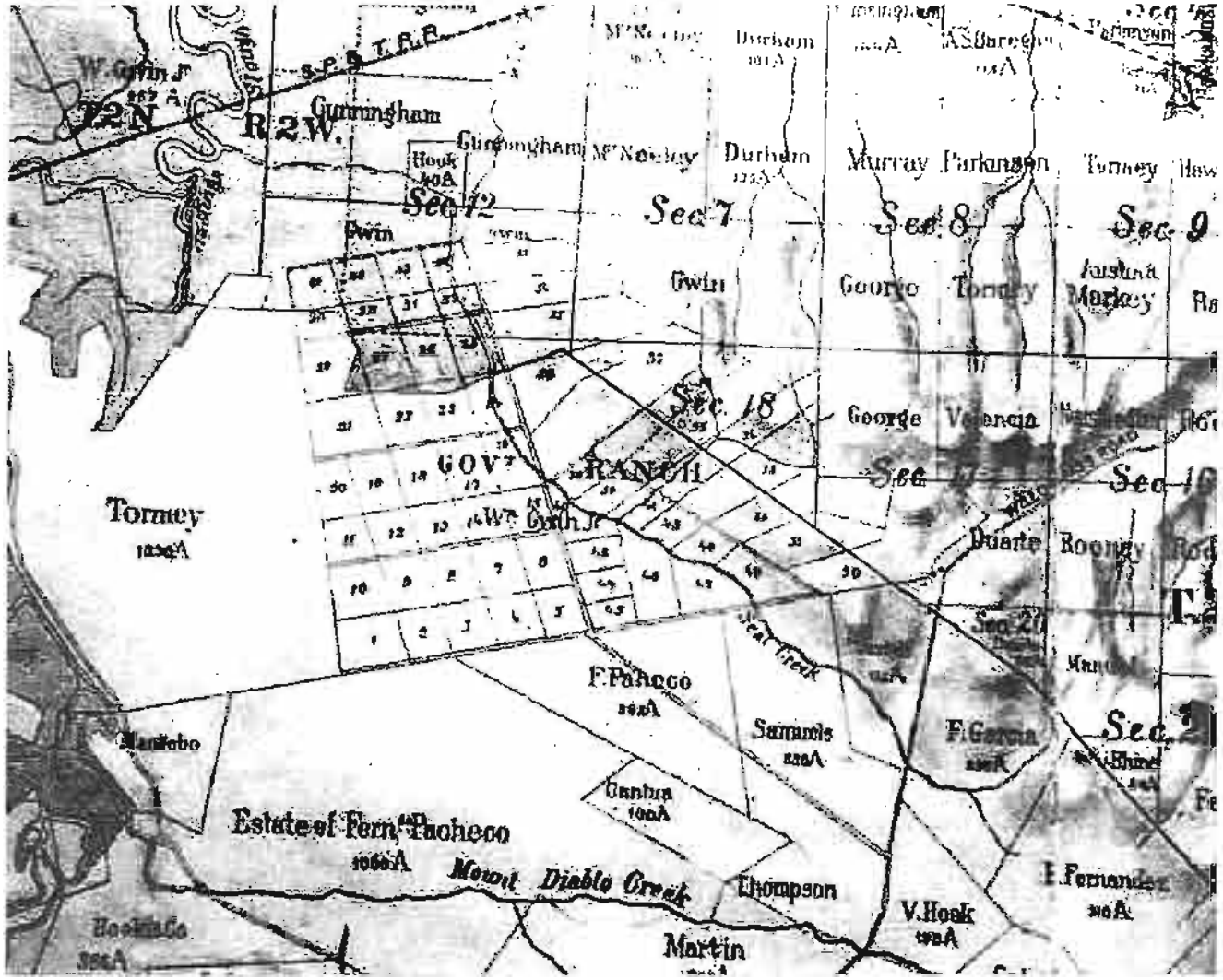

Figure 3.2 Map and caption from Kellogg (2007) Map 5-2.
"Contra Costa County 1885 map showing that Mt. Diablo Creek and Seal Creek were once separate. Map photo taken from McMahon and Minton (1885). Photo taken by Dean McLeod for Mt. Diablo Creek Watershed Inventory (Cain and Walking 2006)."

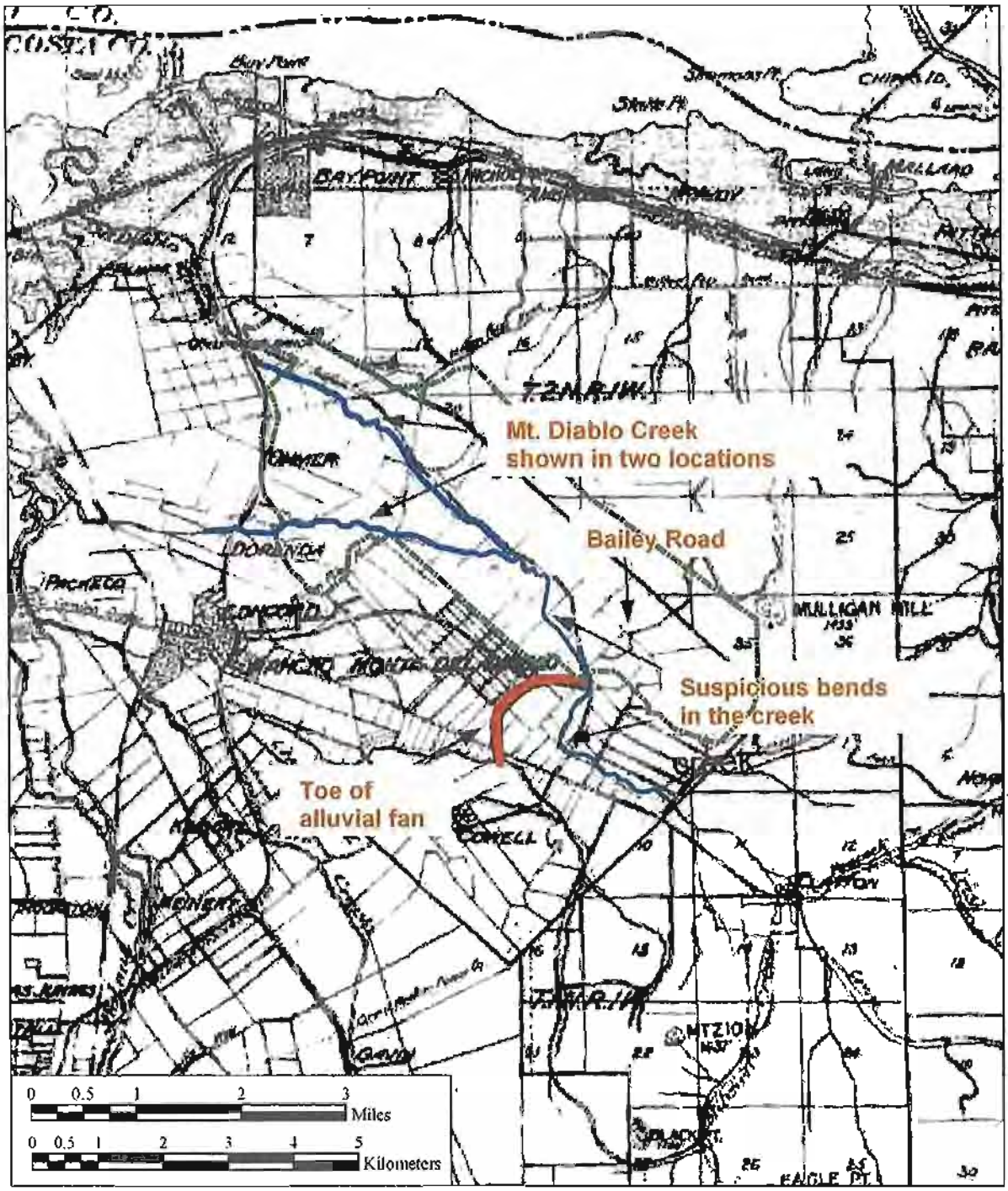

Figure 3.3 Map and Caption from Kellogg (2007) Map 5-3.

"Pocket map from 1915 showing clearly the origin of Seal Creek in the vicinity of NAVWPNSTA Seal Beach Detachment Concord east of Bailey Road. The original Mt. Diablo Creek was diverted into Seal Creek by this time, re-routed from its former course into the Walnut Creek drainage. Annotations are from Natural Heritage Institute's and CCRD's Mt. Diablo Creek Watershed Inventory (2006).

Figure 3.4 Photo and caption from Kellogg (2007) Map 5-5.
"1939 photo showing nearly all the NAVWPNSTA Seal Beach Detachment Concord property outside of the hills in farms (red line indicates approximate edge of property)."

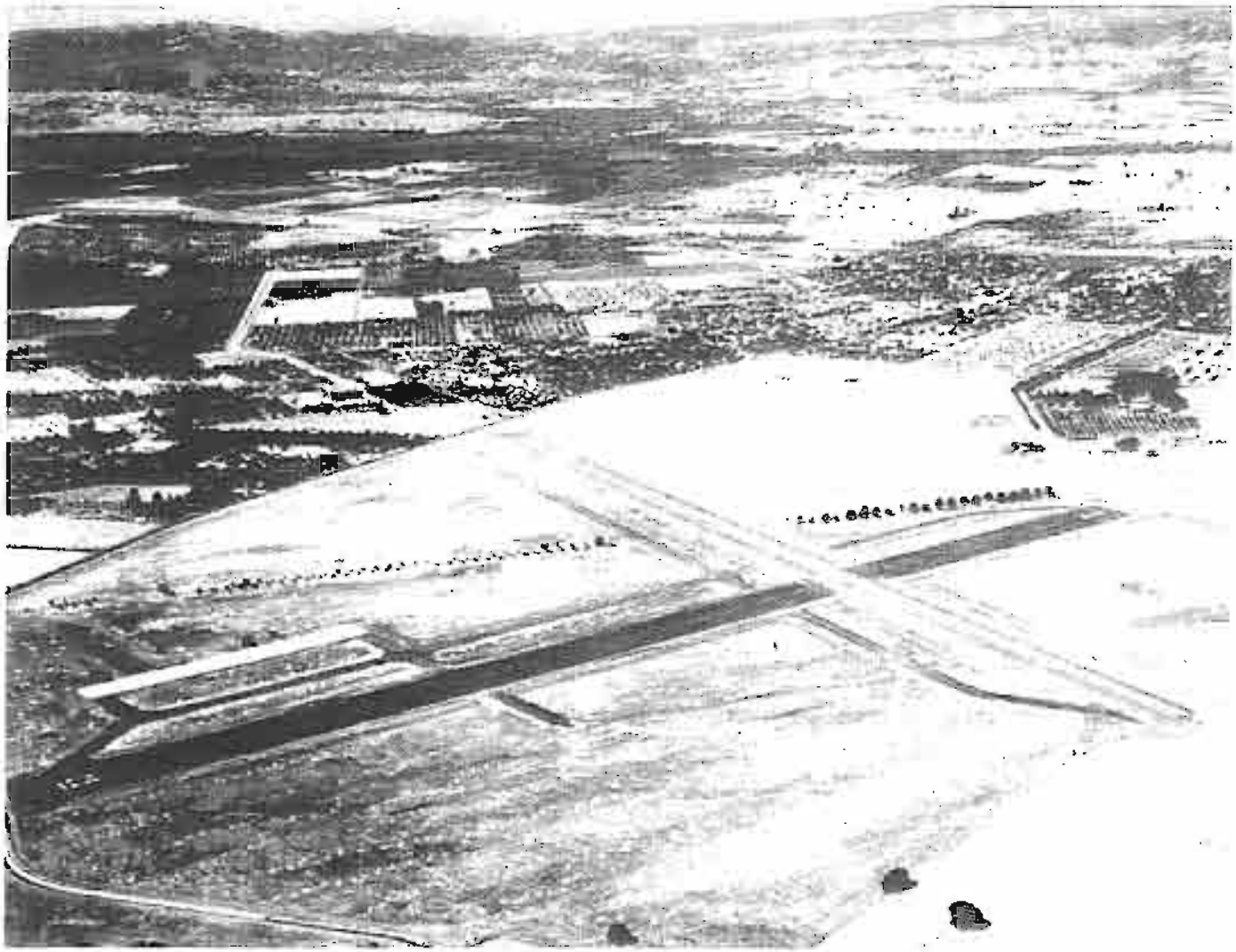

Figure 3.5 Photo and caption from Kellogg (2007) Map 5-6.
"A 1944 aerial view looking southwest at OLF Concord. Photo courtesy of Bill Larkins, taken from www.militarymuseum.org/NOLFConcord.html."

Mining has also occurred in the area since the late 1840s, including the rush to mine coal. While coal mining is evident in the discovery of a coalmine shaft (see Chapter 4), it does not appear to have affected large areas of the base. However, quarry activity left a large mark on the landscape, including a large stone quarry located in the northern portion of the Inland Area (see below). This quarry began activities in the 1940s and continued through the 1960s (Pamela Ramirez, personal communication). It is possible that other areas on the base that appear to have been heavily disturbed may have been prospects for potential quarries.

Military activity at NWSSB DET Concord has contributed much to modification of the natural landscape. Excavation of borrow pits, leveling of the ground surface for bunker complexes, and construction of base facilities (including bunkers, roads, bridges, buildings, and railroads) has completely altered the natural terrain of most low lying areas, except bordering hills (Figure 3.6). ASM conducted a review of construction plans at NWSSB DET Concord to document the extent of construction alterations. This research noted that most bunkers, especially those located in Area 22, were excavated to depths of up to 6 feet to bury blast walls and then stabilized with imported fill. Surrounding roads were also graded and covered with imported fill. Military related construction in the Inland Area has occurred intermittently throughout its active history, including construction of new ammunition bunkers in the 1980's and 1990's (Pamela Ramirez, personal communication).

Figure 3.6 Overview of the project area highlighting extensive disturbance to natural terrain.

The cumulative effect of land modification through the historic period/era, including the diversion of Mt. Diablo Creek, agricultural and dairy farming, mining, and military activity, has been an active transformation of the modern Inland Area environment. Much of the Inland Area was marshland, but some portions may contain archaeological material that has been buried or obscured through such extensive land modifications.

Survey Design

The success of an archaeological survey is partly related to sampling design, type of coverage planned, survey intensity, and ground visibility. Full coverage survey can best be defined as total or 100-percent coverage involving systematic examination of blocks of terrain at a uniform level of intensity. Currently accepted standards of archaeological survey, as described by Cowgill (1990) and Fish and Kowalewski (1990), assume that full coverage surveys are superior to their alternative, which is spatial sampling. Cowgill (1990:250) argued that spatial sampling is adequate when there is much redundancy in the elements of sampling. In other words, if the resources present on unexamined tracts can be inferred with reasonably limited error, then sampling is a sensible and cost effective way to economize. However, in regional archaeological survey, such an inference for properties of unexamined tracts is risky. Spatial sampling yields good estimates of gross numbers and types of historic properties, but important categories can be easily overlooked if the predefined sampling strata do not include specific environmental variables or other features, which could later be defined as important aspects of human adaptation (Cowgill 1990). Additionally, it is often important to know where the cultural resources are actually located as opposed to the estimated number of resources in a given area. In general, spatial sampling has limitations in addressing issues related to physical organization of sites on the ground and their relationships to one another, and patterns of landscape utilization through time and space.

Full coverage survey is economically feasible only in areas where archaeological sites have high surface visibility and the topography is not too rugged (see Fish and Kowalewski 1990). The advantages of full coverage survey are obvious as stated by Cowgill (1990), and the results are much more reliable in terms of site location, densities and inherent limitations of the study. For the Concord project, a full coverage survey was necessary since it is imperative that all cultural resources are inventoried within the present study area, and all survey held to current standards for the profession. Therefore, a full coverage survey at 25-m intervals, considered as intensive, was planned in order to meet professional standards of archeological inventories. As stated above, surface visibility is needed for a successful full coverage survey; one problem in the present study area is variable ground visibility, which was recorded to determine the reliability of the inventory.

The results of an archaeological survey are influenced by two factors: spacing intensity and sensitivity of archaeological discovery. The spacing intensity (interval) adopted in this survey was 25-m uniformly throughout the survey area. The sensitivity of archaeological discovery and inherent limitations of adopting the 25-m interval in this survey need to be addressed. Cowgill (1990:253) defined the intensity of survey as the spacing maintained between individuals, while sensitivity is the probability of detecting an archaeological site. Though

there are several factors which affect the sensitivity issue, in general sensitivity and intensity are interrelated, with the latter determining the former: the more intensive the survey, the more sensitive it is to discovery of archaeological resources--both large and small in size. It is important to detect both large and small sites; often in thick vegetation, very little cultural evidence l is visible. Cowgill (1990) demonstrated that the sensitivity to small sites, or limited scatters do not approach 100 percent unless the intensity of survey is very high. This, then, becomes an issue of cost and effort to identify even the smallest, possibility non-significant, sites.

Cowgill offered a model that can be used to ascertain the predictability and sensitivity of the spacing intensity used in a survey. His model (Cowgill 1990:254 256) assumed that for a fairly sparse artifact scatter, the observer's path should run at least 1 m inside the site for 100 percent detection probability; conversely it would be 95 percent probability of detection if the path is 1 m outside the site perimeter, 75 percent if the path is 3 m away from the site boundary, and 50 percent if it is 5 m outside site boundary. This assumption was not based on empirical data, and assumed that the sites are approximately circular (which is not always true).

Of significance to this issue is the question of whether it is important that a large proportion of sites that are less than 10 m in diameter (or a similar small size) are missed during the survey. Small sites and sparse scatters provide valuable windows to the past, and could be vital in reconstructing the settlement systems at play. However, there needs to be a balance between detecting very small sites and cost of the survey. Cowgill (1990:259) stated that the smaller the sites, the less likely that they are diagnostic of temporal placement, activity or spatial settlement (this is definitely dependent on the region and the occurrence in question). In areas where there has been considerable disturbance of the surface through grading and agricultural activities, the detection of such small sites would not significantly alter the results of the archaeological inventory. Therefore, considering Cowgill's predictive model, visibility within the project area, and disturbance of the ground surface observed at Concord, the 25-m interval spacing adopted in this survey should provide detection of greater than 70 percent of sites that are 15-m in diameter or more.

Native American Heritage Value

Integrating Native American concerns into a survey typically involves communication with local Native American groups to determine the presence of any culturally sensitive areas, archaeological sites, or sensitive remains (i.e., human bone, ceremonial objects, etc.). Consultation provides a vital opportunity both for the involvement of Native Americans, and for the archaeologist to identify cultural resources not documented during a records search. The Navy initiated consultation with local Native American groups for this project. However, human remains have been discovered at previously recorded site CA-CCO-680 indicating the potential for other sensitive finds. Care was taken not to disturb this site during the survey. No other sensitive cultural material was identified.

SURFACE SURVEY AND MAPPING

Pedestrian survey methods utilized for this study exceeded Secretary of the Interior's standards. The field crew consisted of one field director, one crew chief and up to four field technicians. Survey methods were developed to be consistent with areas of variable archaeological sensitivity identified in the Integrated Cultural Resources Management Plan (ICRMP) developed for NWSSB DET Concord. ASM personnel conducted the survey at NWSSB DET Concord in two field rotations between September 7 and 25, 2007.

The pedestrian survey involved conducting systematic transects spaced at no more than 25-m intervals. Transects were generally oriented parallel to terrain, following a consistent compass bearing and using handheld GPS devices to ensure full coverage. Departure from the parallel 25-m transect method occurred in narrow drainages with small side branches, on isolated knolls, or on other unusually shaped landforms that could not be adequately inspected with standard 25-m parallel spacing. At a minimum, these methods covered the entire potential "build area" (approx. 4,157.67 acres with <30 percent slope). Rakes were used to clear 1-x-1-m areas of vegetation from the ground surface at minimum intervals of 100 m. Vegetation clearance was part of the overall sampling strategy intended to enhance detection of archaeological material. Clearance was employed in all aspects of the survey area, although in some cases, ground visibility was good enough (i.e., 50-75 percent) that clearing vegetation would not have enhanced visibility and was thus not employed. The latter conditions represented the exception rather than the norm since areas surveyed received greater than 90 percent coverage with the vegetation clearance sampling program, including most areas with existing ground visibility of 50-75 percent.

Vegetation clearance only removed loose grass and detritus from the ground surface and did not constitute excavation (Figure 3.7). Figure 3.8 is a map illustrating the differential distribution of vegetation clearances. Vegetation clearance was not conducted within Installation Restoration (IR) sites (Figure 3.9), known archaeological sites (i.e., CA-CCO-680, P-07-000485, etc.), the golf course, or the baseball field. Vegetation clearance was not needed within Military Munitions Response Program (MMRP) sites due to enhanced visibility (i.e., 50-75 percent), thereby foregoing the risk of encountering munitions (see Figure 3.9).

Generally, more frequent vegetation clearance was conducted in areas with high and moderate surface and subsurface archaeological potential as identified on the archaeological sensitivity maps (i.e., bordering creeks, springs, etc.) (Figures 3.10a and 3.10b). In most of these areas, vegetation clearance intervals were adjusted to 50 m, unless ground visibility and other factors did not warrant such an adjustment. Some vegetation clearance areas were subjectively placed in irregularly shaped areas or other specific areas of concern. In some areas of high surface and subsurface archaeological potential, vegetation clearances were not increased due to visibility, disturbance, or the presence of IR/MMRP sites.

Approximately 20 percent (approx. 1039.42 acres) of the project area consisted of steeply sloped (>30 percent) upland regions that were subjected to a mixed survey strategy focusing on ridges, mid-slope terraces, and along watercourses where isolated milling stations and task-

specific sites might be encountered. These areas were typically narrow, irregularly shaped, and/or small, and were surveyed in irregular transects or spot-checked; vegetation clearance was conducted in areas with dense vegetation cover.

Figure 3.7 Example of a vegetation clearance.

Additionally, two "Areas of Historical Interest" that exist within the project area boundary were relocated and evaluated; the ICRMP recommended investigation, recordation, and evaluation of any known resources. These areas were intuitively surveyed with the standard vegetation clearance spacing adjusted to account for topography or other variables.

An archaeological resource was defined as three or more artifacts in a 30-x-30-m area, or a bedrock milling feature. Cultural resources were recorded on all necessary DPR 523 forms including, but not limited to Primary, Archaeological, Sketch Map, and Location Map forms. Site boundaries were determined by the surface distribution of artifacts. Once an artifact was found, the crew inspected the surrounding area more intensively in transects spaced no more than 3 m apart and by randomly walking around the defined area, and placing pin flags on all identified cultural items.

No artifacts were collected during the surveys or as a result of vegetation clearance. The presence or absence of evidence for cultural materials or deposits was noted. Diagnostic artifacts were documented in the field (i.e., basic metrics of diagnostic artifacts or tools, location, description, photographs), and left on site. These were described and photo-documented in appropriate site forms.

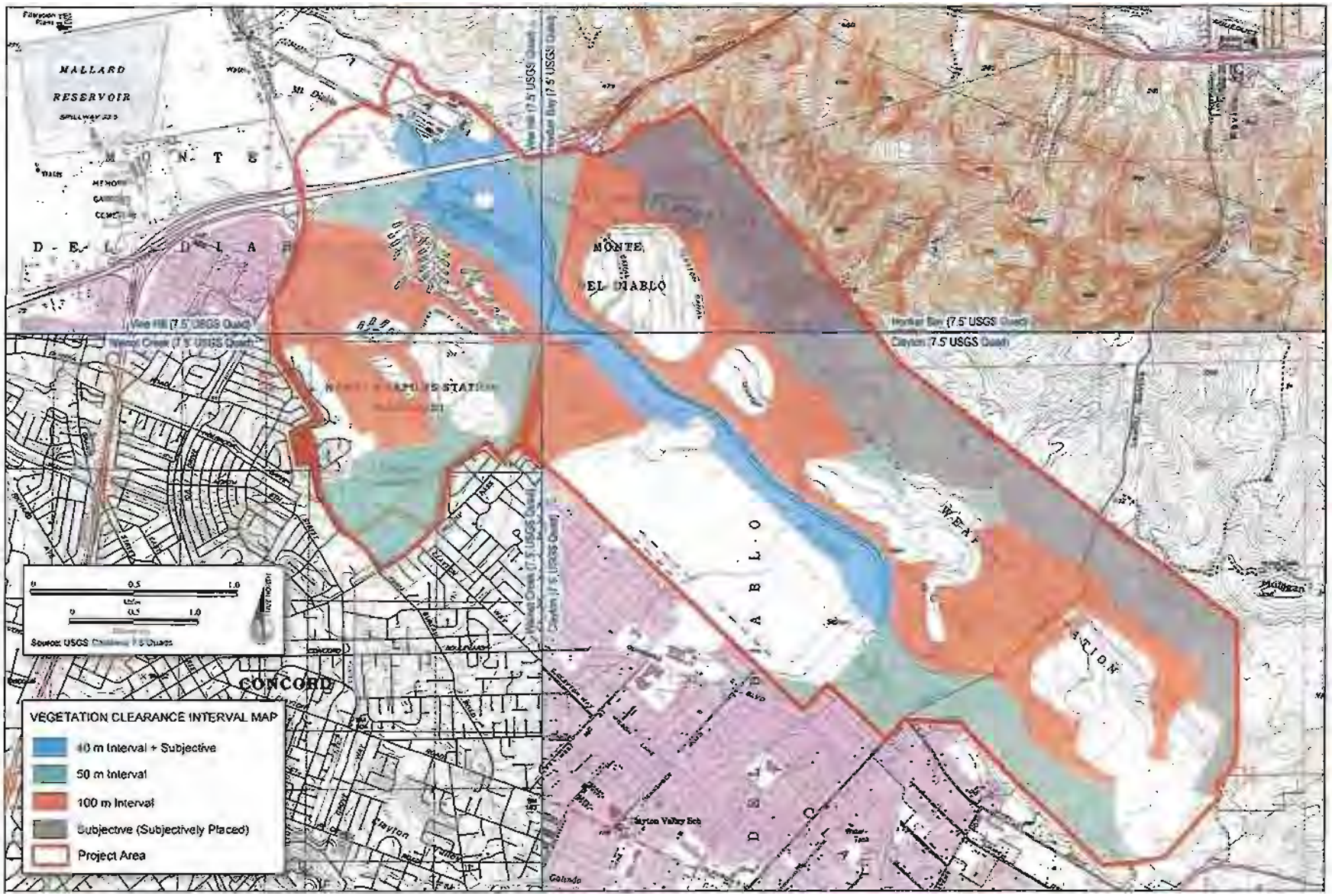

Figure 3.8 Map exhibiting the distribution of vegetation clearances by interval.

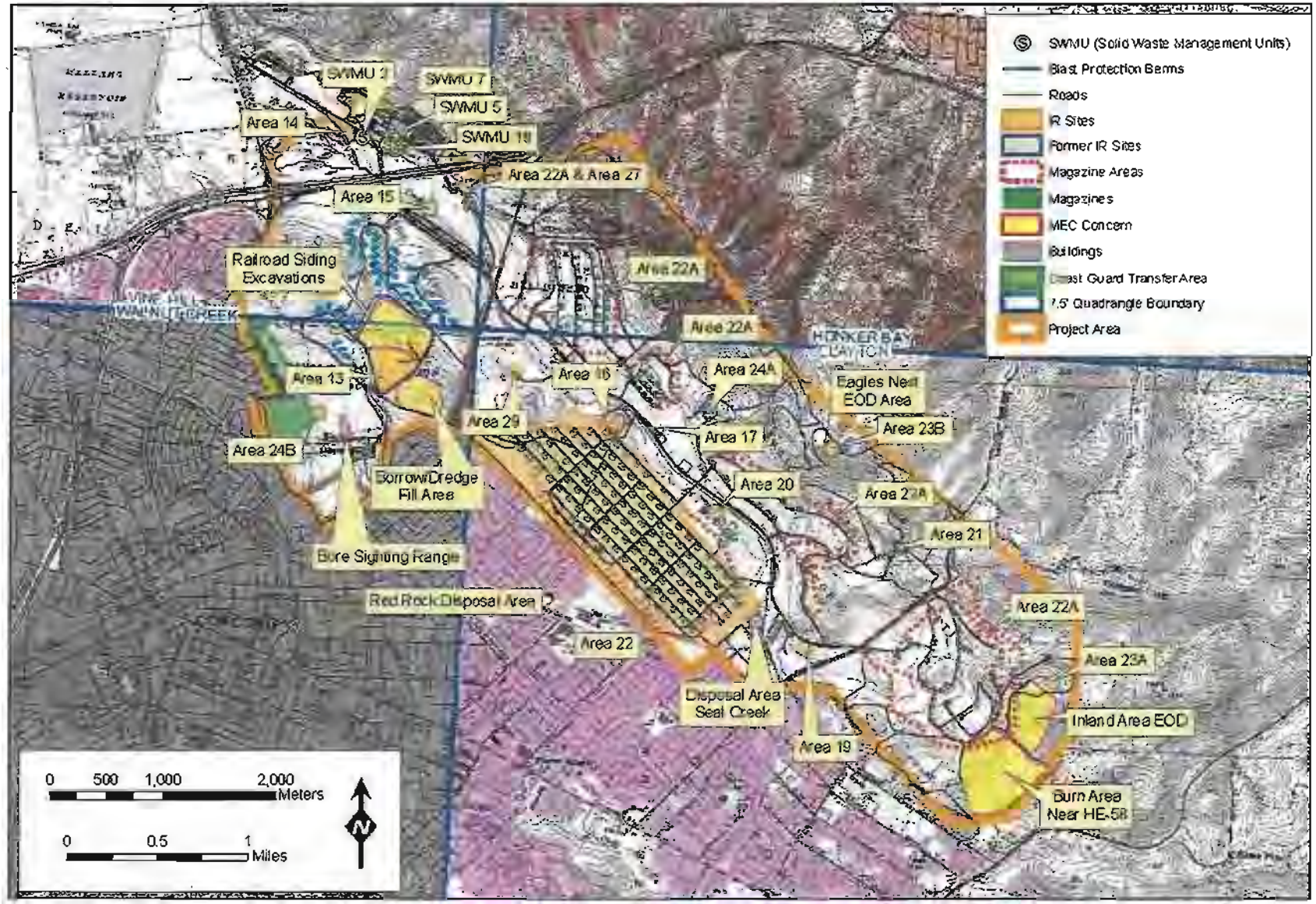

Figure 3.9 Map exhibiting the locations of various hazard areas, including IR/MMRP sites and MEC Concern.

Figure 3.10a Map of surface archeological potential.

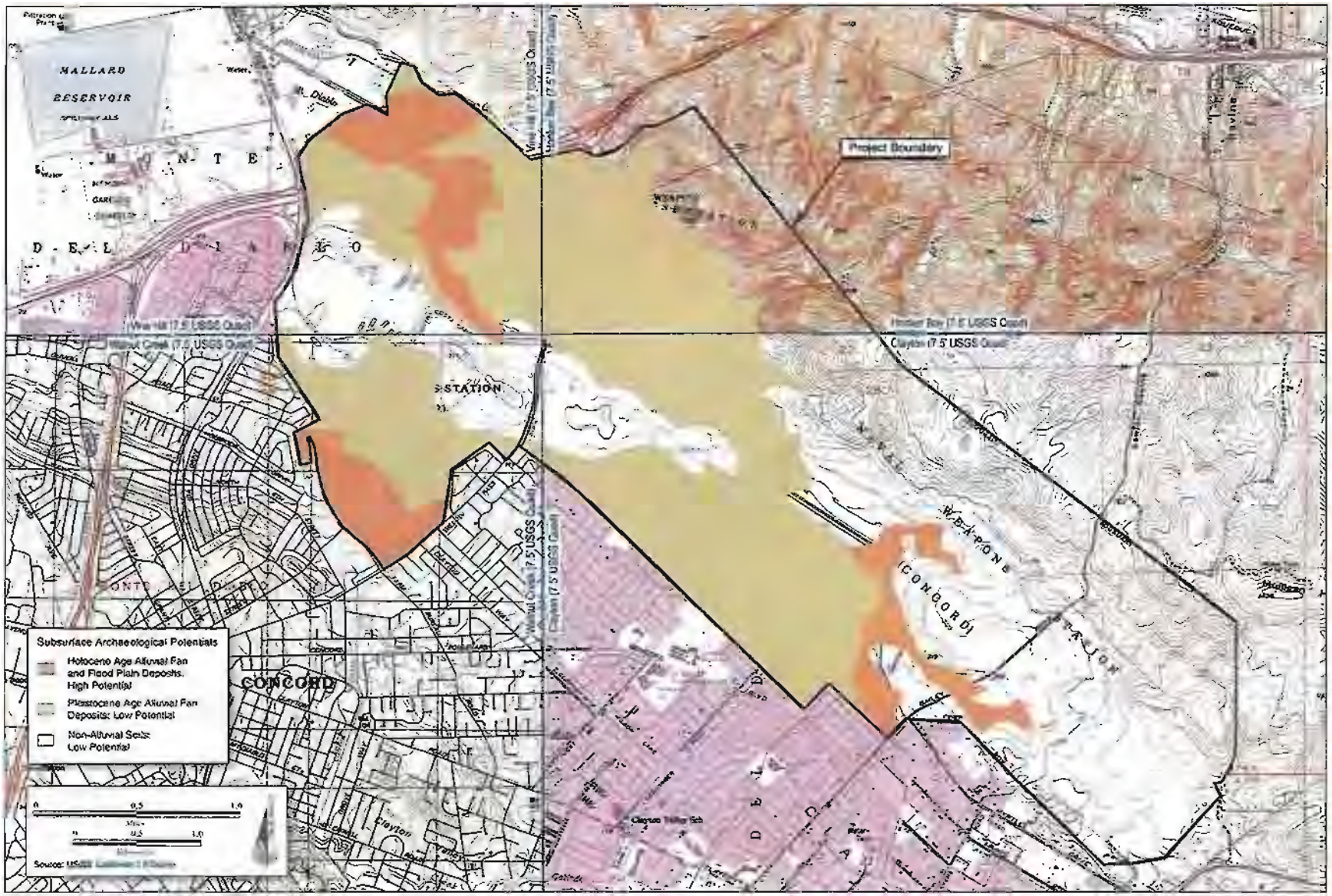

Figure 3.10b Map of subsurface archaeological potential.

Site maps included information regarding the site boundary, features, and surface artifacts. Mapping was based on a datum point established in the field (though not marked) and typically consisted of a stationary, relatively permanent feature. Datum points were used primarily for relocation since each site was mapped using a Trimble GPS device with real-time correction capabilities and decimeter-level accuracy. This method is much quicker and more accurate than traditional hand-drawn maps. Digital photographs were taken to record the general character of each site and its constituents. Isolated artifacts were documented on DPR 523 Primary Forms with a Location Map accompanied by a photo.

During the survey, all ASM personnel adhered to safety protocol outlined in the NEHC approved Health and Safety Plan (HASP) and Accident Prevention Plan (APP). Every morning, the crew was reminded of safety issues and directed toward the evacuation plan and route, which was posted in the work vehicle at all times. A copy of the HASP and APP was given to each crew member. Crew members surveying the IR and MMRP areas were HAZWOPER trained and took the necessary precautions to avoid potential hazards, although none were encountered.

RECORDS SEARCH RESULTS

A records search for the property was conducted at the Northwest Information Center (NWIC), Sonoma State University, on March 13, 2007. The search encompassed the project area and a one-mile radius around the project area boundary. Four separate 7.5' USGS topographic quadrangles comprise the Inland Area, including: Clayton, Honker Bay, Vine Hill and Walnut Creek. The results of the records search are provided in Appendix D.

Known Cultural Resources

The records search at the NWIC identified 290 cultural resources located within the Inland Area project boundary, comprising 288 historic and 2 prehistoric sites (Appendix D). However, it should be noted that there are WWII-era and earlier buildings present within the project area that were evaluated by other studies but may not have been identified by the records search. Only the cultural resources identified by the current records search at the NWIC will be discussed here. The historic cultural resources include: corral/holding pen; abandoned historic airfield; railroad spur; concrete foundation and block structures; metal structures; wood frame structures; Quonset huts; trailers; garages; cistern; assorted housing units; magazines; operations/guard houses; weapons maintenance buildings; lunch locker; boiler; pump houses; emergency generator; central operations; assorted sheds, storage structures, and warehouses; weather shelters/bus stops; sign; parade ground; missile display; flagpole; gun battery; assorted recreation and mess facilities; bathhouse; assorted hobby shops; assorted military personnel service buildings; air compressor; railroad trestle; earth berms; canals, bridges and tunnels; guard tower; sentry posts; water storage tanks; electrical substation; and a mine shaft.

One historic cultural resource - P-07-002695, the Contra Costa Canal - was recommended as eligible for listing in the NRHP in 2005 (refer to the DPR 23 Primary Record Form).

One prehistoric cultural resource - CA-CCO-680 (P-07-000003) – was recommended as eligible for listing in the NRHP. CA-CCO-680, consists of a sparse, albeit diverse, deposit of prehistoric artifacts (i.e., mortars and pestles, an antler wedge, a stone "chopper," and other flaked stone tools and debris) and dietary remains (i.e., mammal bone and marine and freshwater shellfish). A possible hearth feature and several pieces of human bone were also identified as the result of a small test excavation (Busby et al. 1996a). All of the material recovered during this work (including the human bone) was reburied at the cultural resource. A preliminary assessment concluded that CA-CCO-680 may qualify for listing on the NRHP, although the site was not formally evaluated (Busby et al. 1996a). Some deposits from the nearby Maltby Site may have been redeposited at CCO-680 when when almost four feet of archaeological deposit was removed from the Maltby Site to level the area in 1937 for agricultural development (refer to the 1996 DPR 23 Primary Record Form for CA-CCO-680). See below for a description of CA-CCO-250. However, given the presence of a possible hearth at CCO-680, it is likely that most deposits at the site derive from occupation in the immediate vicinity.

Cultural Resources in the project area recommended as not eligible, but that are relevant for the current survey, include an historic cistern (P-07-00860), an historic corral (P-07-00485), and a mine shaft (P-07-02683). The stone cistern, P-07-00860, was first recorded by Self et al. (1993) who determined it to be ineligible for NRHP listing. Self et al. (1993) noted that the cistern dated between 1880 and 1900. The Navy concurred with the eligibility recommendation by Self et al. (1993). JRP (1998) subsequently recorded the cistern and noted that it appeared on an 1896 USGS 7.5' quadrangle, and that the Gehringer-Bollman family owned the land from 1863 until its acquisition by the Navy. Finally, John Kiebel (2001) of the Concord Historical Society reports that the cistern was constructed between 1932 and 1935 by Robert Motheral and Joe Case for Ralph Bollman, the owner and operator of a diary in the area until 1944.

An historic corral, P-07-00485, was recorded by Busby et al. (1996a). It consists of a wood corral with a possible double chute system, stock loading platform, a barbed wire fence, collapsed wood fence, wood debris, and two water tanks. An extensive archival search by Busby et al. (1996a) yielded no information regarding original owners or age of the corral. The site was recommended as ineligible for NRHP listing due to its poor condition, lack of unique features, and an inability to identify age or ownership.

A prehistoric bedrock milling site, P-07-00861, was recorded by Kiebel (2001). This site contained one milling feature with five mortar surfaces (one with an associated slick) situated on the east-facing slope of a small knoll. No eligibility recommendations were given for P-07-00861.

JRP (1998) conducted archival research to evaluate the mineshaft, P-07-02683, and determined that it was most likely associated with either coal or copper mining that began in 1863 in the general vicinity of the base; an exact date on the mine cannot be determined. This mine shaft was determined not eligible for NRHP listing.

22 historic and 2 prehistoric cultural resources were identified within a one-mile radius of the Inland Area project boundary (Appendix D). The historic cultural resources include ranches, houses and homesteads. The prehistoric cultural resources include midden, burials, and an isolated obsidian biface

One historic cultural resource, P-07-002648, the Contra Costa Canal Bridges, was recommended as eligible (Bridges 28C0201, 28C0206, and 28C0376) for listing in the NRHP (refer to the 2005 DPR 23 Primary Record Form).

One prehistoric cultural resource located outside of the project area, CA-CCO-250 (P-07-000131), the Maltby Site, yielded 40 prehistoric burials and an array of prehistoric artifacts (Engineering Field Activity 2002). Although the cultural resource's eligibility for the NRHP is indeterminate on the 1949 site form, Chavez and Woodbridge (1988) suggested that the site still has the potential for discovery of additional burials despite Lillard et al. (1939) describing it as probably destroyed.

Previous Cultural Resource Investigations

A total of 107 documented cultural resource investigations have been conducted within one mile of the project area. Of those, 19 were conducted within the project area boundary (Appendix D), three of which identified or recorded sites located within the project area. However, very little of the current project area has been surveyed since previous investigations were either linear or small parcels. Below is a summary of the findings of each these studies; a map exhibiting previous investigations is located in confidential Appendix D.

Previous Cultural Resource Investigations Within the Project Area

Holman 1984 (S-6704)
Holman and Associates conducted a field reconnaissance of a 30-acre proposed Bart Park/Ride parking lot located in the western portion of NWSSB DET Concord (Holman 1984). A records search indicated the parcel contained no recorded cultural resources. Additionally, no new cultural resources were encountered during the course of an intensive survey; the author did not specify at what interval transects were spaced. The researchers concluded that no impacts to known cultural resources would occur within the project area.

Cartier 1985 (S-7730)
Archaeological Resource Management conducted a records search at the North Western Information Center for Navy Family Housing located in Alameda, Contra Costa, San Francisco and Marin counties (Cartier 1985). The records search indicated that the parcels contained no recorded cultural resources and had not been previously surveyed. The

researchers recommended a survey be conducted on the parcels to assess them for significant cultural resources.

Chavez and Woodbridge 1988 (S-10268)

An archaeological inventory was conducted along the proposed route of BART extension from the station in Concord north to the Highway 4 right-of-way and east through Pittsburgh to Antioch to identify NRHP-eligible sites (Chavez and Woodbridge 1988). The project was undertaken to satisfy Section 106 of the National Historic Preservation Act. A records search indicated that the ROW contained no previously recorded cultural resources. No new cultural resources were encountered during the course of the field vehicle reconnaissance. The researchers concluded that no impacts to known cultural resources would occur within the project area.

Self 1989 (S-13416)

William Self Associates conducted a field survey for the Mt. Diablo Creek Flood Control and Stream Stabilization project located along approximately 10 km of Mt. Diablo Creek and it's environs (Self 1989). A records search at the Northwestern Information Center indicated the parcel contained no recorded cultural resources. Additionally, no new cultural resources were encountered during the course of the intensive survey; the author did not specify at what interval transects were spaced. The researchers concluded that no impacts to known cultural resources would occur within the project area.

Ananian 1990 (S-11405)

Benjamin Ananian conducted a field reconnaissance for the Willow Pass Road Safety Improvements Project located on both sides of the road from 450 feet north of Lynwood Drive to the Kinney Drive Bridge (Ananian 1990). A records search at the North Western Information Center indicated the parcel contained no previously recorded cultural resources. Additionally, no new cultural resources were encountered during the course of the Level I field pedestrian reconnaissance; the author did not specify at what interval transects were spaced. The researchers concluded that no impacts to known cultural resources would occur within the project area.

Chavez and Hupman 1990 (S-12111)

David Chavez and Associates conducted a field reconnaissance for the Pittsburgh-Antioch BART Extension Project - Phase 1A and Phase 1B (Chavez and Hupman 1990). The project extends from the existing Concord BART station to just beyond the proposed North Concord/Martinez Station, at the existing BART park and ride facility near the intersection of Port Chicago Highway and State Route 4 (Phase 1A), as well as from where the Phase 1A alignment tunnel emerges in the Route 4 median eastward within the median to Bailey Road. A records search at the Northwestern Information Center indicated the right-of-way contained no recorded cultural resources. Additionally, no new cultural resources were encountered during the course of the survey, which used zig-zag transects spaced at no more than 20-m intervals. The researchers concluded that no impacts to known cultural resources would occur within the project area.

Self et al 1993 (S-15500)
William Self Associates conducted an inventory of cultural resources on lands administered by NWSSB DET Concord to identify NRHP-eligible sites (Self et al. 1993). The project was undertaken to satisfy Section 110 of the National Historic Preservation Act and to serve as the basis for the ultimate development of a Historic and Archaeological Resources Protection (HARP) plan. No new cultural resources were encountered during the course of the intensive survey; the authors did not specify at what interval transects were spaced. No new cultural resources were recommended as eligible for the NRHP within the Inland Area.

Ananian 1994 (S-17897)
Mills Associates conducted a field reconnaissance for the Port Chicago Highway Pipeline Project located along a 25-x-160-ft.-wide alignment that extends from the North Concord BART station to Olivera Road, then south along Salvio Street to 6th Street in Concord (Ananian 1994). A records search at the NWIC indicated the alignment contained no previously recorded cultural resources. Additionally, no new cultural resources were encountered during the course of the Level I field pedestrian reconnaissance; the author did not specify at what interval transects were spaced. The researchers concluded that no impacts to known cultural resources would occur within the project area, but recommended monitoring of any subsurface excavations.

Cartier and Eckert 1995 (S-18327)
Archaeological Resource Management conducted a field reconnaissance for the Concord Naval Weapons Station Project located along a 160-ft.-long section of a gully located southwest of the Highway 4 and Highway 242 interchange (Cartier and Eckert 1995). A records search at the NWIC indicated the project area contained no previously recorded cultural resources. Additionally, no new cultural resources were encountered during the course of the survey, which included intuitive pedestrian reconnaissance in places where burrowing animals, exposed banks and inclines, and other activities had revealed subsurface stratigraphy and soil contents; the author did not specify at what interval transects were spaced. The researchers concluded that no impacts to known cultural resources would occur within the project area. The authors did note what they thought was evidence of an old ranch consisting of oak orchard trees with a thin scatter of ironstone, two pieces of annular ware, and modern glass (no structures remained of this ranch) (Cartier and Eckhert 1995:5). An additional area of historic interest was identified in the northern end of their project area as a few pieces of ceramics that pre date 1944. No site forms or other documentation was provided regarding the areas of historic interest.

Busby et al. 1996a (S-18439)
Basin Research Associates, Inc. conducted a field survey as part of an archaeological inventory of a portion of NWSSB DET Concord and an archaeological assessment and field condition review of CA-CCO-680 (Busby et al. 1996a). The parcel was located in the western part of the Inland Area with East Olivera Road on the east and Willow Pass Road on the south. A records search at the Northwestern Information Center indicated the parcel contained no previously recorded cultural resources. Aside from one isolated artifact located in the southeast corner of

the parcel, no new prehistoric cultural resources were encountered during the course of the survey, which used transects spaced at no more than 30-m intervals. However, the researchers did locate one unrecorded historic corral and "several" small concentrations of debris likely relating to military activity and primarily composed of sheet metal, none of which were recommended as eligible for the NRHP. No site forms or other documentation were provided for these scatters. Additionally, they relocated, recorded, conducted a conditions review and tested CA-CCO-680, a previously recorded prehistoric cultural resource. A concentration of ground stone artifacts was noted on the surface and two test units produced one piece of obsidian debitage and a Franciscan chert biface medial fragment in the deposits extending to 50 cm below the surface. Ecofacts from these deposits included a few unidentifiable shell flecks, several unidentifiable shell fragments, a few small *Olivella* sp. and *Haliotis* sp. fragments, and few probable freshwater mussel fragments, as well as several small mammal remains. Six fragments of human bone were also recovered. The only resource recommended as eligible for the NRHP by Basin Research Associates, Inc. was CA-CCO-680, and they recommended a passive protection program to avoid impacts to the cultural resource, as well as monitoring during any subsurface excavation for warehouse construction.

West and Welsh 1996 (S-18440)

The Bureau of Reclamation (BOR) conducted a field reconnaissance as part of the transfer of ownership of the Contra Costa Canal System from the BOR to the Contra Costa Water District (West and Welsh 1996). The survey followed the right of way along the length of the canal, including the intake channel from rock slough, Clayton and Ignacio Relift Canals and pumping plants, Martinez Reservoir and Pumping Plants 1, 2, 3 and 4. Records searches at the BOR and NWIC indicated the project area contained two reported but unrecorded cultural resources, and it was unclear if one cultural resource, CA-CCO-386, a shell midden, was located within the APE. The BOR determined that all three cultural resources were located outside the APE, and no attempt was made to evaluate them. Additionally, no new cultural resources were encountered during the course of the initial field reconnaissance and subsequent Class III field survey because the APE has been almost completely modified; the authors did not specify at what interval transects were spaced. They concluded that no impacts to known cultural resources would occur within the project area, and that the Contra Costa Canal System was not eligible for recommendation to the NRHP. However, the BOR recommended monitoring during any subsurface excavation.

Baker and Shoup 1996 (S-19106)

Archaeological/Historical Consultants conducted a field survey for the Panoramic Drive Expansion Project, proposing to build a two-lane expansion of Panoramic Drive extending from the North Concord/Martinez BART Station, south to Willow Pass Road (Baker and Shoup 1996). A records search at the NWIC indicated the project area contained CA-CCO-680, a previously recorded prehistoric cultural resource (Busby et al. 1996a). Additionally, five historic cultural resources were encountered during the course of the systematic survey, which used transects spaced at no more than 15-m intervals: CA-CCO-706H, Naval Airfield Runways; CA-CCO-707H, Railroad Spur; CA-CCO-708H, Concrete Foundation; P-07-000512, Single Story Concrete Building (Bldg IA-56); P-07-000485, Corral/Holding Pen.

None of these historic cultural resources were eligible for the NRHP. The researchers recommended additional testing at CA-CCO-680 to develop a mitigation plan if construction is to take place within the site boundary as planned.

Busby et al. 1996b (S-21131), 1996c (S-21132)
Basin Research Associates, Inc. conducted a field inventory as part of a supplement to an archaeological inventory for a portion of NWS Concord that reviews five alternative warehouse locations (Busby et al. 1996b, 1996c). The parcels are located in the far northwestern portion of the Inland Area north of Kinne Boulevard and the railroad tracks. A records search at the NWIC indicated the parcels contained no recorded cultural resources. Additionally, no new cultural resources eligible to the NRHP were encountered during the course of the inventory, which used transects spaced at no more than 30-m intervals. The researchers concluded that no impacts to known cultural resources would occur within the project area, but recommended monitoring during any subsurface excavation.

Baker 1997 (S-18868)
Archaeological/Historical Consultants conducted a field survey for the Bailey Road Bridge Replacement Project located on Bailey Road where the bridge crosses Mt. Diablo Creek (Baker 1997). A records search at the NWIC indicated the project area contained no previously recorded cultural resources. Additionally, no new cultural resources were encountered during the course of the systematic survey, which used transects spaced at no more than 3-m intervals. The researchers concluded that no impacts to known cultural resources would occur within the project area, and that the Bailey Road Bridge is not eligible for the NRHP.

Rosenthal, Milliken and Mikesell 2000 (S-24281)
Far Western Anthropological Research Group, Inc. and JRP Historical Consulting Services prepared an ICRMP for NWSSB DET Concord (Rosenthal et al. 2000). This document guided the identification and management of significant historic properties and documents, archaeological properties, and cultural resources of traditional cultural importance at NWSSB DET Concord. No cultural resources at NWSSB DET Concord were listed in or had been formally determined eligible for listing on the NRHP as of January 2002. However, two prehistoric sites, CA-CCO-680 and P-07-000861, and one historic cultural resource, P-07-000485, Corral/Holding Pen, had been identified at NWSSB DET Concord.

Baxter 2000 (S-28130)
Past Forward, Inc. conducted a historic property survey for the Bailey Road Bridge Replacement Project located on Bailey Road where the bridge crosses Mt. Diablo Creek (Baxter 2000). A records search at the NWIC indicated the project area contained no recorded cultural resources. While the residence at 1854 Bailey Road and the Bailey Road Bridge were determined to be historic structures, neither is eligible for the NRHP. The researchers concluded that no impacts to known NRHP-eligible cultural resources would occur within the project area.

Self 2001 (S-24337)

William Self Associates conducted a field survey for the proposed anomaly repairs at 14 areas along Line Section 9 located in Contra Costa, San Joaquin and Sacramento counties (Self 2001). A records search at the NWIC indicated the right-of-way in Contra Costa County contained no recorded cultural resources. Additionally, no new cultural resources were encountered during the course of the field pedestrian reconnaissance in the right-of-way in Contra Costa County; the author did not specify at what interval transects were spaced. The researchers concluded that no impacts to known cultural resources would occur within the right-of-way in Contra Costa County.

Clift and Farrell 2002 (S-27455)

Cultural Resource Management Services conducted a field survey for determination of adverse effects arising from the placement of two mobile homes on the Wichman Property, a 20-acre parcel located on the USGS 7.5' Bryson Quad, T24S, R8E, Section 26 (Clift and Farrell 2002). A records search at the NWIC indicated the parcel contained no previously recorded cultural resources. Additionally, no new cultural resources were encountered during the course of the systematic, intensive field pedestrian survey using transects spaced at no more than 10-m intervals. The researchers concluded that no adverse impacts to known cultural resources would occur within the parcel.

Previous Cultural Resource Investigations Within One Mile of the Project Area

Copies of the 87 reports of previous cultural resource investigations within one mile of the project area boundary were not requested as part of the records search results. However, the reports are briefly summarized in Appendix D.

4. SURVEY RESULTS

This section describes the field conditions and archaeological resources documented during the pedestrian survey. A detailed description of field conditions is provided first, with particular attention paid to ground visibility. This is followed by a review of archaeological resources recorded during the survey. Previously recorded archaeological sites are reviewed first, followed by descriptions of newly discovered sites, and then isolated cultural material. All site forms, including updates, can be found in Appendix E. The pedestrian survey resulted in the relocation of five previously recorded archaeological sites (two prehistoric, three historic) and the discovery of 17 new sites (one prehistoric, 16 historic) and four isolated artifacts. Two areas of historical interest were also inspected.

Following a discussion of fieldwork conditions, this chapter is divided into two main sections. The first section is a discussion of all archaeological resources identified during the current survey. The second section presents the survey results for the IR and MMRP sites within the project area.

FIELDWORK CONDITIONS

Factors affecting the discovery of archaeological resources during the pedestrian survey include ground visibility and natural and human disturbances to the overall landscape. Landscape modifications were discussed in Chapter 3, while ground visibility and characterization of disturbances are discussed in the following sections. Although ground visibility was better than expected for much of the project area, areas with assumed moderate to high surface archaeological sensitivity (see Figures 3.10a and 3.10b, below) had lower ground visibility (near drainages and in the old airfield area).

Ground Visibility

The following discussion describes the amount of ground surface visible during the pedestrian survey. In general, visibility in much of the survey area was better than expected due mostly to extensive cattle grazing, reduced precipitation, and because the pedestrian survey took place during the summer dry season. Kellogg (2007) reports the 2006-2007 rainy season as only 55 percent of normal (about 9 inches of rain) and this contributed to less dense grasses and other vegetation that typically obscures the ground surface. Visibility was primarily constrained by vegetation and thus the visibility scale (see below) reflects surface visibility relative to vegetative ground cover. Each level of visibility on the scale is a qualitative statement that is converted to general proportions for ease of discussion. However, it provides an accurate representation of field conditions during the pedestrian survey. Though paved surfaces are considered completely obscured, these are not accounted for in the visibility scale.

During the survey, visibility was estimated on a scale of 0-100 percent: 0-25 percent, poor; 26-50 percent, fair; 30-60 percent, fair-good; 51-75 percent, good; 76-100 percent, excellent (Figure 4.1). These estimates characterized broad areas that sometimes had patches of better or worse visibility. Overlap in the visibility scale, indicated by the 30-60 percent, fair-good level,

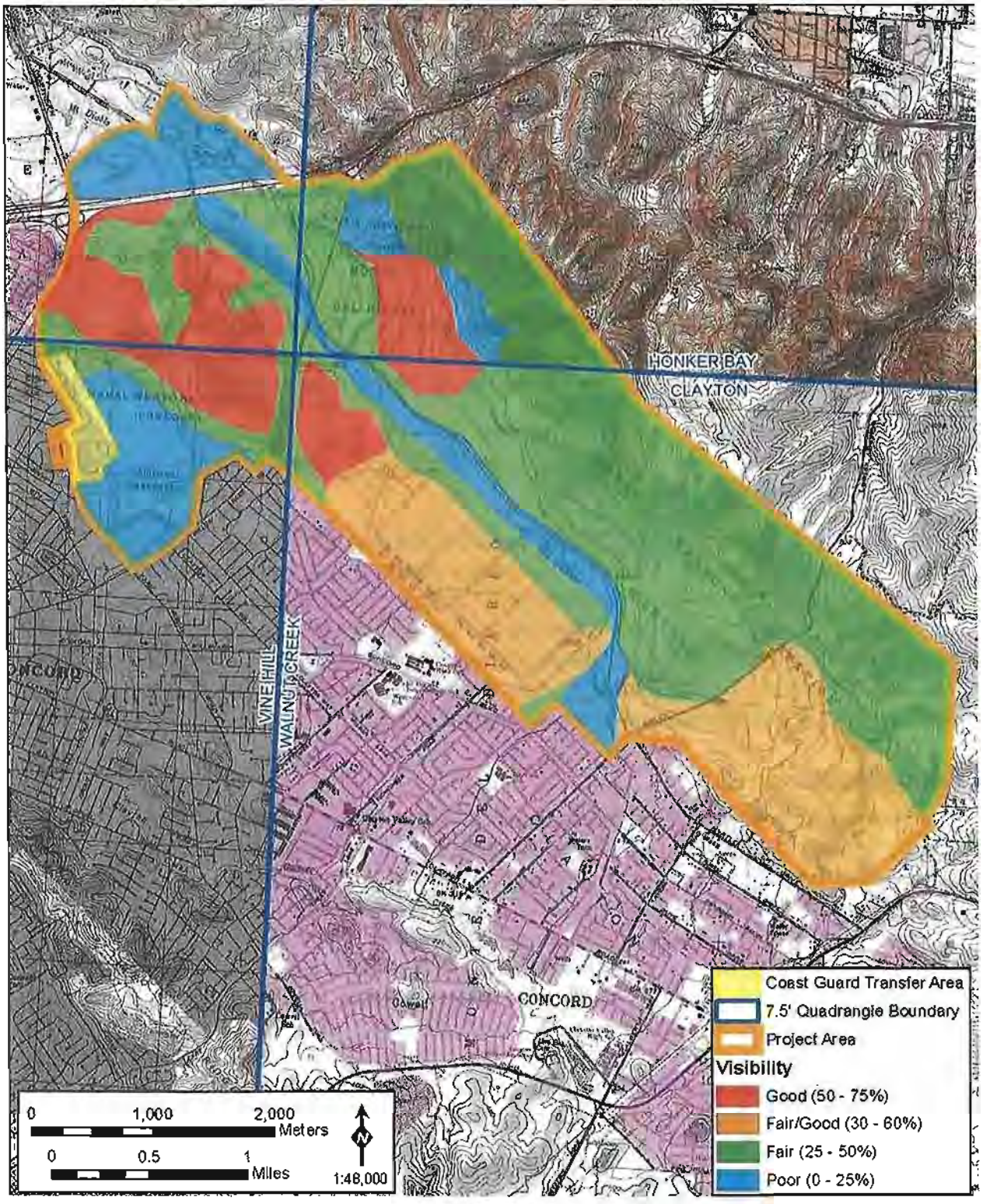

Figure 4.1 Map illustrating variation in ground visibility throughout the project area.

is a reflection of highly variable surface visibility conditions. In fair-good areas, there were multiple interspersed patches with either fair or good visibility. The patchiness of good-fair areas made it impossible to delineate individual visibility zones as either fair or good. Ground surface visibility was never excellent, as vegetation obscured at least part of the surface in every part of the survey area.

A relatively large area located south of Highway 4, straddling Willow Pass Road, and east of the abandoned airfield was characterized as good (see Figure 4.1). This area has been used for cattle grazing, which has significantly reduced the amount of vegetation. Also, the natural geologic deposit contains sub-angular cobbles and gravels causing vegetation to be thin. Some portions of this area contained dense vegetation, especially those areas surrounding train bunkers and located in depressions. Another area characterized as having good visibility is located on the east side of the project area and is fully contained within a bunker complex surrounded by two security fences (see Figure 4.1). This area is currently used for ranching activities and housed bulls at the time of the survey. Visibility was better than average here because of the large number of cattle in the fenced area that actively cleared the ground of vegetation.

The "bunker city" complex (Area 22) located in the west-central part of the Inland Area, and parts of Area 22A, located in the northeast part of the Inland Area, were characterized as having fair-good visibility (see Figure 4.1). These areas have been extensively modified for construction of the bunkers, and also by farming activity that predates the base. During the survey, in bunker city it was noted that the surface was unusually level with small drainages and culverts constructed between each row of bunkers. Imported gravel was used for the roadbeds between bunkers. The excessive modification of the natural ground surface disturbed and co-mingled native soils, lessening grass density. Patches of thick vegetation present were mostly characterized by star thistle and mustard. Despite the fair-good visibility, very few, if any, natural surfaces were observed during the survey of bunker city, except on the periphery. In Area 22A, which includes five magazine areas, visibility was also generally fair-good. The landscape has been graded but generally slopes west toward Mt. Diablo Creek. Visibility in Area 22A was enhanced because the northern three portions of Area 22A are used as cattle pens. The largest of these magazine complexes in Area 22A, is used as a bullpen and in its southern portion, very little vegetation remained. Instead, surface visibility was obscured by manure. This area was characterized as having good visibility. From north to south, the fourth magazine area was characterized by fair visibility and the fifth magazine area had both fair and fair-good visibility.

South of Bailey Road, the survey area was characterized as having a mixture of fair-good visibility in low-lying areas and fair visibility on the steep slopes and drainages to the east-northeast (see Figure 4.1). Cattle had free range in the survey area but cleared much of the vegetation from the lower areas leaving the steeper hills more vegetated, except on ridge tops and drainage bottoms.

A significant portion of the entire survey area had fair ground visibility including nearly all of the steep slopes running along the northeastern base boundary, and adjacent hills and low terraces to the west (see Figure 4.1). Northwest of Willow Pass Road, generally good visibility

was interspersed with more dense vegetation lowering visibility to fair. This was also true of a thin swath between the bunker city and the creek channel.

Areas with poor visibility were unevenly distributed and mostly confined to lower elevations or areas around springs (see Figure 4.1). A large area covering the abandoned airfield and surrounding low-lying level terrain had especially dense vegetation; some areas were completely obscured by brush and thistle. A narrow swath bordering both sides of the creek channel that bisects the survey area had poor visibility due to thick grass. Fences line much of this channel to keep cattle out and grass remains tall and thick (Figure 4.2). The entire northern portion of the survey area located north of Highway 4 was characterized as having poor visibility, mainly due to extensive paving and development, including the construction of the golf course. Visibility was essentially nonexistent at the golf course and survey was limited to small, densely vegetated areas between roads and buildings. A small patch of land located east of the creek and north of Highway 4 had fair visibility. Finally, two small patches of dense grass with "poor" visibility are located southeast of Willow Pass Road abutting the north and east sides of the restricted bunker complex (see Figure 4.1).

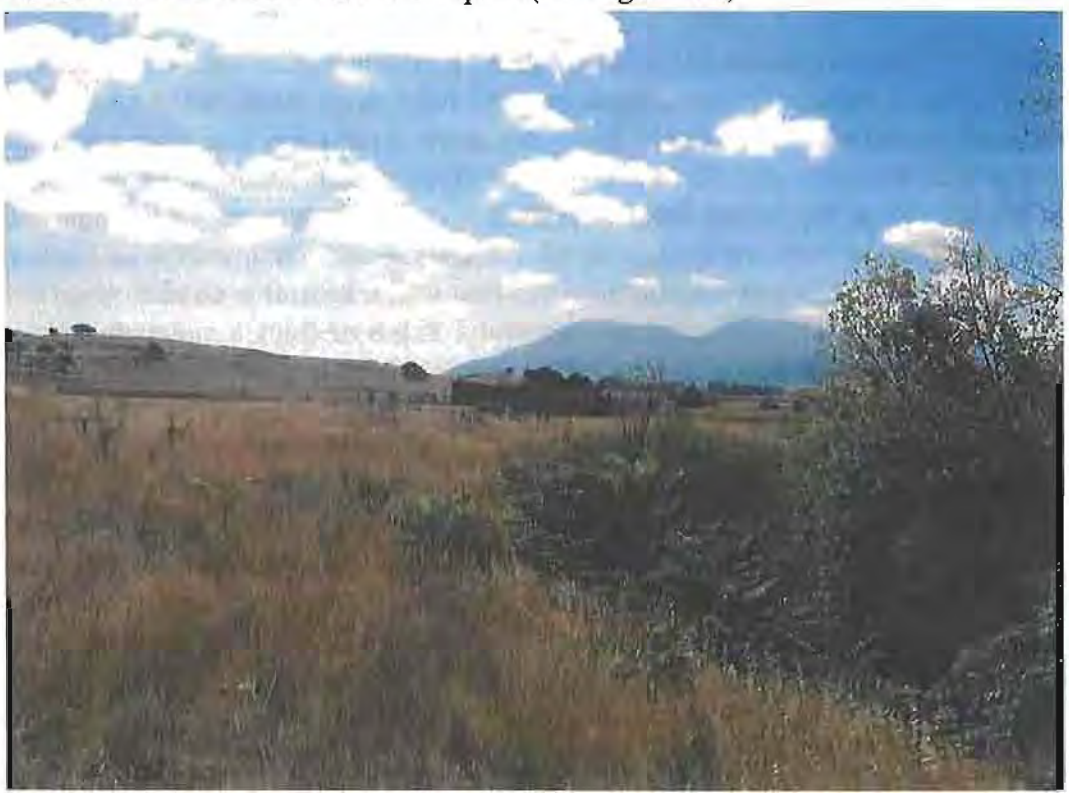

Figure 4.2 Overview of Diablo Creek drainage area; note especially thick grass and brush.

Characterization Of Disturbances

The factors affecting integrity of the natural landscape were reviewed in Chapter 3. However, during the pedestrian survey, general levels of ground disturbance were noted and are illustrated on Figure 4.3. Two general forms of ground disturbance were characterized: military and agricultural. Disturbances noted during survey were validated through the review

Figure 4.3 Map exhibiting estimates of disturbance visible from the surface and cross-checked with Figure 3.4 and base maps of military facilities.

of maps and aerial photos of the Inland Area. Military disturbance was usually more obvious and consisted of construction of facilities (i.e., roads, railroad tracks, culverts, drainages, bunkers, buildings, borrow pits, bulldozing, etc.). Agricultural disturbance was less obvious and was mostly inferred from old maps and a 1939 aerial photo exhibiting an extensive agricultural landscape. Agricultural disturbances identified in the field consisted of unusually level land showing signs of plow furrows and agricultural features (orchards, windmills, water troughs, etc.). Combined, military and agricultural activities have almost completely altered the Inland Area landscape, excluding bordering hills to the east and some low lying hills in the southeast that have extensive bedrock outcrops. However, even hills with exposed bedrock have been extensively disturbed by borrow pits and bulldozing. It is unclear if the latter relate to rock mining that took lace before the development of the base.

ARCHAEOLOGICAL SITES

The pedestrian survey resulted in the discovery of 17 archaeological sites (one prehistoric, 16 historic), and the relocation of five previously recorded sites (two prehistoric, three historic) (Table 4.1). The previously recorded sites include P-07-00860, P-07-00861, P-07-00003/CA-CCO-680, P-07-00485, and P-07-02683. Four isolated artifacts were also found. Refer to Appendix E for a location map of all archaeological sites and isolates, as well as individual site forms with sketch maps and photos.

One area of historic interest identified by Cartier and Eckert (1995) and "several" scatters of sheet metal and other debris in the old airfield area identified by Busby et al. (1996a) were not relocated (see Chapter 3, Records Search Results). No site records, maps, or other documentation (besides informal mention) were provided for any of these potential historic resources. Intensive efforts were made during the survey to identify any cultural remains at either of the areas of historical interest, including increased subjectively placed vegetation clearances. At the westernmost area of historical interest, pre-1944 annular ware ceramics were identified in a deep drainage next to Highway 4. During the current survey, a few pieces of ceramics were found in an erosional drainage associated with an outhouse, well foundation, and Eucalyptus trees surrounded by a large fence. This resource was recorded as historic site CCO-788H (see below). It is unclear at this time whether the recorded location of CCO-788H is located within or outside of the Inland Area project area. At the easternmost area of historical interest, the only identified remains were orchard trees. These were not recorded.

None of the scatters of military-era sheet metal identified by Busby et al. (1996a) were relocated. This could be due to dense vegetation, but it is possible that they have since been removed from the area by firebreak grading. The lack of site forms and locational descriptions also complicated relocation of these scatters.

Table 4.1 Historic and Prehistoric Archaeological Sites

Resource ID	Age	Description	Condition	Area	Previously Recorded?
CCO-777H	Historic	Residence with outbuildings, water facilities, asphalt and stone paved roads, and orchard: cobble/ mortar/ concrete foundations with cobble buttresses on residence; appears on 1896 quadrangle; was secondarily used as original base PMO's residence in 1940's	Poor; Disturbed; standing structures gone, foundations crumbling	South	No
CCO-778H	Historic/ Submodern	Well; 4x4 ft wood box constructed over approximate 6 ft deep hole; barbed wire fence stuffed in box	Fair; Wood box in disrepair and filled with metal debris	South	No
CCO-779H	Historic	Five features consisting of concrete pads, water trough, rubble, cobble/ mortar culvert, residence foundation, and rock alignment	Poor; Disturbed; standing structures gone, foundations crumbling	South	No
CCO-780H	Historic	Historic residence/ ranch; palms and pines mark area; multiple foundations, well, fencing and roofing debris	Poor; Disturbed; standing structures gone, foundations crumbling	NW	No
CCO-781H	Historic	Water facilities foundations; windmill pad, water tank pad; walnut orchard, earthen dam, historic glass, red bricks/mortar; windmill blade and parts	Poor; Disturbed; standing structures gone, foundations crumbling	NW	No
CCO-782H	Historic	Concrete wall foundation with bricks/ mortar debris; water facility	Poor; Disturbed; concrete foundations damaged	NW	No
CCO-783H	Historic	Concrete wall foundation with bricks/ mortar debris; water facility	Poor; Disturbed; concrete foundations damaged	NW	No
CCO-784H	Historic	Historic debris scatter and orchard remnants on low knoll; historic glass fragments, whole abalone shell, red bricks/ mortar from old foundation	Poor; Disturbed; trash pile scattered; cattle churn surface		No
CCO-785H	Historic	Historic residence/ ranch remnants; line of eucalyptus, palms, square depression (foundation), bricks/ mortar scatter, sewar pipe frags., well cap, near old drainage; crosses Willow Pass to the south where there is windmill foundation and debris	Poor; Disturbed; little evidence of structures	NW/ N Central	No
CCO-786	Prehistoric	Ground and flaked stone scatter: 1 basined millingstone, 2 handstones, two assayed cobbles, one chert flake; approximate 80 x 40 m area in low depression just east of A9H	Good; Intact; only cattle traffic and fire-break maintenance impact site	Central	No
CCO-787H	Historic	Series of concrete pads, metal and brick debris; complex of buildings predating railroad and old canal that obscures foundation 1 on its east side and cut through old water trough; includes industrial metal debris	Poor; Disturbed; concrete foundations damaged	Central	No
CCO-788H	Historic/ Modern	Outhouse, pumphouse, foundation, well, light glass/ ceramic scatter, earthen pond; currently surrounded by high net/ chain link fence and gate; modern sprinkler system	Poor-fair; Disturbed; modern activities ongoing; outhouse in fair condition; foundations crumbling	North Central	No
CCO-789H	Historic	Concrete pad; industrial structure with iron bolts/ footing attachments	Poor; Disturbed; no standing structure left; foundation crumbling	West Central	No

Resource ID	Age	Description	Condition	Area	Previously Recorded?
CCO-791H	Historic	Dense glass/ ceramic scatter, borrow pit, water tank foundation, trees; graded road exposes glass scatter; corral to the east	Fair; trash deposit disturbed by road but portions intact; concrete foundation is fair	Southeast Central	No
CCO-792H	Historic	Glass Scatter; margin of dump that extends southeast off base; debris may be spilling onto base; nearby area is old corral facility	Poor; Disturbed by drainage and modern activity including fence construction and cattle	South	No
CCO-793H	Historic	Cobble pillars, glass scatter, water trough behind firehouse	Poor; Disturbed; scattered remains; concrete is poor	North	No
A18H	Historic	Quarry	Fair; Left as-is after operation; currently a sensitive species zone; eroding	North	No
P-861	Prehistoric	P-861; bedrock milling facility; originally only one bedrock outcrop with milling recorded; current efforts identified one other BRM and one cupule rock art boulder	Good; Bedrock features in good condition; no known deposit	South Central	Yes
P-860	Historic	P-860; Cistern on low knoll overlooking wetland/ pond; current efforts identified historic glass scatter to the west on flat terrace below cistern and windmill northeast of cistern and pond	Fair-Good; Cistern in good condition; trash scatter disturbed; windmill in fair condition	South Central	Yes
CCO-680	Prehistoric	P-000003/ CCO-680; Prehistoric scatter of flaked and groundstone; possible component of Maltby Site west of base; previous work found burials, midden deposits	Poor-fair; Disturbed by plowing/ grading but intact deposits may remain below surface	North West	Yes
P-000485	Historic	Corral near CCO-680	Poor; Disturbed; most of fence is down; remaining fence/ chutes comprised of weathered wood	North West	Yes
P-02683	Historic	Coal Mine Shaft: 6 x 9 x 30 ft: broken windmill nearby	Fair; Left as-is; matrix is loose; debris in and outside of shaft	South	Yes

Isolate ID	Age	Description		Area	Previously Recorded?
AI-1	Prehistoric	Single basalt secodary decortication percussion-removed flake		South	No
AI-2	Historic	Axe Head (pic 122)		North	No
AI-3	Prehistoric	Single Basalt secondary percussion flake; in highly disturbed soils southeast of cistern		South	No
AI-4	Prehistoric	Quartz biface; found ON railroad tracks near fenced bunker complex with bulls		North	No

Previously Recorded Sites

Five previously recorded archaeological sites were identified in the project area by the records search. These include an historic above-ground cistern (P-07-00860), a prehistoric bedrock milling feature (P-07-00861), a prehistoric habitation site (P-07-00003/CA-CCO-680, an historic corral (P-07-00485), and an historic mine shaft (P-07-02683). All previously recorded cultural resources in the project area are plotted on Figures 4.4a and b (confidential Appendix E.)

P-07-00860

This site is a stone and mortar cistern located in the southern portion of the Inland Area (Figures 4.4b, Appendix E and 4.5; see confidential Appendix E hereafter). This site was first recorded by Self et al. (1993), who determined it to be ineligible for NRHP listing. The Navy concurred with this recommendation. The site is thought to date between 1880 and 1900. It was subsequently recorded by JRP (1998) who noted that it appeared on an 1896 USGS 7.5' quadrangle, and that the Gehringer-Bollman family owned the land from 1863 until its acquisition by the Navy. The site was last recorded by John Kiebel of the Concord Historical Society in 2001; Kiebel provided a different interpretation, reporting that the cistern was constructed between 1932 and 1935 by Robert Motheral and Joe Case for Ralph Bollman, the owner and operator of a diary in the area until 1944. Given the widely divergent age estimate by Kiebel (2001) in contrast to Self et al. (1993) and JRP (1998), it could be that the knoll was previously occupied by another structure and that the current structure replaced it. There is no indication, however, that an earlier structure once existed at the same location.

The cistern is a rock and mortar building with wooden truss and corrugated steel roof, situated on top of a low rocky knoll overlooking a man-made pond to the east. It appears to have been constructed from rock quarried from the immediate vicinity. Several piles of rock surround the cistern. A dirt ramp with switchbacks runs up the western slope. The inside of the cistern is lined with "an asphalt-type mastic sealer" (Kiebel 2001). Rock buttresses support the longer walls and a stone staircase provides access through the eve of the roof on its north side. It measures 43 feet long and 24 feet wide; the stone walls are 10 feet high and 1.5 feet thick.

During the current pedestrian survey, the cistern was revisited and examined. The cistern is in similar condition to Kiebel's (2001) description. ASM also discovered a previously unrecorded historic debris scatter at this site (see Appendix E). This scatter consists of approximately 200 pieces of ceramic and glass. Ground visibility was poor in the area of the scatter. The glass and ceramics appear to date to the time of construction of the cistern. The scatter was recorded as a part of the cistern site complex. Additionally, a standing windmill is located east of the pond with segments of pipe that appear to run towards the cistern, as noted by Self et al. (1993). Self et al. (1993) also noted debris from a second windmill on the ground near the current windmill. The latter was not relocated during the current survey. The windmill and pipe segments indicate that the pond and windmill facility are associated with the stone cistern. To integrate all original and newly discovered features with the stone cistern, ASM drew a site boundary around the pond, windmill, and debris scatter to facilitate management considerations.

Confidential Figures 4.4a and 4.4b
Removed to Appendix E

Figures 4.4a and 4.4b Location maps of all archaeological sites and isolates documented during the current survey. (Confidential)

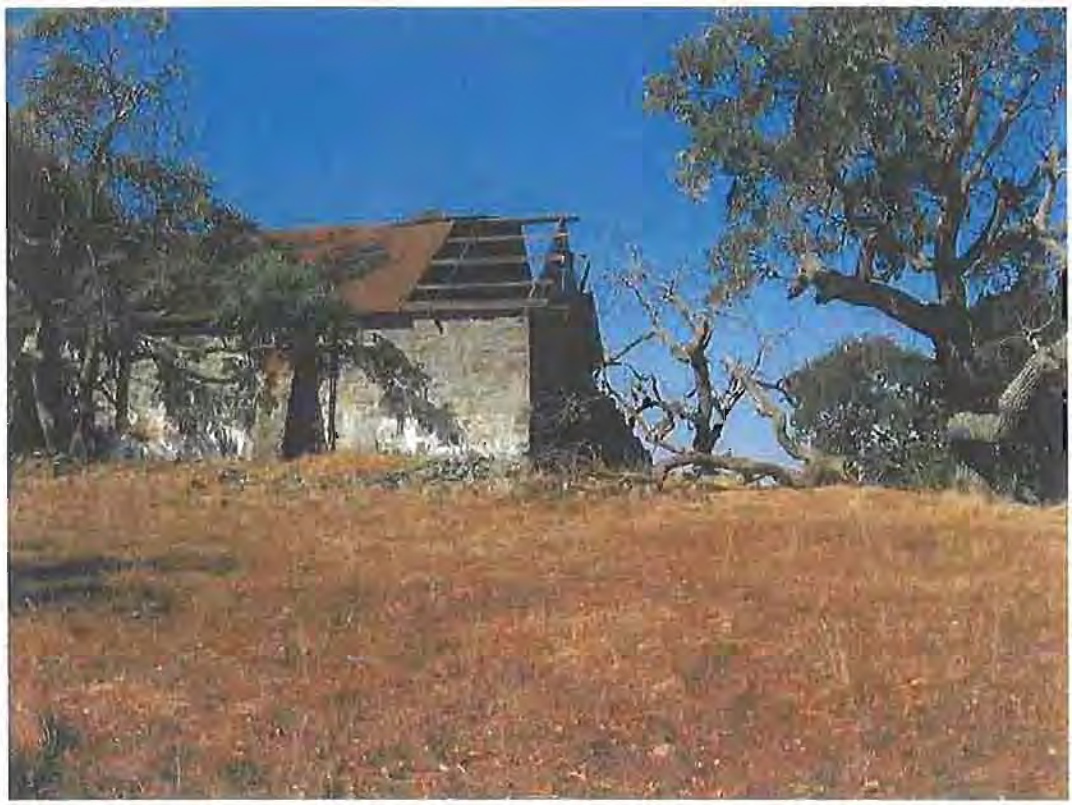

Figure 4.5 Overview of previously recorded historic site, P-07-00860.

Located within the boundary of P-07-00860 is prehistoric site P-07-00861, which consists of several bedrock milling outcrops and a single bedrock outcrop with rock art style cupules (see description for P-07-00861 below). This site was recorded separately from P-07-00860 to facilitate management of each resource as separate entities.

P-07-00861

Kiebel (2001) recorded this site as a single bedrock milling station with five mortar surfaces (one with an associated slick). During the current survey the feature was found to be exactly as described on original site forms. ASM also found two other features in the immediate vicinity: a bedrock outcrop with 10 small (<4 cm diameter) cupules (Feature 2) (Figure 4.6), and a bedrock milling feature with two saucer mortars (Feature 3). The cupules situated on Feature 2 are very similar to those described in other parts of California as a form of rock art related to ceremonies either for "world restoration" or rain production (Parkman 1994). No artifacts or midden soils were identified near any of the features. Heavy disturbance has churned up the surface and may have obscured or destroyed intact archaeological deposits associated with the site.

Figure 4.6 Feature 2 bedrock outcrop containing cupules at previously recorded prehistoric site, P-07-00861.

P-07-00003/CA-CCO-680

This is a prehistoric site encompassed in an approximately 140-m-x-85-m area in the northwest corner of the Inland Area (see Figure 4.4a, Appendix E). The site was originally recorded by Ananian and Day in 1994 (see Busby et al. 1996a) and was subsequently surveyed and tested by Busby et al. (1996a). The site is known to contain several pieces of ground stone (mortars, pestles, and miscellaneous fragments), flaked lithic debris, shell, human remains, midden soils, and a possible hearth.

Busby et al. (1996a) intensively inspected the surface of the site and excavated two shovel test pits (STPs). Busby noted that the surface was obscured by dense stands of thistle and other vegetation; several mortar fragments, pestles, and a few pieces of lithic debris were identified. Two STPs were subjectively placed to test for subsurface deposits. Busby found that midden deposits were present, and included several pieces of human bone from at least two, but probably three individuals in one of the STPs. Also found were pieces of marine and freshwater shell, debitage, and a possible hearth below 40 cm. Busby et al. (1996a) determined that the upper 30 cm of the deposit was disturbed but that the hearth at 40 cm below the ground surface indicates that intact subsurface deposits may remain at the site.

Currently, the site is covered by thistle and mustard, with a 50-m-x-20-m stand of blackberry covering the center of the site. Visibility of the surface varied from good to poor or completely obscured. In spite of visibility constraints, nearly all the artifacts described on the surface by Busby were found in addition to several other pieces of ground stone, flaked stone, and shell. The original site boundary is consistent with current observations of the distribution of cultural material, although recent grading of a firebreak may have moved some artifacts outside of the original boundary, including a hammer stone. Due to visibility constraints, it is possible that subsurface deposits extend beyond the current site boundaries.

Busby et al. (1996a) speculated that this site may represent a portion of the Maltby site. It is unclear whether Busby et al. (1996) thought that CCO-680 represented deposits that were moved to their current location or that CCO-680 represents the western extreme of the Maltby Site after the area was graded for agricultural purposes. The latter may be true since the authors identified a possible intact hearth at 40 cm. Incidentally, any argument that considers this site to be redeposited remains from the Maltby site must take into account that CCO-680 is situated near an old stream channel and that military construction activities in the early 1940's likely dispersed surface deposits that may have been in-situ at CCO-680.

P-07-000485

This is an historic corral originally recorded by Busby et al. (1996). It consists of a wood corral with a possible double chute system, stock loading platform, a barbed wire fence, collapsed wood fence, wood debris, and two water tanks. Busby et al. (1996a) conducted extensive archival research with historic maps to identify the original owners of the corral and a possible age of construction. This research was not successful in determining an age or owner. Busby et al. (1996a) recommended this resource as ineligible for NRHP listing due to its poor condition, lack of unique features, and an inability to identify age or ownership.

During the current visit, the site was found to be in similar condition as it was when originally recorded. However, dense vegetation obscured observation of this site and parts of the fencing that Busby et al. (1996a) noted could not be relocated due to access issues.

P-07-02683

This mineshaft was recorded by ASM as a new site, with temporary number A-9H, and later determined to be previously recorded site, P-07-02683. It is located in the southern portion of the Inland Area near the eastern base boundary (see Figure 4.4b, Appendix E). It is approximately 3 m wide and 2 m tall at its opening, narrowing as it extends down into the hillside to its terminus which is approximately 15 m deep (Figure 4.7). Water fills the bottom of the shaft, which also contains wood debris and a small engine. The remains of a windmill are located outside of the shaft (Figure 4.8). The mineshaft retains some integrity but is currently eroding and subject to collapse.

Figure 4.7 Coal mine shaft in the southern portion of the Inland Area.

Figure 4.8 Debris remaining from windmill that once stood at opening of mine shaft.

JRP (1998) conducted archival research to evaluate the mineshaft and determined that it was most likely associated with either coal or copper mining that began in 1863 in the general vicinity of the base; an exact date for the mine cannot be determined. The windmill at the opening of the shaft was not described by JRP (1998), who may have determined the windmill to be a modern addition to facilitate more recent ranching endeavors. JRP (1998) determined the mineshaft to be not eligible for NRHP listing. The newly documented windmill debris does not change this determination.

Newly Discovered Sites

Of the 17 newly discovered archaeological sites, 16 are historic and one is prehistoric. Historic sites consist primarily of concrete foundations and glass and debris scatters. Many of the concrete foundations are remnants of water facilities (i.e., cattle water troughs, windmill pads, etc.) and storage facilities. Only a few sites include residential features and debris. For the historic resources, historic maps were consulted, only one of which, an 1896 USGS 7.5' quadrangle, yielded information on a specific resource, historic site CCO-777H. Other efforts to determine age of historic resources include an archival search for Land Patent Information from the Bureau of Land Management (BLM), which yielded information for sites CCO-777H, CCO-779H, and CCO-788H. Information is rare for most historic resources documented during this survey because many of the resources are situated in unsectioned areas, and thus require more extensive archival research, such as title searches, to determine age and affiliation (see Chapter 5). Finally, determining age of vague features such as water troughs, windmills, and other ranching / agricultural features is made difficult due to more recent historic and modern agricultural activity. That is, it is often impossible to determine whether early historic or late historic period occupants constructed some of the historic features.

CCO-777H

This site is an historic orchard complex with associated residence and outbuilding foundations. It is located in the extreme southwestern corner of the Inland Area, approximately 300 m north and 200 m east of the base boundary fence (see Figure 4.4b, Appendix E).

The site consists of cobble-mortar-concrete residence foundations with cobble buttresses (marked by two palm trees), various concrete wall and floor foundations, and an orchard (Figure 4.9). An asphalt driveway provides access to the site and curbs made from fieldstone surround the residence foundation and planters. It appears that the site consists of a primary residence foundation, a garage foundation immediately to the east, a secondary building foundation further to the east, a storage facility foundation with loading dock and stairs to the north, a circular water tank foundation, and a spring farther to the northeast. The spring is on a low hill to the north above the residential complex and is actively used to water cattle. The residence foundation has a concrete basement with steel reinforcements and concrete buttresses (Figure 4.10). Two large palm trees mark the entrance to the residence. The foundation located farthest to the east of the residence has a floor made from large flat pieces of fieldstone that show heavy polish from wear. Steel poles set in concrete with wood attached to the top mark a loading dock behind and to the north of the residence.

Figure 4.9 Overview of cobble-mortar foundation at historic site, CCO-777H; note flying buttresses made of cobles and mortar.

Figure 4.10 Main residence foundation at historic site, CCO-777H; note concrete buttresses.

Currently, the low-lying area south of the residence is used to water and feed cattle (Figure 4.11). A buried utility runs north-south along the western boundary of the site. This orchard complex appears on an 1896 USGS 7.5' quadrangle topographic map. Pamela Ramirez, with the Concord NWPSTA administrative staff, indicated that the residence was used as officers' quarters in the 1940s. Currently, no evidence of structures remains aside from foundations; however, the site is considered in good condition, regardless of the lack of structures.

Figure 4.11 Overview south at CCO-777H toward modern well and cattle trough.

CCO-778H

This site is a subterranean well excavated in an ephemeral drainage and capped by a wood enclosure (Figure 4.12). The wood enclosure measures approximately 1.5 x 1.5 m and is 1 m deep. The well is approximately 6 feet deep. A thick roll of fencing wire has been placed in the wood enclosure. There is little indication of age for this feature. The wood is rotting and appears old. However, nails used in the construction of the wood enclosure may or may not be greater than 50 years in age. No other artifactual material was discovered at this location.

CCO-779H

This is a concentration of historic features located on the south side of a small drainage and west of a dirt road (see Figure 4.4b, Appendix E). It is located in the southern portion of the Inland Area. One of the features is a rock and mortar culvert underneath the dirt road passing east of the concentration. Two features are concrete foundations; one a wall foundation measuring 3 x 3 m, and the other a pad, measuring 1.5 x 1.5 m. Another feature is a buried livestock-watering trough, measuring 1.5 x 3 m; it is situated between the concrete

foundations. Both foundations and the water trough are mostly buried with the ground surface nearly level with the top of these features. The remnants of a rock and mortar wall foundation are located under a pepper tree in the southwest corner of the site. The remnant wall foundation measures approximately 3 m in length (north-south) and 30 cm thick. Corners are visible indicating that the rest of the foundation extended east toward the road. It is unclear if this rock and mortar wall foundation is associated with a residence or some other kind of structure. Near the road, a rock alignment is mostly buried but visible on the surface. This alignment consists of several pieces of long, thin fieldstone arranged linearly and extending east toward the rock wall foundation. It probably represents a driveway or curb feature similar to those seen at the historic orchard buildings. This site is in poor condition. No structures remain at the site and the concrete-rock-mortar foundations are in poor condition. The old and weathered appearance of the concrete features suggest an early historic age for the site, although some features, such as the culvert, may date to later periods.

Figure 4.12 Wood structure erected over well hole, CCO-778H.

CCO-780H

This is an historic site consisting of four features, a debris scatter, and trees including palms, pine trees, and eucalyptus. It is located on a high knoll along the northwestern margin of the Inland Area just east of railroad tracks. Features identified at the site include a concrete residence wall foundation (approximately 10 x 10 m) with sidewalk (Figure 4.13), another 3-x-2-m partial wall foundation with water pipe, a well hole marked by large-diameter pipe, and a windmill foundation. The windmill foundation is located more than 150 m east of the residence

foundation in a large depression. A graded dirt road is barely visible on the surface near the aligned palm trees. A pile of wood and metal fencing is located on the eastern site margin on the downslope of the knoll. The wood appears to have been wall siding or roofing lumber from a structure that was presumably standing on the site. The site is considered to be in poor condition due to the lack of standing structures; however, no effort has been made to destroy the concrete foundations. The maturity of the trees and weathered look of the concrete indicate that this site predates the 1944 age for military use of the area.

Figure 4.13 Overview of main foundation at historic site, CCO-780H.

CCO-781H

This site consists of several historic features, a walnut orchard, and an earthen dam. Whether all features are associated is unclear. The site is located in the northern portion of the Inland Area. The three features consist of a windmill foundation, a concrete cistern/well, and a scatter of brick, wood, and metal. The cistern measures approximately 1 x 1 m and is partially filled in with wood, metal, concrete, and sand (Figure 4.14). The windmill foundation is concrete with embedded steel angle-iron used as footings. A piece of the windmill blade is located approximately 40 m east of this feature and has the word "Standard" painted on it. This site is in poor condition. Debris has been concentrated in piles, primarily on top or near the concrete foundations. The windmill debris appears to predate the military era of the Inland Area, as do the mature walnut trees.

CCO-782H and CCO-783H

These are both concrete foundations located less than 80 m apart in the northern portion of the Inland Area. Each consists of an approximately 20 cm thick, 1.5-x-3-m wall foundation with the long axis situated east-west. CCO-782H is intact while CCO-783H is broken along the northern wall. The concrete shows signs of age including weathering and the growth of lichen. The function of these features is unclear but it is presumable that they were livestock water troughs. Pieces of concrete and small chunks of red brick are scattered around each feature, though more debris is around CCO-783H in a 20 m-area including metal fragments. No elements of these features are time sensitive, however, the poor condition of the concrete suggests that they were in use prior to military control of the area.

Figure 4.14 Concrete subsurface foundation with debris piled inside hole at prehistoric site, CCO-781H.

CCO-784H

This site is a large 65-x-175-m scatter of historic debris located on a low knoll in the northern portion of the Inland Area (see Figure 4.4a, Appendix E). The scatter consists primarily of red bricks and mortar concentrated on top of the knoll in the northeast corner of the site. Historic amethyst and clear glass was found primarily along the northern site boundary. A single abalone shell fragment was found in the southern part of the site near an old pipe wrench. The site is actively used by cattle, which have disturbed much of the site surface. Aside from delineating concentrations of debris, the scatter has no spatial integrity. It is possible that the

brick and mortar debris was dumped on top of this knoll and could have originated from the features at CCO-782H and CCO-783H. The amethyst glass suggests that the site dates to the early 1900's.

CCO-785H

This site is most likely the remains of an historic residence. It is located primarily along the northern shoulder of Willow Pass Road on the west side of the Inland Area (see Figure 4.4a, Appendix E). However, part of the site is also located south of Willow Pass Road. The southern part of the site consists of the remains of a windmill and water storage facility including concrete rubble, brick and mortar, metal fragments, wire, windmill parts and other debris. The northern part of the site consists of a low-density scatter of concrete rubble, a small brick scatter, a rectangular depression, a borrow pit, a well, an asphalt paved area, large palm trees, and several linear alignments of large eucalyptus trees (Figure 4.15). The rectangular depression may have been leveled for a house foundation. The site is generally in poor condition since almost all evidence of a previously existing structure has been removed. The age of the site is estimated at 1914 through 1945 based on amethyst and purple glass fragments, along with metal, bricks, and concrete chunks that appear historic in age.

Figure 4.15 Overview north of CCO-785H; note that site spans road.

CCO-786

This is the only new prehistoric site discovered during the current survey. It is located just west of the southern portion of CCO-785H along the southern shoulder of Willow Pass Road (see Figure 4.4a, Appendix E). The site measures 60 x 120 m and is situated in a small depression (Figure 4.16). A modern-looking well cap, marked by a large-diameter steel pipe, was found in the central portion of the site slightly uphill. The surface of the site is somewhat deflated with numerous natural chert and sedimentary cobbles on the surface. Artifacts discovered at the site include two whole hand stones, one basin milling stone margin, one chert core, and four small pieces of chert debitage. The ground stone artifacts exhibit signs of at least moderate use, having multiple wear facets and some polish. The basin milling stone is well used with a smooth and polished surface (Figure 4.17). From the surface, it appears that this site was a temporary processing location. It is unknown if any subsurface archaeological deposits exist; no midden soils or deeply embedded artifacts were noted. The surface of the site is cracked from water inundation and drying episodes. This site is considered to be in good condition.

Figure 4.16 Overview northeast of prehistoric site, CCO-786.

Figure 4.17 Basined millingstone found at prehistoric site, CCO-786.

CCO-787H

This large complex of foundations and debris is bordered on the east by the Clayton Canal (see Figure 4.4b, Appendix E). All foundations are confined in a 75-x-150-m area. A railroad cuts through the center of the site, suggesting that these foundations might have been related to industrial activities and the railroad. The Clayton Canal road partially buries the largest foundation on its southeast corner, indicating that these foundations are older than improvements to the canal, which was constructed during/after construction of the Contra Costa Canal between 1937 and 1948. The largest foundation appears to have been a storage facility of some kind, measuring 80 x 20 m with anchor bolts along its margins. Another rectangular foundation is south of the railroad and measures 20 x 15 m. This concrete foundation is highly weathered. A long, narrow foundation, possibly a loading dock, measures 23 x 6 m. Two small foundations, each measuring 6 m long with short 3-m buttresses on each end, may have been retaining walls for some kind of ramp or other loading facility. Finally, on the east side of the canal, two long, narrow foundations measure 12 x 1 m and 12 x 1.5 m. These are partially destroyed by construction of the canal and appear to be water or feeding

trough features. These are probably not functionally related to the other foundations, unless all features are related to ranching activities. Scattered among the foundations is debris consisting of metal, cable, concrete chunks, and other items. The site is considered to be in poor condition. The age of this site is unknown. The industrial foundations and iron debris may be related to early military use. However, these items may relate to early dairy farming also. It is clear that at least the largest foundation predates construction of the Clayton Canal, during or after the period of 1937 to 1948, as do the two water trough features.

CCO-788H

This site is a combination of modern and historic features situated south of Highway 4. High fencing has been erected around the site, presumably to protect an active spring and revegetation program given a modern sprinkler system (see Figures 4.4a, Appendix E and 4.18). All features are enclosed in an area measuring approximately 80 x 80 m, including an outhouse (Figure 4.19) and a concrete water tank foundation. Small pieces of ceramic were noted in a small drainage running into an earthen dam that is west of the fencing. Another wood storage shed is located just off the southeast corner of the site outside the fencing. Several eucalyptus trees are located inside the fencing as are the sprinkler system and a modern livestock water trough. Extensive modifications to the landscape and modern features indicate that the historical component at this site is in poor condition, except for the outhouse, which retains its original structural integrity. The age of this resource is unclear, partly because it is currently in use and partly because so little of the site remains. The style of the outhouse suggests a pre-military era design.

Figure 4.18 Overview southeast of historic site, CCO-788H.

Figure 4.19 Outhouse at historic site, CCO-788H.

CCO-789H

Situated just outside the Magazine Area and west of Mt. Diablo Creek, this feature is a single concrete pad measuring approximately 16 x 6 m, with a 2.5-x-2.5-m door entry pad located off of its southwest corner (see Figure 4.4b, Appendix E). Angular steel anchors protrude from the foundation, which is in poor condition due to weathering. The function of this structure is unclear. Its robust construction indicates that it probably relates to military activity and may have served as a guard shack or some other entry post to the bunker city. Large pieces of reinforced steel are scattered around the foundation but no other features were found.

CCO-791H

This site is a moderately dense scatter of historic artifacts associated with a concrete foundation. It is located in the southern portion of the Inland Area (see Figures 4.4b, Appendix E and 4.20). The concrete foundation is situated on a low rise and probably supported a water tank or some other water feature. This foundation measures approximately 5 x 5 m, and is 30 cm thick at its surface widening to approximately 50 cm at its base (Figure 4.21). The foundation is robust and was made with wood forms. Water pipe is scattered around the

Figure 4.20 Concrete foundation at historic site, CCO-791H.

Figure 4.21 Overview southeast of historic site, CCO-791H; note modern corral to the east of the site.

foundation. A 15-x-15-m borrow pit is located immediately north. Surrounding the low knoll and foundation is a dirt road that is currently maintained by grading. Evident in the roadbed and spoils piles is a moderately dense scatter of historic bottle glass, ceramics, and other items, such as an axe head (Figures 4.22 and 4.23). Some of the glass fragments, such as brown beverage bottles with patination, amethyst glass, blue-on-white transfer ware, and clear patinated plate glass, indicate that the site dates to the late 1800's to early 1900's. However, it is unclear whether these artifacts are associated with the concrete foundation and borrow pit.

This site is considered to be in fair condition. However, given that a significant number of historic artifacts are currently eroding from the road cut and the roadbed, it is likely that a rich deposit of historic trash remains buried at the site, offering an opportunity to generate time-sensitive material that can better define the nature of historic pre-military use of the area.

CCO-792H

This site is an historic scatter of glass and other debris spilling onto the base from a dump just outside the base boundary (Figure 4.24). Given extensive ground disturbance in the area, it is possible that historic debris is buried on base property but the current survey only identified surface material within 30 m of the base fence. Amethyst glass, nearly whole brown medicine jars with patination, and clear patinated plate glass were identified on the surface and are indicative of an early 1900's age, although more recent material that post-dates 1950 was also found on the surface including pull-tab beverage cans and folded seam food cans. The site is considered to be in poor condition.

CCO-793H

This historic site is located in the northern part of the Inland Area (see Figure 4.4a, Appendix E). It consists of a disorganized, low-density scatter of historic glass, two cobble-mortar pillars, and a potentially historic livestock water trough and orchard. The two cobble-mortar pillars resemble those that are constructed as part of a gate entry, although the specific function of these is not known (Figure 4.25). One pillar is still standing; the other has been displaced and rests on its side. The water trough is completely above ground and is currently full of water. The concrete appears old and has been weathered, although this feature may be modern. This site does not have good integrity and is considered to be in poor condition.

CCO-794H

This is a stone quarry that was used from the 1940s through the 1960s (Pamela Ramirez, personal communication). It is located in the northern portion of the Inland Area (see Figure 4.4b, Appendix E). It is identified as a large pit excavated into the side of a west-facing slope (Figure 4.26). The site measures approximately 75 x 250 m and is about 20 m deep. No artifactual material was found within the quarry limits. No further information was available regarding the function of this quarry but it is likely that it relates to the crushed stone industry that formed a major part of the City of Clayton's economy in the first half of the 1900's (JRP 1998).

Figure 4.22 A piece of historic dishware found in road cut at historic site, CCO-791H.

Figure 4.23 Brown bottle neck from historic bottle at historic site, CCO-791H.

Figure 4.24 Overview southeast of historic dump, CCO-792H; note base boundary fence separating scattered debris within the base from the actual dump off base.

Figure 4.25 Cobble and mortar pillar from historic site, CCO-793H.

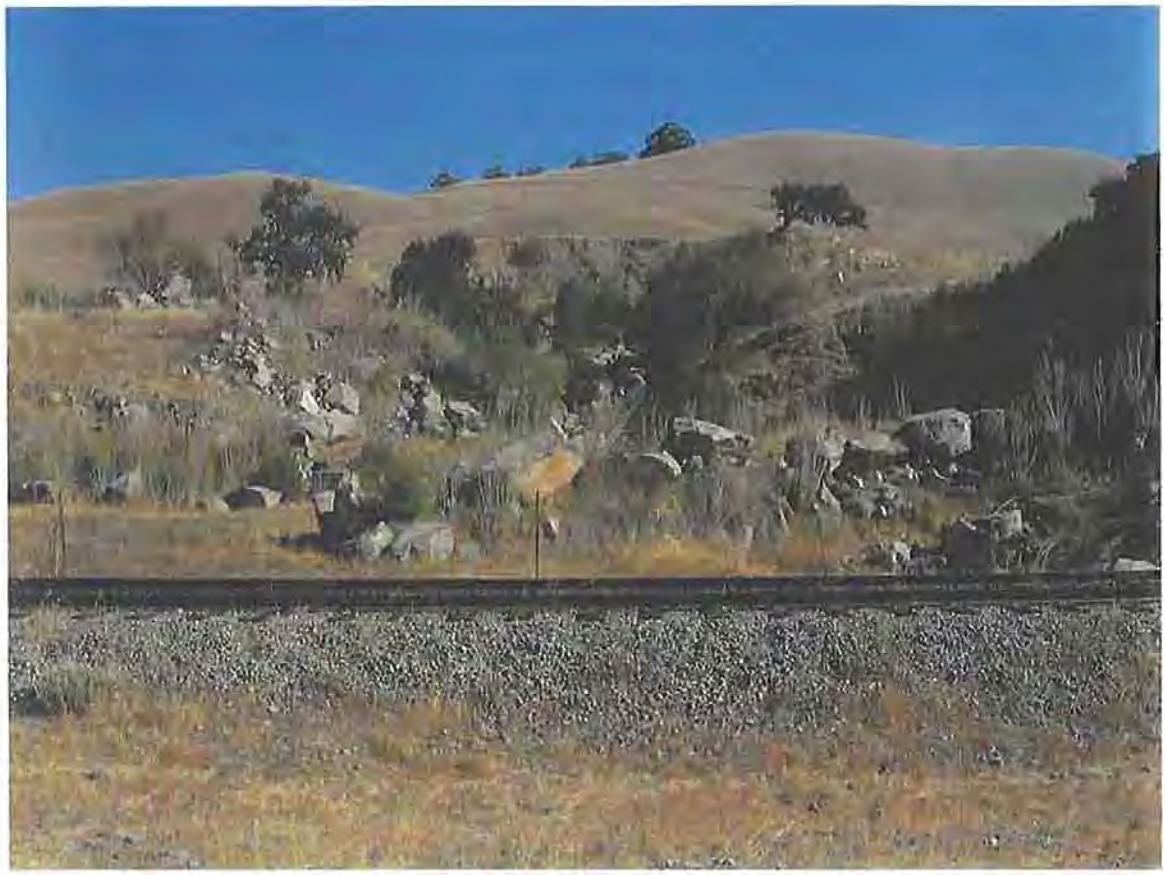

Figure 4.26 Overview of stone quarry in operation from the 1940s to 1960s.

Isolated Artifacts

Four isolated artifacts were discovered including two basalt flakes, an historic axe head, and a quartz biface. Isolate 2, the axe head, was found just south of Highway 4 under a tree (see Figure 4.4a, Appendix E). Both basalt flakes are secondary percussion flakes and are relatively large (averaging 5 x 4 x 2.5 cm). One of these, Isolate 1, was found south of Bailey Road and the other, Isolate 3, was found less than 200 m southwest of the previously recorded site P-07-00861 (see Figure 4.4a and 4.4b, Appendix E). Isolate 1 was found in an area of exceptionally good visibility and no other materials were found near it. Isolate 3 was found in an area with poor visibility, and it was clear that the landform was constructed from fill excavated from the nearby pond attesting to the flake's secondary depositional context.

Isolate 4, the quartz biface, was found in the northern portion of the Inland Area directly on top of railroad tracks (see Figure 4.4a, Appendix E). It is a relatively thin quartz cobble that has been intentionally flaked on both sides of a single margin through percussion (Figure 4.27).

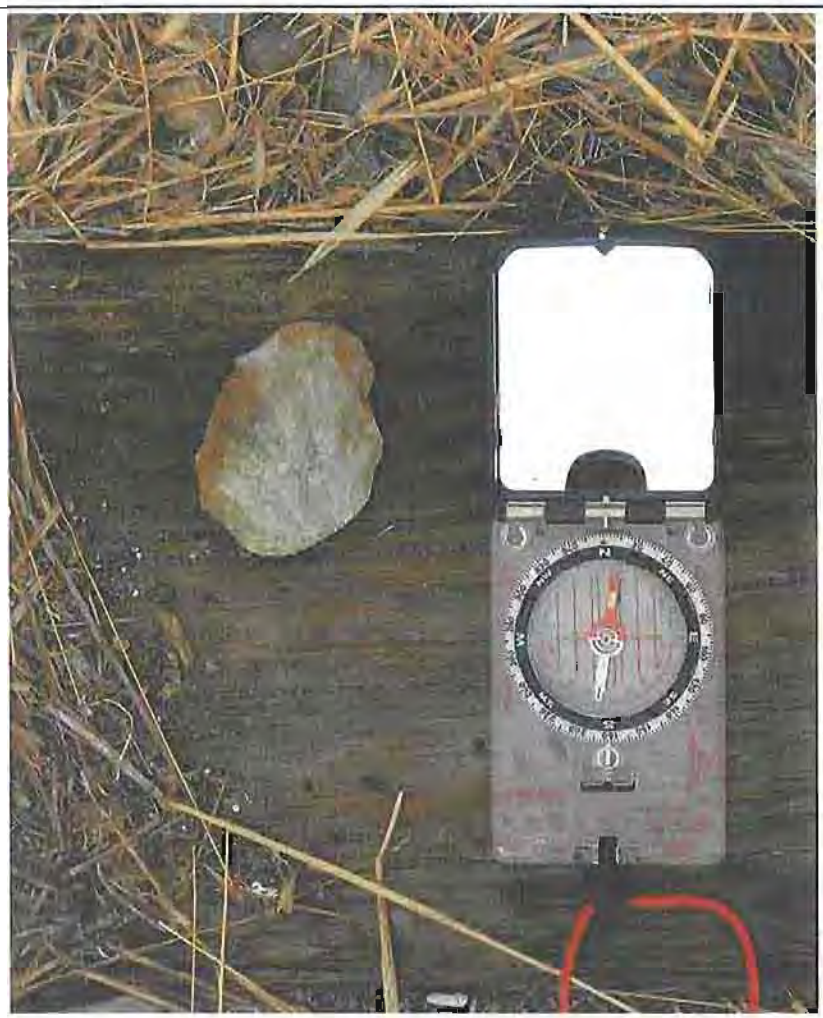

Figure 4.27 Quartz bifacially-flaked cobble; this artifact was found on top of railroad tracks.

SURVEY RESULTS OF THE HAZARDOUS WASTE AREAS

In this chapter, the discussion for each location at NWSSB DET Concord with hazardous working conditions due to the potential of contamination includes a general description taken directly from the ECP (Department of the Navy 2006), as well as the findings of the archaeological evaluation.

SOLID WASTE MANAGEMENT UNIT (SWMU) AREAS IN THE INSTALLATION RESTORATION PROGRAM

The environmental condition investigation of SWMU Areas 2, 5, 7, and 18 was conducted within the NWSSB DET Concord Installation Restoration Program (IRP) (Department of the Navy 2006). The following sections provide a brief description of each SWMU that was evaluated in the NWSSB DET Concord IRP, and as part of the archaeological investigation for this Concord Inland Base Realignment and Closure (BRAC) Survey Project.

SWMU 2 – Building IA-7 Burn Pit

SWMU 2 is located at the fire station (Building IA-7, Figure 4.28). Building IA-7 was constructed in the mid-1940s and is currently one of only a few buildings still in operation in the Inland Area. Fuel oil and napalm were reportedly burned during fire fighting training conducted between 1969 and 1973 in a shallow pit located south of Building 1A-7. Extinguisher chemicals reportedly used include potassium chloride, sodium chloride, ammonium phosphate, and potassium carbonate (Tetra Tech 2005a).

Figure 4.28 SWMU 2 – Building 1A-7 Fire Station.

The Building IA-7 Burn Pit is located S of Kinne Boulevard. Building IA-7 is situated on topography that is generally flat surrounding the fire station, then slopes downward toward the south and east into a ditch. According to the ICRMP (Engineering Field Activity 2002), this area has moderate surface archaeological potential. It also has high subsurface archaeological potential due to the area's location on Holocene-aged alluvial fan and flood plain deposits. The ground surface visibility in the eastern half of the site was completely obscured (zero visibility) by a paved parking lot; the ground visibility in the remaining portion of the area was fair-good (30-60 percent), despite a layer of green grass covering the ground surface. It should be noted that although the entire unpaved ground surface surrounding the building for 50 m in the western half was surveyed using 25-m transect intervals, the burn pit was not relocated. No prehistoric or historic cultural materials were observed. Surface archaeological potential is considered to be low and subsurface potential is low to moderate.

SWMU 5 – Buildings IA-12 & 269

SWMU 5 consists of Buildings IA-12 and 269 (Figure 4.29). Building IA-12 was constructed in the mid-1940s and was in the former main industrial complex of NWSSB DET Concord. It housed the locomotive repair shop, where approximately 1,100 pieces of railway, automotive, construction, and weight-handling equipment were maintained. Building 269, the locomotive and rail car steam-cleaning facility, is located 18 m west of Building IA-12. The steam-cleaning area was constructed in 1976 to collect oily wastes for processing through an oil-water separator located about 5 ft. west of the steam-cleaning area (Tetra Tech 2005a).

Figure 4.29 SWMU 5 – Buildings 1A-12 (background left) and 269 (foreground right).

Buildings IA-12 and 269 are located north of Kinne Boulevard and the topography surrounding the buildings is generally flat. According to the ICRMP (Engineering Field Activity 2002), this area had moderate surface archaeological potential. It also had high subsurface archaeological potential due to its location on Holocene-aged alluvial fan and flood plain deposits. The ground surface visibility in the northern third was completely obscured (zero visibility) by a paved road; the ground visibility in the remaining portion of the area was fair-good (30-60 percent), despite a layer of grass and vegetation covering the ground surface. However, the ground surface in the southern 2/3 was thoroughly disturbed by building and rail line construction. The ground surface for 30 m surrounding the buildings in the northern third was completely obscured (zero visibility) by a paved road and parking lot, and as a result no prehistoric or historic cultural materials were observed. The entire unpaved ground surface for 30 m surrounding the building in the southern portion was surveyed using 25-m transect intervals,

and no prehistoric or historic cultural materials were observed. Surface archaeological potential is low and subsurface archaeological potential is low to moderate due to ground disturbance.

SWMU 7 - Buildings IA-15 & IA-16

SWMU 7 consists of Buildings IA-15 and IA-16 (Figures 4.30 and 4.31). Building IA-15 includes a metals shop, machine shop, weld shop, forge shop, offices, and tool storage area in the eastern portion of the building, and an automotive repair shop at the western end. Building IA-16 is the paint shop where maintenance crews staged painting jobs for NWSSB DET Concord (Tetra Tech 2005a).

Buildings IA-15 and IA-16 are located north of Kinne Boulevard and the topography surrounding the buildings is generally flat. According to the ICRMP (Engineering Field Activity 2002), this area has moderate surface archaeological potential. It also has high subsurface archaeological potential due to its location on Holocene-aged alluvial fan and flood plain deposits. The entire ground surface surrounding the buildings for 30 m is completely obscured (zero visibility) by a paved road and parking lot, and as a result no prehistoric or historic cultural materials were observed. Surface archaeological potential is low, but subsurface archaeological potential is high.

Figure 4.30 SWMU 7 - Building 1A-15.

Figure 4.31 SWMU 7 - Building 1A-16.

SWMU 18 - Building IA-51

SWMU 18 consists of Building IA-51 and a locomotive turntable (Figure 4.32). Building IA-51 was constructed in the 1940s and is located in the main industrial complex. The building was used as a steam-cleaning facility for locomotives, trucks, and other vehicles, and as a tire maintenance shop (Tetra Tech 2005a).

Building IA-51 is located north of Kinne Boulevard and the topography surrounding the buildings is generally flat. According to the ICRMP (Engineering Field Activity 2002), this area has moderate surface archaeological potential and high subsurface archaeological potential due to its location on Holocene-aged alluvial fan and flood plain deposits. The entire ground surface surrounding the buildings for 30 m was completely obscured (zero visibility) by a paved road and cement, and as a result no prehistoric or historic cultural materials were observed. Surface archaeological potential is low, but subsurface archaeological potential is high.

Figure 4.32. SWMU 18 – Building IA-51.

NON-SWMU INSTALLATION RESTORATION (IR) SITES

There were nine non-SWMU IR areas. The following sections present a brief description and archaeological evaluation of each.

IR Site 13 – Burn Area (Active IR and MEC/MMRP)

IR site 13 spans an irregularly shaped area approximately 325 m wide by 426 m long (approximately 35 acres) in the western portion of NWSSB DET Concord (Figure 4.33). From the late 1940s until approximately 1974, portions of IR Site 13 were used for the destruction of live ordnance by open burning in large, excavated trenches and natural gullies (Tetra Tech 2004).

Figure 4.33 IR Site 13 – Burn Area.

The Burn site has topography that gently slopes downward from the roads along the east, west and south edges toward the north. According to the ICRMP (Engineering Field Activity 2002), this IR site has low surface archaeological potential. It also has low subsurface archaeological potential due to its location on non-alluvial deposits. The ground visibility is generally fair-good (30-60 percent), despite a layer of grass and other vegetation covering the ground surface that has been trampled by grazing cattle. The ground surface is generally disturbed due to bulldozing to create trenches that were probably meant to serve as ammunition magazines. There is also disturbance for the construction of the road along the south edge, as well as due to natural gully downcutting. Moreover, the ground surface is also prone to cracking and separating due to extreme desiccation. The burn site was surveyed using 25-m transect intervals, and no prehistoric or historic cultural materials were observed. Surface archaeological potential is low, and subsurface archaeological potential is considered to be low due to the documented ground disturbance.

IR Site 14 – Kinne Boulevard Wells (IR to No Further Action)

The Navy formerly owned and operated three wells along Kinne Boulevard (Figure 4.34). These wells were drilled in 1928 and were used until the 1960s, when they were abandoned but not closed (Tetra Tech 2004). The wells were eventually closed in accordance with the well closure requirements of the Contra Costa County Health Services Department (PRC Environmental Management Inc. 1995).

Figure 4.34. IR Site 14 - Kinne Boulevard Wells, view to southwest.

The Kinne Boulevard Wells area, consisting of a fenced in area east of the golf course, has generally flat topography. According to the ICRMP (Engineering Field Activity 2002), this area has moderate surface archaeological potential. It also has high subsurface archaeological potential due to its location on Holocene-aged alluvial fan and flood plain deposits. The ground visibility is generally fair-good (30-60 percent), despite a layer of grass and vegetation covering the ground surface that has been trampled by grazing cattle. The ground surface along the perimeter of the fenced in area is disturbed from plowing to create a firebreak. Only one of the three wells in the area was relocated. The fenced in area was surveyed using 25-m transect intervals, and only modern debris was observed on the ground surface, in the form of large concrete chunks, metal pipes, brown beer bottle glass shards, and porcelain insulator fragments. One concrete fragment near the well has "MW-4" engraved on it. No prehistoric or historic cultural materials were observed. Surface archaeological potential is low, and subsurface archaeological potential is low to moderate as a result.

IR Site 15 - Railroad Classification Yard (IR to No Further Action)

The Railroad Classification Yard lies in an upland area and includes several railroad cars on tracks (Figure 4.35). Two unbroken vials of the insecticide/rodenticide methyl bromide were found in 1982 along the embankment of the railroad classification yard (Ecology and Environment Inc. 1983; Kellogg 2007). These vials were subsequently removed and disposed. Several broken vials were also found in the IR site. The vials had been used starting in 1954 to control ground squirrel populations.

Figure 4.35 IR Site 15 – Railroad Classification Yard, view to south.

The Railroad Classification Yard's topography is generally flat and level. There is a berm situated along the north edge of the site, and the areas located to the north and south of the berm were surveyed using 25-m transect intervals. According to the ICRMP (Engineering Field Activity 2002), this area has high surface archaeological potential. It also has high subsurface archaeological potential in the northwest portion due to its location on Holocene-aged alluvial fan and flood plain deposits, and low subsurface archaeological potential in the southwest portion due to its location on Pleistocene-aged alluvial fan deposits. The ground visibility is generally fair-good (30-60 percent), despite a layer of grass and vegetation covering the ground surface that has been trampled by grazing cattle. However, the ground surface is completely disturbed by bulldozing to create the berm and by the placement of the rail lines. No prehistoric or historic cultural materials were observed. Surface archaeological potential is low, and subsurface archaeological potential is low due to ground disturbance.

IR Site 20 – Old Homestead, Seal Creek (IR to No Further Action)

The main characteristic of IR Site 20 noted in the 1983 IAS was described as "a gully filled with debris was found on the banks of Seal Creek" (Figure 4.36). Coffee pots, bed pans, old cans, and other household items were located in the gully, which was apparently used as a disposal area by local ranchers prior to the Navy obtaining the property in 1943. No hazardous materials were disposed at the site.

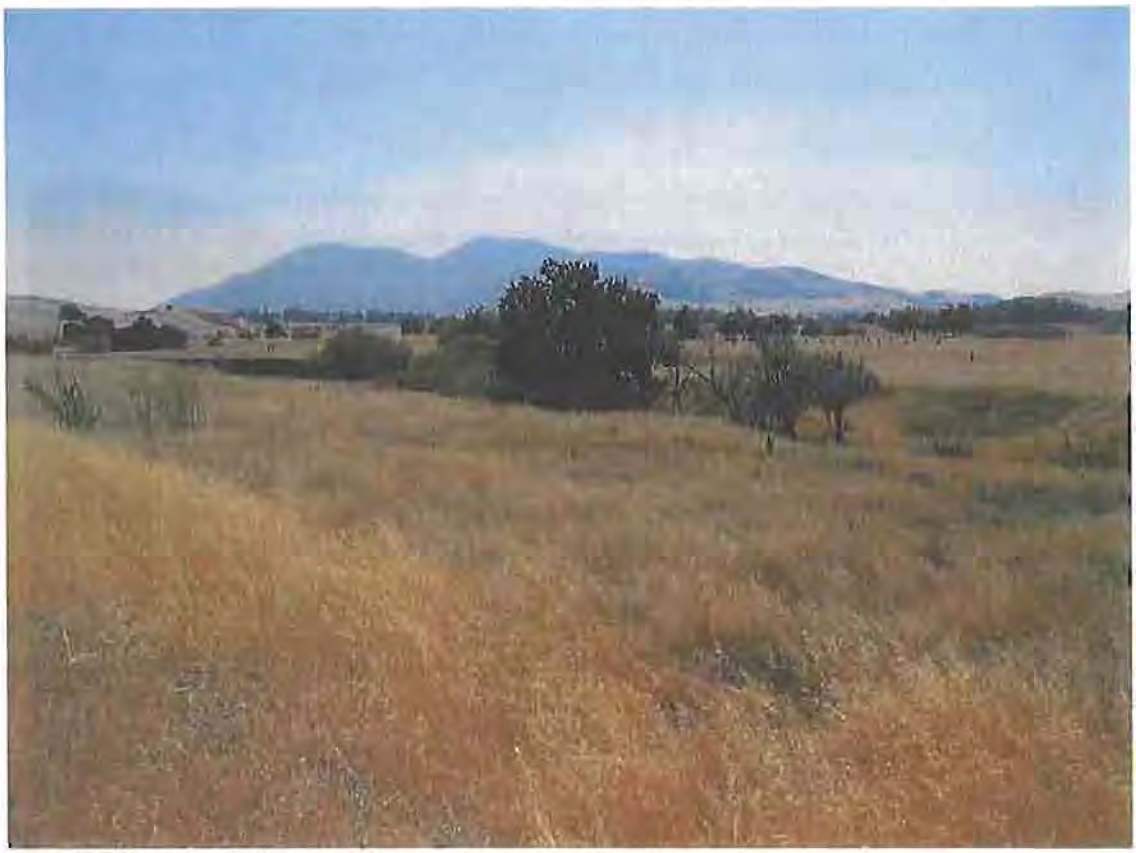

Figure 4.36 IR Site 20 - Old Homestead, Seal Creek.

The IR site has topography that generally slopes from north to south from the asphalted Kinne Boulevard and rail tracks toward Seal Creek. According to the ICRMP (Engineering Field Activity 2002), this area has high surface archaeological potential. It also has low subsurface archaeological potential due to its location on Pleistocene-aged alluvial fan deposits. The ground visibility is generally poor (<25 percent), due to a layer of grass and vegetation covering the ground surface. However, the ground surface has been disturbed by river processes and downcutting that have created terracing, as well as by grading for a dirt track road leading to the creek. A 30-m area around the debris filled gully was surveyed using 25-m transect intervals. A concentration of modern concrete chunks, wood rail ties, a plastic storage bin, and machined wood make up the variety of modern refuse observed in the gully. No prehistoric or historic cultural materials were observed on the ground surface above and surrounding the gully that could be identified or associated with an old, historical homestead. Surface archaeological potential is low, and subsurface archaeological potential is low due to ground disturbance.

IR Site 22 – Building 7SH5 and Magazine Area (Active IR Site)

IR Site 22 is composed of Building 7SH5 and the Magazine Area (Figure 4.37 and 4.38). From 1957 through the mid-1970s, Building 7SH5 was used as an environmental and vibration testing area for missile components. From the mid-1970s through the mid-1990s, maintenance operations were conducted in the IR site, including paint stripping, cleaning, and painting

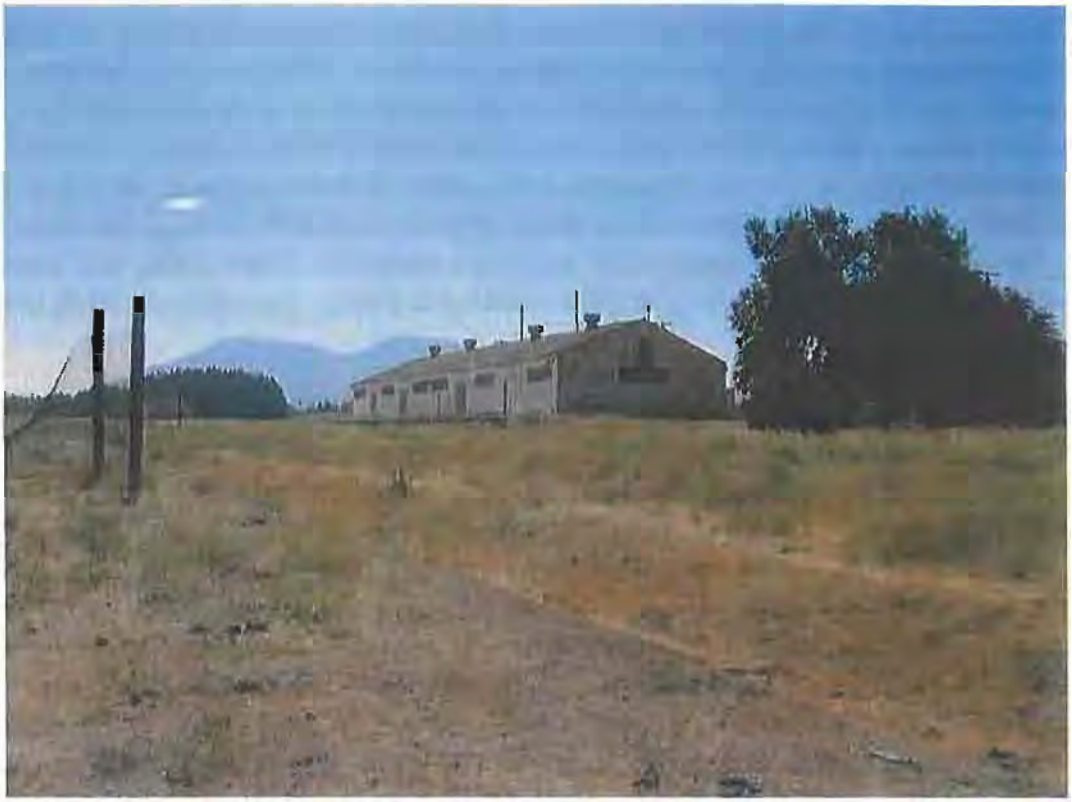

Figure 4.37 Area 22 - Building 7SH5

Figure 4.38 Area 22 - Magazine Area.

missile wings and fins (Ecology and Environment Inc. 1983; Tetra Tech 1997). Through the course of investigative sampling, elevated levels of arsenic in surface soils were detected in open grassland areas of the site. The distribution of arsenic in soil at Area 22 suggests a pattern consistent with surface application of herbicides (Tetra Tech 2005b). Area 22, consequently, was expanded to include the entire Magazine Area. Area 22 was composed of 531 acres of grasslands that includes 13 buildings and an array of more than 250 bunkers (or magazines) built in 1944 that the Navy formerly used to store munitions. Since 2001, the structures (bunkers and magazines) at the area have been sealed and empty. Ranchers currently use this area to graze cattle.

Building 7SH5 and the Magazine Area have generally flat topography. According to the ICRMP (Engineering Field Activity 2002), this area has moderate surface archaeological potential. It also has low subsurface archaeological potential due to its location on Pleistocene-aged alluvial fan deposits. The only exception is the extreme northeast section of the area along the banks of Mt. Diablo Creek where surface and subsurface archaeological potential are high. The ground visibility is generally fair-good (30-60 percent), despite a layer of grass, thistle, and other vegetation covering the ground surface that has been trampled by grazing cattle. However, a large portion of the ground surface is completely obscured (zero visibility) due to the presence of railroad tracks or asphalted roads. The ground surface is largely disturbed because it has been bulldozed extensively to create the berms that cover the magazines, the pads on which Building 7SH5 and other buildings sit, and the ditches and canals that crisscross the entire magazine area. Additionally, grading has occurred for the roads, parking lots and railroad tracks, as well as plowing to create several firebreaks. Moreover, the ground surface is also prone to cracking and separating due to extreme desiccation. The area was surveyed using 25-m transect intervals and only modern debris was observed on the ground surface, in the form of steel tie down posts, wood railroad ties, concrete chunks, assorted metal items, modern soda and beer bottles, and baseballs from fields to the south. No prehistoric or historic cultural materials were observed. Surface archaeological potential is low, and subsurface archaeological potential is low due to ground disturbance.

IR Site 22A – Magazine Areas (Active IR Area)

Comprised of five groups of storage bunkers within a large area, IR Site 22A is believed to contain arsenic in the shallow soils around the base of buildings at several locations within each group (Figure 4.39). IR site 22A consists of five sub sites (Groups 1 through 5) with a total acreage of 504 acres, 102 munitions storage magazines connected by roads and railroad spurs, and surrounding open grassland in the hilly area northeast of Mount Diablo/Seal Creek. The magazines in Groups 1 through 5 were constructed during the mid-1940's on agricultural land to support wartime activities. The Navy stored ammunition and explosives in the magazines from the mid-1940's to 2001. The magazines were used for ordnance storage and non-intrusive activities associated with storage. Previous sampling and analysis at IR Site 22A found arsenic in surface soil at concentrations exceeding the background concentration of 10 mg/kg due to the application of an arsenic containing herbicide (Kellogg 2007).

Figure 4.39 IR Site 22 A – Magazine Area, second section from the north.

From northwest to southeast, the first three magazine areas of IR site 22A have topography that gently slopes to the west and northwest toward Mt. Diablo Creek. The first and third sites in this sequence have fair visibility while the second site, the largest magazine complex, had good visibility. It is currently used as a bullpen and the animals have trampled and/or eaten much of the vegetation. The fourth magazine site, encompassing a large area that includes the man-made pond, also gently slopes toward the creek but includes the western termini of several small alluvial ridges and a low ridge extending northwest. This site is characterized by bedrock outcrops and borrow pits with uneven terrain marked by bulldozed sites and borrow pits. Vegetation cover is slightly denser in this area, having a visibility rating of fair. In the southernmost area of IR site 22A, south of Bailey Road, topography undulates with multiple small drainages and low ridgelines. Ground visibility is generally fair-good, but the easternmost extreme of this magazine site has slightly more ground cover and is characterized as fair. In all portions of IR site 22A, large sections of the ground surface are completely obscured (zero visibility) due to the presence of railroad tracks or paved roads. Additionally, the ground surface is largely disturbed because it has been bulldozed extensively to create the berms that cover the magazines, to build road beds, and to construct drainages, etc. According to the ICRMP (Engineering Field Activity 2002), areas of high surface and subsurface archaeological sensitivity are located along the banks of Mt. Diablo Creek, around the man-made pond, and in the center of the southeastern magazine area of IR site 22A, south of Bailey Road. Otherwise, surface and subsurface archaeological potential in each of the IR site 22A areas is mixed between moderate and low. All parts of IR site 22A were surveyed using 25-m

transect intervals and modern debris was observed on the ground surface, in the form of steel tie down posts, wood railroad ties, concrete chunks, assorted metal items, modern soda and beer bottles, etc. Two previously recorded archaeological resources have been identified in IR site 22A.

IR Site 27 – Buildings IA-20 & IA-36 (Active IR Site)

IR Site 27 is composed of Buildings IA-20 and IA-36 (Figure 4.40). From 1964 to the mid-1990s, Building IA-20 housed a chemical laboratory and a materials testing laboratory. Building IA-36 is a former boiler house and the location of a 10,000-gallon diesel underground storage tank that had since been removed.

The topography surrounding IR Site 27, within the fenced off portion, which considered to be the maximum extent of this area, is generally flat surrounding the buildings and then slopes downward into a ditch to the north, then upward toward the embankment just south of Willow Pass Road. Only the ground surface surrounding the two buildings was inspected. According to the ICRMP (Engineering Field Activity 2002), this area has high surface archaeological potential. It also has low subsurface archaeological potential due to its location on Pleistocene-aged alluvial fan deposits. The ground surface visibility in the northern portion is generally fair-good (30-60 percent), despite a layer of grass and vegetation. The southern portion is covered by asphalt or gravel (zero visibility) and is completely disturbed. No prehistoric or historic cultural materials were observed. Surface and subsurface archaeological potential are low.

Figure 4.40 IR Site 27 – IA-20 (background) and IA-36 (foreground).

IR Site 29 – Building IA-25 and SWMU 13 (Active IR Site)

IR Site 29 comprises Building IA-25 and SWMU 13 (Figure 4.41). Located within an earthen berm, Building IA-25 was reportedly used to manufacture and test military explosives from the mid-1940s to the late-1980s. The building also included a paint spray booth for repainting components, and was renovated significantly for rework of explosives in the late 1970s. SWMU 13 consists of a septic tank, a storm drain outfall, a sanitary sewer line, and a leach field northeast of Building IA-25 (Tetra Tech 2003).

IR Site 29 has topography that gently sloped from southwest to northeast under Building IA-25 and asphalted access road, then slopes downward abruptly to the SWMU 13 leach field below and to the northeast of it. According to the ICRMP (Engineering Field Activity 2002), this area has low surface archaeological potential. It also has low subsurface archaeological potential due to its location on Pleistocene-aged alluvial fan deposits. The ground visibility is generally fair-good (30-60 percent), despite a layer of grass and vegetation covering the ground surface that has been trampled by grazing cattle. There has been significant ground disturbance to create the berm surrounding Building IA-25, as well as excavation for the placement of numerous utility access points, a septic tank, drain, pipes, fence posts, power and telephone posts, and grading for the access road. The area was surveyed using 25-m transect intervals and no prehistoric or historic cultural materials were observed. Surface archaeological potential is low, and subsurface archaeological potential is also low.

Figure 4.41 IR Site 29 – Building IA-25 and SWMU 13.

IR Site 17 – Building IA-24 (Closed IR Site)

Building IA-24 is located along the eastern side of Kinne Boulevard, about 3 miles from the front gate (Figure 4.42). From the 1950s through 1988, Buildings IA-24, IA-24A, and IA-24B were used for forklift maintenance and battery recharging. An asphalt parking lot for forklift storage, located next to Building IA-24, was used as a surface to steam clean forklifts and batteries in order to remove oil and grease. A sump for disposal of battery acid was also reported to be present in the area (Tetra Tech 2005c). Two diesel underground storage tanks were formerly located at the area; both tanks were removed and replaced with aboveground tanks in 1997. Currently, Building IA-24 is locked and empty. Buildings IA-24A and IA24B are used by cattle rancher lease holders to store hay bales for cattle that graze on portions of the area.

The topography surrounding is generally flat. The ground surface is completely disturbed and covered with asphalt or gravel. According to the ICRMP (Engineering Field Activity 2002), this area has moderate surface archaeological potential and low subsurface archaeological potential due to its location on Pleistocene-aged alluvial fan deposits. The ground surface visibility is completely obscured (zero visibility) by asphalt. The modern associated features include gray concrete buildings storing hay (Buildings IA-24A), as well as metal barrels and wood pallets located east and north of Building IA-24. No prehistoric or historic cultural materials were observed. Surface and subsurface archaeological potential are low.

Figure 4.42 IR Site 17 – Building IA-24.

MILITARY MUNITIONS RESPONSE PROGRAM (MMRP) AREAS

The following areas have been evaluated under the MMRP.

Area 16 – Black Pit at Red Rock (IR to MMRP)

A pit measuring approximately 15 ft. long, 10 ft. wide, and 5 ft. deep was observed during the IAS located between the Red Rock Disposal Area and a clean fill borrow area (Figure 4.43). The color of the soil in the pit is very deep black. The sampling and analysis of the surface soil from this area indicates that it was used for the disposal of material generated at NWSSB DET Concord, particularly paints, pigments, and other chemicals. (Ecology and Environment Inc. 1983). Old installation fire department logs suggest that Area 16 may have been used for open burn/open detonation (OB/OD) of munitions. As a result, this area is included in the MMRP where it is referred to as the "Red Rock Disposal Area" (Pirnie 2005).

Figure 4.43 Area 16 – Black Pit at Red Rock.

Area 16 has topography that generally slopes from south to north from the berms surrounding the Red Rock Disposal Area. According to the ICRMP (Engineering Field Activity 2002), this area has moderate surface archaeological potential. It also has low subsurface archaeological potential due to its location on Pleistocene-aged alluvial fan deposits. The ground visibility is generally fair-good (30-60 percent), despite a layer of grass and vegetation covering the ground

surface that has been trampled by grazing cattle. However, bulldozing to create the berms to the south has disturbed the ground surface considerably. The area was surveyed using 25-m transect intervals and concentrations of modern refuse, such as concrete chunks, tires, wood, assorted metal fragments, bottles, golf balls, metal sign posts, metal fencing and rebar were noted. No prehistoric or historic cultural materials were observed. Surface and subsurface archaeological potential are low.

Area 19 - Seal Creek (IR to MMRP)

According to the IAS, the fill area located adjacent to Building 93 on the north bank of Seal Creek contains inert solid waste, such as tree cuttings, rubble, wood, two apparently empty 55-gallon drums, and miscellaneous inert solid wastes (Figure 4.44). This area is included in the MMRP where it is referred to as the "Disposal Area-Seal Creek" based on old fire department logs for NWSSB DET Concord, suggesting that the older landfills, including this area, were used for ordnance disposal (Pirnie 2005).

Figure 4.44 Area 19 - Seal Creek.

Area 19 is located to the east of Building 93 and has topography that gently slopes from north to south from Kinne Boulevard to Seal Creek. According to the ICRMP (Engineering Field Activity 2002), this area has moderate surface archaeological potential. It also has high subsurface archaeological potential due to its location on Holocene-aged alluvial fan and flood plain deposits. The ground visibility is generally fair-good (30-60 percent), despite a layer of grass and vegetation covering the ground surface, which has been trampled by grazing cattle.

However, river processes and downcutting have disturbed the ground surface. The area was surveyed using 25-m transect intervals and neither modern debris, nor prehistoric or historic cultural materials were observed. Surface archaeological potential is observed to be low, and subsurface archaeological potential is low to moderate.

Area 23A - Inland Area EOD (MMRP)

The Explosives Ordnance Detail (EOD) conducted controlled explosions in the hill behind Building 5AT58 (Figure 4.45) (Ecology and Environment Inc. 1983). Because Area 23A was used for EOD operations from the 1940s until 1959, it is included in the MMRP where it is referred to as the "Inland Area EOD" (Malcolm Pirnie 2005).

The Area 23A-Inland Area EOD topography features a 40-x-40-m area that has been bulldozed level from east to west to create a berm along the western and northern edges of this graded area. According to the ICRMP (Engineering Field Activity 2002), this area has low surface archaeological potential. It also has low subsurface archaeological potential due to its location on non-alluvial soils. The ground visibility is generally fair-good (30-60 percent), despite a layer of grass and vegetation covering the ground surface that has been trampled by grazing cattle. The area was surveyed using 25-m transect intervals. However, the ground surface is completely disturbed by the bulldozing, and as such no prehistoric or historic cultural materials were observed.

Figure 4.45 Area 23A - Inland Area EOD.

Area 23B – Eagles Nest EOD (IR to MMRP and MEC/MMRP)

This area, located near a eucalyptus grove, was used for approximately 12 years for controlled explosions (Ecology and Environment Inc. 1983) (Figure 4.46). Based on previous surveys in 1993, the Eagle's Nest EOD Area is not suspected to contain Munitions and Explosives of Concern (MEC/MMRP). However, Munitions Constituents (MC) contamination is of concern at Area 23B due to previous soil sampling that had detected lead at concentrations greater than the reference levels of concern (Pirnie 2005). Consequently, Area 23B is included in the MMRP where it was referred to as the "Eagle's Nest EOD Area" (Pirnie 2005).

Area 23B is located in the foothills along the north side of the base within a fenced area and its topography features a gentle slope trending from north to south. According to the ICRMP (Engineering Field Activity 2002), this area has high surface archaeological potential. It also has low subsurface archaeological potential due to its location on non-alluvial soils. The ground visibility is generally fair-good (30-60 percent), despite a layer of grass, vegetation and tree leaves from a Eucalyptus grove covering the ground surface that have been trampled by grazing cattle. The area was surveyed using 25-m transect intervals and only modern refuse was noted, such as a metal railroad car coupling that must have been transported and dumped, as there were no rail lines that make it up to this location. No prehistoric or historic cultural materials were observed. Surface archaeological potential is low, and subsurface archaeological potential is also low.

Figure 4.46 Area 23B – Eagles Nest EOD.

Area 24A – Pistol Firing Range (MMRP Area Requiring Future Preliminary Assessment)

Area 24A is a former pistol range located near Building IA-57 (Ecology and Environment Inc. 1983) (Figure 4.47). The firing range area was an active pistol range until January 2005.

Area 24A is located in the foothills along the northern part of the project area within a rectangular area with topography that is generally flat. The range is situated on an earthen pad created by bulldozing sediments from the surrounding foothills. According to the ICRMP (Engineering Field Activity 2002), this area has low surface archaeological potential. It also has low subsurface archaeological potential due to its location on non-alluvial soils. The ground surface is effectively completely disturbed and man-made. The ground surface visibility is generally fair-good (30-60 percent), despite a layer of grass and vegetation covering the ground surface. The modern facilities located on the range include a trailer, a metal container, a wood shed, another wooden structure, wood and metal stands, and wood target butt. The area was surveyed using 25-m transect intervals and no prehistoric or historic cultural materials were observed. Surface archaeological potential is low, and subsurface archaeological potential is also low.

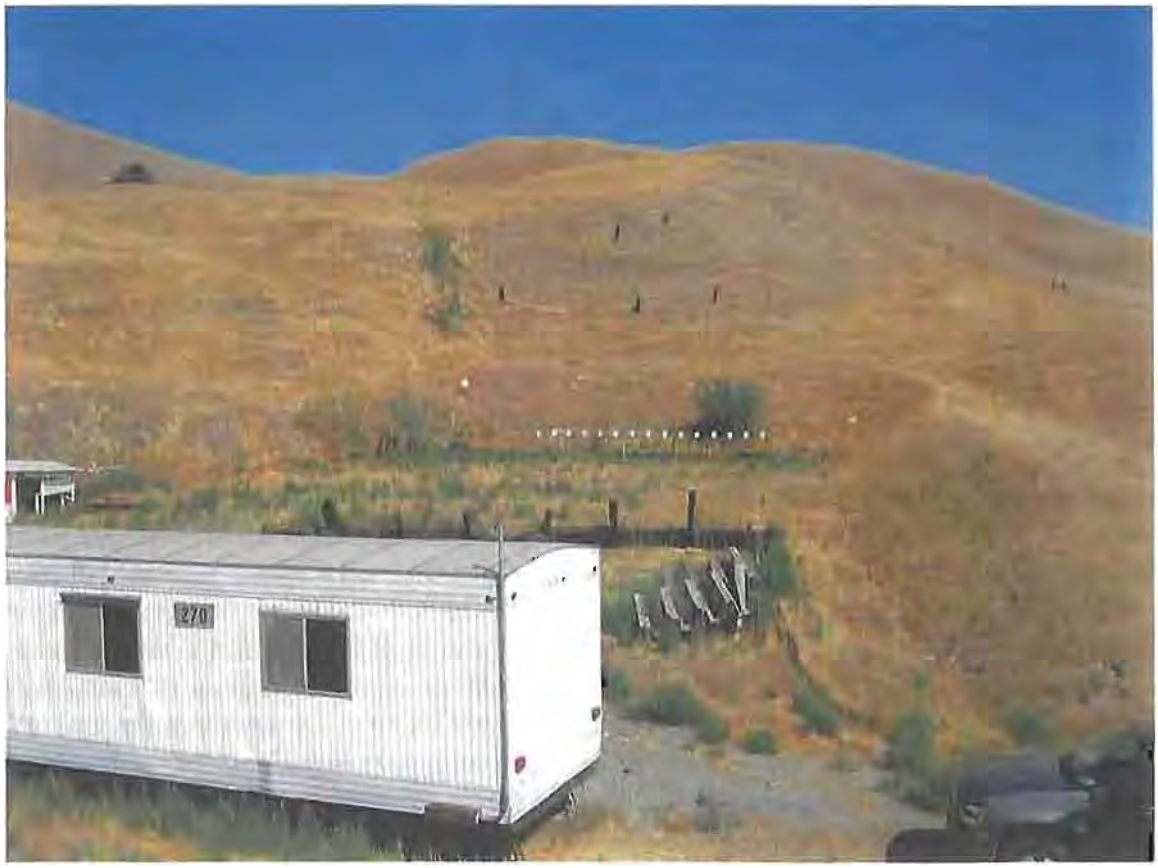

Figure 4.47 Area 24A – Pistol Firing Range.

Area 24B – Aircraft Firing Range (MMRP)

Building IA-56 (P-07-000512) at the old airfield was used between 1944 and 1946 as an aircraft target range for the bore sighting of wing guns (Ecology and Environment 1983) (Figure 4.48). This area, referred to as the "Bore Sighting Range," is included in the MMRP because the backstop berm used at the target range is still intact (Malcolm Pirnie 2005).

Figure 4.48 Area 24B – Aircraft Firing Range MMRP area with refuse concentrations in foreground.

The Aircraft Firing Range is located along the northeast edge of the north-south trending abandoned runway; the area's topography is generally flat. According to the ICRMP (Engineering Field Activity 2002), this area has moderate surface archaeological potential. It also has low subsurface archaeological potential due to its location on Pleistocene-aged alluvial fan deposits. The ground surface visibility is generally fair-good (30-60 percent), despite a layer of grass and vegetation trampled by cows that use the area for grazing covering the ground surface. There is also a small, natural pond in the center of the concentration. The area was surveyed using 25-m transect intervals and it consists of a concentration of metal rocket container fragments (2.25" 1952 and 5" 1945 aluminum U.S. Navy rocket containers), plane fragments and assorted steel refuse spread across an area that was about 30 m north-south x 50 m east-west in size. This concentration was not previously documented on the site form for CA-CCO-706H (Concord Naval Airfield) and CA-CCO-707H (Rail Spur), or during prior investigations of the area (Cartier 1985). The site form for CCO-706H mentions that the Old Airfield area was intermittently used to dump scrap metal and other debris and also as a

training area, which may account for the piles of debris identified in Area 24B. Generally, surface and subsurface archaeological potential are low.

MUNITIONS AND EXPLOSIVES OF CONCERN (MEC) MMRP AREAS

In 2005, a draft Preliminary Assessment (PA) was prepared for the Inland and Tidal Areas in (Pirnie 2005). The draft PA identified nine Areas of Concern (AOCs) in the Inland Area to be evaluated as potentially containing MEC or MC. Each AOC was described and archaeologically; summary information is provided.

Borrow/Dredge Fill Area (MEC/MMRP)

The 27-acre Borrow/Dredge Fill Area was reportedly used during the 1970s and the 1980s for the disposal of dredged material removed from the Contra Costa Canal and local creeks (Figure 4.49). This AOC was determined to need further evaluation because soil piles and trenches were observed in an aerial photo review. This AOC is included in the Navy's MMRP inventory for this reason. No evidence was found during interviews and document reviews that the soil piles and trenches contain MEC or munitions scrap. The Navy has recommended NFA for the Borrow/Dredge Fill Area in the draft PA (Pirnie 2005).

Figure 4.49 Borrow/Dredge Fill Area.

The Borrow/Dredge Fill Area has topography that gently slopes downward from north to south. According to the ICRMP (Engineering Field Activity 2002), this area has low surface archaeological potential. It also has low subsurface archaeological potential due to its location on non-alluvial soils. The ground visibility was poor (<25 percent) due to a layer of grass and other vegetation covering the ground surface. The ground surface should have been disturbed due to trenching and the dumping of dredged soil in the area; however, the soil piles and trenches were not relocated. The area was surveyed using 25-m transect intervals and no prehistoric or historic cultural materials were observed. Surface archaeological potential is low as is the subsurface archaeological.

Railroad Siding Excavations (MEC/MMRP)

The 51-acre Railroad Siding Excavations AOC is located north of the Former Inland Burn Area (Figure 4.50). The Former Inland Burn Area was in use from the late 1940s through the 1970s, and the Railroad Siding Excavations was reportedly used during this time. The AOC would have been used as an emergency destruction and OB/OD area, which was probably conducted within a trench parallel to and east of the Contra Costa Canal.

Figure 4.50 Railroad Siding Excavations (background).

The Railroad Siding Excavations area has topography that gently slopes downward from the hilltop in the center of the area in all directions. According to the ICRMP (Engineering Field Activity 2002), this area has low surface archaeological potential. It also has low subsurface

archaeological potential due to its location on non-alluvial soils. The ground visibility was generally fair-good (30-60 percent), despite a layer of grass and other vegetation covering the ground surface that has been trampled by grazing cattle. The ground surface is generally disturbed due to bulldozing to create trenches, as well as due to natural gully downcutting. Moreover, the ground surface is also subject to cracking and separating due to extreme desiccation. At the top of the hill, two Navy Survey markers (C-168 and C-212) were observed west of a pile of modern refuse that includes concrete and metal tie posts and wood pallets. The area was surveyed using 25-m transect intervals and no prehistoric or historic cultural materials were observed. Surface archaeological potential is low as is the subsurface archaeological potential.

Red Rock Disposal Area (MEC/MMRP)

The 5.3-acre Red Rock Disposal Area has been used for an unknown period of time for the disposal of non-munitions trash and debris (Figure 4.51). Old fire department logs suggest the AOC might have been used for ordnance disposal; hence it was added to the Navy inventory. Based on the visual survey, interviews, and review of other historical documents, the Red Rock Disposal Area is not suspected to contain MEC. The Navy recommended NFA for the Red Rock Disposal Area in the draft PA (Pirnie 2005).

Figure 4.51 Red Rock Disposal Area.

The Red Rock Disposal Area has topography that is generally bowl-shaped, as the main disposal area is surrounded by a man-made berm. According to the ICRMP (Engineering Field Activity 2002), this area has moderate surface archaeological potential. It also has low subsurface archaeological potential due to its location on Pleistocene-aged alluvial fan deposits. The ground visibility was generally fair-good (30-60 percent), despite a layer of grass and vegetation covering the ground surface that has been trampled by grazing cattle. However, bulldozing to create the surrounding berms and ramp, as well as grading for the access road have disturbed the ground surface. The area was surveyed using 25-m transect intervals and concentrations of modern refuse, such as concrete chunks, tires, wood, assorted metal fragments, bottles, golf balls, metal sign posts, metal fencing and rebar were noted. No prehistoric or historic cultural materials were observed. Surface and subsurface archaeological potential are low.

Burn Area Near HE-58 (MEC/MMRP)

The 92-acre Burn Area near HE-58 had been reported at different locations in different documents, but the entire area that reportedly includes the Area of Concern (AOC) occupies approximately 104 acres located east and south of Buildings HE-58 and HE-60 in the southeastern portion of the area (Figure 4.52). Old fire department logs for the AOC indicate that it was used from 1966 to 1978 for maneuvers and Open Burn/Open Detonation (OB/OD) (Pirnie 2005).

Figure 4.52 Burn Area near HE-58.

The Burn Area near HE-58 topography includes very steep slopes (over 30 percent grade slopes) along the west end of the survey area and rolling hills along the east side of the survey areas. According to the ICRMP (Engineering Field Activity 2002), this area has high surface archaeological potential. It also has low subsurface archaeological potential due to the area's location on non-alluvial soils. The ground visibility varies between completely obscured (zero visibility), due to a trampled layer of grass and vegetation covering the ground surface, to fair-good (30-60 percent) in areas where there is disturbance due to rodent burrowing. There is a basalt cobble and boulder outcrop along the south end of this area and there are naturally occurring concentrations of boulder outcrops (Figure 4.53). No cultural materials observed in the area or associated with these concentrations, and the stones themselves were not worked in any observable manner. The area was surveyed using 25-m transect intervals and no prehistoric or historic cultural materials were observed. Surface and subsurface archaeological potential are low.

Figure 4.53 Basalt boulder concentration in field of boulders making up a basalt outcrop.

Disposal Area – Seal Creek (MEC/MMRP)

The Disposal Area – Seal Creek consists of 1.5 acres along Seal Creek southeast (sic) of Building 93 (Figure 4.54). The period of operation for this AOC has been estimated as the 1950s to at least 1983 for the disposal of non-munitions trash. Old fire department logs for NWSSB DET Concord suggest that the older landfills, including the AOC, may have been used for ordnance disposal. This area, however, is not expected to contain MEC or MC. The Navy recommended NFA for this AOC in the draft PA (Malcolm Pirnie 2005).

Figure 4.54 The Disposal Area - Seal Creek with Building 93 in the background to the east.

The Disposal Area - Seal Creek was actually located to the southwest of Building 93 as per Figure 4-6 in the ECP (Department of the Navy 2006). According to the ICRMP (Engineering Field Activity 2002), this area has high surface archaeological potential. It also hads low subsurface archaeological potential due to its location on non-alluvial soils. The topography has a gentle slope trending from north to south toward Seal Creek. The ground visibility varies between completely obscured (zero visibility) by piles of dumped asphalt, to poor (<25 percent) in areas due to a layer of grass and vegetation trampled by cows that use the area for grazing. The ground surface has also been disturbed by bulldozing to create a berm that serves as a ramp for loading and unloading onto a rail cars, by railroad line construction on the east side of the area, and by river processes and downcutting by Seal Creek. On the south side of the ramp, the remains of a rail car were dumped in the creek. The area was surveyed using 25-m transect intervals and no prehistoric or historic cultural materials were observed. Surface archaeological potential is low as is the subsurface archaeological potential

Inland Area EOD (MEC/MMRP)

The 41-acre Inland Area EOD was used from the 1940s to 1959 as an emergency destruction and OB/OD area (Figure 4.55). Based on the known data, particularly the sampling investigation performed in 1992 (PRC 1993), the Navy recommended NFA for the Inland Area EOD in the draft PA (Malcolm Pirnie 2005).

The Inland Area EOD topography has a steep slope trending from north to south. Most of the northeastern portion of this area has over 30 percent grade slopes, except for a flat area at the extreme northeast corner and several terraces on the northwest side. According to the ICRMP (Engineering Field Activity 2002), this area has low surface archaeological potential. It also has low subsurface archaeological potential due to its location on non-alluvial soils. The ground visibility varies between completely obscured (zero visibility), due to a layer of grass and vegetation trampled by cows that use the area for grazing covering the ground surface, to poor (<25 percent) in areas where there is disturbance due to rodent burrowing. The area was surveyed using 25-m transect intervals and no prehistoric or historic cultural materials were observed. Surface and subsurface archaeological potential are low.

Figure 4.55 Inland Area EOD.

Eagle's Nest EOD Area (MEC/MMRP)

Refer to the description and evaluation of Area 23B - Eagles Nest EOD (IR to MMRP) above for the archaeological evaluation of this area, as the two areas overlap geographically.

Former Inland Burn Area (MEC/MMRP)

Refer to the description and archaeological evaluation for Area 13 -Burn Area above as these two areas overlap.

Bore Sighting Range (MEC/MMRP)

The 5.3-acre Bore Sighting Range was used, according to interviewees and historical documents, from 1944 to 1946 for the synchronization of aircraft-mounted machine guns (Figure 4.56). This AOC includes the remnants of the taxiway where the planes were lined up, and the backstop berm (current dimensions measure approximately 50 m x 15 m 4 m. into which they would have sighted or fired. The remnant of the taxiway was 40 m from the berm. The AOC was oriented for sighting and/or firing to the north. NFA was recommended in the Inland Area SI report (PRC 1993) and the draft PA (Pirnie 2005).

Figure 4.56 Bore Sighting Range MEC Area target butt (foreground) with the backstop berm (background).

The Bore Sighting Range MEC Area topography is generally flat with the exception of the man-made backstop berm. According to the ICRMP (Engineering Field Activity 2002), this area has moderate surface archaeological potential. It also has low subsurface archaeological potential due to its location on Pleistocene-aged alluvial fan deposits. The ground visibility varies between completely obscured (zero visibility), due to the presence of dense grass, thistle and other and vegetation, to poor (<25 percent) in areas where the vegetation was more open. Additionally, ground surface visibility was completely obscured in the central portion of the survey area by the paved runway itself. There has been substantial disturbance to the area due to earth moving for the construction of the backstop berm and excavation of the target butt. The area was surveyed using 25-m transect intervals and no prehistoric or historic cultural

artifacts were observed. However, a target butt (non-associated feature) was discovered that was not previously documented on the 1996 site form for CA-CCO-706H (Concord Naval Airfield) and CA-CCO-707H (Rail Spur), or on prior investigations of the area (Cartier 1985). The rectangular target butt was obscured by tall thistle on all sides. It measures approximately 10 m x 15 m x 3 m, and consists of an excavated ramp overlain by machined wood planks. The retaining walls are constructed of machined wood planks and railroad ties. The north end of the target butt has a deposit of cobbles.

AREA 21 – BUILDING 97 FUEL TANKS (IR AREA MOVED TO THE UNDERGROUND STORAGE TANK PROGRAM)

Jet petroleum fuel (JP-5) was stored in underground tanks at Building 97 (Ecology and Environment Inc. 1983) (Figure 4.57). The tanks were removed on December 9, 1990.

Figure 4.57 Area 21 – Building 97 Fuel Tanks.

Area 21 is located within a fenced off area in the foothills along the northern part of the project area and just to the west of Bailey Road. The area topography is generally flat and the buildings are situated on an earthen pad created by bulldozing sediments from the foothills to the north. According to the ICRMP (Engineering Field Activity 2002), this area has low

surface archaeological potential. It also has low subsurface archaeological potential due to its location on non-alluvial soils. The ground surface is completely disturbed and man-made. The ground surface visibility was generally fair-good (30-60 percent), despite a layer of grass and vegetation covering the ground surface. The area was surveyed using 25-m transect intervals and no prehistoric or historic cultural materials were observed. Surface and subsurface archaeological potential are low.

FIELDWORK SUMMARY

Extensive human modifications to the natural landscape have obscured visibility of native soils and therefore the detection of archaeological resources, especially prehistoric sites. Ground visibility was better than expected in many areas due to cattle grazing and because the survey took place in the dry season. However, surface visibility was poor in other areas, particularly along the current creek channel, due to dense grass and other vegetation. Surface visibility was never better than 75 percent, indicating that some cultural resources were obscured from view during the pedestrian survey. To improve visibility, vegetation clearance was conducted to increase the chances of discovering archaeological material that may be present on the surface. Despite visibility limitations, four previously recorded archaeological sites were relocated, and four isolates and 17 new sites were discovered, including 16 historic sites and one prehistoric site. The historic sites primarily relate to ranching activity and consist of concrete foundations and debris scatters. Some are more unique, comprising the remains of residences, and one is a coal mine shaft. The single newly discovered prehistoric site comprises a scatter of ground stone and lithics. Future management considerations for these resources will be discussed in Chapter 5. Of all the hazardous waste areas surveyed, archaeological resources have only been identified in a portion of IR Site 22A.

5. MANAGEMENT CONSIDERATIONS

The primary goals of this study, conducted in support of the BRAC PMO Project, were to identify cultural resources that have the potential to be adversely affected by future development plans, and to provide cultural resource management recommendations (evaluation/mitigation) for specific sites to facilitate future planning needs. The survey accomplished these goals in compliance with Section 106 of the National Historic Preservation Act of 1966 (NHPA), the National Environmental Policy Act (NEPA), and other applicable federal, state, or local laws, ordinances, rules, regulations, and policies.

The NHPA establishes responsibility for federal agencies to provide leadership in the identification, planning, and preservation of historic properties. Under the law, federal agencies must approach historic properties in the spirit of stewardship, and must appropriately involve the public. Two portions of the law most often applied to projects on Department of Defense properties are Section 110, which mandates proactive identification and management cultural resources actions by all federal agencies; and Section 106, which requires federal agencies to take into account the effects of their actions on historic properties.

Implementing Regulation 36 CFR 800 sets forth the procedural requirements for the protection of historic properties under Section 106 of the NHPA. The regulation stipulates processes for identification and evaluation of potential effects of undertakings on historic properties, and for appropriate consultation with the public, interested groups, and other public agencies.

Section 106 of the NHPA applies to federal, federally assisted, or federally licensed and permitted projects and actions, and its protection is afforded to properties listed on, or determined eligible for, the National Register of Historic Places (NRHP), contained within 36 CFR 60. The NRHP's standards for evaluating the significance of properties were developed to recognize the accomplishments of all peoples who have made a significant contribution to our country's history and heritage. The criteria are designed to guide federal agencies and others in evaluating whether a property is eligible for inclusion on the National Register.

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

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

(B) are associated with the lives of persons significant in our past; or

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

(D) have yielded or may be likely to yield, information important in prehistory or history [36 CFR 60.4].

ELIGIBILITY ASSESSMENTS AND RECOMMENDATIONS

The characteristics of each resource identified during this inventory, in conjunction with the limited information obtained from archival research, provide guidance for planning needs and anticipate eligibility determinations. Each cultural resource documented during this survey is listed in Table 5.1, which also includes an eligibility assessment. This assessment is not a formal eligibility recommendation or determination of NRHP significance, but is intended to relate field observations to the potential for eligibility. For some historic resources—i.e., water troughs, orchard remnants, etc.—it is not likely that additional information regarding affiliation or age would be obtained through more intensive archival research and thus there is no recommendation for further work at these resources.

Of the five previously recorded archaeological sites and 17 newly discovered sites, four are considered potentially eligible and seven are indeterminate, but may be eligible for NRHP listing (see Table 5.1). Of the four sites considered potentially eligible, three are previously recorded and one is a newly discovered historic residence and ranch complex, CCO-777H. The previously recorded, potentially eligible sites include P-07-00860, P-07-00861, and P-07-00003.

The first site, P-07-00860, a cistern, is a rock and mortar building with wooden truss and corrugated steel roof, situated on top of a low rocky knoll. This site was first recorded by Self et al. (1993) who determined it to be not eligible for NRHP listing. Self et al. (1993) thought it dated between 1880 and 1900. The Navy concurred with this recommendation. JRP (1998) noted that the cistern appeared on an 1896 USGS 7.5' quadrangle, and that the Gehringer-Bollman family owned the land from 1863 to Navy acquisition. A separate account provided by John Kiebel of the Concord Historical Society in 2001 presents an age estimate in conflict with both previous studies. Kiebel reports that the cistern was constructed between 1932 and 1935 by Robert Motheral and Joe Case for Ralph Bollman, the owner and operator of a diary in the area until 1944. The current survey identified a trash scatter and a windmill that are both associated with the cistern. This site is recommended for re-evaluation, including archaeological testing to determine boundaries and the presence of potentially buried deposits, and further archival research. However, the site appears to meet the NRHP eligibility criteria under Criterion B.

The prehistoric site P-07-00861 is a bedrock milling complex with rock art that was recorded by Kiebel (2001) as a single bedrock milling station with five mortar surfaces (one with an associated slick) situated on the east-facing slope of a small knoll. During the current survey, the feature was found to be exactly as described on original site forms. ASM also found two other archaeological features in the immediate vicinity: a bedrock outcrop with 10 small

Table 5.1 Historic and Prehistoric Archaeological Sites

Resource ID	Age	Description	Condition	Previously Recorded?	Potential NRHP Eligibility	Recommendations
CCO-777H	Historic	Historic residence on 1896 map; Spanish Land Grant 1859, State land claim 1875, Federal to State land grant 1866	Poor; disturbed; standing structures gone, foundations crumbling	No	Yes	Archival Title Search
CCO-778H	Historic/ Submodern	Well covered by wood box	Fair; Wood box in disrepair and filled with metal debris	No	No	none
CCO-779H	Historic	Concrete foundations, rock alignments; 2 homestead claims on land—1820 and 1891	Poor; disturbed; standing structures gone, foundations crumbling	No	No	None
CCO-780H	Historic	Historic residence/ ranch remains	Poor; disturbed; standing structures gone, foundations crumbling	No	Indeterminate	Archival Title Search
CCO-781H	Historic	Concrete foundations, orchard, windmill debris	Poor; disturbed; standing structures gone, foundations crumbling	No	Indeterminate	Archival Title Search
CCO-782H	Historic	Concrete foundation and debris	Poor; disturbed; concrete foundations damaged	No	No	none
CCO-783H	Historic	Concrete foundation and debris	Poor; disturbed; concrete foundations damaged	No	No	none
CCO-784H	Historic	Historic dump	Poor; disturbed; trash pile scattered; cattle churn surface	No	No	none
CCO-785H	Historic	Historic residence/ ranch remains	Poor; disturbed; little evidence of structures	No	Indeterminate	Archival Title Search
CCO-786	Prehistoric	Prehistoric ground and flaked stone scatter	Good; Intact; only cattle traffic and fire-break maintenance impact site	No	Indeterminate	Testing
CCO-787H	Historic	Industrial concrete pads and water troughs	Poor; disturbed; concrete foundations damaged	No	Indeterminate	Archival Title Search
CCO-788H	Historic/ Modern	Outhouse, several foundations, modern water facilities; homestead claim 1872, State land claim 1873	Poor-fair; disturbed; modern activities ongoing; outhouse in fair condition; foundations crumbling	No	Indeterminate	Archival Title Search
CCO-789H	Historic	Concrete pad; industrial structure with iron bolts/ footing attachments	Poor; disturbed; no standing structure left; foundation crumbling	No	No	none
CCO-791H	Historic	Buried historic dump and foundation	Fair; trash deposit disturbed by road but portions intact; concrete foundation is fair	No	Indeterminate	Testing and Archival Title Search
CCO-792H	Historic	Glass Scatter extending onto base from dump	Poor; disturbed by drainage and modern activity including fence construction and cattle	No	No	none

Resource ID	Age	Description	Condition	Previously Recorded?	Potential NRHP Eligibility	Recommendations
CCO-793H	Historic	Debris scatter	Poor; disturbed; scattered remains; concrete is poor	No	No	none
CCO-794H	Historic	Quarry	Fair; Left as-is after operation; currently a sensitive species zone; eroding	No	No	none
P-861	Prehistoric	P-861; two bedrock milling features one cupule rock art panel	Good; Bedrock features in good condition; no known deposit	Yes	Yes	Testing
P-860	Historic	P-860; Stone cistern, trash scatter, windmill and pond	Fair-Good; Cistern in good condition; trash scatter disturbed; windmill in fair condition	Yes	Yes	Testing and Archival Title Search
CCO-680	Prehistoric	P-000003/ CCO-680; prehistoric midden and artifact scatter	Poor-fair; disturbed by plowing/ grading but intact deposits may remain below surface	Yes	Yes	Testing, Boundary Definition
P-000485	Historic	Corral near CCO-680	Poor; disturbed; most of fence is down; remaining fence/ chutes comprised of weathered wood	Yes	No	none
P-02683	Historic	Coal Mine Shaft: 5 x 6 x 30 ft: broken windmill nearby	Fair; Left as-is; matrix is loose; debris in and outside of shaft	Yes	No	none
Isolate ID	**Age**	**Description**		**Previously Recorded?**	**Potential NRHP Eligibility**	**Recommendations**
AI-1	Prehistoric	Single basalt secondary decortication percussion-removed flake		No	No	none
AI-2	Historic	Axe Head (pic 122)		No	No	none
AI-3	Prehistoric	Single Basalt secondary percussion flake; in highly disturbed soils southeast of cistern		No	No	none
AI-4	Prehistoric	Quartz biface; found ON railroad tracks near fenced bunker complex with bulls		No	No	none

(<4 cm diameter) cupules (Feature 2), and a bedrock milling feature with two saucer mortars (Feature 3). The cupules are consistent with rock art forms identified elsewhere in California. This feature, in conjunction with the milling features, indicates that the site has potential for NRHP eligibility under Criterion A and/or Criterion D. This site requires archaeological testing to determine the presence of buried archaeological deposits, although it is likely that this site is eligible given the presence of rock art and extensive milling features.

Previously recorded prehistoric cultural resource P-07-00003 (CA-CCO-680) is a large habitation site with associated midden deposits, organic remains, ground stone, lithics, and human remains. It was tested by Busby et al. (1996a), who found the human remains and documented a 40-cm-thick midden lens. Busby et al. (1996a) recommended the site as eligible for NRHP listing based on assemblage diversity and human remains, and because its occupation may relate to the Maltby site from which over 40 human burials were removed. It is unclear whether Busby et al. (1996a) believe that the deposits from P-07-00003 were imported to their current location. However, the remains of a potentially intact hearth below the disturbed plow zone in one of the units excavated by Busby et al (1996a) suggests that P-07-00003 contains deposits that derive from the immediate area. The current site visit relocated nearly all of the artifacts that were noted by Busby et al. (1996a) and others, and the site condition remains similar to its last recorded condition. The site appears eligible for the NRHP under Criterion D, however, archaeological testing is recommended to determine site boundaries.

One newly discovered historic site is considered potentially eligible for NRHP listing. This site, CCO-777H, is generally in poor condition and consists of a residence foundation, several outbuilding foundations, sidewalks, roads, an orchard, planted trees, a well, and stone floors in some of the foundations. Specifically, the residence foundation includes a cobble-mortar sub-wall that is unique in that it is supported by cobble-mortar arched buttresses. Archival research determined that the site appears as a homestead/ranch on an 1896 USGS topography map. Additionally, land patent information obtained from the Bureau of Land Management for this site included two patents. Salvio Pacheco held approximately half of a quarter section as part of the expansive Monte Del Diablo Spanish-Mexican land grant recognized on March 19, 1859. The State of California acquired the remaining land in the quarter section as part of a 6,736.65-acre Indemnity Selections grant on September 18, 1875 (BLM, Land Grant 112, 1859). These "selections" were also known as "lieu lands" because it was an exchange of acreage. The federal government granted California public land to further education by setting aside certain sections in each township. Profits from selling the land helped establish colleges and universities. In 1866, California obtained the right to select other public land of equal acreage when existing sections were already privately owned, which included land grants (Robinson 1948:187-188). The potential age and affiliation, and the unusual construction characteristics of CCO-777H indicate that this site is potentially eligible for NRHP listing under Criterion C. This site should be researched more thoroughly by conducting a title search.

Seven sites are indeterminate in their potential for NRHP listing due to a dearth of defining elements and integrity (see Table 5.1). One of these, historic site CCO-788H, consists of an outhouse, a shed, a foundation, and a debris scatter, among other modern modifications. The outhouse is in good condition and retains its original structural integrity. This feature may be a contributing element to NRHP significance. Land patent information obtained from the BLM for this site included two patents. Francis W. Lewis patented 130.30 acres of a quarter section with a Cash Entry claim on December 14, 1872. The State of California acquired the remaining acreage in the quarter section on May 10, 1873 under the authority of a September 4, 1841 federal statute (BLM, Land Patent 3513, 1872; BLM, Land Patent 15, 1873). The potential age of the original historic features at the site indicates that it may be eligible for NRHP listing, however, additional archival research, including a title search, is recommended to make final recommendations.

Another historic site, CCO-791H, is a moderately dense scatter of ceramics, glass, and other objects, along with a water feature foundation. The artifact scatter was observed in a road cut and the scatter does extend subsurface. This site may have been an historic dump. Several pieces of temporally diagnostic glass and ceramics were documented. Further work at the site may yield important information relating to historic ranching and mining activities in the area. It is recommended that CCO-791H be subjected to archaeological testing.

Two other historic sites, CCO-780H and CCO-781H, are the poorly preserved remains of historic settlements; the first may be a residence while the second is an orchard with several water features (i.e., windmill, concrete cistern/well, etc.). No information on age or affiliation could be obtained by a land patent search or from historic maps. Further archival research, including a title search, is recommended for these sites to make final eligibility recommendations.

Historic site CCO-785H is the remains of an historic residence with a windmill foundation. All features at this site are poorly preserved and lack integrity. A land patents search and historic map consultation yielded no information on age or affiliation of the site, given that it lies in an unsectioned area. A title search is recommended for this site to make final eligibility recommendations.

Historic site CCO-787H consists primarily of concrete foundations and debris piles. Several features at the site are truncated by Clayton Canal, which is a later addition to the Contra Costa Canal, an eligible historic resource. Clayton Canal was likely built after the construction of the Contra Costa Canal between 1937 and 1948, giving a minimum age for CCO-787H prior to construction of these canals. While it is not likely that CCO-787H will be eligible for NRHP listing due to poor integrity, a title search is recommended for this site to make final eligibility recommendations.

Finally, newly discovered prehistoric site CCO-786 is a scatter of ground stone and lithic tools. The ground is slightly deflated but the nature of the deposit suggests that there could be buried cultural material. Given the lack of prehistoric archaeological sites on base, this site is

unique for the local area and could yield data significant for understanding regional prehistory. This site is recommended for archaeological testing to determine the extent and integrity of subsurface deposits that may be present. All three sites, CCO-786, CCO-788H, and CCO-791H, have the potential for NRHP eligibility but are less likely to have this determination than CCO-777H, P-07-00860, P-07-00861, and P-07-00003.

Of all the other sites documented during this survey (all remaining sites are historic), none possess enough integrity or uniqueness of construction or composition for a favorable eligibility assessment. Many of these sites are piles of historic debris or foundation remnants relating to ranching activity (such as windmill or water tank foundations, and livestock troughs). No further work is recommended for the sites that are not considered potentially eligible (see Table 5.1), including P-00485 and CCO-779H. The previously recorded historic corral, P-00485, was thoroughly documented by Cartier and Eckhart (1995) who conducted archival research. Their extensive research could not find original land owners that could be affiliated with the corral, likely because it is situated in an unsectioned area and lacks land patent information. The corral is mostly destroyed with a few standing segments of fence and loading areas. Cartier and Eckhart (1995) recommended the site as not eligible and no further work is recommended for this site.

Land patent information was obtained for CCO-779H, an historic homestead. Land patent information obtained from the BLM for this site included two patents. Bernard Borach patented a portion of the quarter section under the April 24, 1820 Cash Entry claim on May 16, 1891. John Cornwall patented the remaining portion of the quarter section under the May 20, 1862 Homestead Entry claim on September 5, 1891. The El Pinole Spanish-Mexican land grant claimed a portion of the section, but not in the southeast quarter (BLM Land Patent 16796, 1891; BLM Land Patent 3615, 1891; BLM Land Grant 126, 1868). Despite this information on CCO-779H, features recorded at the site include only fragments of foundations that lack integrity. Water feature foundations at the site may have even been added by later occupants of the vicinity. It is not likely that further research would yield additional information about the site's age and affiliation and no further work is recommended.

Much of the project area is unsectioned, making it difficult to find information on specific plots of land or potential resources. ASM's historian, Sarah Stringer-Bowsher, conducted a Bureau of Land Management (BLM) Land Patents search to determine land holdings but this only yielded information for three historic sites (CCO-777H, CCO-779H, and CCO-788H). Historic maps were also consulted but these typically provided little or no information on specific resources (except CCO-777H, which appeared on an 1896 USGS map). Gathering information from land patent records from the BLM indicated a land grant, homesteading, and state land ownership for sites CCO-777H, CCO-779H, and CCO-788H (this information is detailed below). Since most other historic resources exist in unsectioned areas, acquiring land patent information is not possible; unsectioned areas typically indicate Spanish-Mexican land grants.

Additional archival research could yield more specific information on those persons who patented the quarter sections. Acquiring additional land patent files would be the best source of

information on those homesteaders and could better indicate the possible association between homestead features and a particular homesteader. In addition, requesting a title search for those sites that exist in unsectioned lands would be the most efficient way of determining an association of the resources with an owner. Such efforts, however, would not likely provide chronological resolution or affiliation with specific persons. Many of the historic resources identified during the current survey, including water troughs, wells, orchards, and general foundations may have been constructed by any one of the historic occupants prior to when the military took control of the property in the 1940's.

6. SUMMARY AND CONCLUSIONS

ASM Affiliates, Inc., conducted a cultural resources inventory of the Concord Inland Base Realignment and Closure (BRAC) Survey Project (Project) at Naval Weapons Station Seal Beach Detachment Concord. This inventory consisted of a records search, intensive pedestrian survey, and archival research for historic resources. The pedestrian survey was intended to document archaeological resources not previously evaluated. Thus, base facilities (including buildings, structures, objects, railroads, bridges, culverts, etc.) were excluded from this survey. The pedestrian survey was conducted with 25-m spacing and 1-x-1 m vegetation clears at a minimum of 100-m intervals to improve chances of identifying cultural resources.

Limitations on the discovery of cultural resources include thick vegetation and landscape changes. The survey area was characterized by visibility categories that varied between 0-25 percent (poor), 26-50 percent (fair), 30-60 percent (fair-good), and 51-75 percent (good). Some portions of the project area were characterized as good and fair-good, particularly in the north and west. However, much of the project area was characterized as fair, with the Diablo Creek channel having poor visibility. Despite a large area having fair-good and good visibility, it is possible that additional cultural resources were obscured from view during the survey by vegetation. Vegetation clearances at regular intervals were designed to overcome visibility limitations. Landscape changes include alluvial deposition, re-directing of the original course of Diablo Creek, draining of wetlands, and human modifications including ranching and military activities. These changes significantly affect the potential for discovery of archaeological sites on the surface due either to burial of deposits or destruction.

The survey resulted in the relocation of five previously recorded archaeological sites (three historic, two prehistoric) and the discovery of four isolate artifacts and 17 new archaeological sites (16 historic, one prehistoric). Historic sites consisted of a stone cistern, corrals, residence remains, concrete foundations, artifact scatters, debris piles, a mine shaft, and wells. Archival research to determine age and affiliation included consultation of historic maps and land patent information from the Bureau of Land Management. Information from archival research was limited because much of the project area is unsectioned and requires more intensive title searches to better ascertain affiliation and age. Land patent searches yielded information on settlement and land use for three sites (CCO-777H, CCO-779H, and CCO-788H), and CCO-777H appears on an 1896 USGS map. Prehistoric sites include bedrock milling and rock art, a large habitation site with known human remains, and a small artifact scatter. Based on known characteristics of each site including integrity, uniqueness, and assemblage diversity, assessments of potential NRHP eligibility were given. These assessments are not formal evaluations. However, certain characteristics of each site make it more or less likely to be determined eligible for NRHP listing and these assessments of eligibility are intended to guide future planning needs. In all, four sites are considered potentially eligible (P-07-00003, P-07-00860, P-07-00861, and CCO-777H), and seven others are considered indeterminate (CCO-780H, CCO-781H, CCO-785H, CCO-786, CCO-787H, CCO-788H, and CCO-791H). Further

archaeological work, including testing and archival research, is recommended for all potentially eligible and indeterminate sites identified during this survey.

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APPENDICES

APPENDIX A

SHPO Consultation

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

11011
SER OPDE.DG/7118
June 25, 2007

Larry Myers, Executive Secretary
Attn: Dave Singleton
California Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, CA 95814
(916) 653-4082

Subject: Concord BRAC Disposal and Redevelopment Project

Dear Mr. Singleton,

Naval Facilities Engineering Command Southwest (NAVFAC SW) has contracted ASM Affiliates Inc., on behalf of the Navy's Base Realignment and Closure (BRAC) Program Management Office (PMO) West, to conduct an archaeological survey of approximately 5,000 acres of the Inland area at Naval Weapons Station Seal Beach Detachment Concord, located in Contra Costa County, California (Enclosures 1, 2).

We are requesting a list of Native American individuals/organizations that may have knowledge of cultural resources in the project area. We also would like to request a list of any individuals that have indicated to the NAHC specific knowledge of Traditional Cultural Properties or other significant sites and resources in the project area.

The project area is located on the Clayton, Honker Bay, Vine Hill, and Walnut Creek 7.5' USGS topographic quadrangles (Enclosure 3). The intersection of these four quadrangles is within the Concord Inland project area.

Please refer to the following location data:

Vine Hill Quadrangle
T 2 N / R 1 W Sections: Unsectioned

Honker Bay Quadrangle
T 2 N / R 1 W Sections: 16, 17, 20, 21

Walnut Creek Quadrangle
T 2 N / R 1 W Sections: Unsectioned

11011
SER OPDE.DG/7118
June 25, 2007

Clayton Quadrangle
T 2 N / R 1 W Sections: 21, 22, 26, 27, 28. 34, 35; Unsectioned
T 1 N / R 1 W Sections: Unsectioned

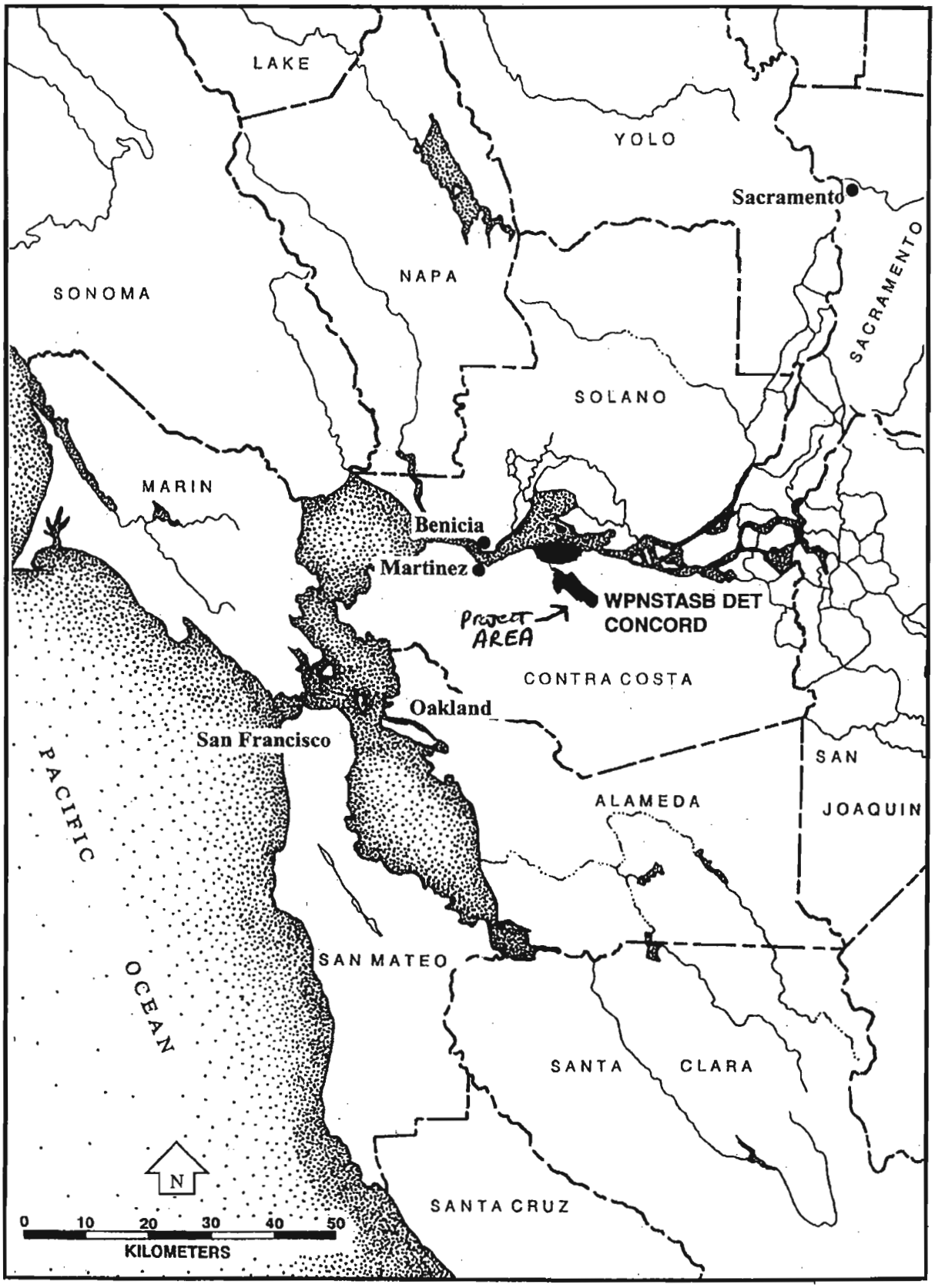
Please fax the response to me at (619) 532-1195. If you have any questions or require additional information please do not hesitate to contact me at my phone (619) 532-3942, or via e-mail: darrell.gundrum@navy.mil. Thank you for your time and consideration.

Sincerely,

Darrell S. Gundrum

Darrell S. Gundrum
Archaeologist
By direction of the
Commanding Officer

Enclosures: 1. Vicinity Map
2. Project Location/Vicinity Map
3. Project Area Map



Map 1. Vicinity Map.

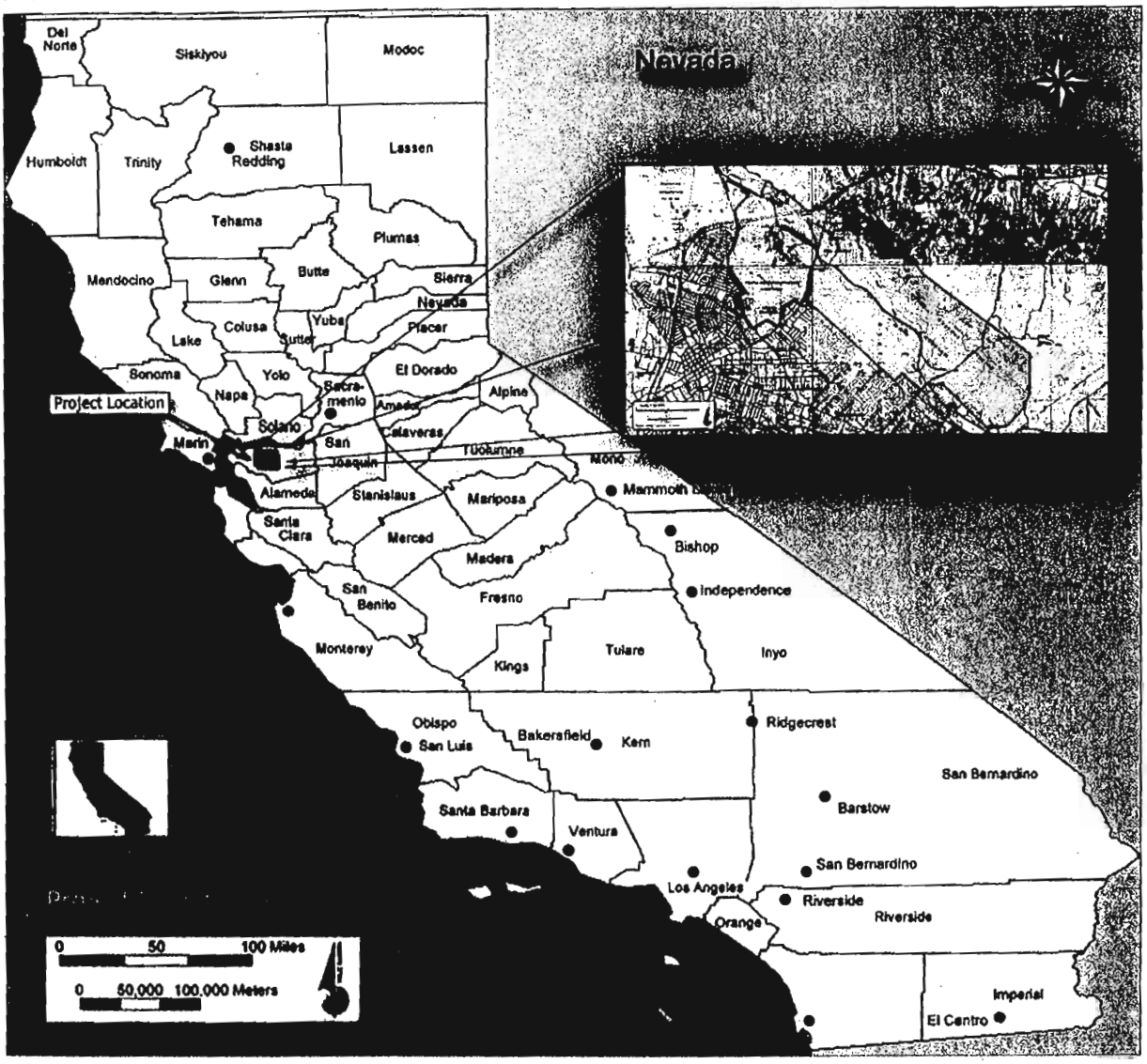
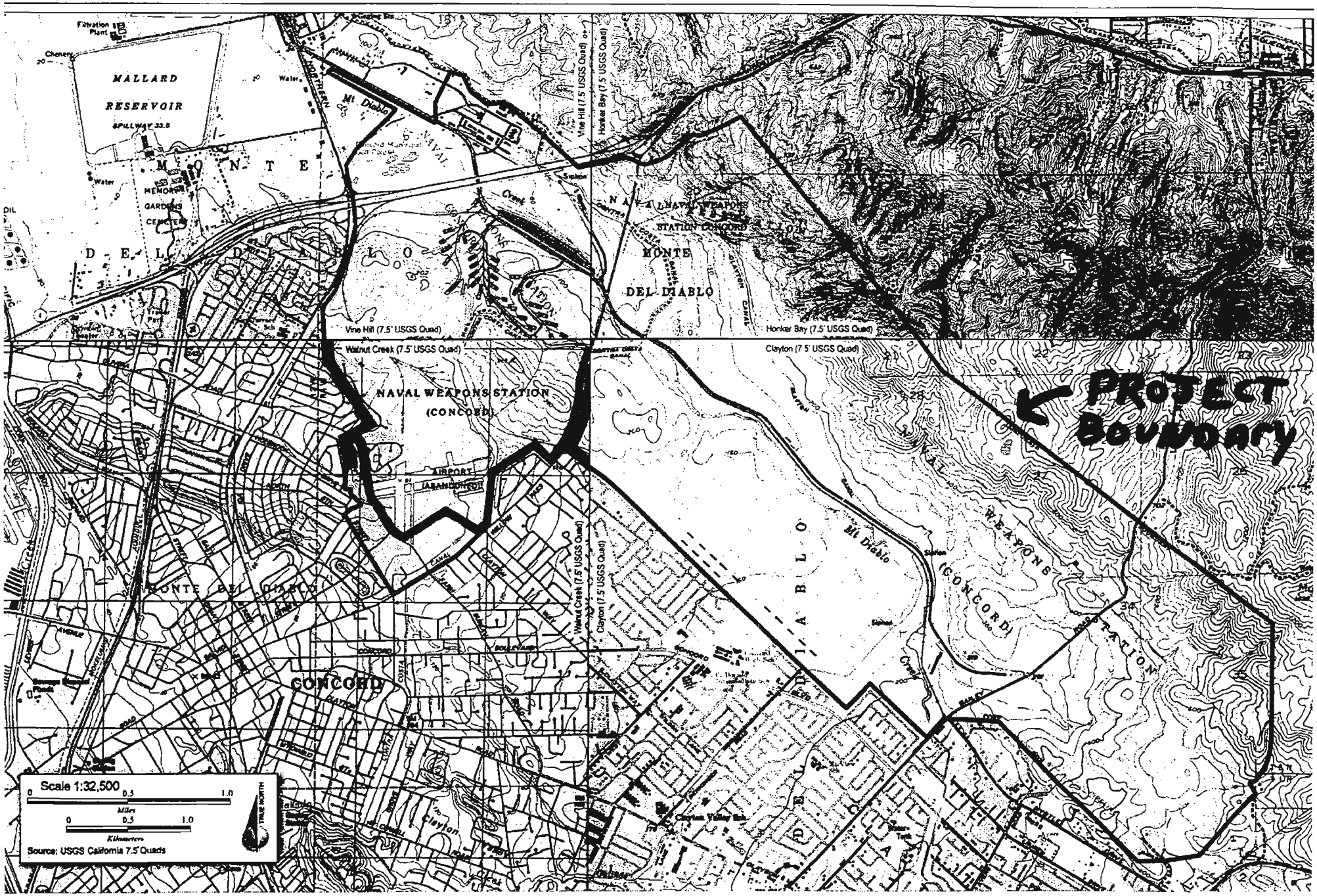


Figure 1. Project Location.


MALLARD RESERVOIR
MONTE DEL DIABLO
NAVAL WEAPONS STATION (CONCORD)
CONCORD
Mt Diablo
Vine Hill (7.5' USGS Quad)
Honker Bay (7.5' USGS Quad)
Walnut Creek (7.5' USGS Quad)
Clayton (7.5' USGS Quad)
PROJECT BOUNDARY
Scale 1:32,500
Source: USGS California 7.5' Quads

Project Ai

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
Fax (916) 657-5390
Web Site www.nahc.ca.gov

July 5, 2007

Darrell S. Gundrum
Archaeologist
Department of the Navy
Naval Facilities Engineering Command Southwest
1220 Pacific Highway
San Diego, CA 92132-5180

Sent by Fax: 619-532-1195
Number of Pages: 2

Re: Proposed Concord BRAC Disposal and Redevelopment Project, Contra Costa County.

Dear Mr. Gundrum:

A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe or group. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 653-4038.

Sincerely,

Debbie Pilas-Treadway
Environmental Specialist III

DEPARTMENT OF THE NAVY
BASE REALIGNMENT AND CLOSURE
PROGRAM MANAGEMENT OFFICE WEST
1455 FRAZEE RD, SUITE 900
SAN DIEGO, CA 92108-4310

11011
Ser BPMOW.pjm/0728
06 AUG 2007

Mr. Milford Wayne Donaldson
State Historic Preservation officer
Office of Historic preservation
1416 9th Street, Room 1442-7
Sacramento, CA 95814

Dear Mr. Donaldson:

The purpose of this letter is to inform you that the Department of Navy (DoN), Base Realignment and Closure (BRAC) Program Management Office plans to transfer approximately 5,032 acres of property from federal ownership at Naval Weapons Station Seal Beach Detachment Concord (NAVWPNSTA Seal Beach Det Concord), located in Contra Costa County, California (Enclosure 1). The Inland Area of the base is being closed in accordance with the enacted BRAC 2005 recommendations. This undertaking primarily comprises of the disposal and reuse of the property. The undertaking could also include layaway, caretaker maintenance and potential interim leases. This undertaking and its effects are being considered under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and implementing regulations 36 CFR 800. The Navy is initiating consultation for this undertaking and seeking concurrence with the proposed project Area of Potential Effects (APE) per 36 CFR 800.4(a)(1).

The APE for this undertaking is the approximate 5,032-acre parcel within the "Inland Area" at NAVWPNSTA Seal Beach Det Concord that is to be transferred from federal ownership (Enclosure 2).

This parcel, which is located entirely within the incorporated City of Concord, was deactivated in 1999 and declared surplus property by the DoN in March 2007. The City of Concord was designated as the Local Redevelopment Authority (LRA) by the Office of Economic Adjustment in 2005. The City of Concord, as the LRA, initiated the Concord Community Reuse Project (CCRP) to prepare a Redevelopment Plan for the site. The City of Concord is currently preparing the Redevelopment Plan, and determined that it will prepare an Environmental Impact Report in accordance with the California Environmental Quality Act to analyze the potential environmental impacts of alternatives developed through the CCRP. The DoN intends to prepare an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA) once the LRA's Redevelopment Plan is completed. The DoN plans to assess the effects for this undertaking in conjunction with its EIS preparation.

While numerous cultural resources investigations have been conducted at NAVWPNSTA Seal Beach Det Concord, only a small portion of the property has been investigated archaeologically. Four archaeological resources (two prehistoric and two historic) have been recorded within the study area. These include Ca-CCo-680, P-07-000861, P-07-000485, and P-07-000860. Ca-CCo-680 consists of a sparse, albeit diverse, scatter of Native American artifacts (i.e. mortars and pestles, an antler wedge, a stone "chopper" and other flaked stone tools and debris) and dietary remains (i.e. mammal bone and marine and freshwater shellfish). A possible hearth feature and several pieces of human bone were also identified as the result of a small test excavation conducted in 1996. All of the material recovered during this work was reburied at the site. The second prehistoric site, P-07-000861, is a bedrock milling feature consisting of four mortar cups and a possible milling slick on a basalt outcrop. Historic archaeological resources include a corral/holding pen (P-07-000485) of undetermined age and a historical stone cistern (P-07-000860) that was built between 1932 and 1935 for use on the Ralph Bollman property and dairy.

All buildings and structures utilized by the DoN have been inventoried and evaluated (Self 1993; JRP Historical Consulting Services 1998) and none have been found to qualify for listing on the National Register of Historic Places (NRHP). The Integrated Cultural Resources Plan (ICRMP) recommended that the DoN consider reevaluating potential eligibility for selected buildings based upon the passage of time and the acquisition of new information. Reevaluation of buildings and structures would likely occur in conjunction with the NEPA process.

An archaeological investigation of the property is proposed to gather baseline cultural resources information early in the BRAC process for consideration in the reuse planning effort. ASM Affiliates, Inc. shall conduct the archaeological investigation of the entire 5,032 acre NAVWPNSTA Seal Beach Det Concord "Inland Area" study area that is part of this action. The investigation shall consist of a pedestrian (walkover) archaeological survey that incorporates vegetation clears designed to remove surface vegetation and improve surface visibility and overall survey effectiveness. The vegetation clears, conducted at various intervals along the survey transects, shall be no greater in size than 1m x 1m and generally not exceed 10cm in depth. No vegetation clears shall be conducted within the boundaries of the previously recorded archaeological sites. No artifacts shall be collected as part of this survey investigation. The survey is currently planned to take place in late August and September 2007.

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06 AUG 2007

The Navy is currently seeking concurrence with the proposed project APE pursuant to 36 CFR 800.4(a)(1).

If you have any questions or comments, please contact Darrell Gundrum at (619) 532-3942. Thank you for your time and consideration.

Sincerely,

JOHN M. HILL
Base Closure Manager
By direction of the Director

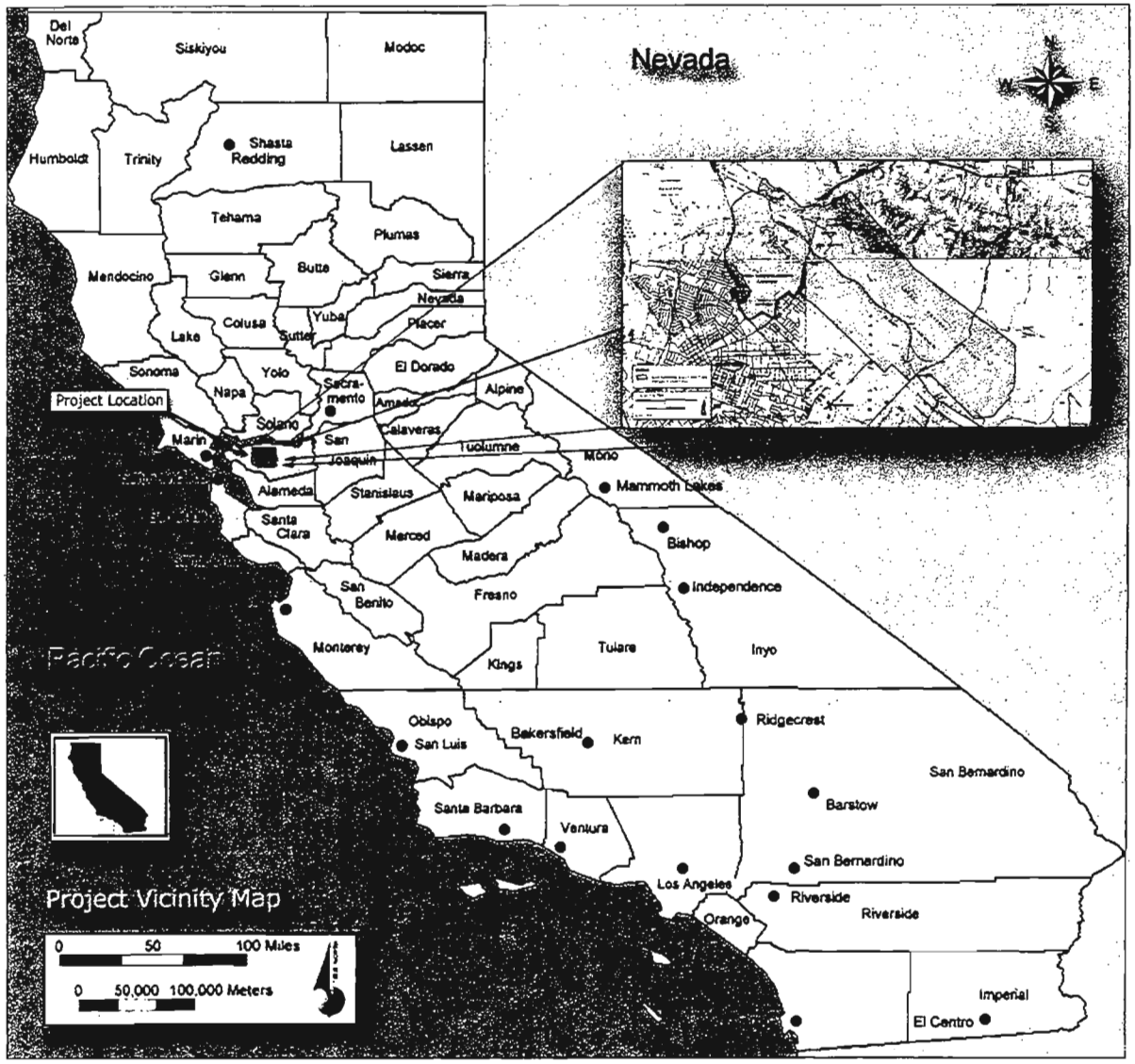
Enclosures: 1. Project Vicinity Map
2. APE

Copy to:
Michael Wright
City of Concord
1950 Parkside Drive
Concord, CA 94519-2578)

Darrell Gundrum (OPDE)
Naval Facilities Engineering Command
Southwest Division
1220 Pacific Highway
San Diego, CA 92132-5190

Lisa Bosalet (N45W)
Naval Weapons Station Seal Beach
800 Seal Beach Boulevard, Bldg. 110
Seal Beach, CA 90740-5000

Richard Pieper (N00DC)
Naval Weapons Station Seal Beach
Detachment Concord
Building IA1, Floor 1
Concord, CA 94520-5100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Sonoma
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Napa
Sacramento
Amador
Alpine
Project Location
Solano
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Tuolumne
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Mono
Alameda
Stanislaus
Mariposa
Mammoth Lakes
Santa
Clara
Merced
Bishop
Madera
San
Benito
Fresno
Independence
Pacific Ocean
Monterey
Kings
Tulare
Inyo
Obispo
San Luis
Bakersfield
Kern
Ridgecrest
San Bernardino
Barstow
Santa Barbara
Ventura
San Bernardino
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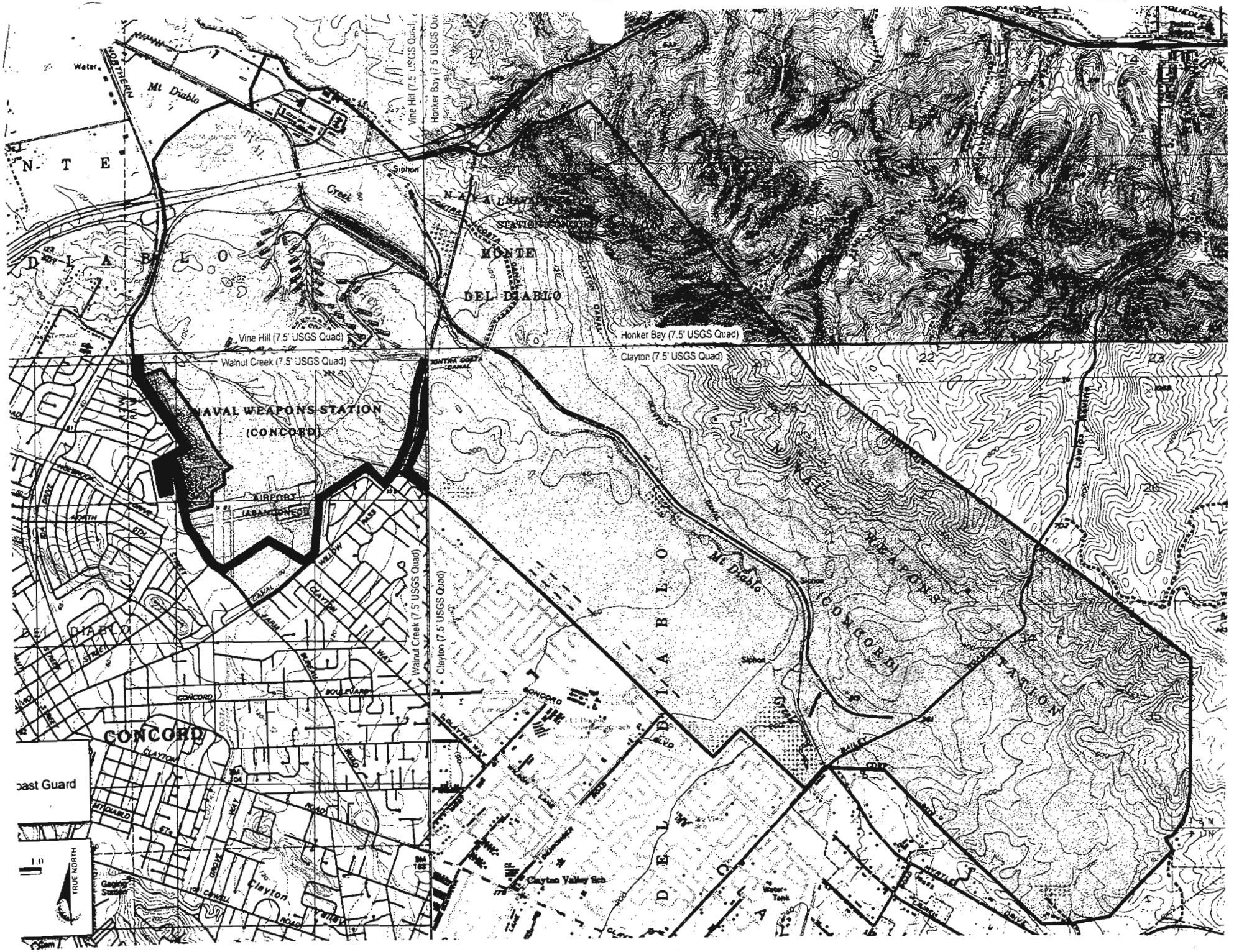

Vine Hill (7.5' USGS Quad)
Honker Bay (7.5' USGS Quad)
Walnut Creek (7.5' USGS Quad)
Clayton (7.5' USGS Quad)
NAVAL WEAPONS STATION
(CONCORD)
AIRPORT
(ABANDONED)
MONTE
DEL DIABLO
Mt Diablo
Siphon
Creek
CONCORD
Clayton
Clayton Valley Sch
Water Tank
Gaging Station
TRUE NORTH
1.0

APPENDIX B

Resumes of Key Personnel

Susan M. Hector, Ph.D.
Principal

Firm Name: ASM Affiliates, Inc., Carlsbad, California

Total Years of Experience: 33 years

Employment History:

2005-	Principal/Senior Archaeologist, ASM Affiliates, Inc., Carlsbad, California
2001-2005	Principal, Susan Hector Consulting, San Diego, California
1999-2001	Director, County of San Diego Department of Parks and Recreation, San Diego, California
1996-1999	Chief, County of San Diego Department of Parks and Recreation, San Diego, California
1992-1996	Senior Project Manager, County of San Diego Department of Parks and Recreation, San Diego, California
1989-1992	Project Manager, County of San Diego Department of Parks and Recreation, San Diego, California
1980-1989	Director of Cultural Resources, RECON, San Diego, California
1977-1980	Senior Museum Preparator, UCLA Museum of Cultural History, Los Angeles, California
1974-1980	Research Collaborator, UCLA Institute of Archaeology, Los Angeles, California

Education:

Ph.D.	1984/Anthropology/University of California, Los Angeles
M.A.	1978/Anthropology/University of California, Los Angeles
B.A.	1975/Anthropology/University of California, Los Angeles

Additional Training:

2006	Section 106: How to Negotiate and Write Agreements, National Preservation Institute
2005	Kumeyaay Ethnobotany. Kumeyaay Community College, Sycuan Reservation
2005	Gourd Rattles. Agua Caliente Culture Museum
2002	Identification and Management of Traditional Cultural Places, National Preservation Institute
2002	Section 106: A Review for Experienced Practitioners, National Preservation Institute

Registrations:

2005	Register of Professional Archaeologists

Professional Memberships:

2004-2006	Governor's Appointee/Governing Board, San Diego River Conservancy
2002-2005	Board of Directors/San Diego Archaeology Center
2002-2005	Board of Directors/Planning and Research Collaborative
2001-2005	Board of Directors/Save Our Heritage Organisation (SOHO)
2001-2003	Communications Committee Chairman/Altrusa International Service Club
2001-present	Advisory Board/Volcan Mountain Preserve Foundation
2000-2004	Editorial Board/Archaeological Conservancy
1999-present	Board of Directors/Presidio Park Council
1998-2000	ad hoc Member/City of Oceanside Historical Site Board
1987-1995	Member/City of San Diego Historical Site Board
1987-1989	Founder/Society for California Archaeology (SCA) Proceedings
1989-1995	Editor-in-chief/Society for California Archaeology (SCA) Proceedings
1995	Board of Advisors/Society for Amateur Scientists
1987-present	Member/Sigma Xi
1987-1991	Coordinator/South Coastal Information Center, San Diego State University
1987-1988	President/Society for California Archaeology (SCA)
1986-1987	Southern Vice President/Society for California Archaeology (SCA)

Awards/Commendations:

2003	Award of Excellence for Historic Preservation, City of San Diego Historical Resources Board, for the San Dieguito River Valley Archaeology Project
2000	California Preservation Foundation (CPF) Preservation Design Award for the restoration of the Spring House at Los Peñasquitos Ranch House National Register District
2000	People in Preservation (PIP) Award from Save Our Heritage Organisation (SOHO) for the restoration of the Spring House
2000	Certificate of Appreciation from Assembly Member Susan Davis for the restoration of the Spring House
1998	Governor's Award for the restoration of Vallecito Stage Station
1997	Governor's Award for the restoration of Rancho Guajome Adobe
1997	California Preservation Foundation (CPF) Preservation Design Award for the restoration of Rancho Guajome Adobe
1996	Orchid Award from the AIA for the restoration of Rancho Guajome Adobe
1996	Orchid Award from the AIA for the restoration of Vallecito Stage Station
1994	Park Project Manager of the Year, County of San Diego
1994	Outstanding Achievement, County of San Diego, for Los Peñasquitos Ranch House restoration and research (with Mary Ward)
1992	Park Project Manager of the Year, County of San Diego
1991	Park Project Manager of the Year, County of San Diego

Clearances: MCAS Miramar, inactive
Edwards AFB, active
Naval Base San Diego, active

Citizenship: USA

References:

Theresa A. Stewart, Senior Biologist, Supervisor, California Department of Fish and Game, (858) 467-4209

Trish Boaz, Chief of Open Space Planning, County of San Diego, Department of Parks and Recreation, (858) 694-3970

Dr. Scott Morrison, Senior Biologist, The Nature Conservancy, (619) 209-5830

Dr. Lynne Christenson, County Historian, County of San Diego, Department of Parks and Recreation, (619) 472-2734

Maeve Hanley, Environmental Management Specialist, County of San Diego, Department of Parks and Recreation, (858) 694-2968

Professional Profile:

Dr. Susan Hector has more than 30 years of experience with prehistoric, historic, and ethnographic cultural resources. She has prepared more than 160 compliance technical reports for federal, state, and local agencies. Dr. Hector has authored many scientific articles and publications, and made technical and popular presentations on prehistoric and historic archaeology and has professional experience with the cultural resources of the Great Basin, American Southwest, and California. She has special expertise in the development of management plans for cultural resources located within open space preserves or parks. Working with the County of San Diego, The Nature Conservancy, the San Dieguito River Valley Park, and the California Department of Fish and Game, she developed a unique system of management recommendations and an implementation program to integrate cultural resources with habitat conservation. Dr. Hector worked for the County of San Diego Department of Parks and Recreation for 12 years, ending as the Director of the department. While working for the County of San Diego, Dr. Hector successfully obtained grants for historic preservation and natural resource conservation. She was directly responsible for the management of historic and prehistoric cultural sites located within the county park system.

Dr. Hector has directed and completed archaeological and historical research projects, field surveys and inventories, test programs, and data recovery projects throughout the west. She has special expertise in ethnobotany, shellfish analysis, lithic tool analysis, historic artifacts, ethnography and ethnohistory, and hunter-gatherer special activity areas. Her diverse background

also includes museum curation and project management. She has also taught classes in anthropology and archaeology at the college level in Los Angeles and San Diego.

Project Experience:

Cultural Resources Support Phase II Project for Cleveland National Forest, San Diego County, California, 2007. As Principal Investigator, directed a survey of SDG&E poles, corridors, and roads within the national forest. The survey provided recommendations to the utility company for avoiding impacts to cultural resources. The project also included work on an Operations and Maintenance plan for SDG&E, development of a cultural resources management strategy for utilities within the forest, and evaluation of impacts to three prehistoric sites as a result of fuel reduction activities by a utility contractor. Coordination with the USFS was a critical part of the project. Two of the three sites were eligible for the National Register, and the damage was determined to be a violation of ARPA. With the involvement of local Native Americans, ASM produced an educational video for utility workers to familiarize them with sensitive cultural resources. Client Reference: Shannon Turek, SDG&E, (858) 637-3712

National Register Nomination for Cuyamaca Village, Cuyamaca Rancho State Park. Dr. Hector prepared a National Register nomination for the archaeological site known as Ah-ha Kwe-ah-mac, an ethnographic village occupied into the 1860s and still used by local Native Americans for traditional purposes. Found eligible by the State Historic Resources Commission under criteria A and D, the nomination combined ethnographic, modern traditional, and archaeological information. Informants from the Native American community provided information on current uses at the site. Extensive research was conducted on the cultural landscape represented by the site and its vicinity. Client Reference: Courtney Coyle, (858) 454-8687

Archaeological Survey of Eastern San Diego County Roads, Trails, and Campgrounds, Bureau of Land Management, 2007. Principal Investigator. This project consisted of a cultural resources study of three existing campgrounds and approximately 270 miles of off-highway vehicle (OHV) trails within the McCain Valley Recreation Area and BLM-managed lands north of McCain Valley, in eastern San Diego County. The purpose of the study was to document and assess any impacts to archaeological sites that may result from continued use of existing trails and campgrounds. This information will inform and assist the BLM in their long-term management policies for the area. The study consisted of a records search and archaeological field survey conducted during 2005 and 2006. Approximately 2,000 acres were surveyed including Upper and Lower Lark Canyon Campgrounds, Cottonwood Campground, the Lark Canyon OHV Area, and existing trails on Table Mountain, Sawtooth Section, and North Section. Higher than anticipated numbers of unrecorded sites, poor access to remote trail segments, and poor documentation of previously recorded sites constrained the survey. The campgrounds were given as a high priority for survey. The study recorded 105 new sites, updated records of known sites, and assessed sites for impacts from recreational activity. Native American consultation and field visits were part of the project. Client Reference: Carrie Simmons, Bureau of Land Management, El Centro Field Office, (760) 337-4437

Palomar Observatory Vegetation Management Project (VMP), California Department of Forestry and Fire Protection, San Diego County, California, 2006. As Principal Investigator, oversaw and conducted an inventory of the cultural resources within the Palomar Observatory property boundaries for a vegetation management project (VMP) proposed by the California Department of Forestry and Fire Protection (CDF). The Observatory is located near the summit of Palomar Mountain, in northern San Diego County. The ownership consists of approximately 500 acres, most of which is undeveloped. The Observatory, operated by the California Institute of Technology (Caltech), is developed with telescopes, living quarters, and administrative and operations buildings, and surrounded by steep slopes covered with dense vegetation. ASM identified an ethnographic village site, and historic sites associated with development of the observatory. Impact avoidance measures were developed in collaboration with CDF foresters. Client Reference: Dan Foster, California Department of Forestry and Fire Protection, (916) 653-0839

Sunrise Fuel Break Vegetation Management Project (VMP), California Department of Forestry and Fire Protection, San Diego County, California, 2006. As Principal Investigator, oversaw and conducted an archaeological survey for the proposed Sunrise Fuel Break. The California Department of Forestry and Fire Protection (CDF) proposes to create a fuel break along the eastern edge of the Cuyamaca Mountains, from the foot of Volcan Mountain south to Sunrise Highway. The north section of the fuel break runs along Wynola Road from Farmer Road to State Route 78. It crosses the state highway and skirts the communities of Whispering Pines and Kentwood-in-the-Pines. The south section of the fuel break extends from Kentwood-in-the-Pines along the edge of the mountains above Chariot Canyon, to Sunrise Highway. The south end of the fuel break is within Cuyamaca Rancho (Anza-Borrego Desert State Park), and runs along Mason Valley Truck Trail for a portion of its route. The total length was approximately 8 miles. ASM recorded both prehistoric and historic cultural resources, including several historic mines. Impact avoidance measures were developed in collaboration with CDF foresters. Client Reference: Dan Foster, California Department of Forestry and Fire Protection, (916) 653-0839

Screening Analysis for the San Vicente Carryover Storage Project, San Diego County Water Authority, San Diego County, California, 2006. As Principal Investigator, oversaw and conducted project in support of the San Diego County Water Authority (SDCWA) plans to construct a Carryover Storage Project (CSP) to add capacity to San Vicente Reservoir. In the event that the addition to the San Vicente Reservoir is not approved, alternative sites and project elements were identified by the SDCWA. ASM Affiliates, Inc. (ASM) assisted in screening five alternative reservoir locations: Lake Wohlford, Loveland Reservoir, Moosa Canyon, Pamo Valley, and Guejito Valley in Rancho Guejito. Pipeline segments were also researched. ASM created a ranking system to evaluate the National Register eligibililty and cultural sensitivity of previously recorded sites within the various project areas. Client Reference: Michael J. Gonzales, PBS&J, (760) 479-2920

A Charmstone Discovery in the Redwood Forests of Mendocino County, California, California Department of Forestry and Fire Prevention, Jackson Demonstration State Forest, Mendocino, California, 2005. As Principal Author, prepared a paper regarding a finely finished, perforated charmstone found embedded in a maintained dirt spur road in Jackson Demonstration State Forest

(JDSF) in 1992.The paper was commissioned by CDF for inclusion in their web site. Client Reference: Dan Foster, Senior State Archaeologist, California Department of Forestry and Fire Protection, (916) 653-0839

The Archaeological Resources of Long Potrero: A Traditional Cultural Landscape in San Diego County, CAL-BLMX, San Diego County, California, 2005. As Principal Investigator, managed intensive cultural resources surveys and ethnographic research for Long Potrero, which is proposed for acquisition as open space to preserve the natural and cultural resources located in this valley. Documented three village complexes with associated special activity and resource procurement areas. Identified and documented historic resources found within the project area, including the McAlmond Homestead and Cemetery. Client Reference: John Eade, Cal-BLMX, (831) 636-6948

The Archaeology of Volcan Mountain, California Department of Forestry and Fire Protection, San Diego County, California, 2005. As Principal Investigator, prepared an overview of the cultural resources of Volcan Mountain, Arkansas Canyon, and San Felipe for the California Department of Forestry and Fire Protection. Over a period of 12 years, documented 60 prehistoric archaeological sites included in the study. The project area burned in 2002 and 2003, partly due to the presence of dead, dying, and diseased pine trees. Provided information to foresters and others working in the region about the types of cultural resources that are present in San Diego's mountains. Client Reference: Dan Foster, California Department of Forestry and Fire Protection, (916) 653-0839

Surveys Conducted to Identify Gathering Places Along the District 11 TEA21 Rural Route Survey, San Diego Corridor, Caltrans District 11, San Diego County, California, 2005. As Principal Investigator, directed a cultural resources inventory conducted for Caltrans along State Routes 76, 78, and 79. Managed ethnographic background research, and survey work with representatives of the California Indian Basketweavers Association and other Native Americans included in the project. Identified many areas along the rural routes that have native plants that are still gathered and used traditionally, including deergrass, three-leaved sumac, tobacco, elderberry, wild cherry, and other species used for baskets, food, and medicine. Client Reference: Deb Dominici, Caltrans District 11, (858) 616-6633

Integrated Cultural Resource Management Plans (ICRMPs), Department of the Navy NAVFAC, for Naval Base San Diego, Naval Base Coronado, and Naval Base Ventura, 2005. As Principal Investigator, managed preparation of ICRMPs based on existing inventories of cultural resources, limited field investigations, and research at the facilities. Supervised the identification of historic and prehistoric resources within facilities, defined how compliance is accomplished, developed standard operating procedures, and made recommendations for future actions. These documents will serve to guide professional and nonprofessional facility staff. Client Reference: Erica Spinelli, Department of the Navy NAVFAC, (619) 532-3331

Phase I Inventory of 1,544 Acres and Phase II Evaluation of Archaeological Sites, Edwards Air Force Base, California, 2005. As Principal Investigator, managed survey portion of an overall program to protect archaeological sites, which continue to be subjected to vandalism at EAFB. The west and northwest boundaries of the Base are particularly vulnerable, as these areas are near residential population centers. Managed a Phase I inventory of the west and northwest boundaries of the base, and recorded historic and prehistoric cultural resources in those areas. Directed Phase II testing on sites judged to be at risk of data loss through vandalism. This information was used to develop management strategies for protecting the sites. As a result of the study, significant sites have been identified and are protected. Client Reference: Rick Norwood, Edwards Air Force Base, (661) 277-7077

Cultural Resource Study for the Pomerado Hospital Expansion Project, Poway, San Diego County, California, 2005. As Principal Investigator, managed an archaeological records search, survey, and testing program conducted on approximately two acres of land proposed for development as part of the Pomerado Hospital expansion. Native American consultation was included as part of the study. One prehistoric archaeological site was found within the project area. Managed testing for significance under the California Environmental Quality Act (CEQA) or for eligibility for inclusion in the California Register. Supervised monitoring by a qualified archaeologist during initial grading to ensure that no previously unidentified buried cultural resources were destroyed as a result of project implementation. Client Reference: Diane Catalano, PBS&J, (858) 514-1010

Archaeological Survey of 71 Orienteering Points Located Within the Laguna Mountain Recreation Area, San Diego County, California, 2005. As Principal Investigator, managed a records search and field survey for an orienteering course located at Laguna Mountain Recreation Area (LMRA) used as part of a land navigation training exercise conducted by the Naval Special Warfare Center Directed an archaeological survey of a 15-m radius around each of 71 orienteering points to determine whether continued use of the course could have adverse impacts on cultural resources eligible for inclusion in the National Register. Conducted Native American consultation for the project. Client Reference: Danielle Page, Department of the Navy NAVFAC, (619) 532-2090

Cultural Resource Survey for a Fuel Reduction Project on Palomar Mountain, San Diego County, California, 2005. As Principal Investigator, managed a records search and field survey conducted along three roads on Palomar Mountain. The project area consisted of a 200-ft. corridor on both public and private lands along both sides of these roads. Foresters marked trees that were proposed for removal. Archaeologists surveyed the areas where marked trees were located, as well as checking previously recorded sites within those areas. As a result of the inventory, nine previously recorded sites and one newly discovered site were identified as being near or within areas proposed for tree removal. Client Reference: Amanda Lopez, PBS&J, (858) 514-1060

Cultural Resources Survey for a Fuel Reduction Project in the Julian Area, San Diego County, California, 2005. As Principal Investigator, managed a cultural resources study to support to removal of dead, dying, and diseased trees within selected areas of San Diego County under a

grant from the U.S. Department of Agriculture, Natural Resources Conservation Service. A records search and field survey were conducted within a 200-ft. corridor on both public and private lands along five major roadways near the town of Julian, California: State Route 79 from Julian to Lake Cuyamaca, State Route 78 from Santa Ysabel to Julian, State Route 78 Banner Grade/Whispering Pines, State Route 79 South, and Sunrise Highway. Foresters marked trees that were proposed for removal; this information was provided on aerial photographs to the field personnel. Archaeologists from ASM Affiliates and PBS&J surveyed the areas where marked trees were located, as well as checking previously recorded sites within those areas. As a result of the inventory, four previously recorded sites and 16 newly discovered sites were identified as being near or within areas proposed for tree removal. Client Reference: Amanda Lopez, PBS&J, (858) 514-1060

Archaeological Survey of MFH Site 8, Department of the Navy NAVFAC, MCAS Miramar, San Diego County, California, 2005. As Principal Investigator, directed an archaeological survey conducted on the MFH Site 8 housing area and within areas proposed for development as an access road. The access road alignment had not been set, and the survey was used in a constraints analysis. Although a portion of the housing project area had been previously surveyed, the area was subsequently burned and the SHPO required additional surveying due to improved visibility. Survey included the housing site and areas not visible during the prior survey because of heavy vegetation cover. Client Reference: Danielle Page, Department of the Navy NAVFAC, (619) 532-2090

Historical Resources Survey of Black Mountain Open Space Park, City of San Diego, San Diego County, California, 2005. As Principal Investigator, managed a complete cultural resources inventory of this 1,314-acre city park. Conducted extensive research on the Black Mountain Mine, located on the north slope of the mountain at an elevation of approximately 1,000 feet, which was mined for arsenopyrite in the 1920s. Managed the preparation of a National Register mining district nomination form. Many remnants of the mining operation still exist on-site. The Rancho Penasquitos Community plan recommends development of an interpretive program and interpretive facilities for the mining operations. Client Reference: Samir Mahmalji, City of San Diego, (619) 236-7342

San Vicente Emergency Storage Project Cultural Resources Survey, San Diego County Water Authority, San Diego County, California, 2005. As Principal Investigator, supervised a cultural resources study of the San Vicente Reservoir, which the San Diego County Water Authority proposes to expand by adding height to the existing dam. The dam raise will result in the inundation of additional land around the perimeter of the reservoir. Summarized expanded field survey information and evaluated the potential impacts to National Register-eligible sites within the project APE. Section 106 evaluations were accomplished on 10 prehistoric and historic sites. Client Reference: Michael Gonzales, PBS&J, (760) 479-2920

Archaeological Investigations at University House, University of California at San Diego, San Diego County, California, 2005. As Principal Investigator, supervised archival research and field

surveys at the Uni House, owned by the University of California, San Diego. Archaeologists have long known that the mesa is rich in cultural deposits and archaeological sites, some of which contain human burials. Managed preliminary studies to gather information about previously recorded archaeological sites. These included research on previous studies, documents about the neighboring residence, research at the Museum of Man, an archaeological survey by ASM personnel, and a ground penetrating radar (GPR) study by Southwest Geophysics, Inc. Forty-three subsurface anomalies were found as a result of the GPR study. Client Reference: Kim Howlett, PBS&J, (858) 514-1018

Santa Margarita Railroad Bridge Replacement and Double Tracking Project, BRG Consulting, San Diego County, California, 2004. As Principal Investigator, managed cultural resources studies supporting the proposed replacement of the Santa Margarita Bridge and construction of a second track for several miles north and south of the bridge. A portion of the project is located on MCB Camp Pendleton. Conducted an historical assessment of the bridge, built in the early 1920s, and evaluated the historical significance of the track, bed, and culverts. Managed archaeological survey of the proposed project area (which included access roads and staging areas) conducted on federal land and within the right-of-way. Supervised testing of one prehistoric archaeological site to determine eligibility for the National Register, and obtained an ARPA permit. Client Reference: Erich Lathers, BRG Consulting, (619) 298-7127

Extended Phase I Investigations of Archaeological Sites along State Route 76, Caltrans District 11, Bonsall, San Diego County, California, 2004. As Principal Investigator, managed the investigation of a series of prehistoric archaeological sites along the right-of-way between the Bonsall Bridge and Interstate 15. Managed Native American consultation, site survey and mapping, and testing in compliance with Section 106. Client Reference: Chris White, Caltrans District 11, (858) 616-6611

Path 15 Transmission Line Cultural Resource Inventory, Western Area Power Administration, Fresno and Tulare counties, California, 2003. As Principal Investigator, supervised survey of 47.5 miles of proposed transmission line and access roads, extending from Los Banos to Coalinga. Managed an extensive records and archival search, evaluation of historic oil fields and canals, and identification of potential constraints from tower and road construction. Directed test excavations conducted to evaluate National Register eligibility. Made recommendations for National Register eligibility for resources within the project corridor. Client Reference: Hal Copeland, Steigers Corporation, (303) 799-3633

Extended Phase I Testing for CA-FRE-3219, State Route 41, Caltrans Central Region, Fresno County, California, 2002. As Principal Investigator, managed extended Phase I testing for prehistoric site CA-FRE-3219 for construction along State Route 41 at the Kings/Fresno county line. Testing was conducted to evaluate National Register eligibility of the site. Supervised fieldwork consisting of the mechanical excavation of three 1-x-3-m backhoe trenches to an initial depth of 1.5 m while monitoring the backdirt for cultural materials or ecofacts. Client Reference: Steven Ptomey, Caltrans Central Region, (559) 243-8243

Extended Phase I Testing for Isolates 4 and 5, State Route 65, Caltrans Central Region, Kern and Tulare counties, California, 2002. As Principal Investigator, managed an archaeological survey conducted to identify any cultural resources within a road widening project along 40 miles of State Route 65 in Kern and Tulare counties. Supervised additional survey at one of the three sites identified during survey. Client Reference: Steven Ptomey, Caltrans Central Region, (559) 243-8242

Sunset Cliffs Natural Park Master Plan Cultural Resources Impact Assessment, City of San Diego, Sunset Cliffs, San Diego County, California, 2001. As Principal Investigator, managed an update of preliminary assessments of the significance of 15 historic and prehistoric cultural resources within this City of San Diego park. Supervised the inventory update, and reviewed proposed changes and improvements at the park, including trails, parking areas, and habitat restoration. Made recommendations to avoid adverse impacts to cultural resources. Client Reference: Jim Harry, Dudek and Associates, (760) 942-5147

Carmel Valley Trunk Sewer Replacement Cultural Resource Survey Report, City of San Diego Metropolitan Wastewater Department, Carmel Valley, San Diego County, California, 2003. As Principal Investigator, managed a cultural resource inventory for approximately 2.5 miles of proposed sewer line replacement. Supervised a literature and records search and a pedestrian field survey and managed monitoring of pre-construction test trenching. Client Reference: Mike Elling, MWWD, (858) 292-6477

Archaeological Site Testing on the Boudreau Property: Maritime Resource Exploitation in the Lower San Dieguito River Valley, Caltrans District 11, Sam Diego County, California, 2000. As Principal Investigator for data recovery of four sites within the City of San Diego, managed analysis of shellfish remains and lithic artifacts to evaluate subsistence patterns along the San Diego coast. As a result of the analysis, a pattern of plant processing, perhaps for the production of reed canoes, was identified. Client Reference: Chris White, Caltrans District 11, (858) 616-6611

2001-2005 Principal, Susan Hector Consulting, San Diego

Ramona Grasslands and Santa Maria Creek Habitat Restoration Project, County of San Diego Department of Parks and Recreation, San Diego County, California, 2004-2005. As Project Manager, assisted the Department of Parks and Recreation in managing a grant that will fund habitat restoration within the Santa Maria Creek watershed. Prepared the scopes of work and contracts for five separate consultants and coordinated the work effort of the five project components. Prepared the cultural resources overview report for the Ramona Grasslands area. Client Reference: Carole Melum, County of San Diego Department of Parks and Recreation, (858) 495-5295

County of San Diego Fire Safety and Fuels Reduction Program, PBS&J, San Diego County, California, 2004. As Principal Investigator, managed cultural resources assessment for sites that

could be impacted by the removal of trees following the 2002 and 2003 wildfires in San Diego County. Surveyed portions of State Route 78 and State Route 79, and the major roads of Palomar Mountain. Developed a staged approach to removing the trees, depending on the location of the tree and the sensitivity of the cultural resources nearby. Coordinated closely with foresters, county staff, and other archaeologists working on different aspects of the project. Client Reference: Kim Howlett, PBS&J, (858) 514-1018

Cultural Resources Survey of the Chollas Creek Water Quality Protection and Habitat Enhancement Project, PBS&J, San Diego County, California, 2004. As Principal Investigator, managed the evaluation of six locations for suitability as habitat enhancement projects within the urbanized area of the City of San Diego. Conducted archival and records searches were accomplished for all six locations. Managed the evaluation of the potential for buried sites. Client Reference: Kim Howlett, PBS&J, (858) 514-1018

Cultural Resource Survey for Lakeland Reservoir, PBS&J, Riverside County, California, 2004. As Principal Investigator, conducted a records search and Native American consultation for the proposed replacement of existing water conveyance facilities located in Lakeland Village, near Lake Elsinore in Riverside County with new pipelines and facilities. Client Reference: Kim Howlett, PBS&J, (858) 514-1018

Improvement of Rice and Leon Roads, PBS&J, Riverside County, California, 2004. As Principal Investigator, prepared a preservation and avoidance plan for two separate road improvement projects near the community of Winchester. One archaeological site was found. Client Reference: Kim Howlett, PBS&J, (858) 514-1018

Otay Mesa Trunk Sewer Monitoring Project, PBS&J, Chula Vista, San Diego County, California, 2004. Construction of this major trunk sewer line near the U.S.-Mexican border required daily monitoring. As Principal Investigator, supervised the archaeology and paleontology monitors working on the project. Attended construction meetings, conducted fieldwork, and prepared summary reports. Client Reference: Kim Howlett, PBS&J, (858) 514-1018

Agua Caliente County Park Ethnographic Study, San Diego County Department of Parks and Recreation, San Diego County, California, 2004. As Principal Investigator, worked with a Native American descendent of the people who settled the region to identify traditional cultural properties that are located within and near the county park. The park is located in the Anza-Borrego Desert, and contains a spring and other important features. The project was conducted for the County of San Diego, which will use the results to manage the parkland and interpret its cultural resources. Managed sensitive cultural information, prepared confidential maps and reports, and extensive field trips to traditional cultural sites. Client Reference: Dr. Lynne E. Christenson, San Diego County Department of Parks and Recreation, (619) 472-2734

The Archaeology of Long Potrero, San Diego County, California, 2004. As Principal Investigator, managed a focused survey to identify historic and prehistoric cultural resources within a more than

3,000-acre property. Twenty-nine cultural resources were found in this previously unstudied area, resulting in the discovery of several major prehistoric village sites. Worked closely with the granting agencies (e.g., BLM and California State Parks) to support acquisition of this project area as open space. Client Reference: John Eade, Cal-BLMX, (831) 636-6948

Irving Gill House, Barona Reservation, Barona Cultural Center and Museum, Barona Indian Reservation, San Diego County, California, 2004. As Principal Investigator, managed a cultural resources study of a house designed by noted architect Irving Gill that burned in the 2003 Cedar Fire. The Barona Group of the Capitan Grande Band of Mission Indians wanted to identify any remaining original historic elements remaining in the rubble of the house. Examined the rubble and remains, collected historic objects, and prepared a report on the house and its remaining historic values. Client Reference: Cheryl Hinton, Barona Cultural Center and Museum, (619) 443-7003

Cultural Resource Management Plan for Bernardo Mountain, CBI, San Dieguito River Park, San Diego County, California, 2004. As Principal Investigator, prepared a management plan to protect sensitive cultural resources identified on the mountain that required active management as part of the San Dieguito River Park, comprising a large mountain and surrounding lands above Lake Hodges. Conducted Native American consisting of a presentation and continued coordination. Client Reference: Jerre Stallcup, CBI, (760) 634-1590

Otay Valley Regional Park Trails, Wallace Roberts and Todd, Chula Vista, San Diego County, California, 2004. As Principal Investigator, managed an inventory of cultural resources within the park, and conducted an analysis of proposed trail development in terms of potential impacts to cultural resources. Conducted historical research resulting in the identification of several potentially important historic and prehistoric sites. Client reference: Rick Barrett, Wallace Roberts and Todd, (619) 696-9303

Putiidhem Site Conservation Planning, California Cultural Resource Preservation Alliance, San Juan Capistrano, Orange County, California, 2002-2004. As Principal Investigator, prepared grant proposals and background information on the site, which has been excavated in the past. This project is a collaborative effort to preserve the site of Putiidhem, a major village of the Acjachemen people of Orange County. Coordinated closely with Native Americans and archaeologists interested in site preservation. Client Reference: Dr. Patricia Martz, California Cultural Resource Preservation Alliance, (949) 559-6490

Santa Ysabel East Open Space Preserve TEA Programmatic Agreement and Management Plan, The Nature Conservancy, San Diego County, California, 2003-2004. As Principal Investigator, prepared a management plan to comply with the TEA grant and Section 106 requirements, for submittal to the granting agencies, Caltrans and the Federal Highways Administration. The property contains many important prehistoric archaeological sites and historically identified site locations. Much of the property burned in the 2003 Cedar Fire, and the management plan had to take into account the lack of vegetation cover and increased potential for erosion and public

damage. Conducted Native American consultation including a tour and site visits. Client Reference: Scott Morrison, The Nature Conservancy, (619) 209-5830

Rose Canyon Watershed Cultural Resources Management Plan, San Diego Earthworks, San Diego County, California, 2003-2004. Principal Investigator for a project funded by a Coastal Conservancy grant consisting of records and archival searches for the Rose Creek and San Clemente Canyon, from their mouths in San Diego Bay to their headwaters east of MCAS Miramar. Of special interest was the original railroad alignment and trestles in Rose Creek Canyon, and Union Brick Company, also located in the canyon. Prepared cultural resources inventory and management plan for use by the City of San Diego in the identification of constraints and opportunities for habitat restoration, interpretation, and public use. Client Reference: Ann Van Leer, San Diego Earthworks, (858) 452-2027

Cultural Resources Inventory, Cuyamaca Ranch, The Nature Conservancy, San Diego County, California, 2002-2003. As Principal Investigator, conducted archival and records searches, original research, Native American consultation, field surveys, public outreach and communications, and preparation of summary reports for the 2,117-acre Cuyamaca Ranch project. Identified the village of Iguai on the property and coordinated with State Parks and Recreation staff to obtain funding for land acquisition based on the discovery of this and other important archaeological resources. Made management recommendations for the project. Client Reference: Scott Morrison, The Nature Conservancy, (619) 209-5830

Archaeology Management Plan for Crestridge Ecological Reserve, California Department of Fish and Game, Crest, San Diego County, California, 2002-2003. As Principal Investigator, prepared a management plan to assist the Department of Fish and Game in planning habitat restoration and interpretive projects for 2,400 acres of land near Crest. A challenge was incorporating conservation of a major archaeological site into a heavily used public area. Managed mapping and recordation of the site; coordinated public participation and stewardship. Worked with Fish and Game to close a road that would have provided public access to an important site. Trained site stewards and docents. Client Reference: Terri Stewart, California Department of Fish and Game, (858) 467-4209

Otay Ranch Preserve Resource Management Plan Implementation Program, San Diego County Department of Planning and Land Use, Chula Vista, San Diego County, California, 2002-2003. As Principal Investigator, prepared an implementation program for land conveyance into the 11,000-acre Otay Ranch Preserve. Developed specific guidance for managing and monitoring sensitive environmental resources, including archaeological and historical sites, as well as native habitat. Collaborated with public agencies involved in developing the program, including the County of San Diego, City of Chula Vista, U.S. Fish and Wildlife Service, California Department of Fish and Game, City of San Diego, and BLM. Prepared an extensive, detailed report on resource-specific management needs, analysis of each proposed land conveyance, and made recommendations for cooperative management among the public agencies. Client Reference: Trish Boaz, San Diego County Department of Planning and Land Use, (858) 694-3075

Archaeology of Old Town San Diego State Historic Park, California State Parks, San Diego, San Diego County, California, 2003. As Principal Investigator, prepared history and archaeology background information for the Bazaar Del Mundo (Casa de Pico) and the Casa de Bandini. Conducted extensive research to identify the footprints of early structures and to summarize the results of previous archaeological studies within the project area. Made management recommendations for structure maintenance and improvements. Client Reference: Ione Steigler, IS Architecture, (858) 456-8555

Archaeology Management Plan, San Felipe Wildlife Area, California Department of Fish and Game, San Diego County, California, 2002. As Principal Investigator, conducted background research, field surveys, prepared inventory forms, and developed a management plan for the 8,329-acre Wildlife Area, which is open for seasonal hunting. The project area is in San Felipe Valley, at the edge of Anza-Borrego Desert. The San Felipe Wildlife Area is adjacent other public lands, and consideration was given to collaborative management of this area with other agencies. Assisted with damage assessment following the Pines Fire, which burned much of this property. Client Reference: Terri Stewart, California Department of Fish and Game, (858) 467-4209

Archaeology Management Plan, Hollenbeck Canyon Wildlife Area and Rancho Jamul Ecological Reserve, Department of Fish and Game, San Diego County, 2002. As Principal Investigator, conducted background research, field surveys, prepared inventory forms, and developed a management plan for the 3,700-acre Wildlife Area. This area is open to public access, and the project included consideration of impacts from trail and staging area development. The Department of Fish and Game also plans to use the Wildlife Area for habitat restoration; surveyed and evaluated specific areas as potential locations for this use. Made recommendations on public and Department access, construction of trails, removal of debris and trash, and conservation of the many historic and prehistoric cultural resources present on the property. Reviewed existing cultural resources information for Rancho Jamul Ecological Reserve. Reviewed site records and archival information for the reserve and prepared a management recommendations matrix to guide the land managers. Client Reference: Terri Stewart, California Department of Fish and Game, (858) 467-4209

Cultural Resources Inventory, Ramona Grasslands, The Nature Conservancy, San Diego County, California, 2002. As Principal Investigator, assisted The Nature Conservancy (TNC) in the preparation of an inventory of cultural resources within the proposed 3,000-acre Ramona Grasslands preserve. Conducted archival and records searches, original research, consultation with Native Americans, field surveys, public outreach and communications, and prepared summary reports. Over 100 archaeological sites have been recorded within the project area. Prepared management recommendations for conservation of these resources. Client Reference: Scott Morrison, The Nature Conservancy, (619) 209-5830

San Diego River Historical Sites Constraints Study, Kyle Consulting, San Diego County, California, 2002. As Principal Investigator, conducted original research with documents, maps, and aerial photographs to identify the locations of buildings and features in the river corridor.

Assessed whether any historic structures or features might remain within the corridor, buried underneath sediments. Client Reference: Carolyn Kyle, Kyle Consulting, (858) 569-0534

Cleveland National Forest Ethnography, Tierra Environmental, San Diego County, California, 2002. As Principal Investigator, compiled existing published and unpublished ethnographic information on the Cleveland National Forest's three districts. Conducted original archival and map research. Managed the production of maps showing the locations of ethnographic villages, gathering areas, and trails. Forest personnel will use this information in their management planning efforts. Client Reference: Dr. Michael Baksh, Tierra Environmental, (858) 578-9064

San Dieguito River Valley Inventory of Archaeological Resources, City of San Diego, San Diego County, California, 2002. As Principal Investigator, managed an archival and records search study of the San Dieguito River Park Planning area located from Del Mar to Sutherland Dam. The project was made possible through a grant to the City of San Diego. Managed preparation of GIS maps for the study area, and developed management recommendations for hundreds of prehistoric and historic archaeological sites. Supervised extensive archival research and consultation of primary sources to identify previously unrecorded cultural resources. Hundreds of sites were identified within the project area. Client Reference: Angeles Liera, City of San Diego, (619) 235-5213. Received an award of excellence for historic preservation from the City of San Diego resources board for work on this project.

1999-2001 Director, Department of Parks and Recreation, County of San Diego

Dr. Hector directed a major county department of 155 full time staff members, and additional seasonal and volunteer positions. The department consisted of four divisions, responsible for over 80 park facilities, including nine campgrounds and three community centers, consisting of 35,000 acres of land. She managed a budget of over $20,000,000; this included an increase of $4,000,000 over previous years; and received over $32,000,0000 in outside grant funds in fiscal year 2000-2001. Major initiatives completed included acquisition and management of tens of thousands of acres of open space land under the Multiple Species Conservation Program (MSCP), major maintenance and ADA repairs and upgrades to park facilities, and new capital projects for park and facility improvement.

While Director, she continued to act as staff archaeologist and cultural resource expert. She received a California Preservation Foundation (CPF) 2000 Preservation Design Award for the restoration of the Spring House at Los Peñasquitos Ranch House historic site, and a People in Preservation Award from Save Our Heritage Organisation in 2000 for the restoration of the Spring House; she also received a Certificate of Appreciation from Assemblymember Susan Davis in 2000 for this project.

1996-1999 Chief, Special Operations, Department of Parks and Recreation, County of San Diego

Open Space Management and Park Program Services Division Operations and Management, September 1999. This project included supervision of 26 division staff and other seasonal and volunteer employees. The division's responsibilities included management of the department's cultural and natural resources, regional open space planning and acquisition efforts, collaborative programs with other County departments and community groups, and multi-agency planning, acquisition, and development projects.

Dr. Hector had a lead role in preparation of grant applications. She served as the Department's Historic and Prehistoric Archaeology technical expert. She was the Project Manager for the restoration of Rancho Guajome, which won an Orchid Award from the AIA (1996), a California Preservation Foundation award (1997) and a Governor's Award (1997). She also won an Orchid (1996) and Governor's Award (1998) for the restoration of Vallecito Stage Station. She prepared the Cultural Resources element of the MSCP Framework Management Plan for the unincorporated area.

Escondido Creek TEA Grant Cultural Resource Survey, San Diego County Department of Parks and Recreation, San Diego County, California, 1996-1999. As Principal Investigator, conducted archival research and field surveys of several parcels proposed for land acquisition. Prepared reports specific to the grant requirements and in compliance with the TEA grant and Section 106 requirements for submittal to the granting agencies, Caltrans and the Federal Highways Administration. Client Reference: County of San Diego Department of Parks and Recreation

Open Space Preserve Management, County of San Diego Department of Parks and Recreation, San Diego County, California, 1996-1999. As Project Manager, conducted cultural and natural resource inventories for planning and operations for Otay Valley Regional Park, Los Peñasquitos Canyon Preserve, El Capitan Open Space Preserve, Wilderness Gardens Preserve, Oakoasis Open Space Preserve, Mt. Gower Open Space Preserve, Hellhole Open Space Preserve, Volcan Mountain Preserve, Mount Olympus Open Space Preserve, Tijuana River Valley Regional Park, San Elijo Lagoon Ecological Reserve, Rancho Guajome Adobe, and Lower Otay Regional Park. Client Reference: County of San Diego Department of Parks and Recreation

Los Peñasquitos Ranch House National Register District, County of San Diego Department of Parks and Recreation, San Diego County, California, 1996-1999. As Principal Planner and Project Manager, oversaw restoration and management of the historic adobe and grounds. Conducted original research that supported the construction of the adobe in 1824, making it the oldest residence in the City of San Diego. Supervised archaeological excavations and directed restoration efforts. Successfully expanded the National Register designation to include a District, containing outbuilding sites and a prehistoric deposit. Client Reference: County of San Diego Department of Parks and Recreation

1992-1996 Senior Park Project Manager, Department of Parks and Recreation, County of San Diego

Supervisor of Environmental Compliance, Regional Parks and Open Space Division, September 1992-September 1996. Dr. Hector supervised Park Project Managers, and prepared periodic employee evaluations. As a project manager for regional parks, her tasks included the preparation of grant proposals for project funding, management of consultant contracts, preparation of budgets and schedules, and development of new projects. She coordinated with other agency staff, consultants, and the public; was staff to citizens advisory committees (Los Peñasquitos, Otay Valley, and Guajome). For specific projects, she was responsible for all aspects of project budget, contracts, and task scoping.

1992-1996 Department Archaeologist, Department of Parks and Recreation, County of San Diego

As the department's archaeologist, she conducted cultural resource surveys and studies for park development projects and maintenance projects. Dr. Hector also conducted training sessions for staff on cultural resource management. She assisted field staff with exhibits and interpretive materials related to archaeology.

Volcan Mountain Preserve Inventory and Management Program, County of San Diego Department of Parks and Recreation, San Diego County, California, 1992-1996. As Principal Investigator, managed research, field survey, recordation, and development of management plans for Volcan Mountain Preserve. Supervised the training and use of volunteers and community members as part of an outreach program. Currently a member of the Volcan Mountain Preserve Foundation Advisory Board. Presented a paper at the 2003 Society for California Archaeology annual meeting in Sacramento on the results of 10 years of investigation on Volcan Mountain. Client Reference: County of San Diego Department of Parks and Recreation

Los Peñasquitos Ranch House, Rancho Guajome, and Vallecito Stage Station Inventory and Restoration, County of San Diego Department of Parks and Recreation, San Diego County, California, 1992-1996. As Principal Investigator and Project Manager, oversaw the restoration and management of these historic resources within the parks system. Collaborated with architects and engineers to develop stabilization and restoration plans compatible with the Secretary of the Interior's Standards. Won Orchid Awards, California Preservation Foundation Awards, and a Governor's Award for these projects. Client Reference: County of San Diego Department of Parks and Recreation

Rancho Guajome Adobe Landmark Restoration, County of San Diego Department of Parks and Recreation, San Diego County, California, 1992-1996. As Project Manager, managed the restoration of this National Historic Landmark. Identified a period of interpretation, coordinated closely with state granting agencies, and supervised construction. Worked with donors to furnish

the adobe. Trained docents and park staff in site management. Client Reference: County of San Diego Department of Parks and Recreation

Cultural Resources Report for the Coronado Strand Beautification Project, County of San Diego Department of Parks and Recreation, San Diego County, California, 1992-1996. As Principal Investigator, managed a survey and report prepared in compliance with the Section 106 requirements of the granting agencies, Caltrans and the Federal Highways Administration for the Silver Strand. Client Reference: County of San Diego Department of Parks and Recreation

1989-1992 Park Project Manager, Department of Parks and Recreation, County of San Diego

Cultural and Natural Resource Management Program, County of San Diego Department of Parks and Recreation, San Diego County, California, 1989-1992. As Project Manager, supervised projects requiring expertise in cultural and natural resources, including restoration of Los Peñasquitos Ranch House Adobe and Rancho Guajome National Historic Landmark. Acted as the Parks and Recreation Department expert on environmental regulations and requirements. Reviewed environmental studies and prepared reports for management.

1980-1989 Director of Cultural Resources, RECON, San Diego

Historic and Archaeological Resources Protection (HARP) Plan for Naval Station Long Beach, Department of the Navy NAVFAC, Los Angeles County, California, 1989. As Principal Investigator, prepared a plan describing the results of cultural resources studies and relating them to planned or potential activities at the station. Identified a National Register district at the base. Provided direction or management of this district in compliance with federal law and Navy procedures. Client Reference: Danielle Page, Department of the Navy NAVFAC, (619) 532-2090

Historic and Archaeological Resources Protection (HARP) Plan, Naval Amphibious Base, Coronado, Department of the Navy NAVFAC, San Diego County, California, 1989. As Co-Principal Investigator, prepared a HARP plan describing the findings of a series of cultural resources investigations at the base in compliance with federal requirements. The HARP integrated current information about eligible resources with the activity's management goals and priorities, and provided standard methods for realizing efficient compliance. Client Reference: Danielle Page, Department of the Navy NAVFAC, (619) 532-2090

Historic and Archaeological Inventory and Eligibility Survey for Savannah and Cabrillo Family Housing, Naval Station Long Beach, Department of the Navy SDWIV, Los Angeles County, California, 1989. As Principal Investigator, identified any cultural resources within the facilities that qualified for inclusion in the National Register. Conducted historical and architectural studies of the housing facilities. Completed inventory forms as part of the project. Client Reference: Danielle Page, Department of the Navy NAVFAC, (619) 532-2090

Archaeological Resources Investigation for Military Construction Project P-254, Naval Station San Diego, Department of the Navy NAVFAC, San Diego County, California. As Principal Investigator, conducted a National Register eligibility evaluation for archaeological site SDI-12093 in support of the proposed construction of a 12-story building in an area where the site was recorded. Client Reference: Danielle Page, Department of the Navy NAVFAC, (619) 532-2090

Cultural Resource Management Plan for Seal Beach Naval Weapons Center, Department of the Navy NAVFAC, Naval Weapons Station Seal Beach, Orange County, California. As Principal Investigator, conducted archival and field study of seven Navy bases in southern California. Prepared a preservation and management plan based on federal requirements. Client Reference: Danielle Page, Department of the Navy NAVFAC, (619) 532-2090

National Register Eligibility Evaluation of CA-SDI-8670, Fleet Industrial Supply Center, Point Loma, Department of the Navy NAVFAC, San Diego County California. As Co-Principal Investigator, conducted an archaeological investigation to evaluate the eligibility of the site for inclusion in the National Register. It was determined that the site was not present at this location. Client Reference: Danielle Page, Department of the Navy NAVFAC, (619) 532-2090

Update on Cultural Resources Located within the Sycamore Valley Project Area, San Diego County, California. As Principal Investigator, conducted a survey and test excavation project. The project included analysis of the significance of historic and prehistoric resources located within the project area, including the town site of Stowe.

City of San Diego Sensitive Lands Pilot Study, San Diego County, California. As Principal Investigator, conducted research on 18 square miles in the northern part of the city to identify previously recorded resources. As the first study of its kind in the city, developed guidelines for future cultural resource studies.

Cultural Resource Survey of 26,000 Acres on Otay Ranch: Constraints Study, Otay Ranch Partners, Chula Vista, San Diego County, California. As Principal Investigator, directed a survey project to identify potentially significant resources for future development in the area. Over 100 previously unrecorded historic and prehistoric sites were found and mapped, and many recorded sites were visited and updated.

City of Carlsbad Cultural Resource Guidelines, San Diego County, California. As Principal Investigator, prepared cultural resource guidelines for Carlsbad under a grant from the State Office of Historic Preservation to the City of Carlsbad.

Cultural Resource Survey of Black Mountain Park, City of San Diego, San Diego County, California. As Principal Investigator, identified and recorded one prehistoric campsite and one historic site during a survey of this city park. The historic site was an arsenic and gold mine, and included structural remains.

An Archaeological Survey of the Railroad Canyon Road Project Area, City of Lake Elsinore, Riverside County, California. As Principal Investigator, managed a road alignment survey resulting in the discovery of four prehistoric sites. Made recommendations for further study.

Archaeological Excavations within the Los Peñasquitos Ranch House Archaeology Site Plan Area, County of San Diego, San Diego County, California. As Principal Investigator, prepared a mitigation report for historic and prehistoric archaeological materials outside the historic adobe house. Also prepared a cultural resource management plan for the County of San Diego as a result of this project.

Archaeological Data Recovery at CA-SDI-10863, Gillespie Field, County of San Diego, California. As Principal Investigator, conducted archaeological excavation and surface collection focusing on the issue of Early Man occupation in San Diego County.

An Archaeological Survey Update for Cottonwood Canyon, City of Lake Elsinore, Riverside County, California. As Principal Investigator for a cultural resources inventory, conducted a significance evaluation of prehistoric and historic sites, including a family cemetery, within a 2,000-acre project area.

Cultural Resource Survey of Lilac Ranch, County of San Diego, Escondido, San Diego County, California. As Principal Investigator, managed survey of more than 900 acres in northern San Diego County. Identified and recorded 20 historic and prehistoric sites. This was the first cultural resources inventory to be conducted in this part of San Diego County.

Historical and Archaeological Survey of Rancho Buena Vista, Vista, San Diego County, California. As Principal Investigator, assessed potential impacts to this city landmark, an adobe built in 1853. Produced a detailed study of the historic integrity of the adobe, which had been modified over the years. Made mitigation measures relating to historical archaeology. Following completion of the project, the adobe was purchased by the City of Vista for preservation.

Archaeological Survey and Resource Assessment of the American Girl Mine Project, Bureau of Land Management, Imperial County, California. As Principal Investigator, conducted historical and archaeological research as mitigation project for impacts to a mining town site located in the Cargo Muchacho Mountains north of Winterhaven, California. This multi-year project, conducted for the BLM, included a complete survey of the American Girl Canyon area, recordation of a series of historic mining features, and aerial photography to map two mining town complexes. The town site of Obregon was occupied in the early twentieth century, and consisted of small homes, a school, and two mining operations. Included in the project was the removal of an historic cemetery. Managed excavation and recording of the entire town site since the proposed project was to construct an open pit gold mine. The town site was found eligible for inclusion in the National Register of Historic Places.

Archaeological Test Excavations at Rancho Guajome, County of San Diego, San Diego County, California. As Principal Investigator, directed archaeological excavations and survey of the Rancho Guajome, a National Historic Landmark. Project included a test excavation program at the nineteenth-century adobe. Dr. Hector's studies provided important information for the restoration of the structure, which she directed as the County of San Diego's project manager.

Excavation of a Portion of CA-SDI-4513, The Rimbach Site, City of San Diego, San Diego County, California. As Principal Investigator, conducted extensive excavation that provided much evidence for early historic occupation at this site. As a result of this research, the site was found to be part of the ethnographic village of Ystagua.

Archaeological Excavations at Los Peñasquitos Ranch House Resource Area, County of San Diego, Rancho Peñasquitos, San Diego County, California. As Principal Planner and Project Manager, managed archaeological investigations, excavations, restoration and management of the historic adobe and grounds. Conducted original research that supported the construction of the adobe in 1824, making it the oldest residence in the City of San Diego. Supervised archaeological excavations and directed restoration efforts over a 10-year period. Successfully expanded the National Register designation to include a district, containing outbuilding sites and a prehistoric deposit.

Archaeological Investigations at SDM-W-1440/SDI-5198: A Special Use Site on Mira Mesa, San Diego, California. As Principal Investigator, managed excavations and surface collection at a multiple-locus site. This site represented specialized use areas located on a mesa top.

Cultural Resource Assessment of the Home Avenue Dump Site, Terrace View Villas, City of San Diego. As Principal Investigator, managed excavation of this large historic site, known to be the site of the 1885 City of San Diego dump. Conducted extensive historic research and identified and analyzed artifacts.

Cultural Resource Management Plan for Seal Beach Naval Weapons Center, Department of the Navy NAVFAC, Naval Weapons Station Seal Beach, Orange County, California. As Principal Investigator, conducted archival and field study of seven Navy bases in southern California. Prepared a preservation and management plan based on federal requirements. Client Reference: Danielle Page, Department of the Navy NAVFAC, (619) 532-2090

Historic Resource Evaluation of the Starlight Bowl, Balboa Park, City of San Diego, San Diego County, California. As Principal Investigator, assessed potential impacts to this National Register property. Managed an evaluation of whether proposed improvements would adversely impact the significance and integrity of the site. As a result, modifications were made in the plans for development to preserve original historic materials.

Excavation and Analysis of the Historic and Prehistoric Components of Archaeological Site SDM-W-1439A, City of San Diego, San Diego County, California. As Principal Investigator, managed excavation of two historic adobes and a series of prehistoric hearths.

Report on the Excavation of CA-SDI-9098 and CA-SDI-9099, Located on Otay Mesa near the International Border, City of San Diego, San Diego County, California. As Principal Investigator, managed mitigation excavation of these two sites, and development of a preservation plan for a third site. Located near a prominent drainage, these sites were unusual for the region.

Records and Archival Searches for Cultural Resources Located in the Otay General Plan Amendment Area, County of San Diego, San Diego County, California. As Principal Investigator, conducted an historic and prehistoric resource assessment from site records for a 12,500-acre area. Prepared impact assessments and management recommendations.

Archaeological Investigations at Hansen's Ranch, San Diego County, California. As Principal Investigator, managed artifact collection at seven quarry sites, test excavations at SDM-W-172B (Sweetwater Village), and mapping of the historic waterworks at Isham Springs.

Historic and Archaeological Resources Protection Plan for Naval Station Long Beach, Department of the Navy NAVFAC, Los Angeles County, California, 1989. As Principal Investigator, prepared a plan describing the results of cultural resource studies and relating them to planned or potential activities at the station. Identified a National Register district at the base. Provided direction or management of this district in compliance with Federal law and Navy procedures. Client Reference: Erica Spinelli, Department of the Navy NAVFAC, (619) 532-3331

Historic and Archaeological Inventory and Eligibility Survey for Savannah and Cabrillo Family Housing, Naval Station Long Beach, Department of the Navy SDWIV, Los Angeles County, California, 1989. As Principal Investigator, identified any cultural resources within the facilities that qualified for inclusion in the National Register. Conducted historical and architectural studies of the housing facilities. Completed inventory forms as part of the project. Client Reference: Erica Spinelli, Department of the Navy NAVFAC, (619) 532-3331

Historic and Archaeological Resources Protection (HARP) Plan, Naval Amphibious Base, Coronado, Department of the Navy NAVFAC, San Diego County, California, 1989. As Co-Principal Investigator, prepared a HARP plan describing the findings of a series of cultural resource investigations at the base in compliance with federal requirements. The HARP integrated current information about eligible resources with the activity's management goals and priorities, and provided standard methods for realizing efficient compliance. Client Reference: Erica Spinelli, Department of the Navy NAVFAC, (619) 532-3331

1974-1980 Research Collaborator, UCLA Institute of Archaeology, Los Angeles

Field Consultant, Nevada State Museum. Dr. Hector was responsible for field investigations concerning historic and prehistoric cultural resources in central Nevada. Her tasks involved extensive surveys of several valley systems, surface collection and mapping of lithic artifacts, and collections of historic artifacts. Final reports were prepared describing the results of these studies.

Research Assistant in Ethnobotany, Pajarito Archaeological Research Project, New Mexico, UCLA Anthropology Department. As supervisor of a crew of graduate students, participated in a National Science Foundation-funded project in northern New Mexico. Collected palynological and botanical samples and assessed ethnobotanical information for the overall project within the Santa Fe National Forest. Investigated historic sites in the region and mapped agricultural features from the prehistoric sites recorded during the project.

Archaeological Excavations at LAN-847 and LAN-848, City of Rancho Palos Verdes, Los Angeles County, California. As Co-Principal Investigator, conducted mitigation excavations at two large midden sites on the coast of Los Angeles County. An important aspect of the project was the fact that most of the lithic artifacts recovered were made of chert.

An Archaeological Resource Survey and Impact Assessment of Hollydale Park, Southgate, Los Angeles County, California. As Project Archaeologist, conducted historic and prehistoric resource investigations.

An Archaeological Resource Survey and Impact Assessment of Triunfo Park, Ventura County, California. Principal Investigator. Prehistoric sites were found during this investigation conducted for the Conejo Recreation and Parks District.

Archaeological Excavations at CA-LAN-789 and CA-LAN-790, San Pedro, Los Angeles County, California. As Principal Investigator, managed data recovery excavations at two coastal prehistoric sites dating to the Archaic period. Significant amounts of shellfish were found at the sites.

Records Search of Archaeological Resources within Los Angeles County, Los Angeles County Department of Urban Affairs, Los Angeles County, California. As Project Archaeologist, prepared a base map for the Los Angeles County Department of Urban Affairs for this groundbreaking project.

Evaluation of the Archaeological Resources and Potential Impact of Proposed Pan Pacific Park, Los Angeles County. As Project Archaeologist, conducted historical and archaeological assessment of resources within a developed park, site of the Pan Pacific Auditorium.

Evaluation of the Archaeological Resources and Potential Impact of Proposed Construction of Flood Control Projects on CA-SBA-1330, USDI Bureau of Reclamation, Santa Barbara County,

California. As Co-Principal Investigator with Dr. D. L. True, managed excavation of midden site for the U.S. Department of the Interior. The site was an Archaic coastal exploitation camp.

Evaluation of the Archaeological Resources and Potential Impact of Proposed Unit A Interceptor Replacement, Phase I, City of Thousand Oaks Utilities Department, Thousand Oaks, Los Angeles County, California. As Principal Investigator, conducted survey and prepared site record forms for a utility alignment.

Evaluation of Archaeological Resources in the Area to be Improved for Pacific Gas and Electric, Bakersfield, Kern County, California. As Project Archaeologist, conducted site assessments and surveys of land within a large improvement area, mapping, and limited testing. The project was conducted over a period of several years, and involved field work in the vicinity of Bakersfield.

Potential Impact on Archaeological Resources of Westlake High School, Ventura County, California. As Project Archaeologist, developed a cultural resources assessment program during the survey of this proposed facility.

Evaluation of the Archaeological Resources and Potential Impact of Proposed Development of Nicholas Canyon Beach, Los Angeles County Facilities, Los Angeles County, California. As Project Archaeologist, managed survey and assessment of resources on this park property.

Mitigation of VEN-65 and VEN-261: The Inland Chumash Settlement System, Thousand Oaks, Ventura County, California. As Co-Principal Investigator, managed preparation of a mitigation report on two large midden sites located in Thousand Oaks. Intact features were found during this investigation, which included field schools from UCLA and University of Santa Clara.

Evaluation of the Archaeological Resources and Potential Impact of Proposed Further Developments of the Abalone Cove Beach Area, Los Angeles County, California. As Project Archaeologist, conducted assessment of the impacts of park improvements on existing sites and recordation of newly discovered sites.

Cultural Resource Survey of Reese River Valley, Nevada. Crew Chief for survey of a proposed power line route and alternatives through the Reese River Valley to provide improved electrical service to remote ranches. The work was conducted through the Nevada State Museum. Prehistoric and historic cultural resources were mapped and recorded as part of this survey.

Prehistory and History of Grass Valley, Nevada. UCLA and UC Berkeley teamed to conduct research on the history and prehistory of Grass Valley, Nevada. The multi-year project consisted of inventory surveys, archival and ethnographic research, surface collections, and test excavations. Ethnographic Shoshone village areas were mapped and recorded. Dr. Hector conducted a study on the village areas to determine relative status and acculturation of the native groups living in the valley. She directed crews on surveys and surface collection projects during two field seasons. The results of the project were published by UCLA.

Rural Electrification Project. Responsible for field investigations of historic and prehistoric cultural resources in central Nevada. Tasks involved extensive surveys of several valley systems, surface collection and mapping of lithic artifacts, and collections of historic artifacts. Final reports were prepared describing the results of these studies.

Cultural Resource Protection Investigation for the Main Base, Edwards Air Force Base, California. Principal Investigator for a survey and site evaluation project in the Mojave Desert. Over 3,000 acres were surveyed, with information gathered on 53 historic and prehistoric sites. For U.S. Air Force.

Cultural Resource Investigation for the Farm Drop Zone, Edwards Air Force Base, California. Principal Investigator for a National Register evaluation study within a 1,500 acre project area in the Mojave Desert. A National Register District was proposed as a result of excavations and surveys of sites in this area. For U.S. Air Force.

The Cultural Resources of Proposed Access Roads on BLM Lands to the Barrett to Cameron 69 kV Transmission Line. Principal Investigator for survey of 4.6 miles; eight sites found and recorded.

Publications:

Hector, Susan M.

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1999 San Diego County's Cooperative Park Initiative: Saving Coastal Park Land. *Coastal Zone 99 Abstracts of Presentations* 538-539. Urban Harbors Institute, University of Massachusetts, Boston.

1998 Late Prehistoric Hunter-Gatherer Activities in Southern San Diego County. *San Diego Reader* June 11, 1998.

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1995 Review of "Santa Barbara Presidio Area: 1840 to the Present." *The Public Historian* 17(2):84-85.

1994 The Historical Archaeology of American Girl Canyon, Imperial County, California. *Proceedings of the Society for California Archaeology* 7:199-212.

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1990 Thematic Evaluation of Historic Period Archaeological Sites at Edwards Air Force Base: A Systematic Approach. *Proceedings of the Society for California Archaeology* 3:349-364.

1990 The Farm Drop Zone Archaeological Investigations, Edwards Air Force Base, California. *Antelope Valley Archaeological Society Occasional Papers* 2:77-86. Lancaster, California.

1988 The Identification of Activity Areas within Late Prehistoric Sites: A Case Study of the Rimbach Site, San Diego County. *Proceedings of the Society for California Archaeology* 1:55-74.

1984 *Late Prehistoric Hunter-Gatherer Activities in Southern San Diego County, California.* Ph.D. dissertation. University Microfilms, Ann Arbor, Michigan.

1984 *The Historic and Prehistoric Components of the Mira Mesa Site: A Study of Special Activity Areas*. Regional Archaeology No. 1, San Diego.

1983 Hunter-Gatherer Sedentary Activities.*San Diego State University Cultural Resource Management Casual Papers* 3:126-134.

1982 Improving Shellfish Analysis. *San Diego State University Cultural Resource Management Casual Papers* 1(2):51-59.

1981 *Historic and Prehistoric Agriculture of the Tewa*. Department of Anthropology, University of California, Los Angeles.

1981 The Illustration of Shell and Bone Artifacts. *Archaeological Research Tools* 1:115-121. Institute of Archaeology, UCLA.

1980 Review of "Southwest," Handbook of North American Indians, Vol. 9, Alfonso Ortiz, editor. Bibliographical Leaflets. Institute of Archaeology, UCLA.

1979 *Pollen Analysis of Field Areas on the Pajarito Plateau, Santa Fe National Forest, New Mexico*. Department of Anthropology, UCLA.

1978 Review of "Historical Archaeology: A Guide to Substantive and Theoretical Contributions" by Robert L. Schuyler. Bibliographical Leaflets. Institute of Archaeology, UCLA.

1978 Cahuilla Farming Under the Reservation System. Master's thesis, Department of Anthropology, University of California, Los Angeles.

1978 Review of "Method and Theory in Historical Archaeology" by Stanley South. Bibliographical Leaflets. Institute of Archaeology, UCLA.

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1978 An Early Basalt Site Located in a Historic Shoshone Village. In *History and Prehistory at Grass Valley, Nevada*, edited by C. William Clewlow, Helen Fairman Wells, and Richard D. Ambro, pp. 141-160. Monograph VII. Institute of Archaeology, UCLA.

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1992 Review of "The Plank Road of Imperial County: Final Report of a Historical and Archaeological Study." *The Public Historian* Winter:81-83.

Technical Reports:

Hector, Susan M.
2007 *Archaeological Investigations at University House Meeting Center and Chancellor Residence, CA-DI-4669 (SDM-W-12), University of California at San Diego, La Jolla, California*. The investigations included ground penetrating radar, canine forensics, geotechnical testing, and archival and museum research.

2006 *Cultural Resources Survey of the Tulloch Property, Santa Ysabel, California*. This report was prepared for the SDG&E Sunrise Powerlink tranmission corridor project.

2006 *Cultural Resources Study of the Tijuana River Valley Channel Dredging Project*. A cultural resources overview was prepared for a City of San Diego maintenance project.

2006 *Documentation of Damage to Three Prehistoric Archaeological Sites Within Cleveland National Forest, Laguna Mountain*. An ARPA violation damage evaluation was conducted on three sites, one of which is an important ethnographic village. Two of the three sites had been found eligible for the National Register.

2005 *The Archaeology of Volcan Mountain, San Diego County, California*. Prepared for the California Department of Forestry and Fire Protection, this study consisted of an overview of cultural resources in recently burned areas, and areas still covered with dead, dying, and diseased trees.

2005 *The Archaeological Resources of Long Potrero: A Traditional Cultural Landscape in San Diego County, California*. Long Potrero is proposed for acquisition as open space preserve land, and this study provided information about the archaeological sites in the valley.

2005 *Surveys Conducted to Identify Gathering Places Along the District 11 TEA21 Rural Route Survey, San Diego Corridor.* This report was prepared for Caltrans to document traditional gathering areas along State Routes 76, 78, and 79.

2005 *Cultural Resources Survey for a Fuel Reduction Project in the Julian Area, San Diego County, California.* This report covered a safety project on State Routes 78 and 79. Dead, dying, and diseased trees and shrubs were removed from major evacuation routes.

2005 *Cultural Resource Survey for a Fuel Reduction Project on Palomar Mountain, San Diego County, California.* The project covered three major evacuation routes on Palomar.

2004 *Cultural Resource Management Plan for the Bernardo Mountain Open Space Preserve, San Dieguito River Park, San Diego.* Preparation of a plan to manage the cultural resources of this large park.

2004 *Historic Property Survey Report for Bernardo Mountain Open Space Preserve.* In compliance with the requirements of a TEA grant, an HPSR was prepared.

2004 *Cultural Resources of Santa Maria Creek, Ramona.* This report provided an overview of the sites recorded within the watershed of the creek. It was prepared for a habitat management program.

2004 *Historic Property Survey Report for the Santa Ysabel East TEA Grant Acquisition Project, San Diego County.* The report was prepared to comply with grant requirements, and included preparation of a management plan.

2004 *Report on the Cultural Resources of Long Potrero, Potrero, California.* This survey resulted in the discovery of 28 sites, and was prepared for a grant application.

2004 *Existing Conditions Assessment for the Otay Valley Regional Park Trails Project, Interstate 5 to Interstate 805, San Diego.* This overview provided information for a trails planning and construction project.

2004 *Supplemental Report: Cultural Resources Existing Conditions Assessment for the Otay Valley Regional Park Trails Project, Western Extension from Interstate to Saturn Blvd., San Diego.* Additional sites were examined for a trails construction project.

2004 *Cultural Resources Survey of the Chollas Creek Water Quality Protection and Habitat Enhancement Project, San Diego.* Survey of six potential habitat restoration locations in the City of San Diego.

2004 *Cultural Resources Survey Report for the Lakeland Reservoir Improvement Project, Riverside County, California*. Survey of existing residential area for water improvement project.

2004 *Cultural Resources Survey Report for Rice and Leon Roads, Riverside County, California*. Archaeological survey for a county road improvement project. One site was found, and will be avoided and monitored.

2003 *The Archaeology of the Casa de Bandini and the Casa de Pico Motor Hotel (Bazaar del Mundo), Old Town San Diego State Historic Park*. This project included preparation of an overlay showing early structures that are located underneath modern buildings.

2003 *Cultural Resource Background Study of 3,600 Acres in Potrero, San Diego County*. The overview was prepared for grant applications.

2003 *Carmel Valley Trunk Sewer Replacement Cultural Resource Survey Report*. ASM Affiliates, Inc. Survey and trench monitoring for 2.5 miles of proposed sewer realignment project in the City of San Diego.

2002 *Crestridge Ecological Reserve Archaeology Management Plan*. State of California Department of Fish and Game. Cultural resource inventory and management plan for 2,400 acres of open space in San Diego County.

2002 *San Felipe Valley Wildlife Area Archaeology Management Plan*. State of California Department of Fish and Game. Cultural resource inventory and management plan for 8,329 acres of open space in southeastern San Diego County.

2002 *Hollenbeck Canyon Wildlife Area Archaeology Management Plan*, with an Appendix for Rancho Jamul Ecological Reserve. State of California Department of Fish and Game. Cultural resource inventory and management plan for 3,700 acres of open space in southern San Diego County.

2002 *Ramona Grasslands Archaeological District*. The Nature Conservancy, San Diego Project Office. Overview of the Santa Maria Valley, its 100-plus cultural resources, and discovery of a rock alignment.

2002 *Historic Property Survey Report-Negative Findings/Negative Archaeological Survey Report, Escondido Creek Open Space Preserve*. Department of Parks and Recreation, County of San Diego. Additional properties surveyed for second round of grant funding. The properties will be in open space preserves.

2001 *Historic Property Survey Report-Negative Findings/Negative Archaeological Survey Report, Escondido Creek Open Space Preserve*. Department of Parks and Recreation, County of

San Diego. Submitted to comply with Transportation Enhancement Act (TEA) grant requirements for federal funding; included record search and survey of a proposed open space preserve.

1998 *The Origin of the Molds for Roof Tile at Rancho Guajome Adobe: Maiden's Leg or Wooden Peg?* Department of Parks and Recreation, County of San Diego. Study of the roof tiles at a National Historic Landmark as part of a management plan for restoration and conservation.

1998 *Historical Shellfish from Downtown San Diego*. Department of Parks and Recreation, County of San Diego. Analysis of shellfish remains from the County Hall of Justice site in downtown San Diego; included extensive archival research on historic shellfish exploitation.

1998 *Archaeological Investigations at Los Peñasquitos Ranch House by San Diego County Department of Parks and Recreation*. Department of Parks and Recreation, County of San Diego. Results of an excavation and recordation program prior to restoration of an element of this National Register of Historic Places District.

1998 *The Olive Jar from Los Peñasquitos Ranch House, San Diego. Department of Parks and Recreation, County of San Diego*. A report on the historic olive jar was prepared as part of an interpretive program installed at the ranch house.

1996 *Marine Corps Logistic Base Barstow Cultural Resources Inventory*. Department of the Navy NAVFAC. Overview, survey, and management recommendations for prehistoric archaeological sites located within the Barstow base.

1996 *NAS Miramar Cultural Resources Inventory and Historic and Archaeological Resources Protection (HARP) Plan*. Overview, survey, and management recommendations for prehistoric sites within the base.

1995 *Cultural Resources Report for Coronado Strand Beautification Project. City of Coronado, California*. Historic Property Survey Report prepared for a TEA grant to improve a portion of State Route 75.

1995 *Shellfish Recovered from SDI-10,258, the Home Avenue Dump Site*. Analysis of historic shellfish found at the City of San Diego dump; included archival research on historic shellfish exploitation.

1995 *Prehistoric Archaeology Report for the Federal Courthouse Project: Phase I Cultural Resource Overview Study for Two Alternative Sites in Downtown San Diego*. U.S. General Services Administration. Evaluation of the potential for buried prehistoric archaeological materials in downtown San Diego.

1995 *Prehistory of Old Town, San Diego*. Research and recommendations on potential buried prehistoric deposits from Old Town, San Diego.

1993 *Analysis of Shellfish Remains Recovered from SDI-5422, San Diego County, California.* Caltrans District 11. Study of shellfish materials from southern San Diego Bay.

1993 *Analysis of Shellfish Remains from Post Mile 15.8, Route 11-SD-75, San Diego County, California*. California Department of Transportation, District 11. Examination of archaeological and non-cultural shellfish deposits along the Coronado Strand.

1992 *Results of Archaeological Monitoring Conducted for Geotechnical Testing: Rancho Guajome, Guajome Regional Park, San Diego County*. Included in the Historic Structures Report prepared by M. Wayne Donaldson, Architect. Department of Parks and Recreation, San Diego County. Analysis of monitoring program that revealed significant information about the foundation and deposits around Rancho Guajome.

1991 Shellfish Remains Recovered from SDI-5422. In *Extended Phase I Investigations at CA-SDI-5422, City of Oceanside, California*, by Martin D. Rosen and Judith D. Tordoff. California Department of Transportation, District 11. Site SDI-5422, located on the grounds of the San Luis Rey Mission, was the focus of a Caltrans investigation to determine site significance.

1990 *Archaeological Survey of the San Dieguito Triangle Project Area, San Dieguito Regional Park*. San Diego County Parks and Recreation Department. Survey of a portion of the park proposed for development. Included an assessment of the significance of a building and gas station features.

1989 *Data Recovery Program at Obregon Town Site and American Girl Mine*. RECON. Conducted between 1986 and 1989, the program consisted of evaluation and excavation of a large mine project near Winterhaven. As a result of this project, a turn-of-the-century town site and an early mine were found and recorded. The major resource evaluated was the ghost town of Obregon, established in the late 1800s as a company town.

1989 *City of San Diego Sensitive Lands Pilot Study*. RECON. The project consisted of research on 18 square miles in the northern part of the city to identify previously recorded resources. As the first study of its kind in the city, guidelines were developed for future studies.

1989 *Cultural Resource Survey of 26,000 Acres on Otay Ranch*. RECON. The goal of this study was to identify potentially significant resources for future development in the area. Over 100 previously unrecorded historic and prehistoric sites were found and mapped, and many recorded sites were visited and updated.

1989 *City of Carlsbad Cultural Resource Guidelines*. RECON. This project was conducted under a grant from the State Office of Historic Preservation to the City of Carlsbad. The objective of the project was to prepare cultural resource guidelines for Carlsbad, located in the northern part of San Diego County.

1989 *Cultural Resource Survey of USIU Playfields*. RECON. Survey of a portion of United States International University for historic and prehistoric cultural resources.

1989 *Cultural Resources Survey of Vesting Tentative Map 45823, Palmdale, California*. RECON. A historic homestead site was recorded as a result of this survey in the Mojave Desert.

1988 *Revised Cultural Resource Survey of Black Mountain Park, City of San Diego*. RECON. One prehistoric campsite and one historic site were discovered during a survey of this city park. The historic site was an arsenic and gold mine, and included structural remains.

1988 *An Archaeological Survey of the Eaton Hills Property, Carlsbad*. RECON. One prehistoric shell midden site was found as a result of this study.

1988 *An Archaeological Survey of the Railroad Canyon Road Project Area, City of Lake Elsinore, Riverside County, California*. RECON. Road alignment survey resulting in the discovery of four prehistoric sites. Recommendations were made for further study.

1988 *Cultural Resource Protection Investigation for the Main Base, Edwards Air Force Base, California*. RECON. Senior author of a survey and site evaluation project in the Mojave Desert. Over 3,000 acres were surveyed, with information gathered on 53 historic and prehistoric sites.

1988 Cultural Resource Investigation for the Farm Drop Zone, Edwards Air Force Base, California. RECON. Senior author of a National Register evaluation study within a 1,500-acre project area in the Mojave Desert. A National Register District was proposed as a result of excavations and surveys of sites in this area.

1988 *Cultural Resource Survey of Lilac Ranch*. RECON. Over 900 acres in northern San Diego County were surveyed, and 20 historic and prehistoric sites were recorded.

1988 *Cultural Resources Constraints Study for the Olympic Training Center*. RECON. Seven potential training center sites within San Diego County were surveyed and assessed for impacts to historic and prehistoric cultural resources.

1988 *Addendum to Archaeological Survey Report on the Daley Rock Quarry, Jamul Valley, California*. RECON. Resurvey, test excavations, and impact assessment on historic and prehistoric sites.

1987 *Archaeological Survey and Resource Assessment of the American Girl Mine Project, Imperial County, California*. RECON. This report describes the results of a survey of 2,000 acres and a National Register eligibility assessment of seven sites. One of the sites is the historic town of Obregon.

1987 *Archaeological Investigations on Alta Road, County of San Diego*. RECON. This mitigation program report describes surface collection and analysis of artifacts at three sites on Otay Mesa, near the Mexican border.

1986 *An Archaeological Survey of the Alta Road/Otay Mesa Road Alignment*. RECON. This road survey was conducted for the County of San Diego and resulted in the discovery of three prehistoric sites.

1986 *Archaeological Survey and Resource Assessment of the American Girl Mine Project, Phase I, Imperial County, California*. RECON. This survey, conducted under a BLM permit, involved the excavation of a late nineteenth-century mining camp to assess its eligibility for the National Register.

1986 *Archaeological Investigations at the West Knoll Site (SDI-10,450), Olivenhain, California*. RECON. Mitigation excavation of a special activity camp.

1986 *Archaeological Investigations at SDM-W-1440/SDI-5198: A Special Use Site on Mira Mesa, San Diego, California*. RECON. Excavations and surface collection at a multiple-locus site.

1986 *Research Design for the Excavation of a Portion of SDI-4513, the Rimbach Site*. RECON. Prepared for the City of San Diego. The plan was for the mitigation excavation of this large ethnographic village site.

1986 *Excavation of a Portion of SDI-4513, The Rimbach Site, City of San Diego, California*. RECON. Conducted under contract to the City of San Diego, this extensive excavation project provided much evidence for early historic occupation at this site.

1986 Archaeological Excavations at SDM-W-132 (SDI-10,024), Carlsbad, California. RECON. Mitigation excavation of a Malcolm Rogers shell midden site.

1986 *Tecolote Canyon Archaeological Survey, City of San Diego*. RECON. Intensive survey of improvement areas within a City of San Diego park.

1986 *Fanita Ranch Archaeology Survey*. RECON. Survey of ranch property including relocation of 14 sites.

1986 *Historical Assessment of the T. M. Meanley House*. RECON. Historical and architectural assessment of a 1920s Mission Revival home.

1985 *Archaeological Investigations at Site SDI-10,088, De Anza Campground, Jacumba, California*. RECON. Mitigation excavation and surface collection at the site.

1985 *Cultural Resource Survey of the Calle Cristobal-Camino Santa Fe Assessment District Project Area*. RECON. Survey of three linear miles of roadway and identification of previously recorded resources.

1985 *Excavation of Site SH-81-2, Sorrento Hills Gateway/Cooper Project Area*. RECON. Mitigation excavation of a limited activity area.

1985 *Excavation of Six Sites in La Costa Near Batiquitos Lagoon, San Diego County, California*. RECON. Large mitigation project conducted at midden sites.

1985 *Excavation of SDI-4609, a Portion of the Village of Ystagua*. RECON. Large mitigation project in Late Prehistoric midden site.

1985 *Cultural Resource Management Plan for Seal Beach Naval Weapons Center*. RECON. Archival and field study of seven Navy bases in southern California; included preparation of a preservation and management plan based on federal requirements.

1985 *Archaeological Assessment of BLM Lands near Campo*. RECON. Survey of lands considered for purchase and trade.

1985 Test Excavations at SDI-1246, Oceanside, California. RECON. Assessment of shell midden site extending over a hillside.

1985 *Archaeological Survey of the Prohoroff Property, San Marcos, California*. RECON. Historic and prehistoric resources were identified and mapped on 560 acres of land.

1985 *Archaeological Survey of the Tourmaline Queen Mountain Project Area*. RECON. Survey and ethnographic study of a proposed transmission tower location on Pala Indian Reservation. BLM assessment required also, since access road crossed federal lands.

1985 *Archaeological Test Excavations on the Hillebrecht Property, Carlsbad, California*. RECON. Surface collections and test excavations at three shell midden sites near Agua Hedionda Lagoon.

1984 Archaeological Investigations at Bonita Meadows, San Diego, California. RECON. Mitigation excavation at site SDM-W-1929.

1984 *Test Excavations at Los Peñasquitos Ranch House, County of San Diego*. RECON. Excavations within the adobe house and in prehistoric midden nearby resulted in the development of a long-term mitigation program and investigation of the historic and prehistoric resources in the county preserve.

1984 *Cultural Resource Management Plan for Los Peñasquitos Ranch House Resource Area*. RECON. Prepared for the County, this plan was the result of an intensive survey for historic features located in the county preserve. The goal of the County was restoration of the area for use as an interpretive center.

1984 *Extended Survey of the OHTE II Project Area, City of San Diego*. RECON. Mitigation excavation of site SDI-9863.

1984 *Cultural Resource Survey of Fallbrook Greens, County of San Diego*. RECON. Historical research on an existing home and the site of an adobe, in addition to a survey and in-field assessment of these resources.

1984 *Archaeological Survey of North County Transit District, Oceanside, California*. RECON. Historic resource assessment for SHPO review.

1984 *Cultural Resource Survey of De Anza Campground, Jacumba, California*. RECON. Survey of 550 acres that resulted in the recordation of 34 historic and prehistoric resources, including an early twentieth-century railroad construction camp.

1984 *Archaeological Test Excavations at SDI-9700, Sycamore Creek, Carlsbad, California*. RECON. Mitigation excavations and surface collections at two loci of this site. Also, presentation of a research design for mitigation excavations at three other sites within the project area.

1984 *Archaeological Survey of the San Dieguito Community Plan Area*. RECON. Survey of 840 acres that resulted in the recordation of 21 archaeological sites.

1984 *Historic Resource Evaluation of the Starlight Bowl, Balboa Park, San Diego*. RECON. Assessment of potential impacts to this National Register property.

1984 *Cultural Resource Survey of the Quaywall Project Area, Naval Amphibious Base, Coronado*. RECON. Historic and prehistoric resource assessment for the U.S. Navy.

1984 *Cultural Resource Survey of the Calle Cristobal-Camino Santa Fe Assessment District Project Area*. RECON. Survey and records search of a three-mile road alignment, with updates of cultural resources located along the route.

1983 *Excavation and Analysis of the Historic and Prehistoric Components of Archaeological Site SDM-W-1439A*. RECON. Two historic adobes were excavated during this project, as well as a series of hearths from the prehistoric portion of the site.

1983 *A Cultural Resource Survey of Oakzanita Springs Campground, San Diego County, California*. RECON. Impacts to site SDM-W-202A were assessed during this 150-acre survey.

1983 *Excavation of SDM-W-19 in the PDU-2A Project Area*. RECON. Mitigation excavation at this coastal shell midden site.

1983 *Report on the Monitoring and Preservation of the Great Western Archaeological Site, Rancho Santa Fe, California*. RECON. Implementation of a protective capping program.

1983 *Archaeological Survey of the A.I.M. Churches, Inc. Property, Ramona, California*. RECON. Mapping and recordation of nine milling features.

1983 *Report on the Excavation of SDI-9098 and SDI-9099, Located on Otay Mesa near the International Border*. RECON. Mitigation excavation of these two sites, and development of a preservation plan for a third site.

1983 *Archaeology of Rancho Del Sol*. RECON. Survey of 260 acres and test excavations at site SDI-6918.

1983 *Archaeological Excavation of SDI-5601/SDM-W-1293, Carlsbad, California*. RECON. Mitigation excavation at this site.

1983 *Archaeological Investigations at SDM-W-1459/SDI-5224, City Public Safety Center, Carlsbad, California*. RECON. Mitigation excavation at this site.

1982 *Records and Archival Searches for Cultural Resources Located in the Otay General Plan Amendment Area*. RECON. Historic and prehistoric resource assessment from records within a 12,500-acre area. Impact assessments and management recommendations were also generated.

1982 *An Assessment of the Cultural Resources of the Expansion of Pio Pico Campground, San Diego County, California*. RECON. Five sites were found and recorded during this 94-acre survey; a search was also made for the Pio Pico adobe.

1982 *Archaeological Investigations for Phases II and III, Carlsbad Research Center, Carlsbad, California*. RECON. Mitigation excavations at five sites within the project area.

1981 *Encina Pipeline Archaeological Survey*. RECON. Fourteen sites were recorded as a result of this two-mile corridor survey.

1981 *Archaeological Investigation at Seaside Solana Beach, San Diego County, California*. RECON. Mitigation of impacts to site SDI-215.

1981 *The Cultural Resources of Proposed Access Roads on BLM Lands to the Barrett to Cameron 69 kV Transmission Line*. RECON. Survey of 4.6 miles; eight sites found and recorded.

1981 *The Cultural Resources of Carlsbad Highlands, City of Carlsbad, San Diego County, California*. RECON. Over 300 acres surveyed; three sites found and recorded.

1981 *An Assessment of Archaeological Site SDM-W-133, Carlsbad, California*. RECON. Mitigation excavation at the site.

1981 *Evaluation of Archaeological Sites, Oakridge, San Diego County, California*. RECON. Mapping and collection program at five sites.

1981 *Archaeological Investigation of South Pointe Farms*. RECON. Mitigation excavation at site SDI-5216.

1981 *An Archaeological Investigation at SDM-W-1225, San Marcos, California*. RECON. Mitigation excavation and surface collection program.

1981 *Archaeological Investigations at Hansen's Ranch, San Diego County, California*. RECON. Collections at seven quarry sites, test excavations at SDM-W-172B (Sweetwater Village), and mapping of the historic waterworks at Isham Springs.

1981 *The Cultural Resource Survey of Lou Grubb Property, Poway, California, and Addendum*. RECON. Mapping and collections at quarry site SDI-4428.

1981 *Investigations Conducted at Archaeological Site SDM-W-2409, Santee, California*. RECON. Mitigation of impacts to the site.

1980 *Archaeological Investigations at Tentative Tract No. 35398, Los Angeles County*. UCLA. Survey and mapping of sites on residential development.

1979 *Assessment of the Archaeological Resources Located at 3190 Triunfo Canyon Road, Agoura, Los Angeles County*. UCLA. Survey and mapping of sites located at a day camp.

1979 *An Archaeological Resource Survey and Impact Assessment of TPM 11253, Los Angeles County*. UCLA. Survey of a large residential development.

1979 *Assessment of the Archaeological Resources Located at 28834 Boniface, Point Dume, Los Angeles County*. UCLA. Recordation of coastal midden sites.

1978 *An Archaeological Resource Survey and Impact Assessment of Hollydale Park, Southgate, Los Angeles County*. UCLA. Historic and prehistoric resources were investigated as a result of this project.

1978 *An Archaeological Resource Survey and Impact Assessment of 6.9- and 83-Acre Parcels on Roy Rogers Ranch, Los Angeles County*. UCLA. Both historic and prehistoric sites were located within this project area; archival research was included.

1978 *An Archaeological Resource Survey and Impact Assessment of Triunfo Park, Ventura County*. UCLA. Prehistoric sites were found during this investigation conducted for the Conejo Recreation and Parks District.

1978 *An Archaeological Resource Survey and Impact Assessment of Parcel Map 10815*. UCLA. Survey of a large residential development.

1978 *Archaeological Excavations at LAN-789 and LAN-790, San Pedro*. UCLA. Mitigation excavations at two prehistoric sites.

1977 *Evaluation of the Archaeological Resources and Potential Impact of Proposed Development of the Barnes and Elder Property on Potrero Road, Ventura County*. UCLA. Survey of large residential development.

1977 *An Archaeological Resource Survey and Impact Assessment of Tract 31359, Calabasas, Los Angeles County*. UCLA. Site recordation and mapping was the goal of this survey project.

1977 *An Archaeological Resource Survey and Impact Assessment of Trailer Life Publishing Co., Los Angeles County*. UCLA. Previously recorded sites were mapped and identified as a result of this project.

1976 *Records Search of Archaeological Resources within Los Angeles County*. UCLA. Preparation of a base map for the Los Angeles County Department of Urban Affairs.

1976 *Evaluation of the Archaeological Resources and Potential Impact of Proposed Construction of Temple Avenue between Azusa Avenue and Del Valle Avenue*. UCLA. Historical and archaeological assessment of improvements within an urban area for the Los Angeles County Road Department.

1976 *Evaluation of the Archaeological Resources and Potential Impact of Proposed Pan Pacific Park, Los Angeles County*. UCLA. Historical and archaeological assessment of resources within a developed park, site of the Pan Pacific Auditorium.

1976 *Evaluation of the Archaeological Resources and Potential Impact of Proposed Construction of Flood Control Projects on CA-SBA-1330*. UCLA. Excavation of midden site for the U.S. Department of the Interior.

1976 *Evaluation of the Archaeological Resources and Potential Impact of Proposed Unit A Interceptor Replacement, Phase I*. UCLA. Survey and preparation of site record forms for a utility alignment, conducted for the City of Thousand Oaks Utilities Department.

1976 *Evaluation of the Archaeological Resources and Potential Impact of Proposed Indian Hills Project, Simi Valley*. UCLA. Large survey of residential property.

1976 *Evaluation of Archaeological Resources in the Area to be Improved for Pacific Gas and Electric, Kern County*. UCLA. Site assessments and surveys of land within a large improvement area; mapping and limited testing.

1976 *Potential Impact on Archaeological Resources of Westlake High School, Ventura County*. UCLA. Resource assessment program developed during the survey of this proposed facility.

1976 *Evaluation of the Archaeological Resources and Potential Impact of Proposed Development of Dos Vientos Ranch, Ventura County*. UCLA. Large-scale survey and site recordation program.

1976 *Evaluation of the Archaeological Resources and Potential Impact of Proposed Development of Nicholas Canyon Beach by Los Angeles County Facilities*. UCLA. Survey and assessment of resources on this property.

1975 *Evaluation of the Archaeological Resources and Potential Impact of the Proposed San Francisquito Canyon Road Improvement from South Portal Canyon to Penstocks at Powerhouse No. 1, Los Angeles County*. UCLA. Extensive survey of large road alignment.

1975 *Evaluation of the Archaeological Resources and Potential Impact of the Proposed Development of Tract 2383, City of Thousand Oaks, Ventura County*. UCLA. Survey of a housing development.

1975 *Evaluation of the Archaeological Resources and Potential Impact of Proposed Further Developments of the Abalone Cove Beach Area, Los Angeles County*. UCLA. Assessment of the impacts of park improvements on existing sites and recordation of newly discovered sites.

1975 *Evaluation of the Archaeological Resources and Potential Impact of Proposed Industrial Tract 2461, City of Thousand Oaks*. UCLA. Survey of a large industrial property.

(with Dr. Michael Baksh)

2002 *Ethnographic Overview of the Cleveland National Forest*. Tierra Environmental for Cleveland National Forest. Inventory of ethnographic locations within the forest; the project included a GIS map showing the locations, linked to an informational table.

(with Alice Brewster)

2002 *San Dieguito River Valley Inventory of Archaeological Resources*. ASM Affiliates, Inc. Archival and records searches resulted in mapping archaeological sites within the River Park planning boundaries. The product included a GIS map with management categories.

(with Daniel G. Foster, Linda C. Pollack, and Gerrit L. Fenenga)

2006 *The Plantation Cache Charmstone*. ASM Affiliates and California Department of Forestry and Fire Protection. This paper reports an unusual cache of artifacts found in Sierra County.

(with Daniel G. Foster, Linda C. Pollack, Gerrit L. Fenenga, and J. Charles Whatford)

2006 *A Charmstone Discovery in the Redwood Forests of Mendocino County, California.* ASM Affiliates and California Department of Forestry and Fire Protection. A charmstone was found during road grading.

(with Daniel G. Foster, Linda C. Pollack, and Gerrit L. Fenenga)

2006 *The Plantation Cache Charmstone*. ASM Affiliates and California Department of Forestry and Fire Protection. This paper reports an unusual cache of artifacts found in Sierra County.

(with Michael Garnsey)

2006 *Cultural Resources Study for the California State University, San Marcos, 2006 Physical Master Plan Update*. ASM Affiliates, Inc. Archival and field studies were conducted to determine the presence of cultural resources on campus.

(with Michael Garnsey)

2006 *Cultural Resources Survey of the Palomar Observatory VMP, Palomar Mountain, San Diego County*. ASM Affiliates, Inc. This survey was conducted for a California Department of Forestry vegetation management plan.

(with Michael Garnsey)

2006 *Cultural Resources Inventory of the Sunrise Fuel Break (North and South), San Diego County, California*. ASM Affiliates, Inc. This survey was conducted for a California Department of Forestry vegetation management plan.

(with Michael Garnsey)

2006 *Cultural Resources Survey of Tecate Peak, California Department of Forestry and Fire Protection*. ASM Affiliates, Inc. The purpose of the study was to evaluate impacts of fire management and public access on archaeological and cultural resources. Tecate Peak is a National Register property.

(with G. Timothy Gross)

1988 *Archaeological Data Recovery at SDI-10,863, Gillespie Field, County of San Diego*. RECON. This archaeological excavation and surface collection project focused on the issue of Early Man occupation in San Diego County.

(with William R. Manley)

1990 *Update on Cultural Resources Located within the Sycamore Valley Project Area, County of San Diego, California*. RECON. Analysis of the significance of historic and prehistoric resources located within the project area, including the town site of Stowe.

(with William R. Manley)

1988 *Results of a Monitoring Program Conducted for Trenching at Rancho Guajome, County of San Diego*. RECON. Trenching for utility installation at this National Historical Landmark site was monitored, and artifacts were collected and analyzed for this project.

(with William R. Manley)

1987 *Archaeological Test Excavations at Rancho Guajome, County of San Diego, California*. RECON. This project included a test excavation program at a nineteenth-century adobe. One feature was excavated.

(with William R. Manley and Carson Anderson)

1994 *Historical and Architectural Assessment -- Naval Station Long Beach, Long Beach, California*. Section 106 study of 27 potentially eligible properties resulted in the identification of a National Register District.

(with William Manley and Carson Anderson)

1993 *Historic and Archaeological Inventory and Eligibility Survey for Savannah and Cabrillo Family Housing, Naval Station Long Beach, California*. Section 106 study prepared for the U.S. Navy in anticipation of closing base housing units. Over 200 buildings inventoried and assessed for eligibility.

(with William R. Manley, James D. Newland, and Stephen R. Van Wormer)

1991 *The Archaeology of Obregon: Mining Activities in American Girl Canyon*. Historical and archaeological research was conducted as a mitigation project for impacts to a mining town site. Included in the multi-year project was the removal of five nineteenth-century graves. The town site was found eligible for inclusion in the National Register of Historic Places.

(with William R. Manley and Martin D. Rosen)

1994 *Historic and Archaeological Resources Protection Plan (HARP), Naval Amphibious Base, Coronado, California*. Management plan for an active Navy base. Both prehistoric and historic resources identified and discussed.

(with William R. Manley and Martin D. Rosen)

1994 *Historic and Archaeological Resources Protection (HARP) Plan for Naval Station Long Beach, California*. The plan was prepared in anticipation of base closure. Measures included identification of archives for storage of information.

(with William R. Manley and Mary Ward)

1994 *National Register of Historic Places, District Nomination Form for Los Peñasquitos Ranch House Historic and Archaeological District*. Department of Parks and Recreation, County of San Diego. Extensive research project to expand the existing National Register site to include various outbuildings and archaeological resources. Approved by the State Historical Resources Commission.

(with Ken Moslak)

2003 *Extended Phase I Testing for Isolates 4 and 5*. ASM Affiliates, Inc. Testing within the right-of-way of State Route TUL-65, conducted for California Department of Transportation.

(with Drew Pallette and Mark S. Becker)

2002 *Archaeological Site Testing on the Boudreau Property: Maritime Resource Exploitation in the Lower San Dieguito Valley*. ASM Affiliates, Inc. Data recovery project for four site loci.

(with Dr. Ronald J. Quinn)

1981 *Cultural Resource Assessment of Olive Hills Vista, El Cajon, California*. RECON. Application of National Register criteria to a historic home and olive oil production facility.

(with Martin D. Rosen)

1980 *Archaeological Excavations at CA-LAn-847 and CA-LAn-848, City of Rancho Palos Verdes*. UCLA. Mitigation excavations at two large midden sites on the coast of Los Angeles County.

(with Martin D. Rosen)

1976 *Ven-65 and Ven-261: The Inland Chumash Settlement System*. UCLA. Mitigation report on two large midden sites located in Thousand Oaks.

(with Martin D. Rosen and Sue A. Wade)

1994 *Archaeological Resources Investigation for Military Construction Project P-254 (SDI-12,093), Naval Station San Diego, California*. Determination of eligibility for inclusion in the National Register of Historic Places.

(with Stephen R. Van Wormer)

1986 *Broken Fragments of Past Lifeways: Archaeological Excavations at Los Peñasquitos Ranch House Resource Area, San Diego*. Volumes I and II. RECON. Mitigation project at several areas of the property, including two wings of the ranch house. Resulted in the discovery of a previously unknown 1830s Mexican period settlement in the area.

(with Stephen R. Van Wormer and William R. Manley)

1988 *Historical and Archaeological Survey of Rancho Buena Vista, Vista, California*. RECON. This study was an assessment of potential impacts to this city landmark, an adobe built in 1853. Mitigation measures relating to historical archaeology were included in the project.

(with Sue A. Wade)

1988 *An Archaeological Survey Update for Cottonwood Canyon, City of Lake Elsinore, Riverside County, California*. RECON. Prehistoric and historic sites, including a family cemetery, were evaluated for significance within a 2,000-acre project area.

(with Sue A. Wade)

1986 *Mitigation Excavations at SDI-6071, SDI-6072, and SDI-6084, Carmel Mountain Ranch, City of San Diego, California*. RECON. This large-scale project involved preparation of a research design and extensive excavation at two late period sites and one early period site.

(with Sue A. Wade and William R. Manley)

1988 *Archaeological Excavations within the Los Peñasquitos Ranch House Archaeology Site Plan Area*. RECON. Mitigation report for historic and prehistoric archaeological materials outside the house.

(with Sue A. Wade and Stephen R. Van Wormer)

1986 *Cultural Resource Assessment of the Home Avenue Dump Site, Terrace View Villas*. RECON. Test excavations at the 1885 City of San Diego dump site.

(with Carol Walker)

1981 *Summary of Research Design for Excavation Program at SDM-W-110*. RECON. Synthesis of previous studies done at various portions of this Malcolm Rogers site.

Presentations:

Hector, Susan M.

2007 The Identification and Description of Cuyamaca Oval Basin Metates. Paper presented at Society for California Archaeology Annual Meeting, San Jose. Co-authors were Daniel G. Foster, Linda C. Pollack, and Gerrit L. Fenenga.

2007 Conservation of Cultural Resources in California. Paper presented at Society for California Archaeology Annual Meeting, San Jose.

2007 A Charmstone Discovery in the Redwood Forests of Mendocino County, California. Paper presented at Society for California Archaeology Annual Meeting, San Jose. Presented by J. Charles Whatford. Co-authors were Susan M. Hector, Daniel G. Foster, Linda C. Pollack, and Gerrit L. Fenenga.

2006 Cultural Resources Surveys of Fuel Reduction Areas in the Mountains of San Diego County. Presented by Dr. Hector, Co-author was Michael Garnsey. Presented at the 40th Annual Meeting of the Society for California Archaeology, Ventura.

2005 Prehistoric California Indian Fiber Technology: The Unseen Culture. Presented at the 39th Annual Meeting of the Society for California Archaeology, Sacramento.

2005 Site Preservation, Community Activism, and a Future for California Archaeology. Presented with Michael Sampson at the 39th Annual Meeting of the Society for California Archaeology, Sacramento.

2003 The Early History of Los Peñasquitos Ranch House. Presented at the 30th Anniversary Celebration for the San Diego County Archaeological Society, San Diego.

2003 The Archaeology of Volcan Mountain, San Diego County: Results 1991-2002. Presented at the 37th Annual Meeting of the Society for California Archaeology, Sacramento.

2002 Archaeology and Young Students: Making the Environmental Education Connection. Presented at the 36th Annual Meeting of the Society for California Archaeology, San Diego.

2002 Women's Perspectives in Interpreting the Past. Mary Ward Memorial Lecture, San Diego County Archaeological Society, panel presentation and discussion.

2001 Rancho Guajome Adobe: Stories that Cave Couts Wouldn't Have Told You. Presented to the California Preservation Foundation Conference, May 20, 2001, San Diego.

2000 Department of Parks and Recreation Programs at Los Peñasquitos Ranch House. Presented at Arch in the Park, a celebration of California archaeology month and the rededication of the Mohnike Barn, April 29, 2000, San Diego.

2000 Incorporation of Cultural Resource Elements in Multiple Species Conservation Planning: Volunteer Participation as a Key Factor for Success. Paper presented at the 34th Annual Meeting of the Society for California Archaeology, Riverside.

2000 Park Philosophy: San Diego County's Department of Parks and Recreation. Presented at Building Connections Between Resources and People, multi-agency regional training, May 3-5, 2000, San Diego.

2000 Cultural Resource Management Training. Presented to Department of Parks and Recreation, County of San Diego and Department of Fish and Game, State of California, February 23, 2000, San Diego.

2000 Docent Training in Archaeology. Presented at Wilderness Gardens Regional Park, County of San Diego, October 21, 2000.

1999 San Diego County's Cooperative Park Initiative: Saving Coastal Park Land. Paper presented at the Coastal Zone 99 Conference, July 24-30, 1999, San Diego.

1999 Strategies for Incorporating Cultural Resources into Multiple Species Conservation Planning. Paper presented at the Southern Data Sharing Meeting of the Society for California Archaeology, San Diego.

1998 Los Peñasquitos Historic and Archaeological District Tour. Conducted for the 32nd Annual Meeting of the Society for California Archaeology, San Diego.

1994 Finding the Hispanic Past at Los Peñasquitos Ranch House. Paper presented at the California Historical Society/California Council for the Promotion of History Annual Conference, San Diego.

1994 The Historical Archaeology of Adobe Ranch Houses: A Case Study. Paper presented at the 29th Annual Convention of the Congress of History of San Diego County, Vista.

1992 Archaeological Research at Los Peñasquitos Ranch Complex: Summary of Studies Focused on Site Chronology and Function. Paper presented at the 26th Annual Meeting of the Society for California Archaeology, Pasadena.

1990 Changes in Historic Site Function: The Johnson-Taylor Adobe. Paper presented at the 24th Annual Meeting of the Society for California Archaeology, Foster City.

1989 The Farm Drop Zone Archaeological Investigations, Edwards Air Force Base, California. Paper presented to the Antelope Valley Archaeological Society, General Meeting, Lancaster, California.

1989 Thematic Evaluation of Historic Period Archaeological Sites at Edwards Air Force Base: A Systematic Approach. Paper presented at the 23rd Annual Meeting of the Society for California Archaeology, Los Angeles.

1987 A Farm House in the City: Examples of Archaeological Discovery and Treatment. Paper presented at 12th Annual California Preservation Conference, Coronado.

1987 The Identification of Activity Areas Within Late Prehistoric Sites: A Case Study of the Rimbach Site in San Diego. Paper presented at the 21st Annual Meeting of the Society for California Archaeology, Fresno.

1986 The Mexican Period Occupation of the Johnson-Taylor Adobe, Los Peñasquitos Rancho Resource Area, San Diego. Paper presented at the Annual Meeting of the Society for Historical Archaeology, Sacramento.

1985 Recent Discoveries at the Johnson-Taylor Adobe. Paper presented to the San Diego County Archaeological Society.

1985 Changes in Historic Site Function at the Johnson-Taylor Adobe. Paper presented at the 19th Annual Meeting of the Society for California Archaeology, San Diego.

1984 Research Designs in Cultural Resource Management: A Local Perspective. Paper presented at Society for American Archaeology California Regional Conference, Santa Barbara.

1983 San Diego Prehistory and Archaeology. Lecture presented at the San Diego Museum of Natural History.

1983 Hunter-Gatherer Sedentism. Paper presented at the 17th Annual Meeting of the Society for California Archaeology, San Diego.

1983 Chaired symposium on San Diego County Archaeology at the 17th Annual Meeting of the Society for California Archaeology, San Diego.

1979 Palynological Research on the Pajarito Plateau. Paper presented to Los Alamos Scientific Laboratories, New Mexico.

1975 Dead Pile Village: A Study in Acculturation. Paper presented at the 9th Annual Meeting of the Society for California Archaeology, Santa Cruz.

(with Martin D. Rosen)
1985 Identification of Activity Areas by Flake Attribute Analysis. Paper presented at the 50th Annual Meeting of the Society for American Archaeology, Denver.

Independent Research:

Dr. Hector is currently studying the technology of processing and preparing materials for the production of California Indian fiber and textile artifacts. She attended a California Indian Basketweavers Association (CIBA) workshop in 2004 as a participant, and has been studying the level of effort needed to produce baskets, mats, and other artifacts. Her study has included fieldwork in Anza-Borrego Desert State Park. She presented a paper at the 2005 SCA meetings on the preliminary results of her study.

Teaching Experience:

1975-1976 Teaching Assistant, University of Santa Clara and University of California, Los Angeles

This position involved supervision and instruction of archaeology students during the excavation of several prehistoric archaeological sites located in Ventura County, California. Her duties included instruction in field and laboratory techniques in a field school setting. This involved setting up, running, and breaking down field camps in southern California and Nevada over two summers.

1983 Adjunct Professor, University of California, San Diego

Dr. Hector taught a field class in archaeology focusing on a late prehistoric village located in southern San Diego County.

1987 Adjunct Professor, San Diego State University

Dr. Hector taught a field archaeology class at Los Peñasquitos Canyon Preserve. The field class included students and volunteers.

2004-2006 and 1990-1991 Professor, San Diego City College

Dr. Hector received a teaching credential in Anthropology. Classes taught included Field Archaeology, Historical Archaeology, Physical Anthropology, and California Indians. She most recently taught sections in Physical Anthropology.

Laboratory Experience:

Dr. Hector has expertise in the laboratory analysis of shellfish remains, and has published one article and written numerous papers on this subject. She has compiled an extensive comparative collection of shellfish that were used by California Indians. Her first experience in the laboratory analysis of shellfish was with the LAN-264 (Malibu Creek) site in 1974. She also has expertise in the analysis of flakes and artifacts, and developed a unique method of characterizing these artifacts through the application of attribute analysis. This method was used to study a site for her doctoral dissertation.

Dr. Hector received a grant from UCLA in 1978 to establish a palynology lab in the Botany Department. She collected and processed soil samples for pollen analysis from sites in California and the Southwest between 1978-1980. She was trained in palynology and ethnobotany at UCLA in the Departments of Botany and Geology.

Dr. Hector conducted a volunteer survey in the Potrero and Sawtooth Wilderness Areas with El Centro BLM personnel and a Native American descendent. Several prehistoric archaeological sites were recorded as a result of this survey, which was conducted in 2002.

Arleen Elena Garcia-Herbst, M.A.
Senior Archaeologist

Firm Name: ASM Affiliates, Inc., Carlsbad, California

ASM Hire Date: July 10, 2006

Total Years of Experience: 14 years

Employment History:

2006-present	Senior Archaeologist, ASM Affiliates, Carlsbad, California
2006-present	Co-Director, The Paleoindian Database of the Americas, University of Tennessee, Knoxville
2006-2007	Geochemical Sourcing Analyst, Wenner-Gren Foundation International Collaborative Research Grant: "High-Latitude Hunter-Gatherers North and South: Variation and Adaptation in the Patagonian and Great Basin Holocene," University of Akron
2004	Field and Mapping Technician, Heritage Resources, Los Padres National Forest, Santa Barbara, California
2001-2006	Web Services Student Assistant, University of California, Letters and Science Information Technology, Santa Barbara
2000-present	Co-Principal Investigator, National Science Foundation Doctoral Dissertation Improvement Grant: "Explaining Ancient Technological Innovation in Southern Argentina," University of California, Dept. of Anthropology, Santa Barbara
2000	Field Supervisor, Dr. Mark Aldenderfer's Ch'amak Pacha Archaeological Research Project in Peru, University of California, Dept. of Anthropology, Santa Barbara
1999-2001	Teaching Assistant and Reader, University of California, Dept. of Anthropology, Santa Barbara
1999	Field Supervisor, Dr. Michael Jochim's Archaeological Research Project in Germany, University of California, Dept. of Anthropology, Santa Barbara
1998	Field Technician, Desert Archaeology, Inc., Tucson, Arizona
1997	Field Technician and Intern, Smithsonian Institution, Washington, D.C.
1996-1997	Data Entry Technician, Desert Archaeology, Inc., Tucson, Arizona
1995-1997	Field Supervisor, Dr. E. Charles Adams's Homol'ovi Research Program, Arizona State Museum, Winslow and Tucson
1994-1995	Data Entry Technician, Arizona Archaeological Site and Survey Database, Arizona State Museum, Tucson
1994-1998	Curatorial Assistant/Technician, Central Arizona Project Repository, Arizona State Museum, Tucson
1993-1994	Field Technician/Laboratory Technician, James Bayman's Archaeological Research Project, Arizona State Museum, Tucson

Education:

Ph.D.	In progress, ABD/Anthropology/University of California, Santa Barbara
M.A.	2000/Anthropology/ University of California, Santa Barbara
B.A. (Cum Laude)	1996/Anthropology/University of Arizona

Additional Education or Training:

1999	Introduction to Geographic Information Systems, UCSB Dept. of Geography
2000	Technical Issues in Geographic Information Systems, UCSB Dept. of Geography
2000	Lab in Geographic Information Systems I, UCSB Dept. of Geography
2000	GIS and Archaeology, UCSB Dept. of Anthropology
2001	TOPCON total station training seminar, May 19, UCSB Dept. of Anthropology
2006	Typology and technology of flaked stone artifacts, October 30-November 3, Universidad Nacional de La Plata, Dept. of Natural Sciences, Argentina
2007	Non-Live Fire Range Safety Officer Training, February 2, Marine Corps Base Camp Pendleton
2007	OSHA 40 Hour HAZWOPER
2007	OSHA 10 Hour Outreach Training Program: Construction Safety
2007	Adult CPR
2007	First Aid
2007	Section 106: An Introduction

Registrations:

2007	Register of Professional Archaeologists

Professional Memberships or Affiliations:

1998-present	Member/Society for American Archaeology
2000-present	Member/Sociedad Argentina de Antropología
2004-present	Member/Lambda Alpha National Honor Society for Anthropology
2006-present	Member/Society for California Archaeology
2007-present	UCSB campus student representative/Society for California Archaeology

Other Special Capabilities: Experience with MS Word, MS Excel, MS PowerPoint, MS Access, Adobe Photoshop, Adobe Fireworks MX, Adobe Acrobat Pro, Adobe Dreamweaver MX, TOPO!, ESRI ArcView 3.x and ArcGIS 9.x, ESRI ArcPad 7, Trimble Field Computers with GPS receiver and MS Windows Mobile software, Terrasync, GPS Pathfinder Tools SDK.

Awards, Commendations, and Testimonials:

2006	Albert Spaulding Fellowship, UCSB Anthropology Dept., $3,000
2006	National Science Foundation: "Doctoral Dissertation Improvement Grant: Explaining Ancient Technological Innovation in Southern Argentina," #0554890, $10,911
2004-2005	Graduate Research Mentorship Program Fellowship, Graduate Division, University of California, Santa Barbara, $15,000
2002	Pre-Dissertation Field Site Visit Travel Grant, University of California, Dept. of Anthropology, Santa Barbara, $1,200
2000	Pre-Dissertation Field Site Visit Travel Grant, University of California, Dept. of Anthropology, Santa Barbara, $1,500
1997	10-week Minority Internship, Office of Fellowships and Grants, Smithsonian Institution, Washington, D.C., $4,000
1996	Dean's Honorable Mention List, University of Arizona, Tucson
1996	Prix de L'Alliance Française (4th prize), University of Arizona, Tucson
1996	Latino/Latina Leadership Opportunity Program Scholar, University of Arizona, Tucson
1995	Dean's Honorable Mention List, University of Arizona, Tucson
1994	Byron Cummings Scholarship, University of Arizona, Dept. of Anthropology, Tucson, $250
1994	Dean's Honorable Mention List, University of Arizona, Tucson
1994	National Hispanic Scholarship Fund Scholar, $1,000

Clearances: N/A

Citizenship: USA

Languages: Spanish, HTML, XHTML, CSS

References:

Dr. Michael Jochim, Professor, University of California, Dept. of Anthropology, Santa Barbara, (805) 893-4396

Dr. Barbara Voorhies, Chair, University of California, Dept. of Anthropology, Santa Barbara, (805) 893-2519

Professional Profile:

Over the last 14 years, Ms. Garcia-Herbst has acquired experience in archaeological research, fieldwork, and publication in the American Southwest (Arizona, Colorado and Nevada), and Argentina. Ms. Garcia-Herbst earned her M.A. in Anthropology from the University of California at Santa Barbara (UCSB) in 2000. She is currently working on her Ph.D. in

Anthropology at UCSB, with a research focus on the flaked stone technology used by foragers during the Mid- to Late Holocene (3124 B.C. to A.D. 1474) in coastal Southern Argentina, and is ABD with an expected graduation in 2008. She has several years of supervisory experience and is able to plan projects, write funding proposals, survey and sample, gather, organize and analyze data, as well as summarize and publish results in print and digital formats. Additionally, she has special technical expertise in lithic technology, specifically flaked and ground stone analysis, and stone raw material geochemical sourcing using Laser-Ablation Inductively Coupled Plasma-Mass Spectrometry. She has received three research grants, totaling $13,600, which have supported her dissertation research projects.

Ms. Garcia-Herbst currently serves as Senior Archaeologist at ASM. In this role, she is charged with the identification, assessment, and data recovery of prehistoric and historical cultural resources for compliance with local, state, and federal environmental requirements. She works closely with and under the direction of ASM principal investigators, prepares work plans, conducts record searches, supervises field staff, organizes travel, directs fieldwork, and prepares technical reports, graphics and maps.

Project Experience:

An Evaluation of 30 Archaeological Sites in the Upper Las Pulgas Corridor, Marine Corps Base Camp Pendleton (MCBCP), San Diego County, California, 2007. As Field Director, conducted testing of 30 prehistoric sites of unknown significance and National Register of Historic Places eligibility to assist MCBCP in its compliance with Section 110 of the National Historic Preservation Act. Client Reference: Ms. Danielle M. Page, Naval Facilities Southwest, (619) 532-2090.

SDG&E Post Fire Poles Project, San Diego County, California, 2007. As Archaeological Monitor, conducted survey of a 46.17-acre project area consisting of the existing and new power pole ROW, as well as monitored subsurface excavation for power pole replacement as a result of damage due to wildfires within Palomar Mountain State Park. Client Reference: Sue Wade, California Department of Parks and Recreation, (760) 767-5790.

Gila River Flood Control Project, Yuma County, Arizona, 2007. As Field Director, conducted pedestrian survey of a 1294.9-acre proposed project area to assist the U.S. Bureau of Reclamation in its compliance with Section 106 of the National Historic Preservation Act. Client Reference: Julian De Santiago, U.S. Bureau of Reclamation, Yuma Area Office, (928) 343-8259.

Santa Margarita Water District Upper Chiquita Emergency Storage Reservoir Site Survey, Orange County, California, 2007. As Project Archaeologist, conducted pedestrian survey of a 15-acre proposed reservoir site. Also prepared the technical report. Client Reference: Mr. Mark Forster, Dudek and Associates, Inc., (800) 450-1818

24 Access Roads Survey, Marine Corps Base Camp Pendleton, San Diego County, California, 2007. As Project Archaeologist, conducted pedestrian Phase I linear survey of selected areas of 24 training range access roads which are in need of repair due to erosion, totaling 8 miles. Of the 24 roads, only Roads #3, #4, and #17 were identified as requiring survey to examine cultural resources. Additionally, a drainage under Road #7 was observed with a possible historic culvert, which was evaluated during this survey. Client Reference: Ms. Adrianne Saboya, Naval Facilities Engineering Command Southwest, (619) 532-4742

Hudson Ranch II Geothermal Project Option Power Plant Site Survey, Imperial County, California, 2007. As Project Archaeologist, conducted pedestrian survey of a 65.12-acre proposed power plant site. Client Reference: Mr. Dwight L. Carey, Environmental Management Associates, Inc., (714) 529-3695

Concord BRAC Survey - CSH, Contra Costa County, California, 2007. As Principal Investigator, prepared the work plan and final report for a survey of 5,197 acres within the non-administrative section of the Inland Area at Naval Weapons Station, Seal Beach, Detachment Concord. The pedestrian survey was conducted using systematic vegetation clears to improve ground surface visibility and overall survey effectiveness. Client Reference: Darrell Gundrum, NAVFACSW, (619) 532-3942

IID All-American Canal, Imperial County, California, 2007. As Field Director, coordinated between client, archaeological personnel, and other agencies and conducted the data recovery or capping of 23 prehistoric ceramic pot drop or stone quarry sites on land within the right-of-way for cement lined canal construction. Client Reference: Vicki Dee Bradshaw, Imperial Irrigation District, (760) 351-2576

ICRMP NB Coronado, San Diego, Ventura, and the Barry M. Goldwater Range, 2007. As Project Archaeologist, helped prepare three Integrated Cultural Resource Management Plans (ICRMP), for Naval Bases Coronado, San Diego, and Ventura, and the Barry M. Goldwater Range. The ICRMP process included assembling available information about prehistoric and historic resources of the bases, working with base staff to identify different types of projects proposed over the short and long term, and developing standard protocols for managing cultural resources and complying with federal regulations. A major aspect of the ICRMPs was identifying buildings and structures that are either eligible for the National Register or that will be eligible before the next ICRMP update. The ICRMPs also included a gap analysis to identify areas where cultural resources could be buried under buildings or sediments, and to identify where no inventories have taken place yet. Client Reference: Danielle Page, Erica Spinelli, Environmental Core Team-Cultural Resources Naval Facilities Engineering Command, (619) 532-3331

Admiral Hartman Monitoring, Lincoln-Clark, San Diego, San Diego County, California, 2007. As Field Director, coordinated between client, archaeological personnel, and Navy staff and managed the monitoring of the replacement of gas lines that run through archaeological site SDI-5017, a large Native American village, *La Rinconada de Jamo*, located within and

adjacent to the Admiral Hartman Family Housing area, as part of its privatization. Also prepared the technical report for submission to the City of San Diego. Client Reference: Dane Baker, Lincoln Military Family Housing, (858) 874-8100

Siempre Viva Industrial Park Property Testing, Kearny Real Estate Company, San Diego, California, 2007. As Project Archaeologist, prepared a technical report based on testing conducted by ASM staff at archaeological site CA-SDI-7208/CA-SDI-7857 for submission to the City of San Diego. The site is a sparse lithic scatter that appears to have functioned primarily as a prehistoric camp or lithic workshop. Client Reference: John Bragg, Kearny Real Estate Company

Caltrans Interstate 5 Extended Phase I and Phase II Testing, California Department of Transportation, San Diego, California, 2006. As Field Director, managed the testing of two archaeological sites west of I-5 (SDI-13484 and -17928), on land proposed for highway widening and sound barrier construction outside the right-of-way but within the highway project's APE. SDI-13484 contains a meager and disturbed archaeological deposit. SDI-17928 is a substantial Early to Middle Holocene site, primarily focused on shellfish processing but also with vertebrate faunal, ground stone, flaked stone, and shell bead cultural remains. Client Reference: Chris White, Caltrans District 11, (619) 6616-6611

Monte Cristo Survey, Enviroscientists, Inc., Esmeralda County, Nevada, 2006. As GIS Analyst, created GIS-based site and location maps. Client Reference: Ruth Carraher, Gold Summit Corporation, (775) 284-7200

Canyon Trails Phase II, City of Hemet, Riverside County, California, 2006. As Project Archaeologist, conducted archaeological testing and evaluation of 13 archaeological sites north of Highway 74, comprised of an extensive series of bedrock milling features and associated artifacts located near the mouth of Reinhardt Canyon, on a property proposed for residential development. Client Reference: Adam Drudge, (714) 505-6360

BLM Eastern San Diego Archaeology, Bureau of Land Management, El Centro, Imperial County, California, 2006. As GIS Analyst, located GIS Information for client. Client Reference: Carrie L. Simmons, Bureau of Land Management, (760) 337-4437

Arboretum Specific Plan Survey, David Evans and Associates, Fontana, San Bernardino County, California, 2006. As Project Archaeologist, conducted pedestrian survey of 485 acres proposed for residential development within historic Grapeland Irrigation District. Client Reference: Ryan Birdseye, David Evans and Associates, (858) 614-4360

North-South Julian Parcels, ERS, Descanso, San Diego County, California, 2006. As Project Archaeologist, conducted pedestrian survey of residential parcels containing trees marked for removal. Client Reference: PBS&J, (858) 874-1810

Lincoln Clark Navy PPV, Lincoln-Clark, San Diego County, California, 2006. As Project Archaeologist, assisted with preparing archaeological background section of a determination of effect on a known, significant archaeological site in Pacific Beach. As GIS Analyst, created a stratigraphic profile and GIS-based maps for the "Determination of Effect on Historic Properties from Phase II Conveyance of Murphy Canyon, Gateway, and Admiral Hartman Family Housing" report. Client Reference: Dane Baker, Lincoln Military Family Housing, (858) 874-8100

Pankey Property, Pardee Homes, Pala, San Diego County, California, 2006. As Project Archaeologist, conducted pedestrian survey of proposed road construction rights-of-way near a known, significant archaeological site located east of Interstate 15 in northeastern San Diego County. Client Reference: Rikki Schroeder, Pardee Homes, (760) 743-3156

SR-76 Extended Phase I, Caltrans District 11, Bonsall, San Diego County, California, 2006. As Project Archaeologist, conducted Phase I pedestrian survey and shovel test pit testing of prehistoric site SDI-12155, in the proposed road construction right-of-way. Client Reference: Debra Dominici, Caltrans District 11, (619) 688-0187

National Exploration Survey, Gold Summit, Nevada, 2006. As GIS Analyst, created GIS-based site and location maps. Client Reference: Ruth Carraher, Gold Summit Corporation, (775) 284-7200

Julian VMP, California Department of Forestry and Fire Protection, San Diego County, California, 2006. As Project Archaeologist, conducted pedestrian survey of CDF vegetation management projects near the Palomar Observatory on Palomar Mountain and on the Sunrise Fuel Break-South near Julian. Also prepared the state park permit application. As GIS Analyst, created GIS-based site and location maps. Client Reference: San Diego Unit Chief, California Department of Forestry, (619) 590-3100

Archaeological Investigations at Early Village Sites in the Middle Santa Cruz Valley, City of Tucson, Pima County, Arizona, 1998. As a Field Technician for Desert Archaeology, Inc., was member of Michael Lindeman and Dr. Jonathan Mabry's field crew carrying out excavations at the Sunset Mesa site (Hohokam period), and the Las Capas site (Early Agricultural Period). Client Reference: Arizona Department of Transportation

Paleoindian and Archaic Sites in Arizona, 1997. As Data Entry Technician for Desert Archaeology, Inc., was Research Assistant to Dr. Jonathan Mabry. Maintained a database of all the Paleo-Indian and Archaic period sites in Arizona, through data entry and quality control of archaeological site card information from the Arizona State Site File, various museums, educational institutions, and National Park Service offices in Arizona into a Microsoft FoxPro database. Client Reference: Arizona State Historic Preservation Office

1996-2001 -Sacramento Archaeological Research Center. Experience includes involvement in all stages of assemblage processing for many projects which consisted of artifact washing, sorting, cataloging (using Microsoft Access, Excel, Word Perfect), artifact numbering, and preparation for curation; flotation and subsequent sorting of soil samples. More detailed lab work experience involved:
-Ground stone analysis; Highway 46 (301 pieces), CA-MER-295 (70 pieces), MCAGCC (Lead Mountain; 42 pieces), thesis research (over 1200 pieces from 8 sites).
-Flaked stone analysis; Komodo (CA-MNO-679) debitage analysis, thesis research (over 700 flaked tools from 8 sites).
-Invertebrate analysis; CA-MER-295.

Selected Publications

Hale, Micah J.

1998 *Preserving Cultural Heritage Through Public Outreach: A Curriculum for Jr. High and High School.*

2005 Processing Economies, Coastal Settlement, and Intensification in Northern San Diego County. In, *Proceedings of the Society for California Archaeology, Volume 18, 2005.*

2005 Ground Stone Analysis. In, *From the Coast to the Inland: Prehistoric Settlement Systems Along the Las Pulgas Corridor, Camp Pendleton, California*, by Micah J. Hale and Mark S. Becker. Report submitted to Southwest Division of Naval Facilities.

2001 *Technological and Social Organization of the Millingstone Horizon in Southern California.* M.A. thesis on file, California State University, Sacramento.

2000 *Consumer Anthropology*: Theory and method of recognizing and interpreting consumption patterns for product development and marketing strategies. Developed for Richard Knight, Director of Intelligent Products, Addidas, USA.

Hale, Micah J., Richard McElreath, and Robert Bettinger

2007, in prep *Modeling Time Minimizing and Energy Maximizing Adaptive Strategies*. Manuscript in preparation.

Hale, Micah J. and Bruce Winterhalder

2007, in prep *Discontinuous Sociocultural Evolution*. Manuscript in preparation.

Hale, Micah J., and Mark S. Becker

2006 *From the Coast to the Inland: Prehistoric Settlement Systems Along the Las Pulgas Corridor, Camp Pendleton, California.* Submitted to Southwest Division of Naval Facilities by ASM Affiliates, Carlsbad, California.

Byrd, Brian F., and Micah J. Hale

2002 *Phase II Investigations of 15 Prehistoric Sites for the Cartago-Olancha Four-Lane Project, US 395, Owens Valley, California.* Prepared for State of California Department of Transportation, Caltrans, District 6, Fresno. Prepared by ASM Affiliates, Inc.

Publications:

García-Herbst, Arleen E.

2008 *Report on Archaeological Monitoring of Site CA-SDI-5017, the Village of La Rinconada de Jamo, during the Gas Line Replacement Project at Admiral Hartman Family Housing, City of San Diego, San Diego County, California*. Submitted to Lincoln Military Family Housing.

Garcia-Herbst, Arleen and Micah Hale

2008 *Final Report for Concord Inland BRAC Disposal Archaeological Survey, Naval Weapons Station, Seal Beach, Detachment Concord, Contra Costa County, California*. Submitted to NAVFAC SW, in press.

García-Herbst, Arleen E.

2007 *Letter Report regarding the Class III Archaeological Survey for the Gila River Flood Control Project, Yuma, Yuma County, Arizona*. Submitted to U.S. Bureau of Reclamation, Yuma Area Office.

Garcia-Herbst, Arleen and Micah Hale

2007 *Final Work Plan for Concord Inland BRAC Disposal Archaeological Survey, Naval Weapons Station, Seal Beach, Detachment Concord, Contra Costa County, California*. Submitted to NAVFAC SW.

García-Herbst, Arleen E., Hector Neff, José Luis Lanata, Luis Garcia Albarido, and Charles R. Stern

2007 Laser ablation ICP-MS analysis of black obsidian nodules from Pampa del Asador and archaeological samples from southernmost Patagonia. *Actas de las VI Jornadas de Arqueología de la Patagonia*, in press.

García-Herbst, Arleen E.

2007 *An Archaeological Evaluation of the Siempre Viva Industrial Park, City of San Diego, San Diego County, California*. Submitted to Kearny Real Estate Company.

García-Herbst, Arleen E., and Susan Hector

2007 *Letter Report regarding the Records Search for the West Fork Honor Camp Restoration Project, Cleveland National Forest, San Diego County, California*. Submitted to BRG Consulting.

García-Herbst, Arleen E.

2007 Review of Tafonomía Regional y Estudios Arqueofaunísticos de Cetáceos en Tierra del Fuego y Patagonia Meridional, by Florencia Borella. *Latin American Antiquity* 18(1):118-119.

Hector, Susan, and Arleen E. Garcia-Herbst

2006 *Determination of Effect on Historic Properties from Phase II Conveyance of Murphy Canyon, Gateway, and Admiral Hartman Family Housing*. Submitted to Lincoln Military Family Housing.

Lanata, José Luis; Silvana Buscaglia; Marcelo Cardillo; Sebastián Luis Frete; María Marschoff; Arleen García; George Herbst; Victoria Nuviala; and Clara Otaola

2004 Cazadores recolectores en Puerto San Julián, Santa Cruz. Primeros resultados. In *Contra viento y marea. Arqueologia de Patagonia*, compiled by María Teresa Civalero, Pablo Marcelo Fernández and Ana Gabriela Guráib, pp. 745-754. Instituto Nacional de Antropologia Pensamiento Latinoamericano, Buenos Aires, Argentina.

Presentations:

Arleen E. García-Herbst, Don Laylander, Sherri Andrews, and Alice Brewster

2007 Archaeological Reconstruction of Ancient Lake Cahuilla Settlement Patterns Using GIS. Paper presented at the 27th Annual ESRI International User Conference, San Diego (18-22 June).

García-Herbst, Arleen E., Charles R. Stern, Hector Neff, José Luis Lanata, Luis Garcia Albarido, Ana M. Albornoz, Eduardo A. Crivelli Montero, Mabel Fernández, Adam Hajduk, Alberto E. Pérez, Lisandro G. López, Isabel Pereda, Alicia H. Tapia and John Dudgeon

2007 Laser ablation TOF-ICP-MS analysis of obsidian nodules from obsidian sources and archaeological samples from the southern Pampas and northern Patagonia. Paper presented at 72nd Annual Meeting of the Society for American Archaeology, Austin (25-29 April).

Lanata, José Luis, and Arleen E. García-Herbst

2007 Exploring the Tempo and Mode of America's Human Dispersal. Paper presented at 72nd Annual Meeting of the Society for American Archaeology, Austin (25-29 April).

García-Herbst, Arleen E., and Michael Garnsey

2007 Recent Archaeological Investigation at Border Fields State Park: a brief report on 5,000 years of unchanged history. Paper presented at the 41st annual meeting of the Society for California Archaeology, San Jose (22-25 March).

Lanata, José Luis, Luis Martino, Ana Osella and Arleen Garcia-Herbst

2006 Ambiente y Demografía Durante la Dispersión Humana Inicial en Sudamérica. Paper presented at the IV annual meeting of the Congreso de Arqueología en Colombia, Pereira (5-7 December).

García-Herbst, Arleen E., and José Luis Lanata

2006 Explaining Ancient Technological Innovation in Coastal Southern Argentina. Paper presented at the 71st Annual Meeting of the Society for American Archaeology, San Juan, Puerto Rico (26-30 April).

García-Herbst, Arleen E., Hector Neff, José Luis Lanata, Luis Garcia Albarido, and Charles R. Stern

2005 Laser ablation ICP-MS analysis of black obsidian nodules from Pampa del Asador and archaeological samples from southernmost Patagonia. Paper presented at the VI Jornadas de Arqueología de la Patagonia, Magallanes, Chile (24-28 October).

Lanata, José Luis, and Arleen E. García

2005 Environmental corridors and early human dispersal in South America. Paper presented at the 70th Annual Meeting of the Society for American Archaeology, Salt Lake City (30 March-3 April).

Garcia, Arleen E.

2004 Late Holocene coastal hunter-gatherers in Southern Argentina. Paper presented at the "Ancient Sites, Modern Maps: Remote Sensing Applications in Archaeology" workshop, Geographic Information Science Center and the Archaeological Research Facility at UC Berkeley (29-30 October, www.gisc.berkeley.edu).

García, Arleen E.

2004 Becoming Involved in Anthropology through the National Association for Student Anthropologists (NASA) and the American Anthropological Association (AAA). Paper presented at the 1st Annual Meeting of the California Undergraduate Anthropology Conference, Santa Barbara (15-16 May).

Lanata, José Luis, and Arleen E. García

2002 Metapopulations and the Colonization of Space. Paper presented at Human Global Dispersal, British Academy International Networks Workshop, Southampton, UK (27-28 June).

Lanata, José Luis, Silvana Buscaglia, Marcelo Cardillo, Sebastián Luis Frete, María Marschoff, Arleen García, George Herbst, Victoria Nuviala, and Clara Otaola

2002 Cazadores recolectores en Puerto San Julián, Santa Cruz. Primeros resultados. Paper presented at the V Jornadas de Arqueología de la Patagonia, Buenos Aires, Argentina (27-31 May).

Craig, Nathan, Elizabeth Klarich, George Herbst, Nicolas Tripcevich, and Arleen E. García

2001 Organizing archaeological geophysical survey and surface mapping data in ArcView. Paper presented at the 21st Annual ESRI International User Conference, San Diego (9-13 July).

García, Arleen E.
2001 Travels and Archaeology in South Chile and Argentina. Paper presented at the UCSB Anthropology Brown Bag Talk Series, Santa Barbara (4 June).

Lanata, José Luis, and Arleen E. García
2001 Population Dynamic and the Peopling of the Americas. Paper presented at the 66th Annual Meeting of the Society for American Archaeology, New Orleans (18-22 April).

García, Arleen E.
1998 Ground Stone Artifacts Associated with Paleoindian Sites: The Lindenmeier Site, A Case Study. Poster presented at the 63rd Annual Meeting of the Society for American Archaeology, Seattle.

Micah J. Hale, M.A., Ph.D. Candidate
Senior Archaeologist

Total Years of Experience: 12

Employment History:

2001-2005 Senior Archaeologist, ASM Affiliates, Inc., Carlsbad, California
2000-2001 Archaeologist, Jones and Stokes, Inc., Sacramento, California
1996-2000 Archaeologist, Sacramento Archaeological Research Center, Sacramento, California

Education:

Ph.D.	Doctoral Candidate/Evolutionary Anthropology /University of California, Davis
M.A. 2001	Anthropology and Archaeology/California State University, Sacramento
B.S. 1996	Biological and Social Anthropology/University of California, Davis

Additional Training:
2004 Ground Penetrating Radar Field Methods and Interpretation Certificate

Registrations:
2001 Register of Professional Archaeologists/member

Professional Memberships:
1997 Society of American Archaeology/member
1997 Society for California Archaeology/member
2005 Antelope Valley Archaeological Society
2004 San Diego Archaeological Society

Other Capabilities: Public Outreach, Ground Stone Analyst, Flaked Stone Analyst, Invertebrate Analyst, Flotation, Field data collection using laser and optical transits and real-time correction Trimble GPS units, Microsoft Word, Excel, Access, Power Point, Word Perfect, Linux operating systems including Ubuntu.

Awards/Commendations:
2006 Fieldwork Fellowship, Graduate Studies, UC Davis
2005 Fieldwork Fellowship, Graduate Studies, UC Davis

Clearances: Active DoD high security clearance for SPAWAR, NBPL, SCLI, and MCBCP
Citizenship: USA
Languages: Spanish reading fluency (speak partially)
References:
Dr. Robert Bettinger, Professor, University of California Davis
Dr. Mark Basgall, Director/Professor, Sacramento Archaeological Research Center, California State University, Sacramento

Employment History

2006	Researcher, Inglefieldland Archaeological Project, Greenland
2001-Present	Senior Archaeologist, ASM Affiliates, Inc.
2005-present	Level III Teaching Assistant, UC Davis Graduate Division in Anthropology
2000-2001	Archaeologist, Jones and Stokes Associates
1997-1999	On-call Substitute Teacher, K-12, Davis and Woodland school districts
1996-2000	Archaeologist, Sacramento Archaeological Research Center

1995 Teaching Assistant, UC Davis Archaeology Field School, Tablelands

Selected Archaeological Experience

2006 -Archaeological Survey and Excavations in the Polar Arctic, Northwest Greenland. Researcher. Research conducted for NSF, National Geographic, and the Inglefieldland Polar Archaeology Expedition; UC Davis.

2005 -Archaeological Data Recovery Excavations at Borderfields State Park, Imperial Beach, California, Field Director, Author.

-Archaeological Testing and Ground Penetrating Radar Study of the Forester Creek Biological Mitigation Area, Santee. Principal Investigator, Field Director, Author. For Caltrans District 11.

-Archaeological Data Recovery Excavations at CA-SDI-16691, a Late Prehistoric site in Escondido, California. Principal Investigator, Field Director, Author. For Jackson-Pendo Development Company.

-Archaeological Evaluation of eight prehistoric sites in the Emerson and Quackenbush Training Areas, MCAGCC 29 Palms. Field Director. For Army Corps of Engineers.

-Archaeological Evaluation of 22 prehistoric and historic sties on Edwards Air Force Base. Field Director, Author. For Army Corps of Engineers.

2004 -Las Pulgas Corridor, Field Director, Author. Phase II testing of 26 sites on Camp Pendleton. For SW DIV.

-Palm Springs, Field Director, Author. Data Recovery/Mitigation of archaeological deposit and human remains at Tahquitz Canyon, Palm Springs, CA. For Agua Caliente Band of Cahuilla Indians.

2003 -San Clemente Island. Field Director, Author, Conducted a survey of the Rose/ Arizone area. For SW DIV

-San Clemente Island. Field Director, Author; Conducted a survey of the Clay and, Photo Drainage areas, and erected protective signing on 750 sites. For SW DIV.

-San Clemente Island. Field Director, Author; Conducted a survey along specific road segments scheduled for maintenance. For SW DIV.

-San Clemente Island. GPS Specialist, Conducted data collection and image rectification for remote sensing project in the detection of archaeological sites. For SW DIV.

-Little Lake, Field Director, Author. Phase II testing of four sites including the ethnohistoric village of Pagunda near the town of Little Lake, CA. For Caltrans.

-Palm Springs, Agua Caliente. Field Director, Author. Mitigative screening and mapping of impacted burial site on the Agua Caliente Reservation. For Agua Caliente Band of Cahuilla Indians.

2002 -Cartago and Olancha Four-Lane Project. Field Director, Author, Analyst. For test excavations of fifteen sites for the proposed widening of Highway 395 near Cartago and Olancha in Inyo County, California. For Caltrans Central Region.

-Coring for SDI-811. Field Director for first phase of geologic coring of a shell midden site along the coast of MCB Camp Pendleton, San Diego County. For the Department of the Navy, South Bay Area Focus Team.

2001 San Clemente Island Testing and Survey. Field Director. Conducted excavations, survey, and site recording on San Clemente Island, California. For the Department of the Navy, South Bay Area Focus Team, SW DIV.

Laboratory Experience

2001-2005 ASM Affiliates. Analysis of invertebrates, lithics, ground stone, pottery, etc.

Appendix 9B

Cultural Resources Inventory and Evaluation

UPDATE REPORT

Historic Building Inventory and Evaluation

Concord Naval Weapons Station
Contra Costa County, California

June 2009

UPDATE REPORT

Historic Building Inventory and Evaluation

Inland Area, Concord Naval Weapons Station,
Contra Costa County, California

In support of the Environmental Impact Statement (EIS)
of the Naval Weapons Station Seal Beach Detachment
Concord, California

Submitted to:

NAVFAC SOUTHWEST
Environmental Contracts Core BRAC Code R06B2
1220 Pacific Highway
San Diego, CA 92132-5190

Prepared by:

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June 2009

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Appendix A
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Appendix B
DPR523 Forms and Update Forms

1

Executive Summary and Introduction

1.1. Executive Summary

This report presents an updated historic context and historic building inventory and evaluation of all buildings and structures built in the Inland Area of the Concord Naval Weapons Station (CNWS). The report was undertaken to ensure compliance of the Base Realignment and Closure (BRAC) process at CNWS with Section 106 of the National Historic Preservation Act, as well as NEPA and CEQA as it pertains to historical resources. Prior documentation has found that none of the resources in the Inland Area meet the criteria for listing in the National Register of Historic Places (NRHP). Revisiting buildings and structures surveyed in these prior cultural resource studies, this updated report assesses if any of the resources now meet the criteria for listing in the NRHP or the California Register of Historical Resources (CRHR). The buildings and structures are primarily Naval property from the World War II and Cold War era, however several of the properties are from periods prior to Naval occupation of the site.

This report includes an introduction, a brief historical overview and context for the entire station with emphasis on the Inland Area, and a discussion of the different property types found within the Inland Area of the Station. Upon this foundation, the report evaluates 422 resources within the Inland Area for NRHP and CRHR eligibility. The resources are evaluated by updating 47 standard California Department of Parks and Recreation historic property inventory forms (DPR523 forms) from previous cultural resource studies, and including a form covering the Contra Costa and Clayton canals of the Bureau of Reclamation's Central Valley Project. The resources are listed either singly or in groups according to classifications of structural type or function. The report reaffirms earlier reports and concludes that none of the buildings or structures in the Inland Area of CNWS meet the criteria for listing in the NRHP or the CRHR.

1.2. Organization of Document

This document consists of a general report accompanied by the DPR523 update forms for buildings and structures in the Inland Area at CNWS.[1] The report contains six chapters. Chapter 1 presents the executive summary and introduction. Chapter 2 details a historical

[1] Although the report addresses 47 original DPR523 forms, there are only 46 update forms because two of the DPR523 forms address the same resource, a pre-Naval stone cistern. The update for both is done on one form.

overview, examining both the regional historical context and critical phases in the development of the Inland Area of CNWS. Chapter 3 presents and analyzes the distinct property types associated with the Inland Area of the CNWS throughout each of its historical phases. The analysis focuses on distinct functional building types built in each of these periods: pre-Naval buildings and structures, magazines, ordnance handling buildings and structures; public works and support buildings; morale/recreational buildings; residential buildings; administrative buildings; and hospital buildings. Chapter 4 presents an evaluation of National Register eligibility and consideration under CEQA and concludes that none of the resources meet the criteria for listing in the NRHP or the CRHR. Chapter 5 contains a comprehensive listing of references utilized in the documentation and evaluation of the Inland Area of CNWS. Chapter 6 includes a statement of preparer qualifications.

Two appendices accompany the document. Appendix A includes three reference tables. Table 1 lists all inventoried and evaluated buildings in ascending order by Navy building identification number or name. Table 2 lists those buildings and structures covered by a 2003 "Program Comment for World War II and Cold War Era (1939-1974) Ammunition Storage Facilities." Table 3 lists those buildings and structures that were not yet fifty years of age at the time of the initial evaluation and/or this update.

Appendix B contains 46 update DPR523 forms, attached to the original 47 DPR 523 forms, along with a form for the canal system and its bridges. These update forms evaluate NRHP and CRHR eligibility for all buildings and structures in the Inland Area at CNWS. As explained previously, the DPR 523 Forms list buildings singly or grouped according to structural type or functions.

1.3. General Description of Concord Naval Weapons Station

Although this update only studies the Inland Area of the CNWS, the report does address the entire facility to provide necessary context for analysis of the Inland Area. CNWS encompasses approximately 12,800 acres and is situated south of Suisun Bay and northeast of the City of Concord, in north-central Contra Costa County, California (see Figure 1.3). The installation consists of two primary zones identified as the Tidal Area and the Inland Area, as well as a single facility in Pittsburg. The Tidal Area is comprised of approximately 7,630 acres, and includes about five miles of the Suisun Bay shoreline running from the Hastings Slough on the west to Shore Acres on the east. The 5,028 acre Inland Area encompasses an oblong tract of land extending from the main gate near Clyde, southeast past Bailey Road and reaching almost to Kirker Pass Road. This area includes most of the Clayton Valley. The third area of the Station, an x-ray facility in Pittsburg, is located nine miles east of the central administrative area of the station, north

of the Pittsburg-Antioch Freeway and east of Loveridge Road in the eastern portion of Pittsburg.

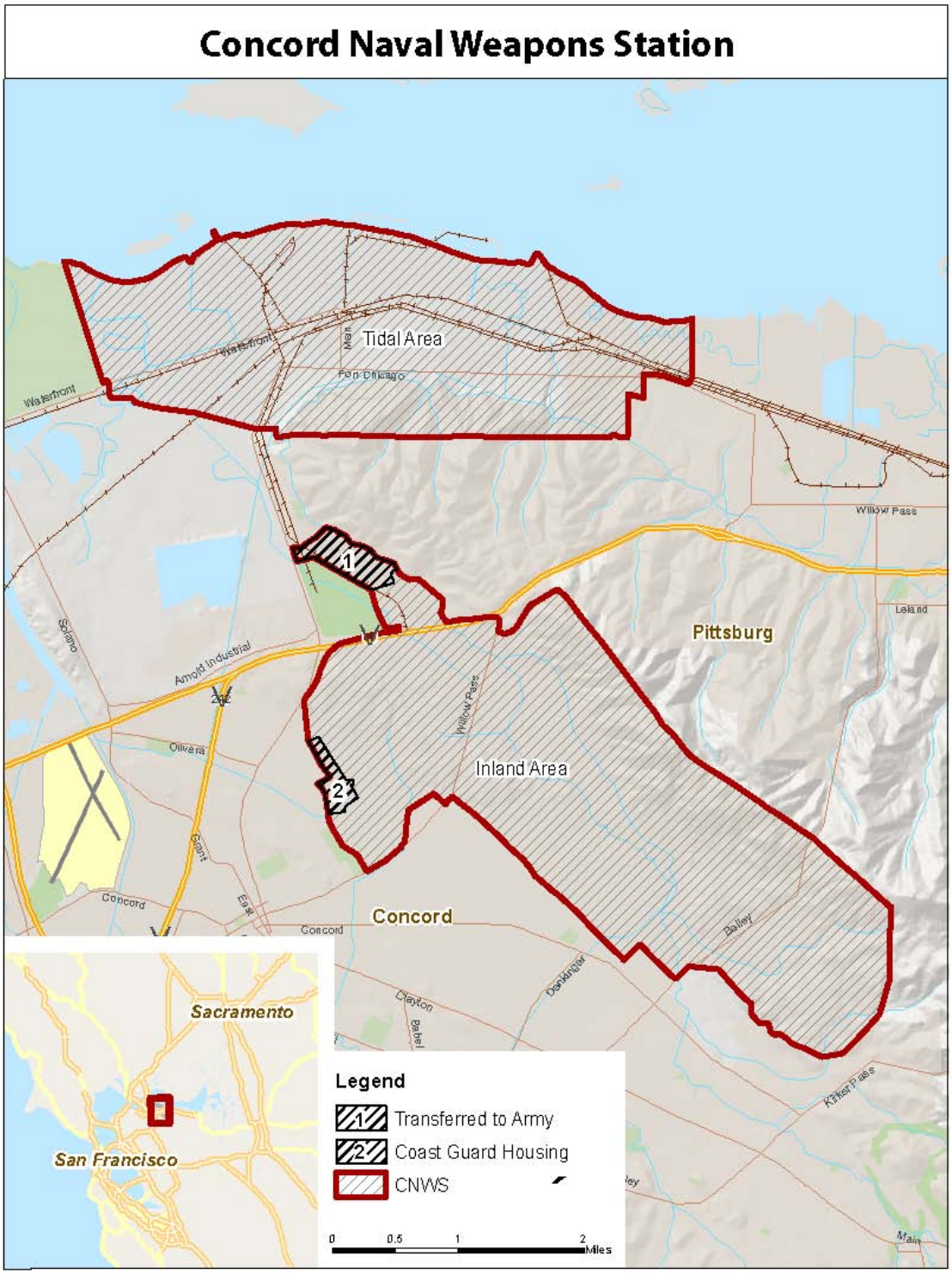

Figure 1.3

Established in 1942, the facility was the Navy's primary ordnance transshipment port on the West Coast of the United States for the latter half of the twentieth century, supplying much of the ordnance for the Pacific fleet. Originally named Naval Magazine Port Chicago after the small unincorporated town situated near the station, the facility was renamed CNWS in 1963. Materiel, mostly ammunition and missiles, arrived at the facility by rail, and increasingly truck in the latter decades of the twentieth century, and was transferred to ships situated along a series of piers in the Tidal Area. The station also featured a Weapons Quality Engineering Center (WQEC) devoted to the testing and quality assurance of weaponry that became one of the largest facilities of its kind in the world. The station's basic mission to "receive, renovate, maintain, store and issue ammunition, explosives, and technical ordnance material," assured CNWS an integral support role in the major military conflicts of the twentieth century.[2] After the cessation of the Cold War, however, the strategic role of CNWS diminished. In 1999, the Tidal Area of CNWS was transferred from the Navy to the Army. The port has remained active, however, the Inland Area has been deactivated since 1999 and was approved for closure by the Base Realignment and Closure Commission (BRAC) in 2005.

1.3.1. General Description of Inland Area of Concord Naval Weapons Station

Located south of the Tidal Area, the Inland Area is directly adjacent to the City of Concord. Crossed by State Route 4 in the northwestern portion of the area, the Inland Area is also traversed by Willow Pass Road and Bailey Road, as well as a rail line of Bay Area Rapid Transit (BART). The Inland Area was established during a second phase of growth in 1944-1945 that drastically expanded the physical size and operational capabilities of the CNWS. The Navy's Bureau of Yards and Docks undertook an ambitious expansion by condemning approximately 5,000 acres of predominantly agricultural land. The Inland Area provided crucial storage and operational facilities that supported the shipping facilities of the Tidal Area. The two areas were connected by an extensive naval railroad system that connected the magazines to ships arriving at the piers. The Inland Area is composed of an administrative section at the northwestern end of the area and a larger section, across Highway 4 that holds numerous magazines and ordnance handling buildings and structures as well as various public works and support buildings. Although approved for closure by BRAC in 2005, two small portions of the inland area will continue to remain in operation, but under different ownership: 115 acres of the Administrative Area near the facility's entrance has been transferred to the Army, and approximately 63 acres of the Quinault Village and Victory Village Housing Areas were transferred to the U.S. Coast Guard.

[2] Paolo E. Coletta, *United States Navy and Marine Corps Bases, Domestic* (Westport, CT: Greenwood Press, 1985), 148-149; Dan Cragg, *Guide to Military Installations*, 2nd edition (S.l.: Stackpole Books, 1988), 51-52.

1.4. Previous Studies at Concord Naval Weapons Station

This report serves as an update to two reports conducted in the 1990s evaluating all of the historic buildings and structures within both the Inland and Tidal areas of CNWS. Although the current work presents only those resources within the Inland Area, the previous reports provide extensive historic context that informs understanding of the role of the Inland Area within the larger area of CNWS. The most recent report, undertaken by JRP Historical Consulting Services (hereafter JRP) of Davis, California in 1998, was an inventory and evaluation of Cold War era, as well as several World War II era, buildings and structures on CNWS. This report, entitled "Inventory and Evaluation of National Register Eligibility of Cold War Era and Selected Other Buildings and Structures, Naval Weapons Support Facility," was prepared under Contract No. DACA05-97-D-0013. The report provided a comprehensive historical context for major phases in Cold War development and inventoried and evaluated 375 buildings and structures on 34 DPR523 Forms. JRP found none to be eligible for listing in the NRHP.

The other report, undertaken by William Self Associates (hereafter Self) of Orinda, California in 1993, inventoried and evaluated World War II era buildings and structures on CNWS. Entitled, "Cultural Resources Overview, Naval Weapons Station Concord, Contra Costa County, California," the report was prepared under Contract No. N62474-92-M-3638. This study included a brief historic context and the preparation of an archeological sensitivity map, as well as an inventory and evaluation of all World War II era (pre- September 1945) buildings and structures located at CNWS. Self Associates evaluated 506 buildings and structures on 32 DPR523 Forms and determined that only the Port Chicago National Memorial, located in the Tidal Area, appeared to be eligible for listing in the NRHP.

In addition to the two reports listed above, this update addresses a single DPR 523 form submitted by John A. Keibel in 2001 for the Concord Historical Society. Although the form evaluates an above ground cistern building that was previously evaluated by Self, the findings of the two were different and this report treats both.

Other cultural resource surveys undertaken for portions of CNWS date between 1980 and 2008 and are listed in the following chronological list. While this report does not update these reports, the work will integrate those studies conducted after the 1993 and 1998 Self and JRP reports to strengthen the historic context and evaluation of CNWS.

1980 U.S. Army Corps of Engineers. “San Francisco Bay to Stockton, California Intensive Cultural Resources Survey and Literature Review of Four Additional Proposed Dredged Material Disposal Sites in Contra Costa and Solano Counties- Final Report,” MS on file, S-2180, Historical Resources Information System (HRIS), Rohnert Park.

1984 Holman, Miley. “Concord BART Park/Ride Parking Area Archeological Reconnaissance.” On file S-6704, Northwest Information Center, HRIS, Rohnert Park.

1985 Cartier, Robert. “Archival Study of Cultural Resources of Four Candidate Sites for Navy Family Housing in Alameda, Contra Costa, San Francisco, and Marin Counties.” On file S-7730, Northwest Information Center, HRIS, Rohnert Park.

1988 Chavez, David and Sally B. Wooldridge. “Cultural Resources Evaluations for the Pittsburg-Antioch Alternatives Analysis, Contra Costa County, California.” MS on file, S-10268, Northwest Information Center, HRIS, Rohnert Park.

1989 Duff Patricia J. “Cultural Resources Survey Report Remedial Action Subsite (RASS) 4, Naval Weapons Station Concord, California.” MS on file, S-12856, Northwest Information Center, HRIS, Rohnert Park.

1989 William Self Associates. “Mt. Diablo Creek Flood Control and Stream Stabilization Plan Archeological Survey Report, Naval Weapons Station Concord, Contra Costa County, California.” MS on file, HRIS, Rohnert Park.

1990 Ananian, Benjamin H. Letter Report to Alex Pascaul, City of Concord. Regarding a field survey for Willow Pass Road Safety Improvements, Project No. 204. Dated January 5, 1990. MS on file, HRIS, Rohnert Park.

1990 Chavez, David and Jan M. Hupman. “Cultural Resources Evaluations for the Pittsburg-Antioch BART Extension – Phase 1A and 1B, Contra Costa County, California.” MS on file, S-12111, HRIS, Rohnert Park.

1990 Jablonowski, Michael. “A Class III Cultural Resources Study for the Proposed Chevron Project Corridor, Contra Costa County, California.” MS on file S-11594, HRIS, Rohnert Park.

1992 PRC Environmental Management and William Self Associates. “Final Cultural Resources Survey Report, RASS, 1,2, and 3, Naval Weapons Station Concord, California.” MS on file S-14156, HRIS, Rohnert Park.

1995 Basin Research Associates, Inc. "Cultural Resources Review: Containerization Project, Naval Weapons Station Concord, Contra Costa County, California." MS on file, S-17696, HRIS, Rohnert Park.

1995 Cartier, Robert (Principal) and Lynne Eckert. "Cultural Resource Evaluation for the Concord Naval Weapons Station Project, County of Contra Costa." MS on file, S-18327, HRIS, Rohnert Park.

1996 Busby, Colin I., and Donna M. Garaventa, Stuart A. Guedon and Melody E. Tannam. "Archeological Inventory of a Portion of NWS Concord and an Archeological Assessment and Field Condition Review of CA-Cco-680. Warehouse Site and Associated Access Roads, Naval Weapons Station, Concord, Contra Costa County, California." MS on file S-***** (to be assigned), HRIS, Rohnert Park.

1996 Busby, Colin I., and Donna M. Garaventa, Stuart A. Guedon and Melody E. Tannam. Supplement - Archeological Inventory of a Portion of NWS Concord. Warehouse Locations D-F, G North and G South, Naval Weapons Station, Concord, Contra Costa County, California." MS on file S- (to be assigned), HRIS, Rohnert Park.

2000 Mikesell, Stephen, Randall Milliken, and Jeffrey Rosenthal. "Naval Weapons Station, Seal Beach, Detachment Concord, Integrated Cultural Resources Management Plan." (ICRMP)

2000 US Army Corps of Engineers, Joseph Murphy, et al. "Army Ammunition and Explosives Storage in the United States, 1775-1945."

2003 South West Division Naval Facilities Engineering Command, William Manley. "Revaluation of Eligibility for Listing in the NRHP: World War II Munitions Depots at Seal Beach, Fallbrook, and Concord."

2006 Advisory Council on Historic Preservation. "Program Comment for World War II and Cold War era (1939-1974) Ammunition Storage Facilities."

2008 ASM Affiliates, Inc. "Final Report for Concord Inland BRAC Disposal, Archeological Survey, Naval Weapons Station, Seal Beach, Detachment Concord, Contra Costa County, California."

An additional general resource for evaluating CNWS is a three volume work: *California Historic Military Buildings and Structures Inventory* written under Contract number DACAO5-97-D-0013 by JRP in 2000 for the United States Army Corps of Engineers. The report provides a methodological framework for evaluating the historic context and property types of California's historical military resources. The work was developed after the Self and JRP reports, however it reaffirms the findings of both reports.

1.5. Methodology

This update report documents and evaluates all of the historic buildings and structures in the Inland Area of CNWS. Because all of the resources in the Inland Area have previously been surveyed in two separate reports, this report serves as an integrative document that updates both the Self World War II era study and the JRP Cold War era study. Both of these previous reports evaluated all of the historic buildings and structures in relation to all of the National Register Criteria. According to the 2002-2007 Integrated Cultural Resources Management Plan for CNWS, the State Historic Preservation Office (SHPO) concurred with both the Self Associates report and the JRP report.[3]

The methodology of this update can be best addressed by treating the documentation and evaluation components of the report separately:

Documentation: The completion of this report required extensive field work and recordation that was undertaken in August of 2008. JRP architectural historians surveyed 422 resources located across the Inland Area. Because these resources had been surveyed before, photo-documentation replicated that of the initial survey. Any changes in the material condition of the buildings from the original surveys were noted. In several cases, buildings that had been surveyed in 1993 and 1998 were no longer in existence at the time of the 2008 field work.

Evaluation: As stated above, all of the resources surveyed in this update report have previously been evaluated and found ineligible for listing in the NRHP. With the exception of one resource, a pre-Naval stone cistern, this report does not re-evaluate these conclusions. Both the Self and JRP evaluations have SHPO concurrence and both have been supported by two subsequent studies that relate to CNWS.[4]

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[3] Concurrence is listed in Section D.2. of Appendix D in the "Naval Weapons Station, Seal Beach, Detachment Concord, Integrated Cultural Resources Management Plan." This update also notes that the date of SHPO concurrence for the JRP report was May 19, 1999. This was obtained through the Office of Historic Preservation, Northwest Information Center, Contra Costa County, Directory of Properties in the Historic Property Data File, May 19, 1999. PRG-Reference Number USN990510A.

[4] The sole exception is a pre-Naval stone cistern that will be discussed in more detail later in the report.

The first supporting study was listed in Section 1.4. and is the *California Historic Military Buildings and Structures Inventory*, prepared in 2000 by JRP Historical and Foster Wheeler Environmental. The inventory was undertaken in cooperation with the Department of Defense Agencies (DoD), the California State Historic Preservation Officer, the Advisory Council on Historic Preservation, and the National Park Service. The four volume work provides a contextual and thematic foundation for evaluating the significance of historic military properties in California. Treating seven distinct eras of historic military properties, the work includes analysis and evaluation of both the World War II era and Cold War era military property types that characterize CNWS, namely those relating to the military theme of Massive Supply and Ammunitions Depots. The work asserts the necessity of three overarching considerations in the evaluation of these resource types: directness of association with important events, rarity, and integrity.[5] These considerations confirm the basis behind both Self's and JRP's assessment that none of the buildings and structures at CNWS meet the criteria for listing in the NRHP.

A second study undertaken in 2003 further supports this evaluation. A report prepared by William R. Manley for the Southwest Division Naval Facilities Engineering Command entitled "Final Reevaluation of Eligibility for Listing in the National Register of Historic Places: World War II Munitions Depots at Seal Beach, Fallbrook, and Concord, California," concurred that the World War II era properties found at CNWS did not meet the criteria for listing in the NRHP. Undertaken because of inconsistency in evaluation between the three properties, the reevaluation found that, "the properties functioned as single elements in broad, interdependent networks," and did not have, "specific and important associations within their context."[6]

Although the Manley finding only considers the World War II era properties at CNWS, the *California Historic Buildings and Structures Inventory* addresses questions of significance in relation to both the World War II and Cold War era. Both conclude that properties must have important, direct associations with character-defining events and features of the distinct military eras. Under both evaluations, the continuing generalized ordnance transfer function of CNWS lacks these direct associations. Further, both reports reaffirm the evaluation that the buildings and structures at CNWS are common prototypes that lack architectural significance.

While this update does not reevaluate the conclusions of the two previous studies, it does address several key considerations arising from the passage of time between this update and past evaluations. Of particular emphasis is the treatment of properties that were not

[5] JRP Historical Consulting Services *California Historic Military Buildings and Structures Inventory*, 7-25.

[6] Manley, William R. "Final Reevaluation of Eligibility for Listing in the National Register of Historic Places: World War II Munitions Depots at Seal Beach, Fallbrook, and Concord, California," 25.

yet 50 years old at the time of the previous surveys, and therefore not yet eligible for standard evaluation for the National Register. This portion of the survey population only relates to the Cold War era resources evaluated by JRP in 1998. The buildings are listed in Table 3 in Appendix A of this document.

Although these buildings and structures evaluated in the 1998 JRP report were from the Cold War era and therefore had not yet reached 50 years of age, all of the buildings and structures were fully considered under all National Register Criteria rather than only under Consideration G (Exceptional Significance). This treatment arose from the fact that enough time had passed to gain sufficient perspective to evaluate the importance of the historic functions of the buildings within the broader contexts of Cold War era technological advancements and Naval materiel development. JRP noted:

> The only consideration that applies to the properties inventoried and evaluated in this report is Consideration G. NRHP guidelines emphasize, however, that the resource must embody exceptional significance as defined by the four main criteria. Because none of the resources on Concord WPNSUPFAC appear to meet these criteria, the application of Consideration G does not alter their level of significance.[7]

By evaluating all of the buildings and structures within the broader framework of the Cold War era, the 1998 JRP evaluation concluded that the ordnance transshipment functions of the buildings and structures at CNWS failed to meet the criteria for listing in the NRHP and therefore also failed to warrant attention under Consideration G. Because all of the historic buildings and structures were fully evaluated in the 1998 report and failed to meet any of the criteria, all of the 422 buildings and structures are treated as a single survey population for the purposes of this update. Within this single survey population, however, the roles of specific property types are addressed in Section 3 of this update and evaluations of these distinct property types are addressed in Section 4.[8]

This report finds that the passage of time has not affected any of the conclusions relating to eligibility status. At the time of initial evaluation, all of the properties failed to meet the threshold for significance and many of the properties had diminished integrity. This update finds the same conditions, although with some further deteriorations in integrity. The Inland Area has been deactivated since 1999, and therefore the passage of time has

[7] JRP Historical Consulting Services. "Inventory and Evaluation of National Register Eligibility of Cold War Era and Selected Other Buildings and Structures, Naval Weapons Support Facility," 61.

[8] The property type discussion in Section Three will pay particular attention to a 2006 Program Comment relating to ammunition storage facilities, which are the primary mission related property types that characterize CNWS. The buildings and structures affected by this Program Comment are listed in Table 2 in Appendix A.

not conveyed any further notable advancements in military related themes. None of the buildings or structures evaluated in this update are now significant under the National Register criteria or the CRHR criteria. None have been found to be associated with significant trends or events in American history since the last evaluation (Criterion A), none have become directly associated with significant persons in American history (Criterion B), and none have been found to be significant in their architecture or engineering, or the work of a master, or a significant representative of a type, period, or method of construction (Criterion C).

1.6. Conclusions

1.6.1. Conclusions Regarding Properties Previously Found Eligible for Listing in the National Register or California Register

None of the resources in the Inland Area of CNWS inventoried and evaluated in this report have previously been found eligible for the NRHP or the CRHR. The only exception is a stone cistern that predates Naval occupation which was found "potentially eligible" by ASM Affiliates in April 2008, who then recommended further research. Previous studies by Self Associates did not find the cistern eligible. After undertaking further research, JRP does not find the cistern eligible. As a lone remnant of a large agricultural complex that is no longer in existence, the structure does not convey historic significance and retains little integrity. The Contra Costa Canal (along with its subsidiary, the Clayton Canal), found eligible for listing in the NRHP and CRHR under other, non-Navy projects, runs through the facility but is not owned by the Navy. Bridges over the canal, built either by the Bureau of Reclamation for farm access, or by the Navy, are standard plan structures and are not part of the eligible resource.

1.6.2. Conclusions Regarding Properties Previously Found Ineligible for Listing in the National Register or the California Register

All of the resources inventoried in this report have previously been found ineligible for listing in the NRHP and the CRHR (although the cistern was found "potentially eligible" by ASM Affiliates in 2008). The findings in this update report do not alter any of these previous findings. The passage of time between the initial evaluation and this update evaluation has not indicated that any of the properties were associated with significant events or historic trends that are associated with broad patterns of history (Criterion A), associated with historically significant persons (Criterion B), or significant in their architecture or engineering (Criterion C).

1.6.3. Properties on CNWS that Appear Eligible for Listing in the National Register or the California Register

None of the resources inventoried and evaluated in this report appear to meet the criteria for listing in the NRHP or the CRHR.

2

HISTORICAL OVERVIEW: CNWS

2.1. Regional History

The earliest uses of the land that comprises the Inland Area of the CNWS revolved around the agricultural operations of Spanish, Mexican, and early American settlers. The Mexican land grants of *Rancho Los Medanos* and *Rancho Monte Del Diablo,* both granted in the 1830s, occupied the variable swath of mountains, plains, and coastline extending between the contemporary areas of Pittsburg and Antioch to Pacheco. Orchards, cattle ranching, and sheep grazing dominated the landscape until the middle of the nineteenth century, when the discovery of coal on the slopes of Mount Diablo brought an influx of mining activity, increased population, and greater connectivity through a burgeoning network of railroads. [9]

With the decline of coal extraction in the 1880s mining boomtowns dwindled, returning agricultural use to preeminence. The general waterfront of which the Tidal Area of CNWS is a part, originally called Seal Bluff, proved ideal for shipping, as the water remained deep enough even at low tide to permit the passage and docking of steam vessels. Further, the Southern Pacific and Santa Fe Railroad lines passing through the area along Suisun Bay allowed for increasingly productive agricultural transfer and storage. Wharves and warehouses were built along the shoreline of the Carquinez Strait, storing abundant agricultural production, most notably wheat. Two warehouses, Bluff Warehouse Company and Blum Warehouse Company stood within the Tidal Area.[10]

A further shift in land use occurred in the 1890s with the development of the short-lived Copper King Smelting Company Plant. Sited at Seal Bluff Landing, the plant increasingly drew men and material to the coastal area. While the company declared bankruptcy in 1903, the area boasted many amenities including a post office, a general store, and a saloon. Upon the heels of this failure, a new venture came to dominate the area when C. A. Smith developed a substantial lumber processing complex at Seal Bluff

[9] The historic context in this update report summarizes that presented in past reports on CNWS. For a more detailed historical context of the regional historic context of the Inland Area of CNWS see Self Associates 1993, "Cultural Resources Overview, Naval Weapons Station Concord, Contra Costa County, California" and JRP Historical Consulting's 1998, "Inventory and Evaluation of National Register Eligibility of Cold War Era and Selected Other Buildings and Structures, Naval Weapons Support Facility."

[10] William Self, et al., "Cultural Resources Overview Naval Weapons Station Concord, Contra Costa County California," Contract No. N62474-92-M-3638 (August 1993), 8

Landing. Employing over 2,000 workers, the company established the town-site of Bay Point, later called Port Chicago. The company remained a dominant figure in the area, despite a 1913 fire which destroyed virtually the entire stock of lumber, until the Great Depression when a diminished demand for lumber forced the plant's closing.[11]

In the early twentieth century two additional railroad lines were constructed in the CNWS area: the Bay Point & Clayton; and the Sacramento Northern Railroad, then called the Oakland, Antioch and Eastern Railway. With ample rail and shipping capabilities, the area was well suited to respond to the military demands of the First World War. In 1917 the War Department entered into a contract with the Electro Metals Company and the Pacific Ship Building Company to build freighters for the war effort. Situating themselves at Bay Point, the wartime production facilities assured continued expansion in the area. The town of Clyde, situated between the Tidal and Inland Areas of the CNWS, was a product of this boom and was established to provide much needed support businesses and residences. Even with the abandonment of the production facilities at the close of the War, the surrounding towns remained populated throughout the 1920s and 1930s.[12]

The Inland Area also features a canal system built just prior to World War II. The Contra Costa Canal (with its subsidiary, the Clayton Canal) is a component of the United States Bureau of Reclamation's (USBR) Central Valley Project, the massive and innovative water project implemented to address the need for fresh water distribution for industrial, agricultural and residential use throughout California. Government interest in comprehensive development of California's irrigable land began in the 1870s, focusing on the Central Valley area and investigating potential systems of irrigations of the fertile Central Valley. With the increased demand from agricultural, industrial and growing metropolitan areas over the next several decades, the need for a systematic, comprehensive approach to resolving the now severe California water shortage problems resulted in the development and implementation of the Central Valley Water Project in the 1930s. A series of studies undertaken by California's State Engineer Edward Hyatt between 1927 and 1931 resulted in the plan released in 1931. It called for a system of canals and reservoirs and transfer systems throughout the state forming storage and distribution systems for the state water resources. Although California voters approved by initiative the Central Valley portion of the comprehensive system in 1933, construction was delayed because the state was unable to market bonds during the economic depression. The state turned to the federal government for aid and secured

[11] Self, "Cultural Resources Overview," 8.
[12] Self, "Cultural Resources Overview," 9.

federal funding by promoting the project as a major jobs creation effort under the New Deal program implemented by President Franklin D. Roosevelt.

Construction of the Central Valley Project (CVP) began in 1935 as a federal reclamation project, ensuring that the USBR would be the constructing agency and that the system would remain in federal ownership for the foreseeable future. The plan was composed of five units operating as an integrated system. They were the Shasta Dam, the Delta-Mendota Canal, the Friant Dam, the Friant-Kern Canal and the Contra Costa Canal. The Shasta Dam and the Delta-Mendota Canal operated together to store and deliver Sacramento River water as far south as Fresno County. The Friant Dam and the Friant Kern Canal also operated together to store San Joaquin River water to the southern extremes of the Central Valley. The Contra Costa Canal, the least integrated and smallest of the initial units, was designed to deliver water to farms, industries and homes in the Sacramento-San Joaquin Delta and northern Contra Costa County. The major initial units were finished in the early 1950s. In subsequent decades, the USBR has greatly expanded the system, adding or absorbing reservoirs, canals, pipelines, pumping plants, and other units. Since the 1970s, the State of California's State Water Project has been operated in conjunction with the CVP, the state project drawing from the same Delta pool as the CVP and the stored water mingling in the Sacramento River flows.[13]

Construction on the 46-mile long Contra Costa Canal began in November of 1937. The original objective of the canal was to provide water for industries threatened by salinity intrusions into Suisun Bay. Agricultural demand during the previous decades had lowered levels of both the Sacramento and San Joaquin Rivers causing the salt waters from the San Francisco Bays to encroach further up into the Carquinez Straits. The canal drew upon the "Contra Costa County Conduit" concept promoted by these influential companies and supported by the State Water Plan Authority. The USBR opened an office in Antioch in 1936 to begin surveys of the proposed route. Over the next two years design studies gradually settled on a canal design capable of carrying 350 cubic feet per second (cfs); while this was above the USBR's original design, the Contra Costa Water District agreed to pay an extra $500,000 to expand the canal.[14] Construction was underway in 1938, even before the canal's final capacity had been set. By 1940 the facility had reached

[13] JRP Historical Consulting Services and California Department of Transportation, *Water Conveyance systems in California: Historic Context Development and Evaluation Procedures*, December 2000, passim; Norris Hundley, *The Great Thirst: Californians and Water, 1770s-1990s* (Berkeley: University of California Press, 1992), 243; Erwin Cooper, *Aqueduct Empire: A Guide to Water in California, Its Turbulent History and Management Today* (Glendale, CA: Arthur H. Clark Company, 1968.), *1770s-1990s* (Berkeley: University of California Press, 1992), 243; Erwin Cooper, *Aqueduct Empire: A Guide to Water in California, Its Turbulent History and Management Today* (Glendale, CA: Arthur H. Clark Company, 1968.)

[14] The Contra Costa County Board of Supervisors approved the organization of an agency to manage the distribution of water from this canal, the Contra Costa County Water District [CCCWD], in 1936.

Pittsburg, and test pumping began in July of that year; construction was completed in 1948.[15] According to the USBR, the purpose of the Contra Costa Canal within the CVP was to deliver water to "... an upland agricultural area, many industrial plants in the upper Bay region, and a number of Contra Costa County municipalities." Contra Costa County Water District purchases water from the USBR and sells it to local retailers as it has since the first "interim contract" with the Bureau between 1948 and 1951, and by a finalized agreement since that date.[16]

During the construction of the Contra Costa Canal smaller branches were built from the main canal to service more specific areas. The Clayton Canal was built between 1947 and 1948 and begins within the Concord Naval Weapons Station, approximately .38 miles south of where Willow Pass Road runs under State Route 4. The Clayton Canal, while no longer in use, is approximately 4.8 miles long and at one time carried 38 cfs. It is approximately 2.2 feet deep, 4 feet wide at the base and the width at the crest varies from 15' to 25'.

Both canals run through Concord Naval Weapons Station and have a series of bridges and culverts which facilitate crossing the roadways and railroad crossings over those canals. The designs that the USBR and the Navy used to build the original bridges over the Contra Costa Canal within the station were common for their type and method of construction when they were built in the 1930s and 1940s. Reinforced concrete had been increasingly used for bridges in California since the 1910s. Construction of concrete structures with embedded reinforcing steel rods, first invented for building construction in warehouses, for example, had proved to be an extremely effective means of compensating for concrete's natural tensile weakness. Reinforced concrete greatly benefited bridge construction, which required increasingly higher load capacities as motor vehicle use increased during the early twentieth century. By the 1930s, reinforced concrete bridges accounted for a majority of new bridges that the Division of Highways, local agencies, and federal agencies constructed in California.

Reinforced concrete bridges were built in the form of arches, slabs, tee-beams, and girders. Slabs are rigid monolithic horizontal elements on which the roadway directly sits. Concrete tee-beams (or T-beams) are concrete girders that have a "T" shape in section, where the top of the girder helps form the road surface. Concrete girders are horizontal members situated beneath a bridge's deck, supported on either end and/or in the middle. They carry stresses and loads in much the same way that steel girders do.

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[15] W. Turrentine Jackson and Alan Paterson, *The Sacramento-San Joaquin Delta: Evolution and Implementation of Water Policy, An Historical Perspective* (Davis: California Water Resources Center, University of California, 1977), 37-40; Teknekron, Inc., "An Overview of the Contra Costa Water District" (November 1977), 8.

[16] Jackson and Paterson, *Sacramento-San Joaquin Delta*, 37-40; USBR, "Technical Record of Design and Construction: Delta-Mendota Canal" (Denver, 1959), 2; Teknekron, "Contra Costa Co. Water District," 8.

One major variation of the concrete girder is the concrete box girder, first built in the 1930s, where horizontal supports are enclosed at the bottom and top to form a hollow space in the middle as viewed in section. Most reinforced concrete was built during the first half of the twentieth century using the cast-in-place method, where liquid concrete was poured into wooden forms built at the bridge's location. Pre-cast methods were developed during the mid-twentieth century, where reinforced concrete could be poured elsewhere and moved into place after it was set. Structurally, girders and slabs can be simple spans or continuous spans. Simple spans are supported on either end. Continuous concrete spans are generally longer than simple spans and are supported in more than two locations. Continuous concrete provides more rigidity in bridge designs and could be used for quick construction as well as in wider spans.[17]

Reinforced concrete tee-beam bridges are among the most abundant type of existing bridge in California built during the 1930s. Tee-beam bridges were inexpensive to build and had low maintenance costs. They were generally used for spans shorter than 80 feet and required form work that was only a little more complex than that for slabs. Concrete slabs were also inexpensive to construct and maintain. They were also the simplest types of spans to erect and were commonly used as approach spans on tee-beam structures.[18]

Both the Contra Costa and Clayton Canals in the study area are crossed by bridges and are carried under roadways and railspurs by culverts. (see the attached DPR523 form for photographs and locations of the bridges and culverts surveyed) From the 13 bridges which were evaluated in this report, four were built to carry farm vehicles only. These 'farm bridges' are constructed mainly out of timber. The remaining nine bridges were constructed with concrete and steel, and were meant to carry either heavy duty military vehicles or rail road cars. All are standard plan bridges, erected by the USBR or the Navy.

While the booms and busts of coal, copper, timber, and military mandates did much to shape the area, it was not until the opening days of World War II that the foundations of CNWS took form. With the bombing of Pearl Harbor, American military officials and political leaders oversaw an unprecedented expansion of America's military facilities as

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[17] Carl W. Condit, *American Building: Materials and Techniques from the Beginning of the Colonial Settlements to the Present*, 2nd Ed. (Chicago: University of Chicago Press, 1982), 258; Carl W. Condit, *American Building Art: The 20th Century*, (New York: Oxford University Press, 1961), 99-100, 208.

[18] Assessment of bridge types on a state-wide basis is from analysis of the Caltrans Historic Bridge Inventory database that Caltrans provided to JRP for its use in the Caltrans state-wide historic bridge inventory update conducted between 2002 and 2004. This database includes data collected from the Caltrans bridge logs that are available online at: http://www.dot.ca.gov/hq/structur/strmaint/. Assessment of relative construction and maintenance costs of various bridge types can be found in: Department of Public Works, Division of Highways Bridge Department, *Bridge Planning and Design Manual*, Vol. 2, 1955-1966, (revised January 1961).

they sought to transform outdated and inadequate military installations into a functioning modern wartime machine.

2.2. World War II Era at Concord Naval Weapons Station: 1942-1945

The Navy established Naval Magazine Port Chicago (NMPC), now CNWS, in February 1942, naming it after the adjacent town. The facility was the first new naval depot designed to specialize in ammunition transshipment for use in overseas combat. It was planned as a permanent addition to the Navy's shore establishment, rather than simply a temporary wartime facility. NMPC received ammunition manufactured and tested at the remote inland naval ammunition depot at Hawthorne, Nevada. Initially, the facility was responsible for some assembly and quality control, but served mostly as an ordnance storage, maintenance and loading point for the growing Pacific Fleet.[19]

NMPC was established as a subordinate command to the sole existing ammunition transshipment point for the 12th Naval District, the depot at Mare Island. Upon opening, the station boundaries encompassed 640 acres of tidal-land on the south side of Suisun Bay, approximately midway between Martinez and Pittsburg. By November 1942 the original facilities were in place, including an ammunition pier, a barge pier, barricaded railroad sidings, storage buildings, housing for officers and enlisted men, guard buildings, a commissary, and an administrative building.

Throughout the years of 1944 and 1945 the facility expanded to the Inland Area, where numerous barricaded sidings, magazines, storehouses, and auxiliary buildings to accommodate military personnel were constructed. During this period, the Navy also added to the size of the Tidal Area by condemning roughly 600 acres for the construction of a recreational building, bachelor officers' quarters (BOQ) and additional barracks and mess facilities.

Shortly after completion of this second phase of growth, the station suffered the largest domestic war-related loss of life during World War II, when a massive explosion occurred on the Piers of the Tidal Area. On July 17, 1944, while sailors were loading ammunition onto waiting vessels, two explosions completely destroyed Pier #1, sinking two docked ships, and killing 320 military personnel, primarily African American stevedores and longshoremen. An additional 390 civilians and military personnel were

[19] Coletta, *Navy and Marine Corps Bases, Domestic*, 148-149; US Bureau of Yards and Docks, *Building the Navy's Bases in World War II* (Washington, D.C.: GPO, 1947), 323, 343-345. Hawthorne had expanded aggressively during the war to keep up with ammunitions demand, adding 147 high-explosives magazines in March 1942, another 230 in May, and over 600 more in October. The Hawthorne ordnance was all shipped by train to Port Chicago until 1944 when the Fallbrook depot was established to serve the San Diego and San Pedro areas as well (*Building the Navy's Bases*, 332, 336).

injured.[20] In the weeks following the explosion, many of the surviving ammunition loaders refused to load waiting ships, leading to the infamous "Port Chicago Mutiny" that resulted in the court martial, conviction and imprisonment of 50 enlisted men.[21]

Despite the controversy, the Navy worked quickly to bring the facility back into service and by the closing months of 1944 six deep-water berths along a new ammunition pier, Pier #2, were ready to receive ships. Another pier, Pier #3, soon followed. By 1945, NMPC also included active facilities in the Inland Area, including 75 high-explosive magazines located in the hills, a group of 93 gun-ammunition magazines on the flat land, and 30 barricaded sidings built along sidings fanning out amidst the hills. Like the Tidal Area, the Inland Area was conceived of as a permanent facility. [22] The new piers, new construction and expanded storage areas soon enabled the base to take over the functions of the old Mare Island ammunition depot.

As early as 1943, the Bureau of Ordnance began to study options for improving the quality control of ammunition. The bureau's wartime experience with mass-produced ammunition and items in long-term storage under variable conditions proved the necessity for continuous inspection of the quality and stability of ordnance. Furthermore, technological advances were producing increasingly advanced weapons systems with many components that required new levels of inspection and monitoring. Bureau investigators concluded that specialized scientific sampling was required and, in the closing months of World War II, authorized the construction of a quality control laboratory at the station. The Quality Evaluation Laboratory (QEL) was completed in 1945, along with a smoke drum warehouse. The QEL complex continued to grow throughout the station's history, as the weapons advances of the Cold War required continuously updated inspection and monitoring capabilities (the complex became known as the WQEC).

At the close of World War II, the Bureau of Ordnance reported that NMPC "had become the principal ammunition loading port and storage point for ammunition and high explosives on the Pacific Coast." The bureau also noted that the station was unusual in the diversity of ordnance it handled. While other stations loaded greater quantities of

[20] Bureau of Ordnance as cited in William Self, et al., "Cultural Resources Overview Naval Weapons Station Concord, Contra Costa County California," Contract No. N62474-92-M-3638 (August 1993), 11-13; *Building the Navy's Bases*, 336, 344. There are several published treatments of the Port Chicago explosion and subsequent events, including Robert Allen's *The Port Chicago Mutiny* (New York: Warner Books, 1989).

[21] Allen, *The Port Chicago Mutiny*.

[22] *Building the Navy's Bases*, 344.

ammunition, few were capable of handling as many distinct types of ammunition.[23] The primacy of NMPC's role in supplying the Pacific Fleet throughout Word War II assured the station a continued strategic place in the years following the War. Despite some diminishments of scale, for example the installation of only 55 sidings for rail cars rather than the originally slated 550, the facility remained a powerful and fully functioning station as the United States entered a new political and militaristic era: the protracted and far-flung Cold War.[24]

2.3. Cold War Era at Concord Naval Weapons Station: 1946-1989

On the morning of July 16, 1945, in the isolated desert of New Mexico, the United States detonated the world's first atomic bomb. Less than one month later, US Army Air Corps B-29s flying over Japan released nuclear bombs over Hiroshima and Nagasaki, obliterating both cities. The atomic age had arrived, ushering in both unprecedented military technological abilities, and equally unprecedented international insecurities.[25] In the following decades, the possession of nuclear weapons capable of immediate international delivery became the hallmark of national might and more than any other single factor demarcated the "superpowers" of the world. This framework increasingly pitted the United States against the Soviet Union in a series of direct diplomatic confrontations and scattered ideological proxy wars.

Although nuclear capabilities defined the terms of the Cold War, the hot-spots of the conflict required massive amounts of strategic preparation and a wide variety of materiel. War in Korea, Vietnam, and Afghanistan, as well as conflicts in other locales, required a steady stream of weapons and munitions. Facilities like NMPC, proven operable and efficient through the expansions of World War II, held much of the responsibility of transporting, storing, and delivering these military supplies to the fleet.

By 1946, NMPC had become the principal loading and storage point for ammunition and high explosives on the West Coast. Further, it existed as the Navy's sole high explosives loading facility on the west coast that was located in a relatively remote area. The depots at Mare Island, Puget Sound, and San Diego were all situated in close proximity to densely populated areas and thus faced greater political and social pressures and expansion challenges. In recognition of this strategic role, the Navy designated the

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[23] Coletta, *Navy and Marine Corps Bases, Domestic*, 148-149; U.S. House of Representatives, *Port Chicago National Memorial Act of 1992*, 102d Cong., 2d sess., 1992, H. Rpt. 102-608, 1-2.

[24] *Building the Navy's Bases*, 344.

[25] For a more detailed historical context of the Cold War era please refer to JRP's 1998, "Inventory and Evaluation of National Register Eligibility of Cold War Era and Selected Other Buildings and Structures, Naval Weapons Support Facility," which this update summarizes.

station as its own distinct command, separate from the Mare Island depot. Although it would be twenty years until the Navy successfully annexed the town of Port Chicago and increased the buffer zone, Navy officials recognized early on the pivotal role that the relatively isolated NMPC could play in the orchestration of the Cold War.

This role was demonstrated in the Korean War of 1950-1953, with NMPC handling 75 percent of all ammunition sent to US forces in the Korean Peninsula.[26] Following the Korean War, the government held several hearings bolstering the strategic position of NMPC. In 1955, the House Armed Forces Sub-Committee held hearings "on the proposed acquisition of additional land to be used as a safety barrier" around the magazine installation. A short time later, the Navy Department authorized a general review of the feasibility of several West Coast sites as alternatives for a naval magazine installation. An engineering firm, Arthur D. Little, Inc., conducted the survey of sites and concluded that retaining the existing Port Chicago facility remained the most economical and safe alternative.[27]

Port Chicago's preeminence as the West Coast's most strategically situated ammunition terminal led to further reorganization when the Secretary of the Navy approved a consolidation of the Port Chicago and Mare Island facilities on December 16, 1957. The Port Chicago installation became the Naval Ammunition Depot Concord (NAD, Concord), replacing NAD, Mare Island, which was in turn reclassified as the Mare Island Annex. In 1958, NAD, Concord also took over operational control of the deactivated Naval Net Depot, Tiburon (NND, Tiburon). Closed immediately after World War II, the Tiburon station had briefly been reactivated during the Korean War, only to be deactivated again prior to falling under Concord's command.[28]

NAD, Concord's ascendancy to independent command was accompanied by technological advancements in the weapons QEL. In 1957, Naval officials dedicated a

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[26] *Building the Navy's Bases*, 330-331.

[27] *Trans-shipper* (September 9, 1955), 1; *Trans-shipper* (April 5, 1957), 1. Copies of the *Trans-shipper* were obtained in Building IA1 at CNWS.

[28] Tiburon had been a naval installation since 1904 when it began serving as a fueling (coal) station. The Navy began to convert to oil-powered ships in the 1920s and by 1931 the Navy Coaling Station, Tiburon was considered obsolete and was closed. Although no longer utilized as a refueling point, the predecessor of the California Maritime Academy used the site in conjunction with its training activities from 1931 until the advent of the Second World War. The Navy commissioned the Tiburon Naval Net Depot on August 1, 1940 for the manufacture of nets and booms, and for training sailors in handling this equipment. The Tiburon facility's most famous contribution was the 6,000 ton, "seven-mile net installed across the entrance to San Francisco Bay stretching from Sausalito to the San Francisco Marina." The closing process at NND Tiburon took several years, as its supplies and stores were distributed to other naval shore establishments. *Trans-Shipper* (June 28, 1957); *Trans-Shipper* (January 10, 1958), 2; Coletta, *Navy and Marine Corps Bases, Domestic*, 148, 632-633; *Trans-Shipper* (April 19, 1963), 1-2; *Trans-shipper* (November 20, 1964), 2.

two million volt x-ray unit. The equipment represented the first major radiographic installation west of Washington, D.C., and allowed the station to perform previously impossible nondestructive inspection and evaluation tasks on a growing array of military armaments.[29] This growing array increasingly consisted of missile technologies. In April 1959, NAD, Concord was selected to perform service and repairs on several types of guided missiles. The new assignment required the construction of two substantial new structures: an inert weapons storage and test facility, as well as a warhead installation and test area (for a more detailed description of these facilities, see Chapter 3 and DPR523 forms for Buildings 81, 87, 93 and 97).[30]

In July 1963, NAD, Concord was again re-designated, this time with its current identification of United States Naval Weapons Station Concord (CNWS). Captain W. L. Savidge, Commanding Officer at Concord, announced that the change was a long overdue recognition of the importance of the "expansion of the Station's missions with the advent of space age weaponry."[31] Concord had requested the change as early as 1959 to reflect the shift from conventional ordnance to the more sophisticated missiles and weapons handled at the facility. The station participated in several Department of Defense programs, such as the Polaris Fleet Ballistic Missile Program, Air-launched Missile Programs, and the Special Weapons Program. The installation also boasted an Advanced Weapons Division and a Guided Missile Facility. The re-designation was further justified by the fact that "over 95% of the ammunition supplied to all the services in the Pacific area [was] shipped by the station" by 1963.[32] With primacy in both standard ordnance distribution and increasingly technologically advanced capabilities, the activities of CNWS responded to the spectrum of twentieth century military requirements.

In addition to loading and unloading ships docked at the depot's own piers, CNWS personnel assisted in re-arming ships berthed at other Bay Area locations, including Naval Air Station Alameda and the Mare Island Annex. The complexity of CNWS's activities led to the use of some of the earliest computer technology, in the form of IBM Model 026 card punch machines, to assist with the tracking and recording of the wealth of material flowing to and from the facility.[33]

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[29] *Trans-Shipper* (February 25, 1957), 3, *Trans-Shipper* (February 6, 1959),*Trans-Shipper* (June 9, 1961), 3-6.

[30] *Trans-Shipper* (April 17, 1959), 1.

[31] *Trans-Shipper* (July 12, 1963), 1.

[32] *Trans-Shipper* (July 12, 1963), 1.

[33] *Trans-Shipper* (February 6, 1959); *Trans-Shipper* (May 15, 1959), 2; *Trans-Shipper* (June 17, 1960), 2; *Trans-Shipper* (July 21, 1961), 3; *Trans-Shipper* (December 13, 1963).

With escalating tensions emerging from Vietnam, the station once again emerged as a pivotal West Coast hub capable of supplying an expanded fleet in the Pacific. Throughout the Vietnam era (1963-1975), CNWS remained the principal port for the transshipment of ordnance, and other supplies, to US troops in all branches of the military serving in Southeast Asia. Deliveries often included mail, water, and personnel transfers.[34] With the strain of the Vietnam War pressing CNWS to full capacity, however, the Navy expanded the station's capabilities, increasing the number of CNWS home-ported ships from nine to eleven in September 1965. Transshipment methods began to change on shore as well and in late 1963 and early 1964 loading activities at Concord increasingly consisted of truck-to-ship transfers rather than the traditionally predominant rail shipment. Effecting this change was the fact that much materiel was coming from inland depots not served by rail lines. Additionally, as increased competition between rail and truck service brought down the cost of truck transport, the efficiency of truck to ship transport became increasingly attractive.[35] This trend continued throughout the following decades.

As the fighting in Vietnam intensified, increasing amounts of ordnance passed through CNWS. In support of the war, the station processed as much as 100,000 tons of munitions each month.[36] This increase may have given the Navy the leverage it needed to annex the town of Port Chicago, a development the Navy had sought almost since the original founding of NMPC. Citing concern for the civilian population in the event of an explosion similar to that during World War II, the Navy succeeded in condemning the town of Port Chicago as part of its program to provide a buffer zone around the depot. The following year, with the inhabitants relocated, the Navy razed nearly all of the buildings and structures in the town.[37]

Despite the increased buffer zone afforded by the condemnation of Port Chicago, the CNWS did not escape increasing citizen scrutiny as protests of America's involvement in Vietnam gained momentum throughout the mid-to-late 1960s. As a pivotal participant in the orchestration of the war, Concord became a target for antiwar demonstrations, some of which drew national attention.[38] Responding to these protests, the Concord City Council issued a resolution in August 1966 setting forth a conflicted position regarding demonstrations at the weapons station. While the council did recognize the right of

[34] *Trans-shipper* (February 11, 1966), 1, 4; *Trans-shipper* (December 10, 1965), 1, 3.

[35] *Trans-shipper* (January 31, 1964), 3.

[36] Allen, *The Port Chicago Mutiny*, 146.

[37] Self, "Cultural Resources Overview, NWSC," table 1; Scrapbook of material related to Port Chicago, Nichols and Clyde, California, compiled by George C. Collier, n.d., Bancroft Library (BANC MSS 70/126 c).

[38] Robert Kelley, *The Shaping of the American Past* (Englewood Cliffs, NJ: Prentice-Hall, Inc., 1975), 962-963; Allen, 146.

citizens to protest, its members questioned the relevance of protests by people from outside the local area and worried that the protests would obstruct crucial operations at CNWS, thus endangering American soldiers in Vietnam.[39]

Despite the social upheaval wrought by divisive views of America's participation in the Vietnam War, CNWS continued to welcome visitors to its open house festivities on the annually celebrated Armed Forces Day. The Frogman and Marine assault demonstrations, as well as facility and ship tours and station train rides continued to be popular activities where civilians and Navy personnel intermingled within the newly expanded boundaries of CNWS.[40]

Evidenced by the "Vietnamization" espoused by Richard Nixon in the tumultuous 1968 United States presidential election, in the closing years of the 1960s American military commanders, politicians, and citizens increasingly advocated for the reduction of American troops from the perceived quagmire of Vietnam. The withdrawal of American troops in 1973, accompanied by the subsequent Watergate scandal, represented the ideological strains facing America's continued role in the Cold War. The morale of the military, its budget consumed by the war and image tarnished by widespread domestic protest, dropped to an all time low. Systems that should have been replaced were extended well past their intended life and research and development of new systems stagnated.[41]

Although the United States military continued to rebuff Soviet advances, including those in Afghanistan, the 1970s saw a marked deterioration of American dominance in the Cold War. While the two countries engaged in ongoing diplomatic negotiations, the underlying anxieties driving the Cold War remained. In November 1980, however, Ronald Reagan was elected president on the campaign promise that he would rebuild the American military forces and strengthen America's international military might. By the late 1980s, under a massive peacetime military expansion, the United States had acquired an entire arsenal of new or improved weapons systems. Throughout these latter years of the Cold War, CNWS remained focused upon its role as an ammunition transshipment point, quality control facility, and intermediate missile maintenance and assembly plant. The station included three ammunition piers, about 200 ammunition magazines and more than 150 buildings by this time, and infrastructure included 75 miles of paved roads and over 100 miles of railroad track. [42]

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[39] *Trans-shipper* (September 2, 1966), 1.

[40] *Trans-shipper* (May 1, 1964), 1.

[41] J.M. Thompson, "From Strategic Defense to Deterrence: The Evolution of Soviet Nuclear Strategy Since 1962," *Transformation in Russian and Soviet Military History* (U.S. Air Force Academy, October 1986).

[42] *Naval Weapons Station Concord*, 8.

During this expansion, CNWS increasingly became a target for those protesting the United State's resumed military build-up and involvement in area such as Central America. In 1980, investigative reporter Stephen Talbot aired an award-winning documentary film, *Broken Arrow*, on public television, the subject of which was Talbot's claim that the station "had become a nuclear weapons storage and transshipment facility." Talbot presented evidence demonstrating that nuclear weapons were routinely flown between CNWS and Alameda Naval Air Station, endangering the densely populated Bay Area. In the fall of 1987, the last widely-covered protest of the Cold War took place at CNWS. Beginning in June, activists began demonstrating in front of the station protesting the shipment of arms to US-backed counter-revolutionaries in El Salvador and Nicaragua. The demonstrations lasted through the summer resulting in nearly 250 arrests. The situation came to a head in September, when, in attempt to stop the movement of ordnance around the station, protestor Brian Willson lay down on the tracks in front of a moving Navy train. The train ran over Willson, severing both his legs at the knees. Although the story received national attention, the incident, and protests in general, did not fundamentally alter the operations of the station.[43]

While domestic protest failed to affect operations at CNWS, the fading of the Cold War fundamentally undercut the station's military mission. The pivotal events that marked the end of the Cold War occurred in rapid succession, and largely without the retinue of armaments so long considered crucial to Cold War dominance. In 1988, the Soviets agreed to withdraw from Afghanistan. In 1989, free elections were held in Poland, Hungary, East Germany, and Czechoslovakia, leading to the replacement of the Soviet controlled communist governments. Earlier the same year, one of the most potent symbols of the Cold War era, the Berlin Wall, was torn down and the city reunited. Although the Soviet Union did not officially dissolve until 1991, the decades long overarching struggle between the world's superpowers had ended.

As a direct result of the end of the Cold War in 1989 and the subsequent cessation of the military's strong demands for personnel and materiel, the station saw a reduction in workforce and volume of ordnance shipped and stored. The station's value to the Navy, however, was still acknowledged and CNWS survived multiple rounds of BRAC determinations that shuttered many facilities across the United States. In November 2005, however, CNWS was recommended for partial closure and realignment. The final BRAC determination will result in the closure of the Inland Area in the end of 2008. The City of Concord has been designated by the Navy as the Local Reuse Authority (LRA) for the area.

[43] Allen, *The Port Chicago Mutiny*, 147-148.

3

PROPERTY TYPES

Defined by the Secretary of the Interior's Standards, the term "property type" refers to "a grouping of individual properties based upon shared physical or associative characteristics."[44] Property types can emerge from shared methods and styles of construction, shared function, or shared association with historical events. Developing cohesive property types requires a thorough evaluation of the historic context surrounding the resources. Establishing property types links the theoretical historical ideas developed in a historic context to the buildings in a study area. By linking historic themes to buildings and structures, property types can be evaluated for significance.[45]

Using the foundation provided by the historic context developed in the previous chapter, this chapter seeks to convey the distinct property types that characterize CNWS. The section will follow the same chronological framework employed in the historic context. After a brief examination of property types from the pre-Navy era, this section will present discussion of World War II era and Cold War era property types. These property types from the World War II era and the Cold War era are bound by a singular historical theme arising from the station's central role in the transshipment of ordnance for the Pacific fleet throughout the major military campaigns of the twentieth century. It is important to note that while these property types were shaped by the historical development of CNWS, they are no longer reflective of current use because the facility has been inactive since 1999.

The resources inventoried and evaluated for this report are primarily buildings or structures with Naval Facility Identification numbers built between 1944 and 1989. A small number of resources, including pre-navy property types as well as Navy era property types, do not hold an identification number and are presented solely by identifying name. All of the property types addressed in this chapter have been developed and studied in the Self and JRP reports. For the purposes of this update, each of the property types is briefly outlined, examined, and described. For more in-depth

[44] Department of the Interior: "Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines," *Federal Register*, Vol. 44, No. 190 (September 22, 1983; October 1995 release).

[45] For more information on property types relating to historic military buildings and structures see JRP Historical Consulting Services three volume "California Historic Military Buildings and Structures Inventory," prepared for the U.S. Army Corp of Engineers in 2000. Of particular interest is "Volume III: Historic Context: Themes, Property Types, and Registration Requirements."

analysis of these property types and their construction please refer to JRP's 1998 "Inventory and Evaluation of National Register Eligibility of Cold War Era and Selected Other Buildings and Structures, Naval Weapons Support Facility," and Self's 1993 "Cultural Resources Overview, Naval Weapons Station Concord, Contra Costa County, California."

3.1. Site Plan and General Character of Construction of the Inland Area

As discussed in the historic context, the basic layout and function of CNWS was determined by the establishment of the Navy's ordnance transshipment operations during World War II. The initial acquisition of the Tidal Area and subsequent expansion into the Inland Area established CNWS's role as one of the preeminent naval transshipment facilities of the West. Despite continuous expansion and construction that increased the physical size and building stock of the facility, the basic relationship of the Inland Area with the shipping facilities of the Tidal Area remained the same.[46] Connected by internal naval railroad and roadways, the Inland Area provided storage, materiel, and institutional infrastructure for the piers and fleet of the Tidal Area.

World War II construction established the station's rail system, road network, barricaded sidings, various magazine complexes, and the initial construction of the laboratory facility that would become the WQEC (QEL). During this period the Navy also installed officers' and enlisted men's housing, recreational facilities, administrative buildings, and a Naval hospital. Hundreds of buildings and structures built subsequently in the Cold War era fell within these basic building types: magazines, ordnance handling buildings and structures; public works and support buildings; morale and recreational buildings; residential buildings; and administrative buildings. Even as changing mandates of the Cold War called for new construction and design that addressed advances in weapons technology, the basic framework surrounding the property types of the Inland Area of CNWS was established during the World War II period with the development of the facility's central mission of ordnance transshipment.

Almost all of the buildings and structures surveyed in this update report are no longer in use by the Navy. Because the Inland Area has been approved for closure under BRAC, all materiel and most personnel are no longer located or stationed within the facility. At the time of the last surveys in 1993 and in 1998, the buildings and structures were still in active use. This discussion of property types, therefore, assesses buildings and structures by original use and intended function rather than contemporary function. In addition, while the property type discussion notes substantial changes to the property since the last

[46] *Building the Navy's Bases*, 343-345.

recordation, insignificant changes such as minor deterioration, spalling, and foliage overgrowth should be assumed to exist on all properties.

3.2. General Discussion of Property Types Found in Inland Area

The characteristic property types of CNWS generally fall into nine distinct categories.

- Assorted Pre-Naval Buildings and Structures
- Magazines
- Ordnance Handling Buildings and Structures
- Public Works and Support Buildings and Networks
- Morale/Recreational Buildings
- Monuments
- Administrative Buildings
- Residential Buildings
- Hospital Buildings

The pre-Naval buildings and structures are not representative of military themes at CNWS and are remnants from earlier uses on the property. Few resources of this type remain, and this update surveys the three located in the Inland Area: a stone cistern, an adit, pre-Naval rail systems, and the US Bureau of Reclamation's Contra Costa Canal and its subsidiary, the Clayton Canal. Section 2.1. details the historic context surrounding these varied resources, as do the DPR 523 forms and Update forms in Appendix B.

Magazines represent both the most central and most plentiful property type at CNWS. As a station devoted to the transshipment of a variety of ordnance during both the World War II and Cold War era, CNWS was defined by an integrated system of ordnance and materiel storage and conveyance systems. This network grew throughout the World War II and Cold War eras and remained the most mission related property type at CNWS. Magazines and ordnance handling buildings were generally built according to standardized plans and designed for rapid and inexpensive production. While built for rapid development, however, they were required to be durable and—importantly—to provide blast protection. Relative to other Naval construction, magazines and ordnance handling buildings and structures are the most standardized property type. Similar magazines to those at CNWS can be found across the country, and in California at Fallbrook Ammunition Depot and Navy Depot Seal Beach.

Because of the standardization and ubiquity of magazines on both Naval stations and other branches of the military, the Advisory Council on Historic Preservation has provided a "Program Comment for World War II and Cold War Era (1939-1974)

Ammunition Storage Facilities." The Program Comment addresses all buildings and structures that were designed and built as ammunition storage facilities that are either listed in or eligible for listing in the National Register of Historic Places. The Program Comment requires that the Navy develop a supplemental context that will be attached as an appendix to the Army's existing context study, "Army Ammunition and Explosives Storage in the United States, 1775-1945." In addition the Navy is required to document a representative sample of the basic types of aboveground and underground ammunition storage facilities. The buildings and structures that are addressed by this Program Comment are listed in Table 2 in Appendix A.

Related to magazines, and often physically intermingled, are an array of ordnance handling buildings and structures. This property type includes railroad barricaded sidings, a Weapons Quality Evaluation Center (WQEC), weapons maintenance buildings, and weapons assembly buildings. Because CNWS was primarily engaged in ordnance transshipment rather than RDT&E efforts, these buildings and structures primarily served as logistical support buildings for the dominant ordnance storage and shipment functions of CNWS. The majority of representatives of this property type are from the Cold War era, although some weapons storage and handling buildings were developed in the World War II era. The buildings are of standardized plans, and many are part of complexes that include other ancillary support structures such as storage sheds, boiler houses, and ready buildings.

The public works and support building property type is composed of a variety of basic support buildings and networks that include the vehicular roadways, Naval railroads, maintenance buildings, routine storage sheds, a firehouse, and various utility facilities. In contrast to the mission related functions of magazines and ordnance handling facilities, this property type is best considered an everyday support network for the station. The property type is filled with various building styles and functions, from prefabricated warehouse, portable trailers, and concrete block buildings.

Morale/recreational buildings and structures served as key personnel support facilities for a variety of social and physical functions. Like the public works property type, they have an indirect association with the mission functions of CNWS but nevertheless were key in providing for the basic day-to-day well-being of personnel. CNWS held a variety of representatives of this property type, from racquetball courts to a firing range, a chapel, and a social club.

A variety of simple monuments were situated across the Inland Area, almost entirely in the administrative area. Built between 1945 and 1983, the property type consists of simple ceremonial markers, signs, a parade ground, flagpoles, and ceremonial weapons

displays. Most of the monuments have been removed and were no longer present at the time of update evaluation.

The administrative building property type provided a variety of levels of logistical and personnel support for operations across the station. With one central administration building (IA1), and several supplementary administration buildings for specific activities, the property type offered indirect mission support. Like the public works property type and the morale/recreational property type, the form of the buildings vary, from more substantial concrete buildings filled with offices, to smaller facilities designed to interact with specific portions of the station.

Although the residential property type played an integral role at CNWS, most areas of residential housing are in ceded areas that are not part of the current study area (see Figure 1.3). The housing stock varied at CNWS, from single family homes that predated naval occupation (not in study area) to barracks, and Bachelor Enlisted Quarters (BEQ). Residential components of Naval stations are common and have divergent architectural styles, however they all serve to accommodate a basic need for station sufficiency and do not have a direct mission association.

The basic health care functions addressed by the hospital property type present a similar indirect association with the mission of CNWS. As a largely self-sufficient locale, the station sought to develop all of the necessary personnel related functions including medical care. The only representative of this property type is in the administrative area of the Inland area.

3.3. Pre-Navy Property Types: pre-1942

3.3.1. Stone Cistern

Located in the southwest corner of Section 27, T2N/R1W, MDBM, in the 4AT Magazine area north of R Street, the stone cistern is likely one of the oldest structures in the Inland Area. The cistern has been documented on two DPR 523 forms, first by William Self Associates in 1993, and subsequently by John A. Keibel for the Concord Historical Society in 2001. While the two evaluations concur that the cistern was built for the Gehringer–Bollman family, who operated a large ranch surrounding the property from 1863 until Naval acquisition, they convey differing construction histories. The Self study found that the cistern was constructed in the late 19th century, while the Keibel study asserted that the structure dated from 1932-1935. Although a structure appears on the location as early as 1896, the present cistern could be constructed on the site of an older

structure.[47] Although Keibel's work does not cite the source of his information, it appears that it was derived from oral history sources. Research undertaken in this update could not confirm the dates stated in either account.

The structure of the cistern is rectangular in plan and of the approximate dimensions of 25' x 42'. The walls are of uncoursed uncut stone masonry that appears to have been quarried from a nearby hillside. Exterior masonry buttresses, two on the long elevations and one on each narrow elevation, support the walls. The interior of the cistern holds a metal tank to store water. The building is covered by a wood frame gable roof, covered in corrugated metal and partially damaged by fire. The water source for the cistern appears to be a spring located about 150 feet downhill and east of the structure where there is a deteriorated windmill. The cistern was once part of an expansive ranch complex that included numerous outbuildings, a residential house, and a dairy. The cistern is the lone remnant reflecting the ranching history that once dominated the lands that now comprise the Inland Area of CNWS, and is now surrounded by magazines.

3.3.2. Railroads

Prior to Naval development, CNWS was traversed by several railroad lines, the most prominent of which crossed the Tidal Area rather than the Inland Area of the facility. The Southern Pacific and the Atchison, Topeka, and Santa Fe crossed through the area along the shoreline of Suisun Bay, where the Tidal Area is located today. There were, however, two additional commercial railroads running through the boundaries of the Inland Area. The lines, owned by The Sacramento Northern Railroad and the Bay Point & Clayton Railroad, are abandoned and almost entirely dismantled. Although the Navy may have incorporated some of the old Bay Point & Clayton Railroad alignment in its new system in 1945, the older line was almost entirely removed. The Navy's railroad tracks along Kinne Boulevard between Bunker City and the 4AT magazine area also follow the old alignment; but the tracks, ties, roadbed and ballast have all been regularly

[47] USGS, Mt. Diablo quadrangle, 1: 62500, (GPO: 1896); *History of Contra Costa County, California* (San Francisco: W.A. Slocum & Co., Publishers, 1882), 565; "Official Map of Contra Costa County California," surveyed by T.A. McMahon and William Minto (1885); *Map Showing Portions of Alameda and Contra Costa Counties, City and County of San Francisco, California*, drawn by George Sandow (Copyrighted by Theodore Wagner, 1894); "Official Map of Contra Costa County California," surveyed by T.A. McMahon (1908); "General Irrigation Plan for Walnut Creek, Ignacio, and Clayton Valley's and Lands Between Bay Point, Antioch, Approximately 30,000 Acres," surveyed by Stephen E. Kieffer (July 1919); "Official Map of Contra Costa County California," compiled by R.R. Arnold, County Surveyor (1938); "Navy Yard, Mare Island, California, Naval Magazine – Port Chicago – California, Inland Storage Area, Property Parcel Map," United States Navy (October 11, 1944).

maintained and replaced and none of the older system's equipment remains in use or evident.[48]

3.3.3. Mine

A small adit, or angled mine shaft, is located in the easternmost corner of the Inland Area.[49] Situated near the center of Section 35, T2N/R1W, MDBM, it is approximately 40 feet deep. The opening is about 10 feet wide, but narrows quickly to about five or six feet wide. The shaft is oval in section. Although there appeared to be a small mound of tailings at the mouth of the adit, there is no other surface evidence of mining-related features or equipment. There are, however, pieces of a metal-bladed windmill lying in the grass near the mine shaft. As discussed in the historic context, the areas surrounding CNWS experienced significant coal and copper mining booms, primarily in the late nineteenth century. The land in this area has been privately owned for at least 130 years, however, and without any formal requirements to register prospects or mines on private lands for much of this period, there is little documentation available for this small adit and it does not appear to be historically significant.

3.3.4. Canal Bridges and Culverts

There are several types of canal bridges within the Inland Area, spanning the Contra Costa and Clayton canals. Four are timber beam and deck bridges, generally 20 feet wide and 25 feet long, that were built prior to World War II by the USBR, from standard plans, to provide access to landowners who were cut off from public roads by the canal. A second group is comprised of steel beam and concrete beam spans built by the Navy during its period of active use to provide for vehicular and rail traffic to serve the Inland Area's ammunition storage facilities. In addition, concrete culverts are located throughout the Inland Area to carry the canals under major roadways and rail spurs.

3.4. Navy Property Types: World War II Era

3.4.1 Magazines

Because the central mission of CNWS was focused on the transshipment of ordnance, magazines and other ordnance handling structures are the most abundant property types within the facility. The Inland Area was primarily a storage and supply area for the piers of the Tidal Area and nearly all of the magazines and ordnance handling structures at

[48] For a description of the remains of the Bay Point & Clayton's trestle, see Appendix C (DPR523 forms) of William Self's cultural resources report (1993).

[49] For more information on the history of the mine, see JRP Historical Consulting Service's 1998 study.

CNWS are found within the Inland Area. The Navy constructed an array of magazines and related structures in the first years of expansion into the Inland Area and this construction continued throughout the Cold War era, largely following the general plan of the magazine area established during the World War II era.

Magazines BP1, BP2, BP3, BP4, and BP5 were constructed in 1945 on N Street, off Kinne Boulevard. The high explosive black powder magazines are of cast-in-place concrete with an earth cover and berm blast protection. The steel entry doors are surrounded on three sides by a concrete and earthen revetment. The concrete is of board formed texture and all of the structures are 1218 square feet in size. The five magazines were surveyed in 1993 and update field work found no substantial material change in their condition.

Magazines 3FT1-3FT10 were constructed adjacent to BP1-5 on N Street in 1945. The ten fuse and detonator magazine structures are of board formed cast-in-place concrete with an earth cover, concrete revetment, and earth berm blast protection. One metal roof vent at the rear protrudes from the earth cover. Steel doors in the head wall allow access to the magazines. Rail lines do not lead directly to the magazines; rather, the magazines are accessed by auto roads. The magazines were surveyed in 1993 and update field work found no substantial material change in their condition.

Magazines GA1-GA93 were constructed in 1945 in the central portion of the Inland Area, flanking Wilden Road (these structures are also referred to as 6PC7-6PC75 and 6LC76-6LC116). The 93 smokeless powder magazine structures are of cast in place concrete with an earth cover. The entrances have two large steel hinged doors along the length of the magazine and glass block transoms for natural light. The magazines are approached by rail lines along the entrance and have concrete loading docks along the façade. Four metal vents line the top of the earth cover. The magazines were surveyed in 1993 and update field work found no material change in their condition.

Magazines HE1-HE60 were constructed in 1945 on several loop roads north of Kinne Boulevard (these structures are also referred to as 2AT1-2AT20, 4AT21-4AT40, and 5AT41-5AT60). The area is comprised of fuse and detonator, special weapons, and high explosive magazines. The magazines are of cast-in-place concrete with earth covers and steel entry doors at one end. Across from the door is a concrete revetment and earthen blast protection. These 60 structures were surveyed in 1993 and update field work in August 1998 found no material change in their condition.

3.4.2 Ordnance Handling Buildings and Structures

Railroad Barricaded Sidings were also constructed during the World War II era, with RBS1-RBS32 and RBS59-RBS95 built in 1945 below Kinne Boulevard and just south of Highway 4. The 42 barricaded railroad sidings are of cast-in-place concrete walls with earthen berm siding. The concrete is horizontal board-formed. The structures were surveyed in 1993 and update field work in August 2008 found no material change in their condition.

Buildings IS1-4 and IS6-9 were constructed adjacent to magazines GA1-GA93 at 0 Street in 1945. Inert storage structures, the rectangular buildings are composed of cast-in-place concrete and have corrugated metal roofing, hinged steel doors, and four roof vents. A concrete loading dock runs along the eastern façade, allowing access by truck or rail. At the time of update field work in 2008, the windows were boarded over with plywood. Otherwise there was no substantial material change in their condition.

Building IS5, an ordnance handling facility built in 1945 on Wilden Road served as a guided missile air launch building. The building measures 10,542 square feet and is a cast-in-place concrete structure with a corrugated gable metal roof lined with four vents. There are four steel doors along the eastern façade and a concrete loading dock for truck or rail. Some opening modifications and a small addition have been made to the original structure, and the windows were boarded over at the time of the 2008 update fieldwork.

Building IA25 was constructed in 1945 as a missile component maintenance facility. Consisting of a single story, the building was a rectangular wood-framed structure with an attached wooden loading dock. At the time of update fieldwork in 2008, the building had been demolished and replaced with a pre-engineered corrugated metal single story building. The new building was constructed in 1993 and has a slightly gabled roof and is roughly rectangular in plan. Personnel doors as well as a roll up door provide access to the building and a wooden raised deck is affixed to the building.

3.4.3. Public Works and Support Buildings and Networks

The operations of CNWS required various public works and support networks that linked the facility and enabled efficient transshipment. The buildings and networks, ranging from road systems to security guard shacks, are found across the Inland Area.

Railroad System

When the Navy acquired the land for the station between 1942 and 1945, it installed an extensive rail system that eventually grew to include over 100 miles of track. This

system utilized some of the original alignment of the Bay Point & Clayton Railroad (no more than nine miles long), but consisted mostly of new construction. The Navy used the rail lines and numerous spurs to transfer ordnance between the Inland and Tidal areas and to access barricaded sidings, storage magazines and ammunition handling facilities. None of the former Bay Point & Clayton equipment appears to remain because the Navy's rail project including replacing the old rails, ties, tieplates and ballast. By the 1960s, the Navy conducted an extensive rehabilitation of their rail system, again replacing many components.

When the Navy acquired the Inland Area, it extended the rail system to reach the numerous new magazines and ordnance handling facilities built throughout the large storage area. Maintenance and improvement projects took place on a consistent basis, but when the Navy authorized a complete rehabilitation of the system in 1960, Naval Facilities building records began to use this date as the age for the system on the station. As of September 1997 the 100.35 miles of standard gauge track consisted of a mix of 75-pound to 115-pound salvaged and new rails.

Buildings C3 and C3a, are the numbers assigned to two earth berms that are each roughly half-mile long and which protect a series of railroad sidings in the Inland Area. These features were also built during the initial construction of the Navy's rail system in the Inland Area in 1945, on the northeast side of Kinne boulevard where they protected eight sidings used for the temporary storage of rail cars. C3 and C3a are each about 50 feet wide at the base and are about 13 to 15' high at the center.

Road System

The existing public roads and railroads needed to be upgraded when the Navy acquired the original tract of land of CNWS in 1942. With the terrain of the Inland Area consisting primarily of ranches and farmsteads, numerous roads leading to the various magazines and complexes were constructed during the initial 1944 and 1945 building campaign. Throughout the entire facility, in both the Inland and Tidal Areas, the Navy built over 100 miles of roadway. It was not until decades later, however, that the two vehicular tunnels that cross under Highway 4 were constructed (they are referenced in the Cold War Era Property Type section).

Buildings and Facilities

In addition to the transportation networks that linked the facility, numerous buildings and structures served public works and service needs. A Supply Department, Building IA5, was constructed in 1945 in the Inland Area in the administrative area off of Kinne

Boulevard at B Street. The structure is one story with a rectangular plan and a corrugated gable roof. A concrete loading dock runs along the western and eastern façade, giving access to both rail and truck. Four vents line the roof and windows on all facades have metal sash and frames and metal security bars. Building IA5 was surveyed in 1993 and update field work found no substantial material change in its condition.

IA7, the Inland Area Firehouse, was built in 1945 in the administrative area at Kinne Boulevard and B Street. An irregular shaped 1-and-2 story cast-in-place concrete building with a built up roof, the fire station has a covered porch on the east and south and two front bays for fire trucks. Steel frame and sash windows appear prominently on both the first and the second story, with tilting casement centers. Some windows have been replaced with aluminum sliders. Building IA7 was surveyed in 1993 and update field work found no substantial material change in its condition.

IA12, a heavy equipment repair building, was constructed in the administrative area at Kinne Boulevard and B Street in 1945. The building is one story with a high center gable bay. Composed of cast-in-place concrete and sheathed in a corrugated metal roof, the building also has a corrugated metal addition on the southwestern corner. The eastern elevation has two roll-up metal doors and a personnel door. There are a large number of fixed multi-pane steel frame and sash windows on all elevations. Building IA12 was surveyed in 1993 and update field work found no substantial material change in its condition.

Building IA13 was also built in 1945. A water distribution building, the structure is located near the administrative area of the Inland Area, adjacent to Kinne Boulevard. The cast-in-place concrete structure has a single metal door with a window and two metal frame tilting windows. The slab roof has a slight overhang around the entirety of the structure. Water distribution apparatus sits outside the building, attached to the structure by pipes. Building IA13 was surveyed in 1993 and update field work found no substantial material change in its condition.

IA15 and IA16, two public works shops in the administrative area off Kinne Boulevard and D Street, were constructed in 1945. IA15 is a large cast-in-place concrete structure with an elevated center gable bay. Roll-up metal doors access either end, along with personnel doors, and multi-pane fixed steel frame and sash windows run the length of the elevated gable and along irregular intervals on all elevations. A wing with a built up roof on the northern side houses garage functions. Awnings run along many of the windows. Building IA16 is a single story board formed cast-in-place concrete rectangular structure with a loading bay as well as personnel entrance on the same southern elevation. Some windows are replacement aluminum sliders and others are

fixed multi-pane steel frame and sash. Aluminum awnings cover some windows. The buildings were surveyed in 1993 and update field work found no substantial material change in their condition.

Building IA19 was constructed in 1945, directly southeast of Building IA25. IA19, a boiler house, is a single story wood framed structure resting upon a concrete slab. Only 180 square feet, the structure has only a single aluminum sliding window opening and an entrance door. There is a slight roof overhang over the doorway. Building IA19 was surveyed in 1993 and update field work found no substantial material change in its condition.

Building IA24, another miscellaneous supply building and battery charging building, was constructed in 1945 along Kinne Boulevard, northeast of O Street. Accompanied by two smaller concrete shed style buildings IA24A and IA24B, the structure served a variety of purposes including storage, public works, and general maintenance. With a roughly rectangular plan, IA24 had a built up roof with no overhangs and a large number of metal framed fixed multi-pane windows across all elevations. Roll-up metal doors allow material access and a concrete loading dock allows freight access. A smaller rectangular addition faces Kinne Boulevard. IA 24A is of board-formed cast-in-place concrete with a built up roof and a slight overhang along one open elevation (northeast) supported by metal columns. IA24B is the same as IA24A in all respects except that the open elevation is partially covered in wood siding. Both are currently being used to store cattle feed for cattle that graze the Inland Area, otherwise there is no substantial material change.

In 1945, storage Building IA27 was constructed off of Kinne Boulevard at L Street. A one story wood framed wood sided building with a rectangular plan, the building has a gabled roof with a slight slope and a concrete loading dock with three loading bays. There is a protective overhang over the loading area and railroad tracks run along the rail area. At the time of the 1993 survey, the storage facility was being used for troop housing storage. Building IA27 was surveyed in 1993 and update field work found no substantial material change in its condition.

IT1 is the first large water storage reservoir built in the Inland area above BP1-BP5 north of Kinne Roulevard. The reinforced concrete reservoir has a domed concrete roof and is about 80’ in diameter. In the years after, IT2 and IT4 were constructed as additional Inland Area water storage facilities. IT2 is located east of the WQEC area above Buildings IA21 and IA22 and measures 25’ in diameter; IT4 measures 38’ in diameter and is on a hill above the Building 87 Complex. The water tanks were surveyed in 1998 and update field work found no substantial material change in their condition.

Buildings CS1-CS16, telephone sheds, were built in 1945 and located throughout the Inland Area. The buildings were simple structures of concrete block on a concrete slabs. The sheds had three sides with one side open and wood roofs that had been removed at the time of William Self's 1993 inspection. All of the sheds have been demolished.

3.4.4. Monuments

A variety of monuments were erected across the Inland Area, most of which were no longer present at the time of the August 2008 update fieldwork. One extant monument is the Parade Ground, which is located in the administrative portion of the Inland Area between Buildings IA1 and IA10. It is bounded by Pearl and 1st streets on the north and south, and by C and D streets on the west and east. Although the original survey work and this update generally excludes open areas from consideration, the parade ground is a central ceremonial feature to Naval installations and as such merits evaluation.

Installed as part of the original plan for the Inland Area in 1945, the Parade Ground has had relatively little formal landscaping. A flagpole and concrete paved ceremonial area are located at its western end, near Building IA1, while a gazebo or bandstand is located in the northeastern corner. At the time of update fieldwork in August 2008, there were metal moveable bleachers along the western end of the grounds.

All other monuments within the Inland Area studied as part of the original survey work in 1998, including flagpoles and missiles displayed in the administrative area, have been removed from the facility.

3.4.5. Administration Buildings

Building IA1, the Administration Building, was built in 1945 on the northeastern corner of the Inland area. The building is prominently located adjacent to the parade grounds and other administration and personnel buildings in the Inland Area. A single story "T" shaped cast-in-place concrete structure with some two story elements, the Administration Building has a flat built-up roof with minimal overhangs. The walls are board formed painted concrete. Some doors and windows have been altered, however the bulk of the multi-pane metal casement windows remain in place. Metal awnings cover the majority of the windows across all elevations. Above the main entrance, covered by a portico, is a depiction of an eagle above an American flag crest. The building housed, and continues to house, a variety of personnel and command offices and serves as the administration hub for the Inland Area.

Building IA8 was constructed in 1945 in the administrative area of the Inland Area at Kinne Boulevard and B Street. The one story irregularly shaped cast-in-place board formed concrete structure was built on a concrete slab and has a flat built-up roof with no overhangs. The building has a porched entry on the northeastern elevation and a shed roof porch addition on the northwestern elevation. The windows and doors on all sides have some modifications some cement plaster additions have been erected. Since the 1993 survey, a mural has been painted on the elevation facing Kinne Boulevard. The building was used as an Ordnance Operator office building and is now the Self Help Building. The building was surveyed in 1993 and update field work found no substantial material change in its condition.

IA11 was built in 1945 and served as a supply office. Located in the administrative portion of the Inland Area, the building is a single story wood frame structure with painted cement plaster siding and a low gable roof with short eaves. The windows are a mixture of original wood casement as well as wood one-over-one sash windows. Some are painted over and some have metal awnings affixed. The building has personnel doors on all elevations, accessed by short steps with stoops. Like other administration buildings, IA11 served a variety of purposes, including cold storage, telephone exchange, data processing, and hazardous storage. The building was surveyed in 1993 and update field work found no substantial material change in its condition.

E98, located in the administration area of the Inland Area at E Street and Pearl Avenue, was built in 1945 and served as the Safety and Training Building. The building is a wood framed structure with a flat built-up roof that was wood sided at the time of the 1993 survey but has since been resided with stucco panels and substantially altered by window modifications. The altered building has entirely new aluminum framed windows. There are exterior stairways leading to the second story and a concrete ramp and stairs leading to a first story covered entrance.

3.4.6. Residential Buildings

Building IA10 was constructed in 1945 as marine barracks in the administrative area of the Inland Area at D Street and Pearl Avenue. The two and three story cast-in-place concrete H-shaped structure has exterior stairwells on the ends of all wings and a central portico supported by concrete columns. A colonnade runs along the front elevation on either side of the portico. All of the windows on the second and third story have been replaced with aluminum frames and black tinted windows while the original multi-pane casement windows remain on portions of the first story. Trees have grown on the central portico and are overtaking the raised concrete platform porch. While Building IA 10 was constructed as marine barracks, it was subsequently used for a variety of personnel and

service purposes. The interior space was divided to provide office space, a comparative analysis lab, printing plant, and service outlets. The building was surveyed in 1993 and update field work found no substantial material change in its condition.

3.4.7. Naval Hospital

A Base Hospital was constructed in 1945 at Pearl Avenue and C Street in the administrative area of the Inland Area. Consisting of several interconnected wings the complex is called IA18, IA18A, IA18B, IA18C, and IA18D. A, B, C, and D are all single story wood frame buildings with wood siding; while IA18 is of cast-in-place concrete. All have flat roofs with slight overhangs. All of the buildings have almost all original tilting casement windows. Aluminum awnings have been added throughout. Although the wings vary in size, the overall square footage is over 41,000 square feet. The main entry is through a glass filled portico on building IA18, although the other wings contain supplementary entrances as well. The hospital was surveyed in 1993 and update field work found no substantial material change in its condition.

3.5. Navy Property Types: Cold War Era

3.5.1. Magazines

With the program established during the World War II era, subsequent Naval development primarily centered upon infill and augmentation rather than continued large-scale magazine development. Construction of magazines in the Cold War era consisted primarily of placing smaller groups of new magazines within the established areas of magazines constructed during World War II.

Magazines 3FT11, 3FT12, and 3FT13 were constructed as part of this infill development in 1953 (these structures are also known as FD11, FD12, and FD13). The fuse and detonator magazines are earth covered reinforced concrete arched vaults with hinged steel doors at one end. The door is surrounded by a concrete revetment that encloses the entry area on three sides. The magazines are accessed by truck access, with no direct rail access. These three structures were surveyed in 1998 and update field work found no material change in their condition.

This infill was often accomplished by adding both magazines and support building to develop operable complexes that managed all facets of ordnance supply, maintenance and development. Complexes from this area are listed below.

Alpha Area

The Alpha Area was built in the 1950s and Consisted of 19 magazines (2AC61-2AC78 and 2HT14) and an operation building (79). The Complex was added to the 2AT1-2AT20 Magazine area. 2HT14 was constructed in 1954, and all of the remaining structures were constructed in 1959. Magazines 61-78 are high explosives magazines with two basic design types: an at-grade magazine and a platform magazine. Both types have reinforced concrete vault arches and a single ventilator that pierces that roof and earth fill cover.

The two types differ in the design of their accessibility and entrances. The at-grade magazines (Buildings 61-71) have a simple reinforced concrete head wall that sits perpendicular to the vault and extends past the vault walls on either side to act as a retaining wall for the earth fill covering the magazine. A pair of hinged steel blast doors, with metal louvers, provide the only access to the vault interior. Railroad tracks pass directly in front of the entrance and through a paved at-grade apron that leads up to the doors. The platform magazines (Buildings 72-78), on the other hand, have truck access only via a concrete ramp and concrete loading dock or platform. Their entrances are comprised of a pair of hinged steel blast doors set in a head wall similar to the other type of magazine, but the head wall is connected to a concrete revetment that encloses the entrance area on three sides.

Building 79 is the former guard house, or reaction force building, for the Alpha Area. It is located at the entrance to the area on Kula Gulf Street. Originally a 25' x 50' concrete block building designed by Indenco Engineers, Inc., modifications in 1977 added a sleeping area, as well as hardening the walls and doors and adding barricades. The building has a simple rectangular plan topped by a gravel-covered pre-cast concrete slab roof with a shallow shed-type slope. The original industrial metal sash with horizontal pivot openings have been replaced with fixed pane mirror glass and bullet proof glass windows. The modifications included an extra layer of concrete block on the lower portion of the south and some of the west elevation, as well as the addition of gun ports at these locations. Earthen barricades, eight feet tall and encased in metal, surround Building 79 on the north, east and some of the south elevation.

Alpha Area was surveyed in 1998 and update fieldwork found no substantial change in the material condition of the facility.

Bunker City

Although the bulk of the magazines at CNWS were constructed during the World War II era, the implementation and construction of new magazines during the Cold War era did

much to shape the Inland Area's function and form. A prime example of this is Bunker City, a magazine area that includes construction ranging from World War II smokeless powder magazines to late Cold War missile magazines. Bunker City began with the construction of GA1-GA93 in 1945. Adjacent to these magazines, which were discussed in the World War II era property type section, Magazines GA94-GA116 were constructed in 1953. The 23 magazines were the largest post-war magazine installation at CNWS. Accessed by both rail and truck, the plan of the magazines is nearly identical to the plan of the 1945 magazines. The magazines consist of a reinforced concrete vault with four roof vents penetrating the earthen cover, two pairs of hinged metal doors, and glass block windows. A concrete loading dock runs along the façade. These 23 magazines were surveyed in 1998 and update field work found no substantial material change in their condition.

In addition to the construction of GA94-GA116, the Navy constructed IS10-IS14 in Bunker City in 1953. The inert storage warehouses were added to the western side of the existing magazines and are accessed by both rail and roadway. The warehouses are of board-formed concrete and have a rectangular plan. The roof has a side gable and is covered in corrugated asbestos cement. A concrete loading dock runs along the eastern elevation of each warehouse. The warehouses are accessed through four sets of metal doors on the eastern elevation. Six sets of industrial metal sash windows are set symmetrically on the eastern elevation of each warehouse, and a single set are under each gable. Building IS10 is the only warehouse with glass block windows along the eastern wall rather than the metal sash of the others. Both the warehouses and the magazines were surveyed in 1998 and update fieldwork found no substantial material change in their condition.

Ordnance handling operations at Bunker City also necessitated the construction of Buildings 291 and 292, two missile magazines constructed in 1980 on the eastern edge of Bunker City. The magazines are earth covered reinforced concrete vaults with three metal overhead doors set symmetrically along the concrete headwall that serves as the façade of the magazine. Two metal doors access a small mechanical room adjoining the main vault room. A concrete loading dock runs along the base of the façade. A paved area in front of the magazines allows truck access; there is no direct rail access. The buildings were surveyed in 1998 and update field work found no substantial material change in their condition. Several years later, two additional magazines 441 and 442 were constructed adjacent to 291 and 292.

Building IA55, the Inland Field Office, was built in 1954 as the main operations building for Bunker City. Located on the northeast side of Kinne Boulevard, across from the magazines of Bunker City, the building is concrete block with a generally rectangular

plan. The roof has a parapet with a shallow gable form and there are varying sizes of industrial metal sash windows on all elevations. Single glazed metal doors provide access on all elevations except the west elevation. Some of the window panes have been infilled with air conditioning units. The building was surveyed in 1998 and update field work found no substantial material change in its condition.

Building 422 and 428, two pre-engineered corrugated metal buildings, complete the Bunker City complex. Building 422 was installed in 1983 has a shallow metal covered gable roof and is located near the east side of Building IA55. Two personnel and a metal overhead door provide access to the structure, which houses additional operations space. Building 428 is a smaller building with a shed-roof form that is open on the west side. Installed in 1987, the building is located northwest of Building IA55. The buildings were surveyed in 1998 and update field work found no substantial material change in their condition.

3.5.2 Ordnance Handling Buildings and Structures

The Weapons Quality Evaluation Laboratory / Weapons Quality Evaluation Center (QEL / WQEC)

The Bureau of Ordnance began to study options for improving the quality control of ammunition in 1943. The Bureau's wartime experience with mass-produced ammunition and items in long-term storage under variable conditions proved that ordnance needed to be continuously inspected for stability and quality. Furthermore, technological advances produced increasingly advanced weapons systems that required new forms of inspection and monitoring. In the closing months of World War II the Bureau authorized the construction of a quality control laboratory in the Inland Area of the CNWS. Located along H Street, south of the Highway 4 overcrossing, construction of the QEL spanned several decades as new programmatic requirements necessitated new buildings. Initially named the QEL, the name was subsequently changed to the WQEC.

Navy contractors completed the initial portions of the QEL, which consisted of Building IA22, and Smoke Drum Warehouse (SD1), in 1945. IA22 is approximately 10,500 square feet and is a single story cast-in-place concrete structure with a shallow gable corrugated metal roof. SD1 is a rectangular cast-in-place board formed concrete building with a flat roof. At the northwest corner of the building is a concrete frame that supports a crane and discharge platform. Railroad tracks running along the southwest side of building brings railcars directly adjacent to both ends of the building for transshipment. The only access to the building's interior is through three sliding metal clad doors in each end.

During the next two years, crews added three more support buildings, Building IA20, IA23, and IA36. IA20 was a small materials laboratory, IA23 and IA36 served as storage and utility sheds. Two small ready storage magazines, RS1 and RS2 were also constructed in 1947. The magazines are against the hillside directly to the northeast of the complex and are earth-covered "igloo" type with a single roof ventilator, a concrete headwall, and timber retaining walls. Other than installing four more magazines of the same design, RS3, RS4, RS5, RS6, the Navy did not expand the complex again until 1953.[50]

Building IA21 was added to the southern corner of Building IA22 in 1953. Attached by a narrow walkway, the building is poured-in-place concrete with a square plan. A shallow, hipped roof tops the building. IA21 has metal casement windows, single and in pairs, on all elevations. Approximately ten years after initial construction, the building was altered by expanding the basement to accommodate the installation of a new computer system in 1962. Also, an addition known as IA21A was added to IA21. The addition, which was 3.5 times the size of the original building, was designed to house various physical and non-destructive testing functions. The building is sheathed in porcelain enamel panels on all exterior elevations and is topped by a shallow gable roof. An overhang, created by corrugated asbestos cement board panels hung vertically from the roof edge, forms a boxlike awning around the entire building. Fixed pane aluminum sash windows appear on the southwest elevation only. Hollow metal personnel doors appear in the southwest and northeast elevations, and a pair of hinged metal freight doors are the only entrance on the southeast elevation.

The largest single addition to the QEL was installed in 1957 with Building IA58. Serving as an x-ray facility, the building is located northwest of Building IA21 near the tunnels under Highway 4 on H Street. The building is a cast-in-place concrete structure with a hollow metal panel shed roof. The building primarily consists of a main x-ray room that allowed rail car access and provided for a crane to be suspended from the ceiling to allow movement of large x-ray equipment. In the east elevation there is a two-foot thick reinforced concrete rolling door. A single story element running along the south side of the large x-ray bay houses support facilities and provided personnel access to the x-ray area.

Reflecting the continuously evolving mandates for weapons testing and evaluation, Building 168 was erected in 1967. The Computer Analysis and Data Processing Center, the building is located across H street from Building IA22. Built against a steep grade,

[50] Coletta, *Navy and Marine Corp Bases, Domestic*, 148; *Trans-shipper* (October 1986), 6-7.

the two story building has at-grade access at both levels: from H Street on the second floor and from a driveway and a railroad line at the first floor. The first floor consists of concrete block construction and the second floor is metal framed with the exterior walls sheathed in pre-fabricated metal panels.

The flat built-up roof is hidden by an overhang, which is created by asbestos cement board panels hung vertically from the roof edge. These panels create a box-like narrow awning around the whole building. Fixed pane aluminum sash windows appear in pairs and sets of three around the second floor and all but those in the northeast elevation are covered by heavy aluminum sun shades that are suspended from the overhang. The overhang and shades echo the design of Building IA21A. The first floor openings consist of both single and double metal personnel doors, but no windows.

All subsequent construction consisted of temporary manufactured buildings. Building 261, a trailer, was installed in 1970. Containers designated as Buildings 295, 296 and 297 were also added in the early 1970s, followed by Buildings 270, 276, 277, and 282 in 1973. These modern temporary structures served various administrative support functions and provided between 250 and 500 square feet of space each. Buildings 293, 294, 406 and 430 are additional pre-engineered metal-clad buildings that served as storage space. Buildings 293 and 294 are metal-clad buildings located south of H Street These end-gabled buildings are completely sheathed in metal panels (walls and roof) and have personnel doors in each gable end, as well as windows in all four elevations. The sash consists of aluminum sliders covered with screens and metal bars. Building 406 is a manufactured metal building that sits on a raised concrete foundation north of Building IA22. This structure serves as "Standard Gas Storage" and is accessed through the southwest elevation by way of a metal overhead door and a metal personnel door. Building 430 is manufactured metal building installed in 1987 and located north of Building 406 and east of Building IA20. This storage structure is topped with a shed-roof form. The building does not have window or door openings, but is open on the west side.

At the time of update fieldwork in August 2008, Buildings 270, 296, and 295 had been removed from the property. Two pre-fabricated metal trailers had been added, however, located next to Buildings 276 and 261. All of the other buildings in the complex remained materially unchanged from the 1998 survey evaluation.

Although the primary focus of construction on the station during the 1950s was on installing additional magazines, the Navy constructed a transfer depot (IA50) in the Inland Area. Designed for rail and truck access, the depot has a basic rectangular warehouse plan and is sheathed in corrugated asbestos cement panels. The building is located along the south side of Kinne Boulevard in the Inland Area, less than one quarter

of a mile north of N Street. Station Public Works built the adjacent restroom structure (Building 112) in 1954. A small wood frame equipment shed built in 1946 (Building 113), was apparently later moved to the site as well. Building IA50 is a metal frame building on a concrete foundation with a rectangular (102' x 16'6") plan and has three sliding metal doors that provide access to the interior from each long side (the north and south elevations) where freight can be delivered by rail on the south side and by truck or rail on the north side. Although originally built with a wood block floor installed over a concrete slab, Public Works replaced the wooden flooring with another layer of concrete in 1955. The building was surveyed in 1998 and update field work found no substantial material change in its condition.

Between 1959 and 1960 the Navy also directed the installation of a series of new ordnance handling complexes in the Inland Area. These complexes included a main ordnance handling structure surrounded by one or more small support buildings or sheds.

Building 81 Complex, which includes auxiliary Buildings 82, 83, 84, 85, and 86, was built in 1959 and served as a Weapons Maintenance Building. It is located at the junction of Mott and Chosin Drive, off Kinne Boulevard. Building 81 is built of reinforced concrete and is earth covered. There are two large reinforced concrete retaining walls running along the two sides if the building that serve to hold up the earth fill that covers the top and ends of the structure. The surrounding support buildings are all of varying sizes and composed of concrete block on concrete slabs with concrete slab roofs. The complex was surveyed in 1998 and update field work found no substantial material change in its condition.

Building 87 Complex, which includes auxiliary Buildings 88 and 89, was also constructed in 1959. Located at the junction of Inchon and Mott Drives, the complex served as an Inert Storage and Processing area. Building 87 is a large warehouse with a simple rectangular plan, concrete foundation, cast-in-place columns and cast concrete panels under a steel frame built up shallow gable roof. A 23-foot parachute tower, sheathed in insulated metal panels, rises through the roof from the northwest corner of the building. Like the Building 81 Complex, the surrounding support structures at the Building 87 Complex are simple utilitarian structures of concrete block. The complex was surveyed in 1998 and update field work found no substantial material change in its condition.

Building 93 Complex, which includes auxiliary Buildings 94, 96, and 420, 421, 429, was constructed in 1960 southeast of Bunker City on Kinne Boulevard. Built as a Guidance Checkout Facility, Building 93 is a large reinforced tilt up slab concrete warehouse with a steel frame and shallow pitched side gable roof. A concrete loading platform for

transshipments by rail or truck extends along most of the western elevation. The building itself housed a series of guidance checkout or test cells in a series of bays that are connected by a monorail system. Beginning in 1980 there were a series of additions to Building 93 that augmented its test cell facilities. An addition housing a Harpoon Test Facility was added in 1980. A Surface Missile test facility was added in 1982 and a Missile Component Rework Building in 1984. Another later addition (1992), a Standard Missile SM-2 Test Cell, sits north of this addition and is also attached to Building 93.

The Ready Issue Magazine 94 in the Building 93 Complex is also reinforced concrete with a steel frame. The magazine is connected to Building 93 by a concrete loading dock and covered storage area. Two pairs of hinged metal doors set in the west elevation of Building 94 provide access to the magazine from a concrete loading platform. Building 96 is a concrete block building with a rectangular plan and a flat roof. At the time of update fieldwork in August 2008, all of the windows were covered with plywood. Building 420, 421, 429 are small metal sheds that were installed in the 1980s and 1990s. Since the initial documentation in 1998, a manufactured corrugated metal warehouse with two metal roll up doors has been erected on the eastern corner of the complex. All of the original buildings remain materially unchanged.

Building 97 Complex, which includes auxiliary Buildings 98 and 151, was built in 1960 north of Bailey Road and east of the 4AT Magazine area. Serving as a Warhead Assembly, Fueling and Igniter Test Building, Building 97 features a main steel-framed structure of reinforced poured-in-place concrete with an irregular plan. The central element of the structure (measuring roughly 42’ x 122’) is a series of steel-reinforced concrete bays for warhead assembly, magazine storage and testing operations. The Test Bay, at the southern end of this element, faces south toward a curved concrete blast deflector that extends about eleven feet from the building. The bay element is surrounded on three sides by materials handling platforms that are housed in a steel frame warehouse that is sheathed in stucco. Related structure, Building 98, is a small reinforced concrete block building that served as a combination sentry house and boiler room. The station public works department oversaw the installation of Building 151, a manufactured structure with metal siding and roofing, on the west side of Building 97 in 1963. Although it has been assigned a separate building number, this structure and its appurtenant ducts and equipment actually functioned as an addition to Building 97. The complex was surveyed in 1998 and update field work found no substantial material change in its condition.

Barricaded Building 263 is an ammunition rework facility built in 1974 that is located in the Breakdown Cell area. The site for the complex, at the western end of L Street in the Inland Area, is cut into the side of a hill and the buildings are located behind an earthen

berm held in place by timber retaining walls. Building 263 is rectangular in plan and is topped by a simple shed roof, but is a combination of several building materials. The westernmost half of the structure appears to be poured-in-place concrete, while the eastern half has concrete block walls topped by wood frame and plywood walls extending up to the roofline. Three metal personnel doors provide access to Building 263, which has no other openings. The structure is located above the grade of the parking lot and is connected to IA25 by a covered timber loading dock.

3.5.3. Public Works and Support Buildings and Networks

The Navy's public works and support construction continued into the Cold War period, as increased operations and new material required continued expansion across the Inland Area through a variety of networks.

Railroad System

Building 269, the Locomotive Steam Cleaning Facility, was installed in 1975. Located northeast of Building IA43 and north of the Engine House (Building IA12) in the Inland Area, the steam cleaner sits on a section of existing track in the rail yard. The concrete pad is 83' long and about 21' wide and slopes away from the rails to drains and a below grade, reinforced concrete oil separator. Public Works later erected a manufactured, metal frame shed over the steam-cleaning pad. The structure was surveyed in 1998 and update field work found no material change in its condition.

Road System

Two vehicular tunnels were built in the late 1970's to carry H Street under Highway 4 in the Inland Area. The highway rests on a tall earthen berm and the tunnels, each roughly 750' long and 20' wide, consist of a corrugated metal oval-arch tube covered with concrete set in the earth berm carrying the highway. The tunnels were surveyed in 1998 and update field work found no substantial material change in their condition.

Former Airport Area

Located in the westernmost portion of the Inland Area, south of Kinne Boulevard, the former airport area consists of two buildings, IA56 and IA45, and aircraft aprons and runways. Building IA56 is a poured in place board formed concrete building with end gable roof covered in corrugated metal. The structure is about 1200 square feet in size and was built in 1954 near the center of the airport area. Bands of metal industrial sash, with awning-type openings, are set high in the south and east elevation. A large sliding

metal door set over a concrete loading dock provided freight or large equipment access to the structure at the west end. A metal personnel door is located just to the left of the sliding door.

Building IA45 is a small concrete block pump house with a flat built up roof located at the eastern edge of the former airport area. A glazed flush wood door is the only opening and the windows were boarded over at the time of the August 2008 update inspection. Some of the pumping equipment is located outside of the building, connected to the interior through pipes that pierce the west elevation.

At the time of the original survey in 1998, there were two unnumbered shed buildings in the former airport area. By the time of the August 2008 inspection these structures had been removed.

The aprons and runways are formed by poured concrete slabs.

Buildings and Facilities

During the first two decades of the Cold War, the Navy steadily added to the number of public works and station infrastructure support buildings in the Inland Area of CNWS. Most of these small buildings are either constructed of concrete block or wood framing (see the table below). The exceptions are the pre-engineered metal buildings and water tanks (Buildings 131, 132, 150, IA37, IA38 and IA43). Over half of these buildings were quite small, with many measuring under 700 square feet. None of the buildings are notable in style or design and are basic utilitarian structures that employ common building materials and building methods. The following table demonstrates the locations and construction types of these homogenous structures.

Bldg. No.	DPR523 Form	Date/Type of Construction
114	Security/Safety	1946-Small wood frame building near Inland Fire House
116	Public Works	1946- Small wood frame structure near Building IA37
131	Utilities/Services	1960-225,000 gal. metal water tank near Building 97
132	Utilities/Services	1960-225,000 gal. metal water tank near Building 97
150	Public Works	1963-Pre-engineered metal shed near Building IA46
416	Security/Safety	1946- Small wood frame building near Inland Fire House
IA37	Public Works	1947-Quonset hut in Public Works area
IA38	Public Works	1947-Quonset hut in Public Works area
IA43	Public Works	1951-Quonset hut in Public Works area
IA46	Public Works	1952-Wood frame shed-style equipment storage/garage

IA48	Public Works	1952-Wood frame shed-style equipment storage/garage
IA49	Public Works	1952-Wood frame shed-style equipment storage/garage
IA51	Public Works	1953-Concrete block structure near Building IA37
IA52	Public Works	1953-Concrete block structure near Building IA37

In addition, two filling stations were built in the Inland Area. Building IA17 was built in 1945 on Adak Street. The building was a single-story, square, cast-in-place concrete structure built on a concrete slab with a post-supported drive-through cover. The building was originally surveyed by William Self Associates in 1993 and has since been demolished. Building 178 was built in 1969 and also served as the station's gasoline service station. Located at the intersection of Pearl and Adak Streets in the administrative area, 178 is a steel frame metal sided building that is rectangular in plan with a metal shed roof that overhangs on all four sides. A covered gasoline pumping area adjoins the building. Sliding aluminum sash windows punctuate the north, west, and south elevations. The building rests on a concrete foundation. The building was surveyed in 1998 and update field work found no substantial material change in its condition.

Building 423 is a manufactured metal building located near IA8, west of Kinne Boulevard. It was erected in 1963 and was part of the Explosive Ordnance Disposal Detachment. Three metal overhead doors fill most of the southeast elevation, while a metal personnel door provides access through the northeast elevation. The shallow side-gabled metal roof is topped by three ridge vents. The building was surveyed in 1998 and update field work found no substantial material change in its condition.

Building 275 is an example of a number of temporary security posts built in the 1970s and 1980s across CNWS. Building 275 is located at Kinne Boulevard and Bailey Road and is a small square pre-engineered metal building on a concrete slab. The sliding aluminum frame windows have been boarded over since the last recordation in 1998. Otherwise there are no substantial material changes in condition.

Building IA6 was a single-story rectangular cast-in-place concrete boiler house that measured 2,660 square feet and stood near IA54 off Kinne Boulevard. The building had a corrugated gable roof with large vent stacks and metal frame and sash windows. The building was surveyed in 1993 by William Self Associates and has since been demolished.

Buildings IA4, IA53 and IA54 are part of an electrical substation complex located west of IA7 on Kinne Boulevard in the Inland Area. Building IA4 is sided in corrugated asbestos cement panels, as is the shed style roof. This simple structure is ventilated

through metal louvers in the northeast elevation and accessed through a personnel door in the southeast elevation. Buildings IA53 and IA54 are the numbers assigned to the generator units encased in metal and resting on concrete pads just southeast of IA4. The buildings were surveyed in 1998 and update field work found no substantial material change in their condition.

3.5.4. Morale and Recreational Buildings

The Navy installed several morale, welfare, and recreational (MWR) buildings on the station during this period. Building 152 is located near 1st and D Streets and served as the station gymnasium. The original structure was designed in 1966 by the 12th Naval District Public Works Office. The overall plan of this building and its additions is linear, with the original portion at the western end and the newer portions added successively to the east. The portion built in 1966 was comprised of two elements: a large multipurpose hardwood court area, and to the west a secondary portion that contains smaller rooms. The secondary element of the original gymnasium housed the lobby, men's and women's lockers, exercise and other rooms. There is an addition to the main structure (Building 152) extending in a linear plan from its east end. It is another composite addition comprised of two portions: one is gable-roofed and rises to the height of the adjacent courts area and the other is a one-story flat-roofed element. Both are of concrete block construction with metal sash topped by corrugated metal roofs. A short enclosed corridor with a flat roof and vertical groove wood siding leads from the east elevation of the single story element to Building 435, a two story prefabricated metal building designed to hold racquetball courts. The buildings were surveyed in 1998 and update field work found no substantial material change in their condition.

Building 159 was built in 1966 as the Enlisted Mens' Club. It is located at the east end of Pearl Street. The 12th Naval District Public Works Office designed the building, which is comprised of pre-cast concrete panels, steel enamel panels and concrete block construction under a built-up roof covered in gravel. The building plan is comprised of an "L" shaped portion contained a kitchen, mess area and bar, and a lounge. A narrow element measuring adjoins the long side (southwest elevation) of the "L" and housed office space, the lobby and restrooms. The building was surveyed in 1998 and update field work found no substantial material change in its condition.

Building 193 was built in 1971 to serve as the station Automotive Hobby Shop and is located just east of the Gymnasium (Buildings 152 and 435) on 1st Street. It is a prefabricated metal sided building with a shallow pitch side-gabled metal roof. Several metal overhead doors, one at the west end and five along the south elevation, provide access to the work space bays in the building. Additional work space is provided on the

east end of the building where a roof extends from the main structure. The building was surveyed in 1998 and update field work found no substantial material change in its condition.

Buildings 252, 253, 254, 256, and 264 are manufactured metal structures, commonly known as "Butler Buildings." These end-gabled buildings are completely sheathed in metal panels (walls and roof) and have personnel doors in each gable end, as well as windows in all four elevations. The sash consists of aluminum sliders covered with heavy gauge screens. Buildings 252, 253 and 254 were installed on Pearl Avenue between D and E streets in 1972 and 256 and 264 were installed in 1974. Buildings 252 and 253 served as retail warehouse space for the station exchange, which was located in the adjacent Building IA10, while Building 254 was designated as Troop Housing Storage. 256 and 264 were designated as Wood Shop and Recreational Gear Issue. The buildings were surveyed in 1998 and update field work found no substantial material change in their condition.

Building 265 is a Special Services Center (Boat Storage Issue) located on E Street and built in 1974. It is a simple concrete block structure, rectangular in plan with a shed roof covered in corrugated metal. The top of the walls are unfinished, leaving an uneven surface and open spaces at the roof-wall junction. Two metal overhead doors, one in the west elevation and one in the south elevation, provide access to the structure. The building was surveyed in 1998 and update field work found no substantial material change in its condition.

The Navy also established several outdoor recreational facilities during the 1950s and 1960s. Building IA57 is the number assigned to the station Pistol Range, which was established in 1946 at the end of a dirt road leading off of Wilden Road north of its intersection with Kinne Boulevard in the Inland Area. The range is located in a depression surrounded by the steeply rising slopes of the foothills and includes several miscellaneous temporary sheds and shelters. The station opened a softball diamond, IA60, in the administrative portion of the Inland Area in 1957. The field had two simple wood frame dugouts. Both the pistol range and softball field were surveyed in 1998 and remain substantially unchanged, except for overgrowth, from prior recordation.

Building 409 is the station chapel. It is located on Pearl Street and was built in 1980 by the station's Self-Help crew and members of Seabee Unit 416 from Naval Air Station Alameda. The chapel has a generally linear plan, with vertical groove wood siding and a side-gabled roof covered in composition shingles. The façade (south elevation) has two entrances each covered by a short end-gabled roof extending from the main building. The south and west walls of the chapel have recessed sections that are smaller than each

wall, but that echo its shape to create a second plane and to frame the windows. These recessed areas are gable-shaped in the gable end and rectangular along the south elevation, and emphasize the placement of stained glass windows that light the chapel space. The stained glass windows are set in the western recess and aluminum sliding windows are set in the southern recess. The steeple (a manufactured Styrofoam feature) straddles the ridge line near the western end of the building. The building was surveyed in 1998 and update field work found no substantial material change in its condition.

3.5.5. Administration Buildings

Most administration buildings were constructed during the World War II era. Those that were constructed during the Cold War era were erected in the Tidal Area, which is not part of the current study area. Some administrative functions were woven into other building construction, however, such as the residentially dominated Bachelor Enlisted Quarters discussed below.

3.5.6. Residential Buildings

Buildings 185 through 187 served as barracks for Marines stationed at CNWS and as administrative space. Constructed in 1972, the complex is located at the northeast corner of Pearl and E Streets. Building 271 is a small storage structure just north of Building 185, and an unnumbered gazebo is located in the lawn area north of Building 187. Buildings 185, 186 and 187 are all concrete block buildings with various types of fixed and sliding metal sash, metal doors, flat roofs and shallow coping at the roof-wall junction. They are visually united by walkways, covered with metal awnings, which run between the buildings. Buildings 185 and 186 are single story and were designed to house administrative space and living quarters respectively. Building 187 is a two-story barracks with living quarters accessed by doorways in the south elevation on both floors. Exterior stairways at the east and west elevations lead to a second floor balcony running along the south elevation. The buildings were surveyed in 1998 and update field work found no material change in their condition.

Buildings 395, 396, 397, and 398 were constructed to serve as a Bachelor Enlisted Quarters (BEQ) and Mess for Marines stationed at CNWS, as well as to provide additional administrative space. The complex was built in 1981, with the exception of Building 398 which was constructed in 1985. The complex is located on Pearl Street, between D and E Streets across from Building IA10.

The four buildings of this complex are connected by a series of covered walkways and parapets that provide a unifying visual link to the generally asymmetrical International

style structures. The basic layout of the buildings has Building 395 (administration offices) and Building 398 (administration and mess) along Pearl Street, with Buildings 396 and 397 (lounge and BEQ) to the rear. The four buildings surround a central open area with a lawn. Parking lots ring the complex to the west, north, and east.

From the street the complex demonstrates the classic horizontal lines and stacked elements of the International style, with smooth undecorated walls and bands of simple aluminum sash windows. Plain shallow coping tops the stucco finished walls that contrast with the dark smoked glass of the windows. Their appearance from the south and west emphasizes cantilevered projections and second stories that jut abruptly out over lower floors. Although somewhat less dramatic than the other elevations, the east and north sides of the complex also display elements of the style. The buildings to the rear (Buildings 396 and 397) dominate these elevations and are three stories tall and encircled by balconies that continue the horizontal theme of the other structures.

The complex utilizes many building materials. The main structures are largely concrete block on concrete slab foundations, with some wood framing for interior spaces. The exterior wall surfaces (including parapets and balcony walls are covered with cement plaster stucco. Most of the windows in the administrative buildings (Buildings 395 and 398) are fixed aluminum or fixed steel sash, with either smoked or wire glass. A few sliding aluminum sash appear in these buildings as well. Smoked glass doors and fixed sash are used at the entrances. The BEQ and Lounge (Buildings 396 and 397) also use both fixed and sliding aluminum sash.

The buildings were surveyed in 1998 and update field work found no substantial material change in their condition.

4

CONCLUSIONS RELATING TO NRHP and CRHR

4.1. General Discussion of Evaluation for the NRHP or the CRHR

Eligibility for listing in either the NRHP or CRHR rests on twin factors of significance and integrity. A property must have both significance and integrity to be considered eligible. Loss of integrity, if sufficiently great, will overwhelm historical significance a property may possess and render it ineligible. Likewise, a property can retain integrity, but if it lacks significance, it must also be considered ineligible.

Historic significance is judged by applying the NRHP and CRHR criteria. The NRHP criteria are identified as Criteria A through D, the CRHR as Criteria 1 through 4. The NRHP guidelines state that a historic resource's "quality of significance in American history, architecture, archeology, engineering and culture" be determined by meeting at least one of the four main criteria. Properties may be significant at the local, state, or national level under the following criteria:

Criterion A: association with events or trends significant in the broad patterns of our history;
Criterion B: association with the lives of significant individuals;
Criterion C: a property that embodies the distinctive characteristics of a type, period, or method of construction, represents the work of a master, or that possesses high artistic values;
Criterion D: has yielded, or is likely to yield information important to history or prehistory.

In general, Criterion D (and Criterion 4 for the CRHR) is used to evaluate prehistoric sites and archaeological resources. Although buildings and structures can occasionally be recognized for the important information they might yield regarding historic construction or technologies, the buildings within the study area for this project are of building types that are generally well documented. Thus, this update does not evaluate the buildings according to Criterion D or Criterion 4.

Certain property types are usually excluded from consideration for listing in the NRHP, but can be considered if they meet special requirements in addition to meeting the regular

criteria. The following are the seven Criteria Considerations that deal with properties usually excluded from listing in the NRHP: [51]

Consideration A: Religious Properties
Consideration B: Moved Properties
Consideration C: Birthplaces and Graves
Consideration D: Cemeteries
Consideration E: Reconstructed Properties
Consideration F: Commemorative Properties
Consideration G: Properties that have Achieved Significance within the Past Fifty Years

The only consideration which affects this study is consideration G, which was discussed in the methodology and will be addressed in Section 4.2.

Integrity under the NRHP program is determined through applying seven factors to the historical resource. Those factors are location, design, setting, workmanship, materials, feeling, and association. These seven can be roughly grouped into three types of integrity considerations. Location and setting relate to the relationship between the property and its environment. Design, materials, and workmanship, as they apply to historic buildings, relate to construction methods and architectural details. Feeling and association are the least objective of the seven criteria, pertaining to the overall ability of the property to convey a sense of the historical time and place in which it was constructed.

The criteria for listing properties in the CRHR are in Section 15064.5(a)(2)-(3) of the CEQA Guidelines, which provide the criteria from Section 20524.1 of the California Public Resources Code. The CRHR is in the California Code of Regulations Title 14, Chapter 11.5. According to this code, properties eligible for listing in the NRHP are automatically eligible for listing in the CRHR. The CRHR criteria are largely based on the NRHP which are codified in 36 CFR Part 60 and explained in guidelines published by the Keeper of the National Register.[52]

The CRHR criteria closely parallel those of the NRHP. Each resource must be determined to be *significant* at the local, state, or national level under one of four criteria (paraphrased below) in order to be determined eligible:

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[51] USDI, National Park Service, "How to Apply the National Register Criteria for Evaluation," *National Register Bulletin 15*, 25, 41-43; USDI, National Park Service, "Guidelines for Evaluating and Nominating Properties that have Achieved Significance within the Last Fifty Years," *National Register Bulletin No. 22* (Washington, D.C.: Government Printing Officer, 1979, revised 1990 and 1996).

[52] The most widely accepted guidelines are contained in the U.S. Department of Interior, National Park Service, "Guidelines for Applying the National Register Criteria for Evaluation," *National Register Bulletin 15* (Washington D.C.: US Government Printing, 1991, revised 1995 through 2002).

Criterion 1: Resources associated with important events that have made a significant contribution to the broad patterns of our history.
Criterion 2: Resources associated with the lives of persons important to our past.
Criterion 3: Resources that embody the distinctive characteristics of a type, period, or method of construction, or represents the work of a master.
Criterion 4: Resources that have yielded, or may be likely to yield, information important in prehistory or history.[53]

The CRHR definition of integrity and its special considerations for certain properties are slightly different than those for the NRHP. Integrity is defined as "the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance." The CRHR further states that eligible resources must "retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance," and lists the same seven aspects of integrity used for evaluating properties under the NRHP criteria. The CRHR's special considerations for certain properties types are limited to: 1) moved buildings, structures, or objects; 2) historical resources achieving significance within the past fifty years; and 3) reconstructed buildings.

To apply the criteria and evaluate significance and integrity, a period of significance must be established. Developing a period of significance creates a context, baseline, and standards against which a particular building or structure's significance and integrity is measured. The procedures for evaluating historic resources are explained in bulletins issued by the National Park Service, including Bulletin 15, *How to Apply the National Register Criteria for Evaluation*.[54]

Prior documentation of CNWS has evaluated the resources through several periods of significance. In the 1993 Self report, the stated period of significance was the World War II era (1942-1945). In subsequent work by JRP in their 1998 report, the time addressed was generally the Cold War era (1946-1989). Within this broader backdrop of the Cold War era, the JRP report evaluated resources within distinct periods of the Cold War: the early Cold War period (1946-1963); the Vietnam Era (1964-1972); and the post-Vietnam Era (1973-1989).[55] Neither of these reports found any buildings or structures at CNWS to

[53] California Public Resources Code, Sections 4850 through 4858; California Office of Historic Preservation, "Instructions for Nominating Historical Resources to the California Register of Historical Resources," August 1997.

[54] CFR Title 36, Part 60; *National Register Bulletin 15*, passim.

[55] William Self's 1993 cultural resources survey included an inventory and evaluation of most of the World War II Era buildings and structures on Concord WPNSUPFAC and, therefore, the 1942-1945 period is not

be historically significant in relation to these potential periods of significance, and the current update evaluation concurs.

4.2. Evaluation of Representative Property Types at CNWS

This update finds that none of the buildings and structures in any of the nine distinct property types are eligible for listing in the NRHP or the CRHR. All of the resources have been previously declared ineligible and this update finds that the passage of time has not altered these findings in relation to any of the applicable criteria (Criteria A, B, C and 1, 2, 3). The following section presents evaluation of each property type. Evaluations can also be found in the DPR 523 forms and corresponding Update forms in Appendix B.

Assorted Pre-Naval Buildings and Structures

This update addressed three buildings and structures in this property type: an adit, a stone cistern, pre-Naval rail track, and the Contra Costa and Clayton Canal bridges. All of have been previously surveyed and evaluated and none were found to meet the criteria for listing. This update finds that the passage of time does not alter these findings. The resources do not have a direct association with significant trends or events in American history (Criterion A), they are not directly associated with persons significant in American history (Criterion B), and they do not embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values. Further, all have very little integrity, as lone representations of historic uses that have long been superseded by Naval occupation and land-use.

In the case of the adit, extensive research undertaken in several studies has not located any historical documentation that indicates any significant associations arising from the property. Although coal and copper mining was a major historic activity around the Mount Diablo area and in the vicinity of the small adit, there is no direct or significant association with any events or persons. Further, the adit is modest in scale and is not demonstrative of any significant engineering or architectural accomplishments.

Similarly, the pre-Naval rail lines that fill the Inland Area lack historic significance. Most pre-Naval rail did not run through the Inland Area, but instead the Tidal Area of CNWS. Those lines that did, owned by the Sacramento Northern Railroad and the Bay Point & Clayton Railroad, are abandoned and almost entirely dismantled. Although the Navy may have incorporated some of the old Bay Point & Clayton Railroad alignment in its new system in 1945, all original lines were almost entirely removed. Those sections

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included here. Neither the Self survey, nor this report finds that any of the buildings or structures built between 1942 and 1945 appear to be eligible for listing in the National Register of Historic Places.

that may exist, if any, do not convey any direct historic association to any significant historic events, trend, or persons. The burgeoning railroad network of the nineteenth century is a common phenomenon that shaped development across California and across the nation and these isolated sections do not convey any direct historical significance. Further, the lines that traversed the moderate terrain of the Inland Area are not representative of any significant advances in railroad engineering or development.

Although past studies have differed to some extent in their evaluations of the pre-Naval stone cistern located in the Inland Area, this update reaffirms William Self Associates 1993 finding that the structure lacks significance and integrity. After extensive research by Self, JRP, John A. Keibel, and ASM Affiliates, the historical record does not convey any direct associations with significant events or trends in American history. Although the cistern is associated with the prevalent ranching culture and physical development that defined the area prior to Naval occupation, this basic association is not strong enough for eligibility under Criterion A. Similarly, while the cistern is associated with a locally prominent ranching family, it does not convey any significant association to the family's history and was only a small utilitarian component of their agricultural operations that does not merit consideration under Criterion B. While the structure is impressive, it does not appear to be a significant representation of a type, period, or method of construction, or representative of the work of a master, or possessive of high artistic values, and therefore eligible under Criterion C. Quarried from local stone, the building appears to be a pragmatic utilitarian response to the need for a guaranteed and consistent water supply. Finally, and equally important, the cistern is the sole remnant of a very large agricultural complex that included a ranch house, barn, and numerous outbuildings. No evidence of this surrounding context exists today, and the cistern is inoperable and surrounded by hundreds of Naval magazines. This diminished integrity reinforces the structures inability to convey significance for the purposes of either the NRHP or the CRHR.

The road and rail bridges over the Contra Costa and Clayton canals are standard plan structures that are not considered eligible for listing in the NRHP or CRHR as contributors to the eligible canal system. All provided access to the ammunition storage facilities, which have been recommended as ineligible for listing the NRHP or CRHR. Under Criterion A, therefore, they cannot logically be considered, therefore, to be eligible when the facilities they served are not. There is no evidence that they were associated with any particular individuals, and thus would not merit consideration under Criterion B. Under Criterion C, the local access farm bridges are common features elsewhere on the canal, and are also common on other CVP canals. The bridges built by the Navy are of common designs used throughout the state. They therefore would not be considered eligible under Criterion C.

Magazines

The 2000 "California Historic Military Buildings and Structures Inventory" states that of all Naval property types, magazines present some of the most challenging evaluation problems. This arises from the fact that ammunition depots are by their nature mass-produced, uniform, and relatively undifferentiated. The benchmark work asserts that three primary considerations should dictate evaluation of magazines: directness of association with important events, rarity, and integrity.[56] Utilizing this framework, this update evaluation concurs with previous findings of both Self and JRP that the magazines at CNWS do not meet the criteria for listing in the NRHP or CRHR and finds that the passage of time does not alter any of the previous conclusions relating to the magazines. Under standard evaluation and under evaluation in relation to Consideration G (CRHR Consideration 2), none of the magazines meet the criteria for listing in either the NRHP or the CRHR.

The magazines do not have a direct association with important events or trends in the World War II or Cold War era. Although they supplied massive amounts of ammunition for the Pacific fleet during both eras, this basic supply association does not warrant consideration under Criterion A. Similarly, the basic ordnance functions fail to convey any direct significant association with persons significant in the World War II or Cold War eras (Criterion B). The magazines are representative of a small portion of a massive supply chain that undergirded Naval activities in the World War II and Cold War era, however this representation fails to rise to a level of significance under NRHP of CRHR criteria.

The magazine property type at CNWS does not convey architectural or engineering rarity, and thousands of identical or similar structures can be found in California and across the country. The Naval magazines at Fallbrook and Seal Beach are nearly identical in type and number. Many surviving examples of this mass-produced typology exist. Further, the construction of magazines at CNWS was not at the forefront of military construction methods but was instead representative of common military construction practices of the time, across all Department of Defense branches. Although the magazines evolved through the World War II and Cold War era, this evolution was a response to design advances happening elsewhere rather than the leading edge. The magazines are not a significant representation of a type, period, or method of construction, or representative of the work of a master, or possessive of high artistic values (Criterion C). Although the magazines do largely retain integrity, they do not

[56] JRP Historical Consulting Services *California Historic Military Buildings and Structures Inventory*, 7-25.

convey significance in relation to any of the criteria for listing in the NRHP or the CRHR.

As discussed in Section 3.2., this update evaluation notes a 2006 Program Comment addressing NRHP listed or eligible World War II and Cold War era magazines. While previous evaluations and this update do not find the magazines at CNWS eligible, any subsequent application or extension of the Program Comment would need to consider those CNWS magazines that fall under its purview (see Table 2 in Appendix A).

Ordnance Handling Buildings and Structures

All of the ordnance handling buildings and structures addressed in this update have been previously surveyed and evaluated and none were found to meet the criteria for listing in the NRHP. This update finds that the passage of time does not alter these findings. The resources do not have a direct association with significant trends or events in American military history (Criterion A), they are not directly associated with persons significant in American military history (Criterion B), and they do not embody the distinctive characteristics of a type, period, or method of military construction, or represent the work of a master, or possess high artistic values. Under standard evaluation and under evaluation in relation to Consideration G (CRHR Consideration 2), none of the buildings or structures meet the criteria for listing in either the NRHP or the CRHR.

Although the property type does have an association with the ordnance transshipment activities of CNWS, this association is secondary to the major mission related functions of the station which were concerned with the loading, storage, and dissemination of an array of ordnance to the Pacific theatre during World War II, as well as during the subsequent wars in Korea and Vietnam. The primary mission of CNWS was always as a loading and storage facility rather than a leading edge RDT&E facility.[57] Despite a number of buildings and structures in the Inland Area that were engaged in repair, assembly, and basic testing (Weapons Quality Evaluation Center (WQEC), Buildings 81, 87, 93, and 97) these activities are not directly associated with historically significant contributions to either the World War II or Cold War era military build-up. No advanced testing that shaped either era occurred in any of the buildings or structures, and no historically significant persons in the military history of either era were involved in the station operations.

[57] For a more detailed discussion of this mission see JRP Historical Consulting's 1998 "Inventory and Evaluation of National Register Eligibility of Cold War Era and Selected Other Buildings and Structures, Naval Weapons Support Facility," 12-13.

The buildings of this property type in the Inland Area played a key supporting role in the logistical operations of the station, however this role does not rise to the level of significance in relation to the broader context of the World War II or Cold War era. The most significant contribution of the station was in the storage and transshipment of a diverse array of ordnance rather than to advanced ordnance handling operations.

In addition to a lack of significance in relation to the broad historic themes of the World War II and Cold War era, the buildings and structures of this property type lack architectural significance. The buildings are generally of utilitarian construction, many are standard cast-in-place concrete structures surrounded by small sheds and temporary buildings and trailers. The architectural form, plan, and material of the buildings are not significant representations of advances in military construction and are instead standard programmatic responses to the need for basic facilities. Further, many of the buildings have severely compromised integrity. This general lack of integrity through alteration and neglect was noted in the initial evaluations and was even more marked in the update survey work.

Public Works and Support Buildings and Networks

All of the buildings and structures of the public works property type have previously been surveyed and evaluated and none were found to meet the criteria for listing in the NRHP. This update finds that the passage of time does not alter these findings. The resources do not have a direct association with significant trends or events in American history (Criterion A), they are not directly associated with persons significant in American history (Criterion B), and they do not embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values. Under standard evaluation and under evaluation in relation to Consideration G (CRHR Consideration 2), none of the buildings or structures meet the criteria for listing in either the NRHP or the CRHR.

Rather than having a mission related function, the buildings and structures that encompass this property type represent day-to-day secondary support functions. Ranging from road networks to boiler houses, this property type cannot be considered significant in the larger context of World War II era or Cold War era military history and instead is a utilitarian network designed for necessary—yet prosaic—purposes. None of the buildings or structures represent any significant advances in Naval operations or support capabilities, and instead are standard building types of common design. Like the ordnance handling property type, the buildings are most commonly of either standard cast-in-place concrete construction or standardized sheds and prefabricated metal structures. Given the moderate and open terrain of the Inland area, neither the Naval

railways nor the roadways represent any significant contribution to transportation related architecture or engineering. In addition to a lack of significance, many of the buildings and structures exhibit substantial deterioration in integrity.

Morale/Recreational Buildings

All of the buildings and structures of this property type have previously been surveyed and evaluated and none were found to meet the criteria for listing in the NRHP. This update finds that the passage of time does not alter these findings. The resources do not have a direct association with significant trends or events in American history (Criterion A), they are not directly associated with persons significant in American history (Criterion B), and they do not embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values. Under standard evaluation and under evaluation in relation to Consideration G (CRHR Consideration 2), none of the buildings or structures meet the criteria for listing in either the NRHP or the CRHR.

Like those buildings and structures in the public works property type, morale and recreational buildings are related to secondary functions rather than primary mission related activities. By providing for an array of personnel needs, the property type satisfied requirements for a self-sustaining and sufficient station, however it did not make a significant contribution within the overall context of military developments in the World War II or Cold War era. Further, none of the buildings or structures represent any significant innovation in personnel related activities at the station, or innovation in architecture and engineering. The buildings and facilities are all modest examples of basic building types and programs, including a church, a gymnasium, and social club. While these types were integral in personnel support, they are not historically significant in relation to any of the criteria for listing in the NRHP or CRHR. Additionally, all have diminished integrity, both at the time of the initial evaluation and for the purposes of this update.

Monuments

All of the buildings and structures of this property type have previously been surveyed and evaluated and none were found to meet the criteria for listing in the NRHP. This update finds that the passage of time does not alter these findings. The resources do not have a direct association with significant trends or events in American history (Criterion A), they are not directly associated with persons significant in American history (Criterion B), and they do not embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values.

Under standard evaluation and under evaluation in relation to Consideration G (CRHR Consideration 2), none of the buildings or structures meet the criteria for listing in either the NRHP or the CRHR.

While the Inland Area was an active component of CNWS, a number of modest monuments filled the administrative area of the station. These included a sign at the entryway to the station, flagpoles, missile, and gun displays. Between the 1998 evaluation and this update, almost the entirety of these monuments have been removed. While in operation, these monuments filled important symbolic roles, however these roles fail to convey historic significance in relation to any of the three criteria for listing in the NRHP or CRHR. All were common expressions that could be found on other Naval Stations as well as in other branches of the military. None were directly affiliated with important events or trends in Naval history and none were affiliated or commemorative of significant persons in Naval history. Further, all of the monuments were simple, common features that were not the work of a master or representative of high artistic values.

Administrative Buildings

CNWS has relatively few buildings that fall into the administration property type. All have been surveyed and evaluated and none were found to meet the criteria for listing in the NRHP. This update finds that the passage of time does not alter these findings. The resources do not have a direct association with significant trends or events in American history (Criterion A), they are not directly associated with persons significant in American history (Criterion B), and they do not embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values. Under standard evaluation and under evaluation in relation to Consideration G (CRHR Consideration 2), none of the buildings or structures meet the criteria for listing in either the NRHP or the CRHR.

Although the buildings in this property type provided key logistical support for station operations, none are directly associated with any significant events, trend, or persons from the World War II or Cold War era. Containing personnel offices, communications centers, and other logistical support facilities, the buildings possessed a generalized function. Further, all of the buildings are standard programmatic responses to the need for generalized personnel space. The central administration building, IA1, is a simple T-Shaped cast-in-place concrete structure erected in 1945 to quickly accommodate increased transshipment activity at the station. The remainder of the smaller administration buildings located throughout the Inland Area are even more modest structures. Additionally, all of the buildings of this type also have diminished integrity

due to minor alterations in windows, doors, and siding that were noted in initial evaluation and even more prevalent at the time of this update.

Residential Buildings

As discussed in Section 3.2. most of the housing stock at CNWS is not in the Inland Area study area. Those few representatives of this property type that are in the Inland Area, however, have been previously evaluated and found not to meet the criteria for listing in the NRHP. This update finds that the passage of time does not alter these findings. The buildings are not historically significant in relation to any of the criteria in either the NRHP or CRHR. The resources do not have a direct association with significant trends or events in American history (Criterion A), they are not directly associated with persons significant in American history (Criterion B), and they do not embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values. Under standard evaluation and under evaluation in relation to Consideration G (CRHR Consideration 2), none of the buildings or structures meet the criteria for listing in either the NRHP or the CRHR.

Like other secondary support related property types, residential buildings did not play a direct role in mission related activities at CNWS. Rather the buildings were expedient solutions to the need for personnel housing. Representatives from both the World War II and Cold War era remain at CNWS, and all lack the strength of association within the broad context of their respective eras. For the most part, the buildings are standard barracks style buildings with no discernible architectural style. The exception to this is the New Bachelor Enlisted Quarter complex (395, 396,307,398) which exhibits attributes of the International Style with its unadorned horizontality and stacked elements. Although the International Style is representative of Cold War era military construction, the BEQ Complex is a modest example of the style. All of the buildings also have had notable diminishments in integrity, evident at the time of initial evaluation and at the time of this update.

Hospital Buildings

With only one representative property, this property type is not a character-defining feature of CNWS. The hospital facility has been surveyed and evaluated and found to not meet the criteria for listing in the NRHP. This update finds that the passage of time does not alter these findings. The building does not have a direct association with significant trends or events in American history (Criterion A), it is not directly associated with persons significant in American history (Criterion B), and they does not embody the

distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values.

Constructed in 1945 shortly after initial acquisition of the Inland Area, the hospital was a standard response to the need for on-station medical facilities. The hospital only served as a station resource, and was not engaged in any more expansive medical care or research. The multi-wing wooden structure did not represent any innovation in medical design. Further, the building lacked integrity at the time of initial evaluation and has had a further deterioration in integrity at the time of this update.

General Conclusions

All of the other resources evaluated and surveyed in this update lacked both significance and integrity. No material or historical changes have altered the significance of any resources in the Inland Area of the CNWS since prior documentation. Even though a number of resources documented in 1993 and 1998 have reached the fifty year age requirement for regular consideration in the NRHP or CRHR; none of these resources possess significance under the criteria and therefore the aging of the resources did not change the outcome of the updated evaluations. Those resources that still have not reached the fifty year age requirement do not possess significance under the basic criteria or exceptional significance and do not require further consideration.

While it is apparent that the Naval Facilities in the Inland Area of CNWS played a substantive role in major military campaigns of the second half of the twentieth century, this role does not meet the high threshold of importance necessary to convey direct historical significance. In the larger context of the Navy's Cold War efforts, CNWS logistical support did not make exceptionally significant contributions by direct involvement in nationally important events or trends. Furthermore, both the World War II and Cold War era resources at Concord are largely utilitarian structures that are relatively common for naval weapons stations and ordnance handling facilities. For example, magazines very similar to those in Concord's Bunker City can be found at NWS Yorktown, Virginia; Seal Beach NWS has a similar system of rail sidings for ordnance transfer; and a radiographic unit comparable to Concord's Building IA58 was installed at the Polaris Missile Facility-Pacific, in Bangor, Washington in 1964.[58] Much of the building stock consists of utilitarian infrastructure that does not convey direct associations related to any of the potential periods of significance. Prior studies of the

[58] R. Christopher Goodwin and Associates, Inc., *Navy Cold War Guided Missile Context: Resources Associated with the Navy's Guided Missile Program, 1946-1989,* prepared for Department of the Navy, Atlantic Division, NAVFAC (August 1995), 261-293.

Inland Area concluded that the building stock of CNWS lacked significance, and this update report reaffirms these findings.

The accompanying lack of integrity further hinders any demonstration of significance. Both prior reports found that many of the resources lacked integrity, and this update finds a further diminishment in integrity across the Inland Area. Most of the buildings have been modified and altered; with new siding, windows, expansions, and loss of historic functions. Many complexes have had related structures moved or demolished, and remaining structures often do little to convey historical use or association.

This update report concludes that although CNWS played a role in twentieth century Naval expansion and operation, the buildings and structures of the station do not meet the eligibility criteria for listing in the NRHP or CRHR.

4.3. Properties that Meet the Criteria for Listing in the NRHP or the CRHR

None of the buildings or structures surveyed in this report appear eligible for listing in the NRHP or the CRHR. Prior documentation found no resources meeting the criteria for listing on the National Register, and the update research and field work find this assessment correct. Although ASM Associates found that the pre-Naval cistern could "potentially" be eligible, this update evaluation finds that both a lack of significance and substantial lack of integrity undermines the ASM assessment.

4.4. Properties that Do Not Meet the Criteria for Listing in the NRHP or CRHR

All of the properties surveyed do not meet the criteria for listing in the NRHP or the CRHR. None convey historic significance within the context of World War II and the Cold War era and most exhibit marked deteriorations in integrity. Although a number of the Cold War buildings and structures have not yet reached the 50 year age required for standard evaluation for both the NRHP and CRHR, all have been fully evaluated within the Cold War era period of significance and found to lack historic significance under any of the criteria for listing.

5

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PREPARERS' QUALIFICATIONS

This report was prepared under the direction of Rand F. Herbert, a principal at JRP Historical Consulting, LLC, with more than 25 years experience conducting these types of studies. Mr. Herbert received his B.A. in History from the University of California, Berkeley, in 1973, and his M.A.T. in History from the University of California, Davis, in 1977. Since that time he has been active in private consulting on cultural resources management projects for federal, state and local agencies and private companies and individuals. Mr. Herbert qualifies as a historian/architectural historian under United States Secretary of Interior's Professional Standards as defined in 36 CFR Part 61. Mr. Herbert participated in field work, evaluation, and report preparation.

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Rebecca Flores assisted with report and graphics production.

APPENDIX A

Table 1: All Inventoried Buildings and Structures

Building Number	Function	Year Built	DPR 523 Form
61	High Explosive Magazine	1959	Alpha Area
62	High Explosive Magazine	1959	Alpha Area
63	High Explosive Magazine	1959	Alpha Area
64	High Explosive Magazine	1959	Alpha Area
65	High Explosive Magazine	1959	Alpha Area
66	High Explosive Magazine	1959	Alpha Area
67	High Explosive Magazine	1959	Alpha Area
68	High Explosive Magazine	1959	Alpha Area
69	High Explosive Magazine	1959	Alpha Area
70	High Explosive Magazine	1959	Alpha Area
71	High Explosive Magazine	1959	Alpha Area
72	High Explosive Magazine	1959	Alpha Area
73	High Explosive Magazine	1959	Alpha Area
74	High Explosive Magazine	1959	Alpha Area
75	High Explosive Magazine	1959	Alpha Area
76	High Explosive Magazine	1959	Alpha Area
77	High Explosive Magazine	1959	Alpha Area
78	Small Arms / Pyrotechnics Magazine	1959	Alpha Area
79	Guard House	1959	Alpha Area
81	Weapons Maintenance	1959	Building 81 Complex
82	RDT&E Storage	1959	Building 81 Complex
83	Lunch, Locker, and Boiler	1959	Building 81 Complex
84	Storage	1959	Building 81 Complex
85	Pumphouse	1959	Building 81 Complex
86	Generator	1959	Building 81 Complex
87	Inert Storage Building	1959	Building 87 Complex
88	Storage Shed	1959	Building 87 Complex
89	Pump House	1959	Building 87 Complex
93	Guidance Checkout Facility	1960	Building 93 Complex
94	Ready Issue Building	1960	Building 93 Complex

Building Number	Function	Year Built	DPR 523 Form
96	Lunch, Locker, Boiler Building	1960	Building 93 Complex
97	Warhead Assembly Building	1960	Building 97 Complex
98	Boiler and Sentry House	1960	Building 97 Complex
112	Field Toilet	1954	Building IA50 Complex
113	Operational Storage	1946	Building IA50 Complex
114	Fire Station Outbuilding	1946	Security and Safety
116	Public Works Shop	1946	Public Works
131	Water Tank	1960	Utilities and Services
132	Water Tank	1960	Utilities and Services
150	Public Works Maintenance Storage	1963	Public Works
151	Guided Missile Facility	1963	Building 97 Complex
152	Gymnasium	1966	MWR
159	E.M. Club	1966	MWR
161	Parade Grounds	1945	Monuments
168	Computer / Analysis Lab.	1967	WQEC Complex
178	Service Station	1969	Utilities and Services
185	Barracks / Admin. Building	1972	Old BEQ
186	Company Barracks	1972	Old BEQ
187	BEQ	1972	Old BEQ
193	Auto Hobby Shop	1971	MWR
252	Warehouse	1972	MWR
253	Warehouse	1972	MWR
254	Storage	1972	MWR
256	Hobby Shop	1973	MWR
261	Guided Missile Laboratory	1970	WQEC Complex
263	Ammunition Rework	1974	Barricaded Building 263
264	Special Service Center	1974	MWR
265	Special Service Center	1974	MWR
270	Administrative Storage	1973	WQEC Complex
271	Storage	1976	Old BEQ
275	Sentry House	1976	Security and Safety
276	Guided Missile Laboratory	1973	WQEC Complex
277	Administrative Storage	1973	WQEC Complex
282	Computer / Analysis Laboratory	1976	WQEC Complex

Building Number	Function	Year Built	DPR 523 Form
291	Missile Magazine West	1980	Bunker City
292	Missile Magazine East	1980	Bunker City
293	Administrative Storage	1980	WQEC Complex
294	Administrative Storage	1980	WQEC Complex
296	Materials Laboratory	1971	WQEC Complex
297	Materials Laboratory	1971	WQEC Complex
395	Administration	1981	New BEQ
396	Lounge	1981	New BEQ
397	BEQ	1981	New BEQ
398	Dining Facility and BEQ	1981	New BEQ
405	Utility Shed		WQEC Complex
406	RDT&E Storage	1980	WQEC Complex
409	Chapel	1980	MWR
416	Fire Station Outbuilding	1946	Security and Safety
420	Storage Shed	c.1990	Building 93 Complex
421	Storage Shed	c.1990	Building 93 Complex
422	Ordnance Operations	1983	Bunker City
423	Ordnance Operations	1984	Public Works
428	Hazardous Waste Storage	1987	Bunker City
429	Hazardous Waste Storage	1987	Building 93 Complex
430	Hazardous Waste Storage	1987	WQEC Complex
435	Racquetball Courts Addition	1989	MWR
441	Magazine	c.1980	Bunker City
442	Magazine	c.1980	Bunker City
BP1-BP5	Black Powder Magazine	1945	BP1-BP5
C3, C3A	Railroad Barricade	1945	Railroad
CS1-CS16	Telephone Sheds	1945	CS1-CS16
3FT1-3FT10	Fuse and Detonator Magazine	1945	3FT1-10
E98	Safety and Training Building	1945	E98
FD11	Fuse and Detonator Magazine	1953	3FT Area
FD12	Fuse and Detonator Magazine	1953	3FT Area
FD13	Fuse and Detonator Magazine	1953	3FT Area
FD14	Fuse and Detonator Magazine	1954	Alpha Area
GA1-GA93	Magazines	1945	GA1-93
GA94-GA116	Smokeless Powder Magazines	1953	Bunker City
HE1-HE60	High Explosive Magazines	1945	HE1-60
IA1	Administration Building	1945	IA1

Building Number	Function	Year Built	DPR 523 Form
IA4	Generator		Utilities and Services
IA5	Warehouse / Supply Department	1945	IA5
IA6	Boiler House	1945	IA6
IA7	Inland Firehouse	1945	IA7
IA8	Personnel Offices	1945	IA8
IA10	Barracks	1945	IA10
IA11	Offices / Storage	1945	IA11
IA12	Heavy Equipment Repair	1945	IA12
IA13	Water Distribution Facility	1945	IA13
IA15	Public Works Shop	1945	IA15 and IA16
IA16	Public Works Shop	1945	IA15 and IA16
IA17	Service Station	1945	IA17
IA18, A, B, C, D	Base Hospital	1945	IA18, A, B, C, D
IA19	Boiler House	1945	IA19
IA20	Materials Laboratory	1947	WQEC Complex
IA21	Computer / Analysis Lab	1953	WQEC Complex
IA21A	Physical / Non-destructive Testing	1953	WQEC Complex
IA22	Evaluation Library	1945	IA22
IA23	Ammunition / Explosives	1947	WQEC Complex
IA24, A, B	Battery Charging Building	1945	IA24
IA25	Ammunitions Rework Building	1945	IA25
IA27	Car Blocking Shop / Storage	1945	IA27
IA36	Utility Building	1946	WQEC Complex
IA37	Public Works Shop	1947	Public Works
IA38	Warehouse	1947	Public Works
IA43	Storage	1951	Public Works
IA45	Pumphouse		Former Airport Area
IA46	Storage	1952	Public Works
IA48	Storage	1952	Public Works
IA49	Maintenance / Storage	1952	Public Works
IA50	Ammunition Transfer Facility	1953	Building IA50 Complex
IA51	Auto Maintenance Facility	1953	Public Works
IA52	Compressor House	1953	Public Works
IA53	Substation	1988	Utilities and Services
IA54	Substation		Utilities and Services
IA55	Ordnance Operations	1954	Bunker City

Building Number	Function	Year Built	DPR 523 Form
IA56	Field Office	1954	Former Airport Area
IA57	Pistol Range	1946	MWR Outdoor
IA58	Materials Laboratory	1957	WQEC Complex
IA60	Baseball Field	1957	MWR Outdoor
IS1	Inert Storehouse Building	1945	IS1-4, IS6-9
IS2	Storehouse Building	1945	IS1-4, IS6-9
IS3	Storehouse Building	1945	IS1-4, IS6-9
IS4	Guided Missile Maintenance Facility	1945	IS1-4, IS6-9
IS5	Guided Missile Air Launch	1945	IS5
IS6	Inert Storehouse Building	1945	IS1-4, IS6-9
IS7	Guided Missile Container Storage	1945	IS1-4, IS6-9
IS8	Inert Storehouse Building	1945	IS1-4, IS6-9
IS9	Inert Storehouse Building	1945	IS1-4, IS6-9
IS10-IS14	Inert Material Storage	1953	Bunker City
IT1	Water Tank	1945	Utilities and Services
IT2	Water Tank		Utilities and Services
IT4	Water Tank	1959	Utilities and Services
RBS1-RBS32 and RBS59-95	Railroad Barricaded Sidings	1945	RBS1-9
RS1-RS6	Ready Magazine	RS1-2 1947, RS3-6 1952	WQEC Complex
SD1	RDT&E Storage	1945	WQEC Complex
	Tunnels	c.1975	Road System
	Mine	c. 1870-1900	Mine
	Railroad Trackage	continuous	Railroad
	Locomotive Steam Cleaner	1975	Railroad
	Gazebo	1972	Old BEQ
	Canal Bridges	1937-1950s	Canal Bridges
	Cistern	c. 1896	Cistern

Table 2: Buildings and Structures covered by 2003 "Program Comment for World War II and Cold War Era (1939-1974) Ammunition Storage Facilities."

Building Number	Function	Year Built	DPR 523 Form
61-77	High Explosive Magazines	1959	Alpha Area
78	Small Arms / Pyrotechnics Magazine	1959	Alpha Area
291	Missile Magazine West	1980	Bunker City
292	Missile Magazine East	1980	Bunker City
420	Storage Shed	c.1990	Building 93 Complex
421	Storage Shed	c.1990	Building 93 Complex
441	Magazine	c.1980	Bunker City
442	Magazine	c.1980	Bunker City
3FT1-3FT10	Fuse and Detonator Magazines	1945	3FT 1-3FT10
FD11	Fuse and Detonator Magazine	1953	3FT Area
FD12	Fuse and Detonator Magazine	1953	3FT Area
FD13	Fuse and Detonator Magazine	1953	3FT Area
FD14	Fuse and Detonator Magazine	1954	Alpha Area
BP1-BP5	Black Powder Magazines	1945	BP1-BP5
HE1-HE60	High Explosive Magazines	1945	HE1-HE60
GA1-GA93	Magazines	1945	GA1-GA93

Building Number	Function	Year Built	DPR 523 Form
GA94-GA116	Smokeless Powder Magazines	1953	Bunker City
IS1	Inert Storehouse Building	1945	IS1-4, IS6-9
IS2	Storehouse Building	1945	IS1-4, IS6-9
IS3	Storehouse Building	1945	IS1-4, IS6-9
IS6	Inert Storehouse Building	1945	IS1-4, IS6-9
IS7	Guided Missile Container Storage	1945	IS1-4, IS6-9
IS8	Inert Storehouse Building	1945	IS1-4, IS6-9
IS9	Inert Storehouse Building	1945	IS1-4, IS6-9
IS10-IS13	Inert Material Storage Building	1953	Bunker City
RS1-RS6	Ready magazine	RS1-2 1947, RS3-6 1952	WQEC Complex

Table 3: Buildings and Structures Under 50 Years of Age at Time of Initial Evaluation and/or Update.

Building Number	Function	Construction Date	Age at Last Survey	Age at Update	DPR 523 Form
61-79	Magazines and Guard House	1959	39	49	Alpha Area
81	Weapons Maintenance	1959	39	49	Building 81 Complex
82	RDT&E Storage	1959	39	49	Building 81 Complex
83	Lunch, Locker, Boiler	1959	39	49	Building 81 Complex
84	Storage	1959	39	49	Building 81 Complex
85	Pumphouse	1959	39	49	Building 81 Complex
86	Generator	1959	39	49	Building 81 Complex
87	Inert Storage	1959	39	49	Building 87 Complex
88	Storage Shed	1959	39	49	Building 87 Complex
89	Pump House	1959	39	49	Building 87 Complex
93	Guidance Checkout Facility	1960	38	48	Building 93 Complex
94	Ready Issue Building	1960	38	48	Building 93 Complex
96	Lunch, Locker, Boiler Building	1960	38	48	Building 93 Complex
97	Warhead Assembly Building	1960	38	48	Building 97 Complex

Building Number	Function	Construction Date	Age at Last Survey	Age at Update	DPR 523 Form
98	Boiler and Sentry House	1960	38	48	Building 97 Complex
112	Field Toilet	1954	44	54	Building IA50 Complex
131	Water Tank	1960	38	48	Utilities and Services
132	Water Tank	1960	38	48	Utilities and Services
150	Public Works Storage	1963	35	45	Public Works
151	Guided Missile Facility	1963	35	45	Building 97 Complex
152	Gymnasium	1966	32	42	MWR
159	E.M. Club	1966	32	42	MWR
168	Computer/ Analysis Lab	1967	31	41	WQEC Complex
178	Service Station	1969	29	39	Utilities and Services
185	Barracks/ Administration	1972	26	36	Old BEQ
186	Company Barracks	1972	26	36	Old BEQ
187	BEQ	1972	26	36	Old BEQ
193	Auto Hobby Shop	1971	27	37	MWR
252	Warehouse	1972	26	36	MWR
253	Warehouse	1972	26	36	MWR
254	Storage	1972	26	36	MWR
256	Hobby Shop	1973	25	35	MWR
261	Guided Missile Laboratory	1970	28	38	WQEC Complex
263	Ammunition Rework	1974	24	34	Barricaded Building 263
264	Special Service Center	1974	24	34	MWR
265	Special Service Center	1974	24	34	MWR

Building Number	Function	Construction Date	Age at Last Survey	Age at Update	DPR 523 Form
270	Administrative Storage	1973	25	35	WQEC Complex
271	Storage	1976	22	32	Old BEQ
275	Sentry House	1976	22	32	Security and Safety
276	Guided Missile Laboratory	1973	25	35	WQEC Complex
277	Administrative Storage	1973	25	35	WQEC Complex
282	Computer/ Analysis Lab	1976	22	32	WQEC Complex
291	Missile Magazine West	1980	18	28	Bunker City
292	Missile Magazine East	1980	18	28	Bunker City
293	Administrative Storage	1980	18	28	WQEC Complex
294	Administrative Storage	1980	18	28	Administrative Storage
296	Materials Laboratory	1971	27	37	WQEC Complex
297	Materials Laboratory	1971	27	37	WQEC Complex
395	Administration	1981	17	27	New BEQ
396	Lounge	1981	17	27	New BEQ
397	BEQ	1981	17	27	New BEQ
398	Dining Facility and BEQ	1981	17	27	New BEQ
405	Utility Shed	c. 1970-1987	c. 28-11	c. 38-21	WQEC Complex
406	RDT&E Storage	1980	18	28	WQEC Complex
409	Chapel	1980	18	28	MWR
420	Storage Shed	c.1990	c.8	c.18	Building 93 Complex
421	Storage Shed	c.1990	c.8	c.18	Building 93 Complex
422	Ordnance Operations	1983	15	25	Bunker City

Building Number	Function	Construction Date	Age at Last Survey	Age at Update	DPR 523 Form
423	Ordnance Operations	1984	14	24	Public Works
428	Hazardous Waste Storage	1987	11	21	Bunker City
429	Hazardous Waste Storage	1987	11	21	Building 93 Complex
430	Hazardouse Waste Storage	1987	11	21	WQEC Complex
435	Racquetball Courts Addition	1989	9	19	MWR
441	Magazine	c.1980	c.18	c.28	Bunker City
442	Magazine	c.1980	c.18	c.28	Bunker City
FD11-FD13	Magazines	1953,1954	45, 44	55, 54	3FT Area
FD14	Magazine	1954	44	54	Alpha Area
GA94-GA116	Magazines	1953	45	55	Bunker City
IA4	Generator	c.1988	c.10	c.20	Utilities and Services
IA21	Computer/ Analysis Lab	1953	45	55	WQEC Complex
IA21A	Testing	1953	45	55	WQEC Complex
IA43	Storage	1951	47	57	Public Works
IA45	Pumphouse	c.1954	c. 44	c.54	Former Airport Area
IA46	Storage	1952	46	56	Public Works
IA48	Storage	1952	46	56	Public Works
IA49	Maintenance/ Storage	1952	46	56	Public Works
IA50	Ammunition Transfer	1953	45	55	Building IA50 Complex
IA51	Auto Maintenance	1953	45	55	Public Works
IA52	Compressor House	1953	45	55	Public Works
IA53	Substation	1988	10	20	Utilities and Services
IA54	Substation	c.1988	c.10	c.20	Utilities and Services

Building Number	Function	Construction Date	Age at Last Survey	Age at Update	DPR 523 Form
IA55	Ordnance Operations	1954	44	54	Bunker City
IA56	Field Office	1954	44	54	Former Airport Area
IA58	Materials Laboratory	1957	41	51	WQEC Complex
IA60	Baseball Fields	1957	41	51	MWR Outdoor
IS10-IS14	Inert Material Storage	1953	45	55	Bunker City
IT2	Water Tank	c.1950-1955	c.58-48	c.68-58	Utilities and Services
IT4	Water Tank	1959	39	49	Utilities and Services
RS1-RS6	Magazines	1947, 1952	51, 46	61,56	WQEC Complex
Tunnels		c.1975	23	33	Road System
Locomotive Steam Cleaner		1975	23	33	Railroad
Gazebo		1972	26	36	Old BEQ

Appendix 10A

Supplemental Hazardous Materials/Waste Tables

Table 10A-1 Underground and Aboveground Storage Tanks[1]

Location	Tank ID	Tank Capacity (Gallons)	Tank Contents	Date Removed	Status	Regulatory Concurrence Received
Administrative Area Bldg 522	UST 523 T-1 UST 524 T-2 UST 525 T-3 UST 526 T-4 UST 527 T-5	12,000 12,000 12,000 12,000 12,000	Gasoline Gasoline Diesel Diesel Diesel	Not Removed	USTs empty and out of service: Three tanks formerly used for vehicle fueling station and 2 for locomotive fueling.	A closure report is pending. The tanks are in temporary closure status until the possibility of their future use is determined.
Administrative Area Bldg 178	UST 178A UST 178B UST 178C UST 178D	12,000 12,000 12,000 280	Gasoline Gasoline Gasoline Waste Oil	10/31/91	Closed	CCCHSD determination of NFA for USTs 178 on 05/28/98 (CCCHSD 1998a). RWQCB closure granted 12/23/99 (RWQCB 1999a).
Inland Area Bldg 87	UST 87	6,500	Diesel	03/19/97	Closed	CCCHSD determination of NFA for UST 87 on 02/13/98 (CCCHSD 1998b). RWQCB closure granted 10/06/05 (RWQCB 2005a).
	AST 87	Unknown	Unknown	2004	AST cleaned and removed.	Unknown
Inland Area Bldg IA-55	UST IA-55	550	Diesel	02/10/97	Closed	CCCHSD determination of NFA for UST IA-55 on 04/17/97 (CCCHSD 1997a). RWQCB closure on 11/18/05 (RWQCB 2005b).
	AST IA-55	Unknown	Unknown	2004	AST cleaned and removed.	Unknown
Inland Area Bldg 96	UST 96	6,500	Diesel	02/10/97	Closed	CCCHSD determination of NFA for UST 96 on 02/13/98 (CCCHSD 1998c). RWQCB closure on 10/24/05 (RWQCB 2005c).
	AST 96	Unknown	Unknown	2004	AST cleaned and removed.	Unknown
Inland Area Bldg 7SH5	UST 7SH5	1,000	Diesel	01/28/97	Closed	CCCHSD determination of NFA for UST 7SH5 on 04/08/97 (CCCHSD 1997b). RWQCB closure on 10/26/05 (RWQCB 2005d).
	AST 7SH5	1,000	Unknown	2004	AST cleaned and removed.	Unknown

Location	Tank ID	Tank Capacity (Gallons)	Tank Contents	Date Removed	Status	Regulatory Concurrence Received
Inland Area Bldg IA-58	UST IA-58	1,000	Diesel	04/15/97	Closed	CCCHSD determination of NFA for UST IA-58 on 02/13/98 (CCCHSD 1998d). RWQCB closure granted on 11/07/05 (RWQCB 2005e).
Inland Area Bldg IA-35	UST IA-35	1,000	Diesel	11/08/90	RWQCB closed.	Closure granted for UST IA-35 by the RWQCB on 12/23/1999 (RWQCB 1999b).
Inland Area Bldg 7SH4	UST 7SH4	1,000	Diesel	01/27/97	CCCHSD NFA; no additional approvals necessary.	CCCHSD determination of NFA for UST 7SH4 on 04/09/97 (CCCHSD 1997d).
	AST 7SH4	1,000	Unknown	2004	AST cleaned and removed.	Unknown
Inland Area Bldg 7SH14	UST 7SH14	3,500	Diesel	01/28/97	CCCHSD NFA; no additional approvals necessary.	CCCHSD determination of NFA for UST 7SH14 on 04/17/97 (CCCHSD 1997d).
	AST 7SH14	1,000	Unknown	2004	AST cleaned and removed.	Unknown
Inland Area Bldg 5AT	UST 5AT	280	Diesel	11/05/90–03/01/91	CCCHSD NFA; no additional approvals necessary.	CCCHSD determination of NFA for UST 5AT on 09/19/94 (CCCHSD 1994a).
Inland Area Bldg 79	UST 79	550	Diesel	11/08/90	CCCHSD NFA; no additional approvals necessary.	CCCHSD determination of NFA for UST 79 on 02/21/95 (CCCHSD 1995a).
Inland Area Bldg 97	UST 97A UST 97B UST 97C UST 97D	2,000 2,000 2,000 2,000	Diesel JP-5 Fuel JP-5 Fuel JP-5 Fuel	12/09/90	CCCHSD NFA; no additional approval necessary.	CCCHSD determination of NFA for USTs 97 on 9/18/94, 02/21/95, 7/19/02, and 10/10/06 (CCCHSD 1995b).
	AST 97	1,000	Diesel	Not Removed	AST cleaned.	Unknown
Administrative Area Bldg 395	UST 395	3,000	Diesel	02/21/97	CCCHSD NFA; no additional approvals necessary.	CCCHSD determination of NFA for UST 395 on 03/18/97 (CCCHSD 1997e).

Location	Tank ID	Tank Capacity (Gallons)	Tank Contents	Date Removed	Status	Regulatory Concurrence Received
Administrative Area Bldg IA-1	UST IA-1A UST IA-1B	300 280	Diesel Gasoline	02/26/97 11/08/90	IA-1A – CCCHSD NFA; no additional approvals necessary. IA-1B – CCCHSD NFA; no additional approvals necessary.	CCCHSD determination of NFA for UST IA-1 on 03/18/97 (CCCHSD 1997f). CCCHSD determination of NFA for UST IA-1B on 02/21/95 (CCCHSD 1995c) and RWQCB determination of NFA on 12/4/06.
	AST IA-1C AST IA-1	500 1,000	Diesel Propane	Not Removed Not Removed	AST IA-1C empty and out of service, but not removed. AST IA-1 in use.	Unknown
Administrative Area Bldg IA-10	UST IA-10	2,100	Diesel	02/21/97	CCCHSD NFA; no additional approvals necessary.	CCCHSD determination of NFA for UST IA-10 on 03/18/97 (CCCHSD 1997g).
Administrative Area Bldg IA-18	UST IA-18	500	Diesel	11/08/90	CCCHSD NFA; no additional approvals necessary.	CCCHSD determination of NFA for UST IA-18 on 11/27/96 (CCCHSD 1994b).
Inland Area Bldg IA-19	UST IA-19 UST IA-19A	1,417 1,850	Diesel Diesel	02/04/93 07/28/04	IA-19 – CCCHSD NFA and RWQCB NFA; IA-19A – CCCHSD NFA; no additional approvals necessary.	CCCHSD determination of NFA for UST IA-19 on 11/30/93 (CCCHSD 1993) and RWQCB determination of NFA on 6/16/06. CCCHSD determination of NFA for UST IA-19A on 09/07/05 (CCCHSD 2005a).
Inland Area Bldg 6LC98	UST 6LC98	1,000	Diesel	03/08/93	CCCHSD NFA and RWQCB NFA.	CCCHSD determination of NFA for UST 6LC98 on 06/01/95 (CCCHSD 1995d) and RWQCB determination for NFA on 6/16/06.
Inland Area Bldg IA-36	UST IA-36	10,000	Diesel	04/15/97	CCCHSD NFA and RWQCB NFA.	CCCHSD determination of NFA for UST IA-36 on 02/13/98 (CCCHSD 1998e) and RWQCB determination for NFA on 6/16/06.
Administrative Area Bldg IA-12	UST IA-12A	6,000	Waste Oil	11/04/93	UST closed by DTSC.	DTSC acknowledgement of RCRA closure for UST IA-12A on 03/21/95 (DTSD 1995).

Location	Tank ID	Tank Capacity (Gallons)	Tank Contents	Date Removed	Status	Regulatory Concurrence Received
	AST IA-12B AST IA-12C AST IA-12D AST IA-12E AST IA-12F AST IA-12G	550 550 550 2,000 600 600	Engine Oil Engine Oil Engine Oil Hydraulic Oil Used Oil Used Oil	2004	ASTs have been cleaned and removed.	Unknown
Administrative Area Bldg IA-6	UST IA-6	10,000	Diesel	06/29/89	RWQCB NFA; no additional approval necessary.	RWQCB determination for NFA on 6/16/06.
Inland Area Bldg 83	UST 83	6,500	Diesel	03/19/97	RWQCB NFA; no additional approval necessary.	RWQCB determination for NFA on 10/4/06.
Inland Area Bldg 86	UST 86A UST 86B	2,500 2,500	Diesel Diesel	03/19/97	RWQCB NFA; no additional approval necessary.	RWQCB determination for NFA on 10/4/06.
Administrative Area Bldg IA-17	UST IA-17A UST IA-17B UST IA-17C UST IA-17D	10,000 (total)	Gasoline Gasoline Gasoline Diesel	01/19/99	Site investigation ongoing. SCAPS report recommends additional site investigations (DoN 2004a).	Site investigation ongoing.
Inland Area Bldg IA-24	UST IA-24A	2,000	Diesel	02/10/97	RWQCB NFA; no additional approval necessary.	RWQCB determination for NFA on 10/4/06.
	AST IA-24	1,000	Diesel	2004	AST cleaned and removed.	Unknown
Administrative Area Bldg 262	AST 262	500	Propane	Not Removed	AST still in use.	Unknown
Administrative Area Bldg IA-4	AST IA-4B	500	Diesel	Not Removed	AST empty and out of service, fuel tank fro 1,400 KW generator	Unknown
Administrative Area Bldg IA-7	AST IA-7	1,000	Propane	Not Removed	AST still in use.	Unknown

Location	Tank ID	Tank Capacity (Gallons)	Tank Contents	Date Removed	Status	Regulatory Concurrence Received
Administrative Area Bldg IA-15	AST IA-15B	1,000	Used Oil	2004	AST cleaned and removed.	Unknown
Runway Area Bldg IA-56	AST IA-56B	275	Diesel	2004	AST cleaned and removed.	Unknown

Notes:
AST = Aboveground Storage Tank
Bldg = Building
CCCHSD = Contra Costa County Health Services Department
DTSC = Department of Toxic Substance Control
NFA = No Further Action
RWQCB = Regional Water Quality Control Board
SCAPS = Site Characterization and Analysis Penetrometer System
UST = Underground Storage Tank

Source: Department of the Navy (DoN), 2006a.

Table 10A-2: Environmental Restoration Sites

Navy's Site Number or Identifier	Regulatory Program(s)[1]	Site Description	Status[2]	Land Area (acres)	Comments on Status[3]	Primary Constituents & Media of Potential Concern
Installation Restoration Sites						
SWMU 2	CERCLA-RCRA CA	Bldg. IA-7 Burn Pit (Fire Station; burn pit south side)	ROD	8.0	SWMUs 2, 5, 7 & 18 are being addressed under CERCLA as one unit. Groundwater treatment pilot study was conducted to evaluate the effectiveness of a solvent cleanup technology. Draft Final ROD submitted October 2009~~Feasibility Study submitted in March 2008~~.	PCE, solvents, petroleum hydrocarbons in groundwater
SWMU 5	CERCLA-RCRA CA	Bldgs. IA-12 (Locomotive Repair Shop) and Bldg. 269 (nearby wash station)	ROD~~FS~~	4.0	See Status under SWMU 2	PCE, solvents, petroleum hydrocarbons in groundwater
SWMU 7	CERCLA-RCRA CA	Bldgs. IA-15 and IA-16 [IA-15 had Public Works shops, including automotive; IA-16 was a paint shop]	ROD~~FS~~	4.0	See Status under SWMU 2	PCE, solvents, petroleum hydrocarbons in groundwater
SWMU 18	CERCLA-RCRA CA	Bldg. IA-51 (vehicle maintenance bldg.; steam-clean locomotives prior to Bldg. 269)	ROD~~FS~~	6.3	See Status under SWMU 2	PCE, solvents, petroleum hydrocarbons in groundwater
14	CERCLA	Kinne Blvd. Wells (3 production wells that have been closed)	NFA	Unk	Site Closed. NFA recommended by Navy in 1996.	Fuel oil
15	CERCLA	Railroad Classification Yard	NFA	Unk	Site Closed. NFA recommended by Navy in 1983 IAS.	Methyl bromide and shell casings
17	CERCLA	Bldg. IA-24, Forklift maintenance and storage	NFA	1.1	Site Closed. NFA ROD signed on 09/30/2005 by Navy, EPA, DTSC & RWQCB.	Metals, fuel
18	CERCLA	Bldg. IA-25, Potential burn pit and solvent disposal area	NFA	Unk	Site Closed. NFA recommended by Navy in 1983 IAS.	Paints, solvents

Navy's Site Number or Identifier	Regulatory Program(s)[1]	Site Description	Status[2]	Land Area (acres)	Comments on Status[3]	Primary Constituents & Media of Potential Concern
20	CERCLA	Old Homestead, Seal Creek	NFA	Unk	Site Closed. NFA recommended by Navy in 1983 IAS;	Household wastes: cans, coffee pots, bed pans, etc.; no hazardous wastes identified
22	CERCLA	Bldg. 7SH5 and Magazine Area (encompasses 14 buildings & 116 magazines)	Proposed Plan~~FS~~	531.0	Draft Final Proposed Plan submitted to agencies on October 2, 2009. ~~Draft FS report submitted to agencies on May 23, 2008~~	Arsenic (surface soil)
22A	CERCLA	Group 1-5 Magazine Areas, Munitions storage bunkers	RI	502.0	Draft FS is scheduled for submittal in late 2009~~Draft RI report submitted to agencies on September 19, 2008~~.	Arsenic (surface soil)
27	CERCLA	Bldgs. IA-20 (Chem Lab) and IA-36 (Boiler House)	Time Critical Removal Action	0.5	Removal Action Completion Report scheduled for submittal in December 2009~~TCRA implemented in November 2008~~.	Lead, mercury, Arochlor - 1248 and Arochlor-1254 (surface soil)
29	CERCLA	Bldg. IA-25, Missile Component Maintenance	RI	1.0	Field Activities Summary Report for the RI submitted to the agencies on June 27, 2008	TCE in groundwater, lead in surface soil.
Solid Waste Management Units						
SWMU 1, and Admin Area Bldg. IA-6 (UST site)	UST & RCRA CA	Bldg. IA-6 (Boiler House, 10k gal. UST, removed 6/29/89)	NFA	Unk	Navy completed site investigation and requested closure by SFBRWQCB in 2005. Petroleum-only site so Navy addressed under UST program. Boiler house was demolished in 1997. RWQCB closure issued on 6/16/06	Fuel oil
SWMU 13	CERCLA-RCRA CA	Bldg. IA-25 (building's septic system and leach field)	RI under Site 29	1.0	Draft RI Work Plan issued 11/7/06; A draft final FS report was issued, but in Aug 2005 TCE was detected in groundwater at a concentration of 4,300 µg/L (MCL is 5 µg/L) in a well located in the septic leach field. A sample collected in May 2006 had 1,600 µg/L. Site is in RI stage under Site 29.	TCE in groundwater, lead in surface soil.
SWMU 12	RCRA CA	Bldg. IA-24, Forklift Maintenance (Septic system; also see Site 17)	NFA	Unk	NFA ROD was signed for Site 17 under CERCLA; Septic tank decommissioned in place in 2005.	Lead
SWMU 14	RCRA CA	Bldg. IA-27, Carpenter Shop	NFA	Unk	Septic tank was the concern; septic tank waste removed in 1997; April 1997 RCRA CA report proposed NFA. Septic tank decommissioned in place in 2005.	Unk

Navy's Site Number or Identifier	Regulatory Program(s)[1]	Site Description	Status[2]	Land Area (acres)	Comments on Status[3]	Primary Constituents & Media of Potential Concern
SWMU 15	RCRA CA	Bldg. IA-41, Paint Storage (bldg. demolished)	NFA	Unk	NFA proposed by Navy in their 1997 RFA Confirmation Study (PRC, Aug. 1997). Septic tank/leach field (reason identified as SWMU) determined not to be present.	Unk
SWMU 16	RCRA CA	Bldg. IA-46 (PW Maintenance Storage) and Bldg. 150 (storage shed southwest of IA-46)	NFA (IA-46) NFA (Bldg. 150)	Unk	RCRA Part B clean closure obtained from DTSC for fluorescent bulb crushing in IA-46 on June 27, 2003. Removal of pesticide contaminated soils performed in 1997. Septic tank decommissioned in place in 2005.	Silver, asbestos, and pesticides
SWMU 17	RCRA CA	Bldg. IA-50, Rail/Truck Transfer Depot	NFA	Unk	Septic tank waste removed in 1997; both the 1997 RCRA CA report and RFA Confirmation Study proposed NFA. Septic tank decommissioned in place in 2005.	Unk
SWMU 20	RCRA CA	Bldg. IA-55, Ordnance Operations Bldg.	NFA	Unk	NFA ROD was signed for Site 17 under CERCLA; Septic tank waste removed in 1997; both the 1997 RCRA CA report and RFA Confirmation Study proposed NFA. Septic tank decommissioned in place in 2005.	Unk
SWMU 22	RCRA CA	Bldg. 81, Ordnance Maintenance and Test Bldg.	NFA	Unk	Septic system was the concern; the 1997 RFA Confirmation Study proposed NFA. Septic tank decommissioned in place in 2005.	Unk
SWMU 23	RCRA CA	Bldg. 87, Storage Bldg.	NFA	Unk	Septic tank waste removed in 1997; both the 1997 RCRA CA report and RFA Confirmation Study proposed NFA. Septic tank decommissioned in place in 2005.	Unk
SWMU 24	RCRA CA	Bldg. 93, Guided Missile Division	Further investigation planned	Unk	Septic tank waste removed in 1997; both the 1997 RCRA CA report and RFA Confirmation Study proposed NFA. Septic tank decommissioned in place in 2005. Further investigation planned in septic tank leach field area for munitions constituents.	Unk
SWMU 25	RCRA CA	Bldg. 97, Ordnance Assembly Bldg.	NFA	Unk	Septic system was the concern; the 1997 RFA Confirmation Study proposed NFA. Septic tank decommissioned in place in 2005.	Unk

Navy's Site Number or Identifier	Regulatory Program(s)[1]	Site Description	Status[2]	Land Area (acres)	Comments on Status[3]	Primary Constituents & Media of Potential Concern
SWMU 26	RCRA CA & UST	Bldg. 178, Navy Exchange Gasoline Service Station	UST-NFA RCRA CA-NFA	Unk	The 3 gasoline USTs were removed in 1991 and site remediation subsequently completed; closure received from county (1998) and RWQCB (1999).	Unk
SWMU 30	RCRA CA	UNOCAL Corporation Oil Pipeline Site	RCRA CA-Under investigation (by UNOCAL)	Unk	UNOCAL pipeline easement traversing east-west. 1989 crude oil release (2-3 barrels, or up to 84 gals). UNOCAL performed cleanup response under RWQCB direction. ECP states Investigation continuing. Site not listed in State Water Resources Control Board GeoTracker data base, or in DTSC's EnviroStor data base. Need to contact RWQCB to ascertain current status.	Crude oil
SWMU 33	UST & RCRA CA	Site 6LC98 UST, Magazine boiler, (1k gal. diesel, removed 1991)	NFA	Unk	County NFA received 6/1/95; RWQCB closure received on 12/4/06.	Fuel oil
SWMU 51	RCRA CA	Runway Area Bldg. IA-56 (septic tank)	NFA	Unk	Septic system was the concern; 1997 RFA Confirmation Study proposed NFA. Septic tank decommissioned in place in 2005.	Unk
SWMU 52	RCRA CA	Inland Area Bldg. 7SH-5 (septic tank and leach field)	NFA	Unk	Septic system was the concern 1997 RFA Confirmation Study proposed NFA. 7SH-5 and surrounding magazine area are Site 22 under CERCLA program. Septic tank decommissioned in place in 2005.	Solvents, metals
SWMU 53	RCRA CA	Inland Area Bldg. 7SH-14 (septic tank and leach field)	NFA	Unk	Septic system was the concern 1997 RFA Confirmation Study proposed NFA. Septic tank decommissioned in place in 2005.	Solvents, metals
SWMU 54	RCRA CA	Inland Area Bldg. 79 (septic tank)	NFA	Unk	Septic system was the concern Septic tank waste removed in 1997. Both the 1997 RCRA CA report and RFA Confirmation Study proposed NFA. Septic tank decommissioned in place in 2005.	Unk

Navy's Site Number or Identifier	Regulatory Program(s)[1]	Site Description	Status[2]	Land Area (acres)	Comments on Status[3]	Primary Constituents & Media of Potential Concern
Military Munitions Response Program Sites						
UXO0009~~13~~	MMRP & CERCLA	Former Inland Burn Area (MMRP) / Burn Area (CERCLA Site 13)	RI~~SI~~	28.0	Site being investigated with Site 24B, Railroad Siding Excavation Area, as one site. Draft SI submitted April 2009 and awaiting regulatory concurrence. RI proceeding. Field activities scheduled to begin spring/summer 2010.~~CERCLA- RI ongoing to investigate Perchlorate in groundwater ≤ 2.0 µg/L (below California Dept. of Health Services Proposed MCL of 6.0 µg/L). Site Inspection is being conducted.~~	MEC & MC (soil)
UXO0003	MMRP	Railroad Siding Excavations	SI	22.0	Site is being investigated with UXO0009, as one site. Draft SI submitted April 2009 and awaiting regulatory concurrence. RI proceeding. Field activities scheduled to begin spring/summer 2010.	MEC & MC (soil & groundwater)
UXO0004~~16~~	MMRP & CERCLA	Black Pit at Red Rock	SI	<0.1	Draft SI submitted April 2009. NFA recommended~~The pit (<0.1 acres) is within the "Red Rock Disposal Area" (historical clean borrow area and refuse transfer station). Site inspection is being conducted.~~	MC (soil & groundwater)
UXO0006~~19~~	MMRP & CERCLA	Disposal Area - Seal Creek	NFA	1.5	CERCLA- NFA recommended in IAS of 1983; Navy "moved to MMRP" and site was included in MMRP PA. Final MMRP recommended NFA.	Disposal of trash and debris
23A	MMRP & CERCLA	Inland Area Explosive Ordnance Disposal (EOD) (Located just north of "Burn Area Near HE-58.")	NFA~~Supplemental PA~~	41.0	Supplemental PA will recommend performing a new MMRP SI for portions of Site 23A. NFA received in FY2009~~NFA recommended in 1993 SI (CERCLA); no official concurrence from EPA or DTSC. Sampling in 1992 revealed no explosives in soil. Navy moved to MMRP. Supplemental PA is being conducted.~~	Open detonation of munitions

Navy's Site Number or Identifier	Regulatory Program(s)[1]	Site Description	Status[2]	Land Area (acres)	Comments on Status[3]	Primary Constituents & Media of Potential Concern
UXO0010~~23B~~	MMRP & CERCLA	Eagle's Nest EOD	RI~~SI~~	2.4	NFA recommended in 1993 SI (CERCLA); no official concurrence from EPA or DTSC. Moved to MMRP. Draft SI submitted April 2009 and awaiting regulatory concurrence. RI proceeding. Field activities scheduled to begin spring/summer 2010. ~~Site inspection is being conducted.~~	Open detonation of munitions, bulk propellants, explosives, pyrotechnics, small arms, and grenades. MC (soil & groundwater)
UXO0001A~~24A~~	MMRP & CERCLA	Pistol Range	SI	0.5	Inactive range requiring evaluation and closure. Near IA-57. Not officially part of MMRP since became inactive in January 2005, but was used infrequently since 1999. Requires final range closure (investigation/cleanup); Site inspection is being conducted.	MEC & MC (soil & groundwater)
24B	MMRP & CERCLA	Bore Sighting Range (MMRP) / Aircraft Range (CERCLA)	NFA	5.3	NFA recommended in 1993 SI (CERCLA); no official concurrence from EPA or DTSC. Moved to MMRP. Final MMRP PA recommends NFA.	MEC & MC
UXO0002~~-~~	MMRP	Borrow/Dredge Fill Area	NFA	27.0	Final MMRP PA recommended NFA.	Unk
UXO0004~~-~~	MMRP	Red Rock Disposal Area	NFA	5.3	Final MMRP PA recommended NFA.	Trash and debris disposal
~~-~~	~~MMRP~~	~~Railroad Siding Excavations~~	~~SI~~	~~51.0~~	~~Site inspection is being conducted.~~	~~MEC & MC (soil & groundwater)~~
UXO0005~~-~~	MMRP	Burn Area Near HE-5	NFA~~SI~~	92.0	Draft SI submitted April 2009. NFA recommended.~~Site inspection is being conducted.~~	MEC & MC (soil & groundwater)

Notes:

[1] Where more than one Regulatory Program is listed, the primary one under which the Navy is addressing the site is listed first.
[2] Table does not list the 14 RCRA SWMUs recommended for NFA in DTSC RFA, or USTs for which RWQCB closure has been received.
[3] Status is of 30 March 2009 and does not reflect status changes after that date.
[4] Twelve additional Areas of Potential Interest are currently being researched. Work Plan was submitted to the regulatory agencies in June 2009.

AOC- Area of Concern
AST- Aboveground storage tank (petroleum)
CERCLA- Comprehensive Environmental Response, Compensation and Liability Act (Superfund)
FS- Feasibility Study
IAS- Initial Assessment Study
PCE- Tetrachloroethylene (aka, Perchloroethylene)
RA- Removal or Remedial Action
RCRA CA- Resource Conservation and Recovery Act Corrective Action
RI- Remedial Investigation
ROD- Record of Decision

Navy's Site Number or Identifier	Regulatory Program(s)[1]	Site Description	Status[2]	Land Area (acres)	Comments on Status[3]	Primary Constituents & Media of Potential Concern

MMRP- Military Munitions Response Program
NFA- No Further Action
PA- Preliminary Assessment
SI- Site Inspection
TCE- Trichloroethene
UST- Underground Storage Tank (petroleum; regulated by County, sometimes also RWQCB)

Sources:

Department of the Navy (DoN), 2006a. Environmental Condition of Property (ECP) Report, April 28, 2006.
Department of the Navy (DoN), 2007a. Environmental Restoration Program, NWSSBD-Concord, Inland Area Fact Sheet. July 2007.

Table 10A-3: Summary of Asbestos-Containing Materials Survey Findings

Building Number	Building Description	Year Built	Area (square feet)	Building Location	ACM Survey Performed? [1]	Asbestos Survey Report [2]	ACM Found?	Location of ACM	Condition of ACM
152	Gymnasium	1966	12,867	Admin Area	Yes	1999 2002b	Yes	18 homogeneous areas (including pipe insulation, tar sealant, coving mastic, floor tile, grout)	1999: Two locations low friable, remaining locations non-friable 2002: All locations non-friable (two low friable locations abated)
155	Navy Exchange Patio Snack Bar	1964	960	Admin Area	Yes	2002a	No	Unknown	Unknown
159	Recreation Center	1966	8,344	Admin Area	Yes	1999 2002b	Yes	15 homogenous areas (including insulation, coving mastic, grout, cinder block and mortar, floor tile)	1999: Two high friable, remaining locations low and non-friable 2002: Seven friable, remaining locations non-friable
178	Navy Exchange Gas Station	1969	1,664	Admin Area	Yes	2002a	No	Unknown	Unknown
185	Administrative Office	1970	1,295	Admin Area	Yes	1999 2002b	Yes	10 homogenous areas (including roofing, grout, floor tile, coving, mastic, cinder block and mortar)	1999: All locations non-friable 2000: All locations non-friable
186	Navy Reserves Administration Building	1972	2,681	Admin Area	Yes	1999 2002b	Yes	10 homogenous areas (including roofing, grout, fire door, floor tile, coving mastic, cinder block and mortar)	1999: All locations non-friable 2000: All locations non-friable
187	Former USMC Barracks	1972	10,724	Admin Area	Yes	2002a	Yes	Pipe enclosure, pipe lagging, floor tile, fire doors	Transite friable, all other materials non-friable

Building Number	Building Description	Year Built	Area (square feet)	Building Location	ACM Survey Performed? [1]	Asbestos Survey Report [2]	ACM Found?	Location of ACM	Condition of ACM
190	Pool Bath House	1971	668	Admin Area	Yes	2002a	No	Unknown	Unknown
245A-D	Two-story Fourplex Unit (2-bedroom)	1947	7,056	Admin Area	Yes	2002a	Yes	Drywall, linoleum, floor tile, transite vent pipes, thermal system insulation debris, fire doors, air cell, boiler system gaskets	Non-friable
245 E, F	Community Mess	1947	4,086	Admin Area	Yes	2002a	Yes	Drywall, linoleum, floor tile, transite vent pipes, thermal system insulation debris, fire doors, air cell, boiler system gaskets	Transite friable, all other materials non-friable
252	Navy Exchange Warehouse/Public Works Storage	1972	1,308	Admin Area	Yes	2002a	Yes	Vinyl floor tile, mastic, drywall	Non-friable
253	USMC Troop Storage	1972	960	Admin Area	Yes	2002a	No	Unknown	Unknown
254	Morale, Welfare, and Recreation Storage	1973	1,480	Admin Area	Yes	2002a	No	Unknown	Unknown
256	Morale, Welfare, and Recreation Outdoor Gear Issue Building	1974	224	Admin Area	Yes	2002a	No	Unknown	Unknown
264	Picnic Grounds	1976	Unknown	Admin Area	Yes	2002a	No	Unknown	Unknown
395	Navy Barracks	1981	11,210	Admin Area	Yes	2002a	Yes	Vinyl floor tile, stair tread, mastic	Non-friable

Building Number	Building Description	Year Built	Area (square feet)	Building Location	ACM Survey Performed? [1]	Asbestos Survey Report [2]	ACM Found?	Location of ACM	Condition of ACM
396	USMC Troop Storage	1972	960	Admin Area	Yes	2002a	Yes	Vinyl floor tile, mastic	Non-friable
397	Navy Barracks	1981	21,609	Admin Area	Yes	2002a	Yes	Vinyl tile, mastic	Non-friable
398	Navy Barracks	1981	2,748	Admin Area	Yes	2002a	Yes	Vinyl floor tile, leveling compound	Friable and non-friable
409	Chapel	1980	2,004	Admin Area	Yes	2002a	Yes	Flooring, vinyl floor tile, mastic	All locations non-friable
433	Storage	1987	1,800	Admin Area	Yes	2002a	Yes	Fire door	Non-friable
435	Racquetball Courts	1989	1,080	Admin Area	Yes	1999 2002b	Yes	7 homogenous areas (including coving mastic, fire door, roofing)	1999: All locations non-friable 2002: All locations non-friable
E-98	Administrative Office	1953	10,710	Admin Area	Yes	1988 1989 2002b	Yes	1988: Pipe insulation 1989: Pipe insulation, transite panels, floor tile, debris under building	1988: Pipe insulation friable 1989: Pipe insulation and debris under building friable, transite panels and floor tiles non-friable 2002: Pipe insulation and debris under building friable, transite panels abated and floor tiles non-friable
IA-5	Station Theater & FISC Warehouse	1945	11,364	Admin Area	Yes	2002a	Yes	Window putty, transite panels, drywall, vinyl floor tile	Non-friable
IA-18	Dental Clinic/Dispensary	1945	9,921	Admin Area	Yes	1999 2002b	Yes	26 homogeneous areas (including pipe insulation, sheet rock, tar paper, mortar, grout, roofing, sheet flooring)	1999: 2 moderate friable, remaining locations low and non-friable 2002: 24 friable, remaining locations non-friable

Building Number	Building Description	Year Built	Area (square feet)	Building Location	ACM Survey Performed? [1]	Asbestos Survey Report [2]	ACM Found?	Location of ACM	Condition of ACM
IA-18A	Administrative Offices	1945	7,868	Admin Area	Yes	1988 1989 1999 2002b	Yes	1988: None 1989: Pipe insulation 1999: 13 homogeneous areas (including pipe insulation, sheetrock, coving mastic, floor tile, grout)	1989: Pipe insulation friable 1999: Four moderate friable, remaining locations non-friable 2002: Five friable, remaining locations non-friable
IA-18C	Administrative Offices	1945	8,558	Admin Area	Yes	1988 1989 2002b	Yes	1989: Ceiling material, pipe insulation, floor tile, transite panels 1999: 18 homogeneous areas (including debris, sheetrock, coving mastic, grout, roofing, floor tile)	1989: Ceiling and pipe insulation friable, tiles and panels non-friable 1999: Low to non-friable locations 2002: 26 friable, remaining locations non-friable
IA-18D	Human Resources Office and Credit Union	1945	6,203	Admin Area	Yes	1988 1989 1999 2002b	Yes	1988: None 1989: Pipe insulation, pipe elbow/joint insulation, floor tile 1999: 19 homogeneous areas (including pipe insulation and fittings, transite, covingmastic, floor tiles, roofing)	1989: Pipe insulation and pipe elbow/joint insulation friable, floor tile non-friable 1999: Three moderate friable, one low friable, remaining location non-friable 2002: four friable, remaining locations non-friable
IA-18B	Administrative Offices	1945	7,376	Admin Area	Yes	1988 1989 1999 2002b	Yes	1988: Pipe and joint insulation 1989: Pipe and joint insulation 1999: 16 homogeneous areas (including pipe and fitting insulation, transite, floor tile, grout, fire door, roofing)	1988: Pipe and joint insulation friable 1989: Pipe and joint insulation friable 1999: Two high friable, seven low friable, remaining locations non-friable 2002: 18 friable, remaining locations non-friable

Building Number	Building Description	Year Built	Area (square feet)	Building Location	ACM Survey Performed? [1]	Asbestos Survey Report [2]	ACM Found?	Location of ACM	Condition of ACM
193	Auto Hobby Shop	1971	3,900	Admin Area	Yes	2002a	No	Unknown	Unknown
265	Morale, Welfare, and Recreation Garage	1974	1,092	Admin Area	Yes	2002a	No	Unknown	Unknown
IA-10	Administrative Building	1945	39,416	Admin Area	Yes	1999 2002b	Yes	40 homogeneous areas (including vent duct insulation, glazing undercoat, grout, coving mastic, floor tile, roofing, tar sealant)	1999: one high friable, one low friable, remaining locations non-friable 2002: 2 friable, remaining locations non-friable
IA-46	Public Works Maintenance Storage	1952	17,136	Admin Area	Yes	2002a	Yes	Transite panel	Non-friable
262	ROICC Public Works Administrative Office Building	1959	3,242	Admin Area	Yes	1999 2002b	Yes	12 homogeneous areas (including sheetrock, pipe insulation, flooring, roofing, transite panels)	1999: 1 high, 1 moderate friable, remaining locations low to non-friable 2002: All locations non-friable (high location abated, moderate location re-accessed as non-friable, low locations abated or re-assessed as non-friable)
IA-1	Command Administration Building	1945	11,095	Admin Area	Yes	1999 2002b	Yes	27 homogeneous areas (including coving mastic, floor tile, grout, transite, tar sealant, sheetrock, ceiling tile, pipe and fitting insulation)	1999: 5 high friable, 2 moderate friable, remaining locations are low and non-friable 2002: 8 friable, remaining locations are non-friable

Building Number	Building Description	Year Built	Area (square feet)	Building Location	ACM Survey Performed? [1]	Asbestos Survey Report [2]	ACM Found?	Location of ACM	Condition of ACM
IA-2	Security Pass and ID Office	1951	1,920	Admin Area	Yes	1999 2002b	Yes	12 homogeneous areas (including roofing, roofing sealer, sheet flooring, coving mastic)	1999: 1 moderate friable, remaining locations non-friable 2002: 1 friable, remaining locations non-friable
522	Fueling Station	1945	1,100	Admin Area	Yes	2002a	No	Unknown	Unknown
IA-7	Inland Fire Station	1945	6,333	Admin Area	Yes	1988 1989 1999 2002b	Yes	1988: Pipe insulation 1989: Pipe insulation and sealant 1999: 12 homogeneous areas (including pip and fitting insulation, surfacing, grout, coving mastic, floor tile, roofing)	1988: Pipe insulation friable 1989: Pipe insulation friable, roof sealant non-friable 1999: 3 high friable, 2 moderate friable, 5 low friable, remaining locations non-friable 2002: 9 friable, remaining locations non-friable
IA-8	Explosive Ordinance Disposal Offices	1945	2,159	Admin Area	Yes	1988 1989 2002b	Yes	Pipe insulation and floor tile	1988: Pipe insulation friable, floor tile non-friable 1989: Pipe insulation friable, floor tile non-friable 2002: Pipe insulation abated, floor tile non-friable
IA-11	FISC Admin Building	1945	7,910	Admin Area	Yes	1989 2002b	Yes	Pipe and joint insulation, vault ceiling, roof sealant, transite panel, floor tile	1989: Insulation and ceiling friable, sealant, transite, floor tile non-friable 2002: Insulation and ceiling friable, sealant, transite, floor tile non-friable

Building Number	Building Description	Year Built	Area (square feet)	Building Location	ACM Survey Performed? [1]	Asbestos Survey Report [2]	ACM Found?	Location of ACM	Condition of ACM
IA-12	Locomotive and Railroad Maintenance	1945	16,715	Admin Area	Yes	1988 1989 2002b	Yes	1988: Pipe and joint insulation 1989: Pipe and joint insulation, floor tile, transite panels	1988: Insulation friable 1989: Insulation friable, floor tile, transite non-friable 2002: Insulation and transite abated, floor tile non-friable
IA-15	Administrative Offices and Vehicle Maintenance	1945	34,240	Admin Area	Yes	1988 1989 2002b	Yes	1988: Pipe insulation 1989: Pipe insulation, floor tile, transite panels	1988: Pipe insulation friable 1989: Pipe insulation friable, floor tile non-friable 2002: 2 friable (pipe insulation), floor tile non-friable
IA-16	Paint Shop and Vehicle Dispatch	1945	5,528	Admin Area	Yes	1988 1989 2002b	Yes	1988: Pipe and joint insulation 1989: Pipe and joint insulation, floor tile, roof sealant	1988: Pipe and joint insulation friable 1989: Pipe and joint insulation friable, floor tile, roof and sealant non-friable 2002: four friable, remaining locations non-friable.
IA-37	Public Works Shop	1947	5,123	Admin Area	Yes	1988 1989 2002b	Yes	1988: Pipe insulation 1989: Pipe insulation, floor tile, roof	1988: Pipe insulation friable 1989: Pipe insulation friable, roof non-friable 2002: Pipe insulation abated, all remaining locations non-friable
IA-38	Public Works Shop Stories	1947	11,002	Admin Area	Yes	1988 1989 2002b	Yes	1988: Pipe and joint insulation 1989: Pipe and joint insulation, roof	1988: Pipe insulation friable 1989: Pipe insulation friable, roof non-friable 2002: Pipe insulation abated, roof non-friable

Building Number	Building Description	Year Built	Area (square feet)	Building Location	ACM Survey Performed? [1]	Asbestos Survey Report [2]	ACM Found?	Location of ACM	Condition of ACM
IA-43	Public Works Part Storehouse	1947	2,058	Admin Area	Yes	2002a	Yes	Drywall, fire doors	Non-friable
IA-48	Vehicle Storage Shed	1952	12,190	Admin Area	No	Unk	Unk	Unknown	Unknown
IA-49	Storage	1952	4,186	Admin Area	Yes	2002a	Yes	Fire door	Non-friable
IA-51	Steam Clean Facility	1975	1,865	Admin Area	Yes	2002a	Yes	Window putty	Non-friable
IA-52	Electronic Shop	1953	3,356	Admin Area	Yes	2002a	Yes	Window putty, vinyl floor tile, mastic	Non-friable

Notes:

[1] ACSurvey Performed?
Only areas where ACM survey has been performed are represented in this table.
Garages and other buildings not intended for long-term human occupancy were excluded from the 2002 ACM Survey.
Housing units 221 and 222 were assumed to be demolished when planning the 2002 ACM survey; therefore, the units were not included in this survey.
Housing units 147 and 249 were inadvertently not included in the list of housing units to be surveyed for ACM.

[2] AM Survey Reports:
1988: Inventory of Friable Asbestos-Containing Materials for the Naval Weapons Station at Concord, California. Pacific Environmental Services, Inc., February 1988.
1989: Draft Asbestos Survey and Assessment Naval Weapons Station Concord, Concord, California. IT Corporation, April 1989.
1996: Asbestos Management Plan, Miscellaneous Housing Naval Weapons Station – Concord, Concord, California. Department of the Navy, May 1996.
1999: Asbestos, Environmental, and Lead Pre-Demolishment Survey, Concord Naval Weapons Station. SSPORTS Environmental Detachment, 1999.
2000: Naval Weapons Station, Seal Beach Detachment Concord Asbestos Survey of Selected Facilities and Buildings, Ameritac, Inc., 2000.
2002a: Asbestos Survey Report for Inland Area Naval Weapons Station Seal Beach Detachment Concord. Brown & Caldwell, 2002.
2002b: Asbestos Condition Assessment – Concord Naval Weapons Station. CDM Federal Programs, Inc., 2002.

Admin = Administration
ACM = Asbestos Containing Materials
FISC = Fleet Industrial Supply Center
NA = Not Applicable
ROICC = Resident Officer in Charge of Construction

Source: Department of the Navy (DoN), 2006a.

Appendix 11A
Detailed Urbemis Outputs

5/15/2009 4:09:47 PM

Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\Kimberly.Seigel\Application Data\Urbemis\Version9a\Projects\Clustered Villages Total Land Uses.urb924

Project Name: Clustered Villages -- Total Land Uses

Project Location: Contra Costa County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (tons/year unmitigated)	30.39	109.49	470.43	0.46	1,545.91	4.53	1,550.44	323.17	4.06	327.23	50,218.07
2010 TOTALS (tons/year mitigated)	21.49	109.49	470.43	0.46	1,545.91	4.53	1,550.44	323.17	4.06	327.23	50,218.07
Percent Reduction	29.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2011 TOTALS (tons/year unmitigated)	28.67	99.25	433.33	0.46	1,539.99	4.19	1,544.17	321.94	3.74	325.67	50,050.24
2011 TOTALS (tons/year mitigated)	19.63	99.25	433.33	0.46	1,539.99	4.19	1,544.17	321.94	3.74	325.67	50,050.24
Percent Reduction	31.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2012 TOTALS (tons/year unmitigated)	27.13	90.36	401.35	0.46	1,545.91	3.90	1,549.81	323.17	3.48	326.65	50,267.41
2012 TOTALS (tons/year mitigated)	18.07	90.36	401.35	0.46	1,545.91	3.90	1,549.81	323.17	3.48	326.65	50,267.41
Percent Reduction	33.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2013 TOTALS (tons/year unmitigated)	25.65	81.90	369.61	0.46	1,545.91	3.63	1,549.54	323.17	3.23	326.40	50,291.32

2013 TOTALS (tons/year mitigated)	16.58	81.90	369.61	0.46	1,545.91	3.63	1,549.54	323.17	3.23	326.40	50,291.32
Percent Reduction	35.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2014 TOTALS (tons/year unmitigated)	24.26	74.02	340.88	0.46	1,545.91	3.37	1,549.28	323.17	2.99	326.16	50,311.16
2014 TOTALS (tons/year mitigated)	15.19	74.02	340.88	0.46	1,545.91	3.37	1,549.28	323.17	2.99	326.16	50,311.16
Percent Reduction	37.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2015 TOTALS (tons/year unmitigated)	23.01	66.90	314.74	0.46	1,545.91	3.16	1,549.07	323.17	2.79	325.96	50,325.85
2015 TOTALS (tons/year mitigated)	13.94	66.90	314.74	0.46	1,545.91	3.16	1,549.07	323.17	2.79	325.96	50,325.85
Percent Reduction	39.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2016 TOTALS (tons/year unmitigated)	21.90	60.69	292.38	0.46	1,545.91	2.96	1,548.87	323.17	2.61	325.78	50,333.07
2016 TOTALS (tons/year mitigated)	12.83	60.69	292.38	0.46	1,545.91	2.96	1,548.87	323.17	2.61	325.78	50,333.07
Percent Reduction	41.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2017 TOTALS (tons/year unmitigated)	20.83	54.93	270.59	0.46	1,539.99	2.76	1,542.75	321.94	2.43	324.36	50,146.29
2017 TOTALS (tons/year mitigated)	11.80	54.93	270.59	0.46	1,539.99	2.76	1,542.75	321.94	2.43	324.36	50,146.29
Percent Reduction	43.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018 TOTALS (tons/year unmitigated)	20.01	50.12	252.75	0.46	1,545.91	2.60	1,548.51	323.17	2.29	325.46	50,343.83
2018 TOTALS (tons/year mitigated)	10.94	50.12	252.75	0.46	1,545.91	2.60	1,548.51	323.17	2.29	325.46	50,343.83
Percent Reduction	45.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2019 TOTALS (tons/year unmitigated)	19.22	45.65	235.37	0.46	1,545.91	2.45	1,548.36	323.17	2.14	325.32	50,348.21

2019 TOTALS (tons/year mitigated)	10.16	45.65	235.37	0.46	1,545.91	2.45	1,548.36	323.17	2.14	325.32	50,348.21
Percent Reduction	47.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2020 TOTALS (tons/year unmitigated)	18.49	41.75	219.63	0.46	1,551.83	2.33	1,554.16	324.41	2.03	326.45	50,545.19
2020 TOTALS (tons/year mitigated)	9.39	41.75	219.63	0.46	1,551.83	2.33	1,554.16	324.41	2.03	326.45	50,545.19
Percent Reduction	49.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2021 TOTALS (tons/year unmitigated)	16.08	32.28	156.95	0.46	1,545.91	2.12	1,548.03	323.17	1.84	325.01	50,376.38
2021 TOTALS (tons/year mitigated)	7.01	32.28	156.95	0.46	1,545.91	2.12	1,548.03	323.17	1.84	325.01	50,376.38
Percent Reduction	56.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2022 TOTALS (tons/year unmitigated)	16.02	32.16	156.35	0.46	1,539.99	2.11	1,542.09	321.94	1.83	323.77	50,183.37
2022 TOTALS (tons/year mitigated)	6.99	32.16	156.35	0.46	1,539.99	2.11	1,542.09	321.94	1.83	323.77	50,183.37
Percent Reduction	56.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2023 TOTALS (tons/year unmitigated)	16.02	32.16	156.35	0.46	1,539.99	2.11	1,542.09	321.94	1.83	323.77	50,183.37
2023 TOTALS (tons/year mitigated)	6.99	32.16	156.35	0.46	1,539.99	2.11	1,542.09	321.94	1.83	323.77	50,183.37
Percent Reduction	56.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2024 TOTALS (tons/year unmitigated)	16.14	32.41	157.56	0.46	1,551.83	2.12	1,553.96	324.41	1.84	326.26	50,569.39
2024 TOTALS (tons/year mitigated)	7.04	32.41	157.56	0.46	1,551.83	2.12	1,553.96	324.41	1.84	326.26	50,569.39
Percent Reduction	56.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2025 TOTALS (tons/year unmitigated)	16.08	32.28	156.95	0.46	1,545.91	2.12	1,548.03	323.17	1.84	325.01	50,376.38

2025 TOTALS (tons/year mitigated)	7.01	32.28	156.95	0.46	1,545.91	2.12	1,548.03	323.17	1.84	325.01	50,376.38
Percent Reduction	56.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2026 TOTALS (tons/year unmitigated)	14.69	27.79	121.49	0.46	1,545.91	2.03	1,547.94	323.17	1.76	324.94	50,407.00
2026 TOTALS (tons/year mitigated)	5.62	27.79	121.49	0.46	1,545.91	2.03	1,547.94	323.17	1.76	324.94	50,407.00
Percent Reduction	61.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2027 TOTALS (tons/year unmitigated)	14.69	27.79	121.49	0.46	1,545.91	2.03	1,547.94	323.17	1.76	324.94	50,407.00
2027 TOTALS (tons/year mitigated)	5.62	27.79	121.49	0.46	1,545.91	2.03	1,547.94	323.17	1.76	324.94	50,407.00
Percent Reduction	61.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2028 TOTALS (tons/year unmitigated)	14.63	27.68	121.03	0.46	1,539.99	2.03	1,542.01	321.94	1.76	323.69	50,213.87
2028 TOTALS (tons/year mitigated)	5.60	27.68	121.03	0.46	1,539.99	2.03	1,542.01	321.94	1.76	323.69	50,213.87
Percent Reduction	61.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2029 TOTALS (tons/year unmitigated)	14.69	27.79	121.49	0.46	1,545.91	2.03	1,547.94	323.17	1.76	324.94	50,407.00
2029 TOTALS (tons/year mitigated)	5.62	27.79	121.49	0.46	1,545.91	2.03	1,547.94	323.17	1.76	324.94	50,407.00
Percent Reduction	61.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030 TOTALS (tons/year unmitigated)	14.69	27.79	121.49	0.46	1,545.91	2.03	1,547.94	323.17	1.76	324.94	50,407.00
2030 TOTALS (tons/year mitigated)	5.62	27.79	121.49	0.46	1,545.91	2.03	1,547.94	323.17	1.76	324.94	50,407.00
Percent Reduction	61.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2031 TOTALS (tons/year unmitigated)	13.90	25.66	98.93	0.46	1,545.91	2.00	1,547.91	323.17	1.73	324.90	50,431.51

2031 TOTALS (tons/year mitigated)	4.84	25.66	98.93	0.46	1,545.91	2.00	1,547.91	323.17	1.73	324.90	50,431.51
Percent Reduction	65.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2032 TOTALS (tons/year unmitigated)	13.96	25.76	99.31	0.46	1,551.83	2.01	1,553.84	324.41	1.74	326.15	50,624.73
2032 TOTALS (tons/year mitigated)	4.86	25.76	99.31	0.46	1,551.83	2.01	1,553.84	324.41	1.74	326.15	50,624.73
Percent Reduction	65.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2033 TOTALS (tons/year unmitigated)	13.85	25.56	98.55	0.46	1,539.99	1.99	1,541.98	321.94	1.72	323.66	50,238.28
2033 TOTALS (tons/year mitigated)	4.82	25.56	98.55	0.46	1,539.99	1.99	1,541.98	321.94	1.72	323.66	50,238.28
Percent Reduction	65.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2034 TOTALS (tons/year unmitigated)	13.85	25.56	98.55	0.46	1,539.99	1.99	1,541.98	321.94	1.72	323.66	50,238.28
2034 TOTALS (tons/year mitigated)	4.82	25.56	98.55	0.46	1,539.99	1.99	1,541.98	321.94	1.72	323.66	50,238.28
Percent Reduction	65.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2035 TOTALS (tons/year unmitigated)	13.90	25.66	98.93	0.46	1,545.91	2.00	1,547.91	323.17	1.73	324.90	50,431.51
2035 TOTALS (tons/year mitigated)	4.84	25.66	98.93	0.46	1,545.91	2.00	1,547.91	323.17	1.73	324.90	50,431.51
Percent Reduction	65.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2036 TOTALS (tons/year unmitigated)	13.60	25.00	87.51	0.46	1,551.83	2.00	1,553.84	324.41	1.73	326.15	50,629.71
2036 TOTALS (tons/year mitigated)	4.49	25.00	87.51	0.46	1,551.83	2.00	1,553.84	324.41	1.73	326.15	50,629.71
Percent Reduction	66.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2037 TOTALS (tons/year unmitigated)	13.54	24.90	87.18	0.46	1,545.91	1.99	1,547.90	323.17	1.73	324.90	50,436.46

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2037 TOTALS (tons/year mitigated)	4.48	24.90	87.18	0.46	1,545.91	1.99	1,547.90	323.17	1.73	324.90	50,436.46
Percent Reduction	66.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2038 TOTALS (tons/year unmitigated)	13.54	24.90	87.18	0.46	1,545.91	1.99	1,547.90	323.17	1.73	324.90	50,436.46
2038 TOTALS (tons/year mitigated)	4.48	24.90	87.18	0.46	1,545.91	1.99	1,547.90	323.17	1.73	324.90	50,436.46
Percent Reduction	66.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2039 TOTALS (tons/year unmitigated)	13.49	24.80	86.84	0.46	1,539.99	1.99	1,541.97	321.94	1.72	323.66	50,243.22
2039 TOTALS (tons/year mitigated)	4.46	24.80	86.84	0.46	1,539.99	1.99	1,541.97	321.94	1.72	323.66	50,243.22
Percent Reduction	66.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2040 TOTALS (tons/year unmitigated)	4.16	24.90	87.16	0.46	1,545.91	1.99	1,547.90	323.17	1.73	324.90	50,425.24
2040 TOTALS (tons/year mitigated)	4.16	24.90	87.16	0.46	1,545.91	1.99	1,547.90	323.17	1.73	324.90	50,425.24
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	218.60	36.07	295.54	0.79	42.63	41.03	45,577.79

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	380.72	440.10	4,029.55	2.98	550.13	105.68	299,588.93
TOTALS (tons/year, mitigated)	310.04	348.88	3,194.25	2.36	436.08	83.78	237,481.72
Percent Reduction	18.56	20.73	20.73	20.81	20.73	20.72	20.73

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SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	599.32	476.17	4,325.09	3.77	592.76	146.71	345,166.72

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

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Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\Kimberly.Seigel\Application Data\Urbemis\Version9a\Projects\Concentration and Conservation Total Land Uses.urb924

Project Name: Concentration and Conservation

Project Location: Contra Costa County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (tons/year unmitigated)	25.75	98.27	396.08	0.39	1,227.64	4.09	1,231.73	256.65	3.68	260.33	42,716.58
2010 TOTALS (tons/year mitigated)	18.64	98.27	396.08	0.39	1,227.64	4.09	1,231.73	256.65	3.68	260.33	42,716.58
Percent Reduction	27.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2011 TOTALS (tons/year unmitigated)	24.12	89.19	364.90	0.39	1,222.93	3.78	1,226.71	255.67	3.38	259.05	42,573.22
2011 TOTALS (tons/year mitigated)	17.03	89.19	364.90	0.39	1,222.93	3.78	1,226.71	255.67	3.38	259.05	42,573.22
Percent Reduction	29.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2012 TOTALS (tons/year unmitigated)	22.80	81.31	338.05	0.39	1,227.64	3.52	1,231.16	256.65	3.15	259.80	42,757.53
2012 TOTALS (tons/year mitigated)	15.69	81.31	338.05	0.39	1,227.64	3.52	1,231.16	256.65	3.15	259.80	42,757.53
Percent Reduction	31.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2013 TOTALS (tons/year unmitigated)	21.53	73.81	311.39	0.39	1,227.64	3.27	1,230.91	256.65	2.91	259.57	42,777.47

2013 TOTALS (tons/year mitigated)	14.42	73.81	311.39	0.39	1,227.64	3.27	1,230.91	256.65	2.91	259.57	42,777.47
Percent Reduction	33.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2014 TOTALS (tons/year unmitigated)	20.34	66.77	287.27	0.39	1,227.64	3.03	1,230.67	256.65	2.70	259.35	42,794.03
2014 TOTALS (tons/year mitigated)	13.22	66.77	287.27	0.39	1,227.64	3.03	1,230.67	256.65	2.70	259.35	42,794.03
Percent Reduction	34.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2015 TOTALS (tons/year unmitigated)	19.26	60.40	265.31	0.39	1,227.64	2.84	1,230.47	256.65	2.51	259.17	42,806.30
2015 TOTALS (tons/year mitigated)	12.15	60.40	265.31	0.39	1,227.64	2.84	1,230.47	256.65	2.51	259.17	42,806.30
Percent Reduction	36.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2016 TOTALS (tons/year unmitigated)	18.30	54.83	246.54	0.39	1,227.64	2.65	1,230.29	256.65	2.35	259.00	42,812.34
2016 TOTALS (tons/year mitigated)	11.19	54.83	246.54	0.39	1,227.64	2.65	1,230.29	256.65	2.35	259.00	42,812.34
Percent Reduction	38.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2017 TOTALS (tons/year unmitigated)	17.38	49.65	228.23	0.39	1,222.93	2.47	1,225.40	255.67	2.18	257.85	42,653.38
2017 TOTALS (tons/year mitigated)	10.29	49.65	228.23	0.39	1,222.93	2.47	1,225.40	255.67	2.18	257.85	42,653.38
Percent Reduction	40.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018 TOTALS (tons/year unmitigated)	16.66	45.32	213.26	0.39	1,227.64	2.32	1,229.96	256.65	2.05	258.70	42,821.34
2018 TOTALS (tons/year mitigated)	9.55	45.32	213.26	0.39	1,227.64	2.32	1,229.96	256.65	2.05	258.70	42,821.34
Percent Reduction	42.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2019 TOTALS (tons/year unmitigated)	15.98	41.29	198.66	0.39	1,227.64	2.18	1,229.82	256.65	1.91	258.57	42,825.02

2019 TOTALS (tons/year mitigated)	8.87	41.29	198.66	0.39	1,227.64	2.18	1,229.82	256.65	1.91	258.57	42,825.02
Percent Reduction	44.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2020 TOTALS (tons/year unmitigated)	15.34	37.77	185.46	0.39	1,232.34	2.07	1,234.41	257.64	1.81	259.45	42,992.52
2020 TOTALS (tons/year mitigated)	8.20	37.77	185.46	0.39	1,232.34	2.07	1,234.41	257.64	1.81	259.45	42,992.52
Percent Reduction	46.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2021 TOTALS (tons/year unmitigated)	13.32	29.62	133.02	0.39	1,227.64	1.88	1,229.52	256.65	1.64	258.29	42,848.60
2021 TOTALS (tons/year mitigated)	6.20	29.62	133.02	0.39	1,227.64	1.88	1,229.52	256.65	1.64	258.29	42,848.60
Percent Reduction	53.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2022 TOTALS (tons/year unmitigated)	13.27	29.51	132.51	0.39	1,222.93	1.87	1,224.81	255.67	1.63	257.30	42,684.43
2022 TOTALS (tons/year mitigated)	6.18	29.51	132.51	0.39	1,222.93	1.87	1,224.81	255.67	1.63	257.30	42,684.43
Percent Reduction	53.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2023 TOTALS (tons/year unmitigated)	13.27	29.51	132.51	0.39	1,222.93	1.87	1,224.81	255.67	1.63	257.30	42,684.43
2023 TOTALS (tons/year mitigated)	6.18	29.51	132.51	0.39	1,222.93	1.87	1,224.81	255.67	1.63	257.30	42,684.43
Percent Reduction	53.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2024 TOTALS (tons/year unmitigated)	13.37	29.74	133.53	0.39	1,232.34	1.89	1,234.23	257.64	1.65	259.28	43,012.77
2024 TOTALS (tons/year mitigated)	6.23	29.74	133.53	0.39	1,232.34	1.89	1,234.23	257.64	1.65	259.28	43,012.77
Percent Reduction	53.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2025 TOTALS (tons/year unmitigated)	13.32	29.62	133.02	0.39	1,227.64	1.88	1,229.52	256.65	1.64	258.29	42,848.60

2025 TOTALS (tons/year mitigated)	6.20	29.62	133.02	0.39	1,227.64	1.88	1,229.52	256.65	1.64	258.29	42,848.60
Percent Reduction	53.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2026 TOTALS (tons/year unmitigated)	12.15	25.77	103.36	0.39	1,227.64	1.81	1,229.45	256.65	1.57	258.23	42,874.18
2026 TOTALS (tons/year mitigated)	5.03	25.77	103.36	0.39	1,227.64	1.81	1,229.45	256.65	1.57	258.23	42,874.18
Percent Reduction	58.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2027 TOTALS (tons/year unmitigated)	12.15	25.77	103.36	0.39	1,227.64	1.81	1,229.45	256.65	1.57	258.23	42,874.18
2027 TOTALS (tons/year mitigated)	5.03	25.77	103.36	0.39	1,227.64	1.81	1,229.45	256.65	1.57	258.23	42,874.18
Percent Reduction	58.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2028 TOTALS (tons/year unmitigated)	12.10	25.68	102.97	0.39	1,222.93	1.80	1,224.73	255.67	1.57	257.24	42,709.91
2028 TOTALS (tons/year mitigated)	5.02	25.68	102.97	0.39	1,222.93	1.80	1,224.73	255.67	1.57	257.24	42,709.91
Percent Reduction	58.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2029 TOTALS (tons/year unmitigated)	12.15	25.77	103.36	0.39	1,227.64	1.81	1,229.45	256.65	1.57	258.23	42,874.18
2029 TOTALS (tons/year mitigated)	5.03	25.77	103.36	0.39	1,227.64	1.81	1,229.45	256.65	1.57	258.23	42,874.18
Percent Reduction	58.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030 TOTALS (tons/year unmitigated)	12.15	25.77	103.36	0.39	1,227.64	1.81	1,229.45	256.65	1.57	258.23	42,874.18
2030 TOTALS (tons/year mitigated)	5.03	25.77	103.36	0.39	1,227.64	1.81	1,229.45	256.65	1.57	258.23	42,874.18
Percent Reduction	58.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2031 TOTALS (tons/year unmitigated)	11.49	23.96	84.50	0.39	1,227.64	1.78	1,229.41	256.65	1.55	258.20	42,894.64

2031 TOTALS (tons/year mitigated)	4.38	23.96	84.50	0.39	1,227.64	1.78	1,229.41	256.65	1.55	258.20	42,894.64
Percent Reduction	61.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2032 TOTALS (tons/year unmitigated)	11.53	24.06	84.82	0.39	1,232.34	1.79	1,234.13	257.64	1.55	259.19	43,058.99
2032 TOTALS (tons/year mitigated)	4.39	24.06	84.82	0.39	1,232.34	1.79	1,234.13	257.64	1.55	259.19	43,058.99
Percent Reduction	61.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2033 TOTALS (tons/year unmitigated)	11.44	23.87	84.17	0.39	1,222.93	1.77	1,224.70	255.67	1.54	257.21	42,730.30
2033 TOTALS (tons/year mitigated)	4.36	23.87	84.17	0.39	1,222.93	1.77	1,224.70	255.67	1.54	257.21	42,730.30
Percent Reduction	61.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2034 TOTALS (tons/year unmitigated)	11.44	23.87	84.17	0.39	1,222.93	1.77	1,224.70	255.67	1.54	257.21	42,730.30
2034 TOTALS (tons/year mitigated)	4.36	23.87	84.17	0.39	1,222.93	1.77	1,224.70	255.67	1.54	257.21	42,730.30
Percent Reduction	61.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2035 TOTALS (tons/year unmitigated)	11.49	23.96	84.50	0.39	1,227.64	1.78	1,229.41	256.65	1.55	258.20	42,894.64
2035 TOTALS (tons/year mitigated)	4.38	23.96	84.50	0.39	1,227.64	1.78	1,229.41	256.65	1.55	258.20	42,894.64
Percent Reduction	61.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2036 TOTALS (tons/year unmitigated)	11.23	23.41	74.95	0.39	1,232.34	1.78	1,234.12	257.64	1.55	259.18	43,063.17
2036 TOTALS (tons/year mitigated)	4.09	23.41	74.95	0.39	1,232.34	1.78	1,234.12	257.64	1.55	259.18	43,063.17
Percent Reduction	63.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2037 TOTALS (tons/year unmitigated)	11.19	23.32	74.67	0.39	1,227.64	1.77	1,229.41	256.65	1.54	258.20	42,898.81

2037 TOTALS (tons/year mitigated)	4.07	23.32	74.67	0.39	1,227.64	1.77	1,229.41	256.65	1.54	258.20	42,898.81
Percent Reduction	63.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2038 TOTALS (tons/year unmitigated)	11.19	23.32	74.67	0.39	1,227.64	1.77	1,229.41	256.65	1.54	258.20	42,898.81
2038 TOTALS (tons/year mitigated)	4.07	23.32	74.67	0.39	1,227.64	1.77	1,229.41	256.65	1.54	258.20	42,898.81
Percent Reduction	63.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2039 TOTALS (tons/year unmitigated)	11.14	23.23	74.38	0.39	1,222.93	1.77	1,224.70	255.67	1.54	257.21	42,734.44
2039 TOTALS (tons/year mitigated)	4.06	23.23	74.38	0.39	1,222.93	1.77	1,224.70	255.67	1.54	257.21	42,734.44
Percent Reduction	63.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2040 TOTALS (tons/year unmitigated)	11.19	23.32	74.67	0.39	1,227.64	1.77	1,229.41	256.65	1.54	258.20	42,898.81
2040 TOTALS (tons/year mitigated)	4.08	23.32	74.67	0.39	1,227.64	1.77	1,229.41	256.65	1.54	258.20	42,898.81
Percent Reduction	63.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	180.22	28.86	242.41	0.65	35.32	34.00	36,518.46
TOTALS (tons/year, mitigated)	180.22	28.86	242.41	0.65	35.32	34.00	36,518.46
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	302.09	350.81	3,214.08	2.39	441.29	84.75	240,237.20
TOTALS (tons/year, mitigated)	252.06	285.16	2,612.42	1.95	358.70	68.88	195,267.14
Percent Reduction	16.56	18.71	18.72	18.41	18.72	18.73	18.72

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	482.31	379.67	3,456.49	3.04	476.61	118.75	276,755.66
TOTALS (tons/year, mitigated)	432.28	314.02	2,854.83	2.60	394.02	102.88	231,785.60
Percent Reduction	10.37	17.29	17.41	14.47	17.33	13.36	16.25

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Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\Kimberly.Seigel\Application Data\Urbemis\Version9a\Projects\No Project.urb924

Project Name: No Project Alternative

Project Location: Contra Costa County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.04	0.02	0.31	0.00	0.00	0.00	26.39

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.93	1.28	11.47	0.01	1.50	0.29	814.00

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.97	1.30	11.78	0.01	1.50	0.29	840.39

Appendix 11B

CALINE4 Screening per BAAQMD CEQA Guidelines (1999)

Concord Community Resource Plan

CALINE4 SCREENING PER BAAQMD CEQA GUIDELINES (1999)

This tool uses the BAAQMD CEQA Guidelines of December 1999 to estimate CO Concentrations near roadways and intersections.

This model has been developed specifically for the Concord Community Resource Plan project.

Limitations as of Feb 2008:

1 Emission factors for **2007 and 2030** ONLY are provided. These come from EMFAC 2007 for Contra Costa County.
2 The model computes CO concentrations at any **distance from 0 to 500 feet f**rom the roadways.
3 The model assumes that **two-way** traffic is specified for each roadway.
4 Allowable **speeds** are from 0 to 65 mph, in 5mph increments only. 30 mph is the default, in accordance with the BAAQMD guidelines, but actual or modeled speeds can be input.
5 All roadways are assumed to be **at grade.**
6 **Background** concentrations are from the Guidelines, and can be modified if better info exists.

These limitations can be easily addressed and the model modified, if needed.

Shaded sections in each table are computed, and should not be modified.

Questions should be addressed to:
Armando Balloffet
a.f.balloffet@usa.net

Concord Community Resource Plan
CALINE4 SCREENING PER BAAQMD CEQA GUIDELINES (1999)
SUMMARY

Intersections			Existing		No Project		PA		CC	
Int. No.	Road 1 (N-S)	Road 2 (E-W)	LOS	8-hr CO	LOS	8-hr CO	LOS	8-hr CO	LOS	8-hr CO
1	Port Chicago Hwy	Arnold Industrial Wy	A	2.50	D	2.16	C	2.15	C	2.16
2	Port Chicago Hwy	Panoramic Dr	A	2.46	B	2.17	F	2.26	E	2.26
3	Port Chicago Hwy	Olivera Rd	D	2.43	E	2.11	F	2.18	F	2.19
4	Olivera Rd	Salvio St	A	2.22	C	2.07	A	2.06	A	2.07
5	Clayton Wy	Willow Pass Rd	A	2.45	B	2.17	B	2.16	B	2.17
6	Farm Bureau Rd/Olivera Rd	Willow Pass Rd	B	2.50	F	2.17	F	2.17	F	2.18
7	Diamond Blvd	Willow Pass Rd	B	2.97	C	2.25	C	2.25	C	2.25
8	Market St/On Ramp	Concord Ave	F	2.89	F	2.26	E	2.30	E	2.29
9	Oakland Ave	Clayton Rd	B	2.82	C	2.21	B	2.17	B	2.16
10	Beechwood Dr	Landana Dr	B	2.19	C	2.06	D	2.06	F	2.07
11	West St	Concord Blvd	A	2.65	B	2.19	D	2.21	C	2.21
12	West St/Laveta Wy	Clayton Rd	B	2.71	C	2.20	B	2.18	B	2.19
13	Denkinger Rd	Concord Blvd	A	2.63	B	2.17	C	2.19	C	2.20
14	Treat Blvd/Denkinger Rd	Clayton Rd	C	2.80	E	2.22	E	2.22	D	2.22
15	Treat Blvd	Cowell Ln	D	2.78	E	2.20	E	2.20	E	2.20
16	Treat Blvd	Oak Grove Rd	F	3.06	F	2.27	F	2.28	F	2.28
17	Oak Rd	Treat Blvd	E	3.42	F	2.29	F	2.30	F	2.29
18	Bailey Rd	Myrtle Dr	A	2.28	A	2.09	A	2.07	A	2.10
19	Bailey Rd	Concord Blvd	A	2.49	B	2.14	C	2.15	C	2.16
20	Bailey Rd	Clayton Rd	B	2.72	B	2.17	B	2.17	B	2.17
21	Kirker Pass Rd	Clearbrook Dr	A	2.45	B	2.15	C	2.19	B	2.15
22	Kirker Pass Rd	Concord Blvd	B	2.51	E	2.19	E	2.20	E	2.20
23	Kirker Pass Rd	Clayton Rd	B	2.70	D	2.22	D	2.22	D	2.22
24	Cowell Ln	Ygnacio Valley Rd	E	2.95	F	2.30	E	2.30	E	2.31
25	Oak Grove Rd	Ygnacio Valley Rd	D	2.85	F	2.23	F	2.24	F	2.24
26	Galindo St	Willow Pass Rd	C	2.66	E	2.18	E	2.18	D	2.18
27	Market St	Willow Pass Rd	B	2.91	B	2.20	C	2.24	C	2.23
28	I-680 NB Ramps	Willow Pass Rd	C	3.19	D	2.30	D	2.29	D	2.29
29	I-680 SB Ramps	Willow Pass Rd	A	3.00	B	2.27	A	2.27	A	2.27
30	Market St	Clayton Rd	B	2.57	F	2.17	E	2.17	E	2.16
31	SR-242 SB Ramps	Concord Ave	D	3.06	F	2.25	F	2.30	F	2.30
32	Diamond Blvd	Concord Ave	C	3.23	D	2.33	D	2.34	D	2.34
33	Oak Grove Rd	Monument Blvd	A	2.68	C	2.20	C	2.21	C	2.21
34	Walnut Blvd	Ygnacio Valley Rd	F	3.41	F	2.34	F	2.35	F	2.35
35	Bancroft Rd	Ygnacio Valley Rd	D	3.12	E	2.28	E	2.28	E	2.28
36	Alberta Wy	Ygnacio Valley Rd	D	2.77	E	2.25	D	2.24	E	2.25
37	Ayers Rd	Ygnacio Valley Rd	E	2.83	F	2.28	E	2.27	F	2.28
38	N Main St	Geary Rd	E	3.14	F	2.29	F	2.29	F	2.28
39	Port Chicago Hwy	Bates Ave	C	2.52	C	2.15	C	2.15	C	2.15
40	Bancroft Rd	Treat Blvd	D	3.05	F	2.30	F	2.32	F	2.32
41	Kirker Pass Rd	Myrtle Dr	A	2.44	C	2.19	C	2.19	C	2.20
42	Buskirk Ave	Treat Blvd	F	3.25	F	2.28	F	2.28	F	2.28
43	N Main St	Sunnyvale Ave	E	2.90	F	2.26	F	2.28	F	2.28
44	I-680 NB Ramps	Ygnacio Valley Rd	F	3.54	F	2.38	F	2.40	F	2.39
45	I-680 SB Ramps	Ygnacio Valley Rd	B	2.90	C	2.25	B	2.26	C	2.25
46	Willow Pass Rd	Evora Rd (East)-SR-4 WB off-ramp [In Pittsburg]	A	2.53	F	2.19	F	2.20	F	2.21
47	Willow Pass Rd	Evora Rd (West) [At Project Site]	A	2.30	F	2.15	F	2.17	F	2.16
48	Willow Pass Rd	Avila Rd	A	2.41	F	2.19	F	2.26	F	2.24
49	Bailey Rd	Willow Pass Rd	B	2.42	D	2.17	E	2.18	E	2.17
50	San Marco Blvd	W Leland Rd	A	2.37	C	2.18	D	2.22	E	2.22
51	Bailey Rd	W Leland Rd	B	2.50	F	2.22	F	2.21	F	2.21
52	Railroad Ave	W Leland Rd	E	2.90	F	2.26	F	2.26	F	2.26
53	Railroad Ave	Buchanan Rd	C	2.69	C	2.18	C	2.18	C	2.18
54	Kirker Pass Rd	James Donlon Blvd [Future extension of James Donlon Blvd]	A	2.40	F	2.21	F	2.21	F	2.22
55	San Marco Blvd-	Willow Pass Rd & SR-4 EB off-ramp	A	2.44	C	2.18	E	2.24	E	2.24
56	Bailey Rd	SR-4 EB ramps-BART access	F	2.70	F	2.23	F	2.28	F	2.28
57	Bailey Rd	SR-4 WB onramp-Canal Rd	B	2.49	D	2.19	E	2.17	E	2.16
58	Railroad Ave	SR-4 WB onramp-California Ave	A	2.61	C	2.18	C	2.17	B	2.18
59	Railroad Ave	SR-4 EB ramps	B	2.77	D	2.20	C	2.20	D	2.20
60	Willow Pass Rd	SR-4 WB ramps	C	2.36	F	2.18	F	2.18	F	2.17
61	Willow Pass Rd	SR-4 EB ramps	D	2.45	F	2.18	F	2.26	F	2.24
62	Port Chicago Hwy	SR-4 WB ramps	A	2.64	C	2.20	E	2.18	E	2.19

Notes: indicates "hot spot" = LOS D, E, F

Concord Community Resource Plan **INTERSECTIONS** **CALINE4 SCREENING PER BAAQMD CEQA GUIDELINES (1999)**

2007 Existing Conditions **1-Hr Background= 2.4 ppm** **8-Hr Background= 2 ppm** **persistence: 0.7** **CO Standards: 20 9**

			Road 1 (N-S)							Road 2 (E-W)							Primary Road (Highest Volume)			Secondary Road (Intersecting Road)			Total Intersection			
Int. No.	LOS		Street Name	type	# lanes	Dist (ft)	Pk Hour Volume	am/ pm	speed (mph)	Street Name	type	# lanes	Dist (ft)	Pk Hour Volume	am/ pm	speed (mph)	EMFAC Emission Factor	Ref. CO Conc.	1-hr CO (ppm)	EMFAC Emission Factor	Ref. CO Conc.	1-hr CO (ppm)	1-hr CO (ppm)	8-hr CO (ppm)	Exceeds 1-hr standard?	Exceeds 8-hr standard?
1	A		Port Chicago Hwy	AG	6	25	2,407	am	30	Arnold Industrial Way	AG	2	25	628	am	30	4.364	6.1	0.641	4.364	2.7	0.074	3.115	2.500	No	No
2	A		Port Chicago Hwy	AG	6	25	2,177	am	30	Panoramic Drive	AG	4	25	736	am	30	4.364	6.1	0.580	4.364	2.6	0.084	3.063	2.464	No	No
3	D	hot spot	Port Chicago Hwy	AG	4	25	1,562	pm	30	Olivera Rd	AG	4	25	1,202	pm	30	4.364	7	0.477	4.364	2.6	0.136	3.014	2.429	No	No
4	A		Olivera Rd	AG	2	25	851	am	30	Salvio St	AG	2	25	248	am	30	4.364	7.6	0.282	4.364	2.7	0.029	2.711	2.218	No	No
5	A		Clayton Wy	AG	2	25	170	am	30	Willow Pass Rd	AG	4	25	1,885	am	30	4.364	2.6	0.019	4.364	7.6	0.625	3.044	2.451	No	No
6	B		Farm Bureau Rd/Olivera	AG	4	25	1,118	pm	30	Willow Pass Rd	AG	6	25	1,964	pm	30	4.364	2.3	0.112	4.364	7	0.600	3.112	2.499	No	No
7	B		Diamond Blvd	AG	4	25	2,002	pm	30	Willow Pass Rd	AG	8	25	3,914	pm	30	4.364	2.2	0.192	4.364	7	1.196	3.788	2.971	No	No
8	F	hot spot	Market St/On Ramp	AG	2	25	2,206	am	30	Concord Ave	AG	6	25	3,170	am	30	4.364	2.3	0.221	4.364	7.6	1.051	3.673	2.891	No	No
9	B		Oakland Ave	AG	2	25	1,176	pm	30	Clayton Rd	AG	6	25	3,183	pm	30	4.364	2.3	0.118	4.364	7.6	1.056	3.574	2.822	No	No
10	B		Beechwood Dr	AG	2	25	60	am	30	Landana Dr	AG	2	25	811	am	30	4.364	2.7	0.007	4.364	7.6	0.269	2.676	2.193	No	No
11	A		West St	AG	2	25	562	am	30	Concord Blvd	AG	4	25	2,595	am	30	4.364	2.6	0.064	4.364	7.6	0.861	3.324	2.647	No	No
12	B		West St/Laveta Wy	AG	3	25	637	am	30	Clayton Rd	AG	6	25	2,851	am	30	4.364	2.3	0.064	4.364	7.6	0.946	3.410	2.707	No	No
13	A		Denkinger Rd	AG	2	25	863	am	30	Concord Blvd	AG	4	25	2,430	am	30	4.364	2.6	0.098	4.364	7.6	0.806	3.304	2.633	No	No
14	C		Treat Blvd/Denkinger Rd	AG	4	25	2,145	pm	30	Clayton Rd	AG	6	25	3,054	pm	30	4.364	2.3	0.215	4.364	7	0.933	3.548	2.804	No	No
15	D	hot spot	Treat Blvd	AG	4	25	3,177	am	30	Cowell Ln	AG	4	25	1,274	am	30	4.364	7	0.971	4.364	2.6	0.145	3.515	2.781	No	No
16	F	hot spot	Treat Blvd	AG	6	25	3,229	am	30	Oak Grove Rd	AG	4	25	4,289	am	30	4.364	2.6	0.366	4.364	6.1	1.142	3.908	3.056	No	No
17	E	hot spot	Oak Rd	AG	4	25	2,368	pm	30	Treat Blvd	AG	6	25	5,842	pm	30	4.364	2.3	0.238	4.364	7	1.785	4.422	3.416	No	No
18	A		Bailey Rd	AG	2	25	1,141	am	30	Myrtle Dr	AG	2	25	200	am	30	4.364	7.6	0.378	4.364	2.7	0.024	2.802	2.281	No	No
19	A		Bailey Rd	AG	2	25	994	am	30	Concord Blvd	AG	4	25	1,758	am	30	4.364	2.6	0.113	4.364	7.6	0.583	3.096	2.487	No	No
20	B		Bailey Rd	AG	4	25	741	am	30	Clayton Rd	AG	6	25	3,131	am	30	4.364	2.3	0.074	4.364	7	0.956	3.431	2.722	No	No
21	A		Kirker Pass Rd	AG	4	25	2,044	am	30	Clearbrook Dr	AG	4	25	182	am	30	4.364	7	0.624	4.364	2.6	0.021	3.045	2.452	No	No
22	B		Kirker Pass Rd	AG	6	25	2,194	am	30	Concord Blvd	AG	4	25	1,224	am	30	4.364	6.1	0.584	4.364	2.6	0.139	3.123	2.506	No	No
23	B		Kirker Pass Rd	AG	6	25	2,851	pm	30	Clayton Rd	AG	6	25	2,355	pm	30	4.364	6.1	0.759	4.364	2.3	0.236	3.395	2.697	No	No
24	E	hot spot	Cowell Ln	AG	4	25	1,601	pm	30	Ygnacio Valley Blvd	AG	4	25	3,830	pm	30	4.364	2.6	0.182	4.364	7	1.170	3.752	2.946	No	No
25	D	hot spot	Oak Grove Rd	AG	4	25	1,942	pm	30	Ygnacio Valley Blvd	AG	6	25	3,326	pm	30	4.364	2.3	0.195	4.364	7	1.016	3.611	2.848	No	No
26	C		Galindo St	AG	6	25	2,711	pm	30	Willow Pass Rd	AG	4	25	1,912	pm	30	4.364	6.1	0.722	4.364	2.6	0.217	3.339	2.657	No	No
27	B		Market St	AG	4	25	2,153	pm	30	Willow Pass Rd	AG	6	25	3,560	pm	30	4.364	2.3	0.216	4.364	7	1.088	3.704	2.913	No	No
28	C		I-680 NB Ramps	AG	2	25	1,291	pm	30	Willow Pass Rd	AG	6	25	4,742	pm	30	4.364	2.3	0.130	4.364	7.6	1.573	4.102	3.192	No	No
29	A		I-680 SB Ramps	AG	2	25	1,639	am	30	Willow Pass Rd	AG	6	25	3,827	am	30	4.364	2.3	0.165	4.364	7.6	1.269	3.834	3.004	No	No
30	B		Market St	AG	4	25	2,011	am	30	Clayton Rd	AG	6	25	1,972	am	30	4.364	7	0.614	4.364	2.3	0.198	3.212	2.569	No	No
31	D	hot spot	SR-242 SB Ramps	AG	2	25	1,616	pm	30	Concord Ave	AG	6	25	4,088	pm	30	4.364	2.3	0.162	4.364	7.6	1.356	3.918	3.063	No	No
32	C		Diamond Blvd	AG	2	25	2,177	pm	30	Concord Ave	AG	6	25	4,634	pm	30	4.364	2.3	0.219	4.364	7.6	1.537	4.155	3.229	No	No
33	A		Oak Grove Rd	AG	4	25	1,832	am	30	Monument Blvd	AG	6	25	2,601	am	30	4.364	2.3	0.184	4.364	7	0.795	3.378	2.685	No	No
34	F	hot spot	Walnut Blvd	AG	2	25	1,384	pm	30	Ygnacio Valley Blvd	AG	6	25	5,636	pm	30	4.364	2.3	0.139	4.364	7.6	1.869	4.408	3.406	No	No
35	D	hot spot	Bancroft Rd	AG	4	25	2,301	am	30	Ygnacio Valley Blvd	AG	6	25	4,476	am	30	4.364	2.3	0.231	4.364	7	1.367	3.998	3.119	No	No
36	D	hot spot	Alberta Wy	AG	4	25	1,170	am	30	Ygnacio Valley Blvd	AG	4	25	3,151	am	30	4.364	2.6	0.133	4.364	7	0.963	3.495	2.767	No	No
37	E	hot spot	Ayers Rd	AG	2	25	821	am	30	Ygnacio Valley Blvd	AG	4	25	3,288	am	30	4.364	2.6	0.093	4.364	7.6	1.091	3.584	2.829	No	No
38	E	hot spot	N Main St	AG	4	25	3,217	pm	30	Geary Rd	AG	4	25	4,124	pm	30	4.364	2.6	0.365	4.364	7	1.260	4.025	3.137	No	No
39	C		Port Chicago Hwy	AG	2	25	1,719	pm	30	Bates Ave	AG	2	25	1,440	pm	30	4.364	7.6	0.570	4.364	2.7	0.170	3.140	2.518	No	No
40	D	hot spot	Bancroft Rd	AG	4	25	2,288	am	30	Treat Blvd	AG	6	25	4,148	am	30	4.364	2.3	0.230	4.364	7	1.267	3.897	3.048	No	No
41	A		Kirker Pass Rd	AG	5	25	2,003	am	30	Myrtle Dr	AG	4	25	201	am	30	4.364	7	0.612	4.364	2.6	0.023	3.035	2.444	No	No
42	F	hot spot	Buskirk Ave	AG	2	25	2,110	am	30	Treat Blvd	AG	6	25	4,738	am	30	4.364	2.3	0.212	4.364	7.6	1.571	4.183	3.248	No	No
43	E	hot spot	N Main St	AG	4	25	3,220	am	30	Sunnyvale Ave	AG	2	25	2,544	am	30	4.364	7	0.984	4.364	2.7	0.300	3.683	2.898	No	No
44	F	hot spot	I-680 NB Ramps	AG	2	25	3,875	am	30	Ygnacio Valley Blvd	AG	4	25	5,299	am	30	4.364	2.6	0.440	4.364	7.6	1.757	4.597	3.538	No	No
45	B		I-680 SB Ramps	AG	2	25	1,761	am	30	Ygnacio Valley Blvd	AG	4	25	3,287	am	30	4.364	2.6	0.200	4.364	7.6	1.090	3.690	2.903	No	No
46	A		Willow Pass Rd	AG	4	25	2,269	am	30	Evora Rd (East)-SR-4 WB of	AG	2	25	492	am	30	4.364	7	0.693	4.364	2.7	0.058	3.151	2.526	No	No
47	A		Willow Pass Rd	AG	4	25	1,044	am	30	Evora Rd (West) [At Project	AG	2	25	912	am	30	4.364	7	0.319	4.364	2.7	0.107	2.826	2.298	No	No
48	A		Willow Pass Rd	AG	4	25	1,884	am	30	Avila Rd	AG	2	25	30	am	30	4.364	7	0.576	4.364	2.7	0.004	2.979	2.405	No	No
49	B		Bailey Rd	AG	2	25	816	pm	30	Willow Pass Rd	AG	4	25	1,534	pm	30	4.364	2.6	0.093	4.364	7.6	0.509	3.001	2.421	No	No
50	A		San Marco Blvd	AG	4	25	1,336	am	30	W Leland Rd	AG	2	25	1,040	am	30	4.364	7	0.408	4.364	2.7	0.123	2.931	2.371	No	No
51	B		Bailey Rd	AG	2	25	1,412	am	30	W Leland Rd	AG	2	25	1,652	am	30	4.364	2.7	0.166	4.364	7.6	0.548	3.114	2.500	No	No
52	E	hot spot	Railroad Ave	AG	2	25	3,000	pm	30	W Leland Rd	AG	2	25	2,516	pm	30	4.364	7.6	0.995	4.364	2.7	0.296	3.691	2.904	No	No
53	C		Railroad Ave	AG	2	25	2,352	pm	30	Buchanan Rd	AG	2	25	1,698	pm	30	4.364	7.6	0.780	4.364	2.7	0.200	3.380	2.686	No	No
54	A		Kirker Pass Rd	AG	2	25	1,722	am	30	James Donlon Blvd [Future e	AG	2	25	0	am	30	4.364	7.6	0.571	4.364	2.7	0.000	2.971	2.400	No	No
55	A		San Marco Blvd-	AG	2	25	1,336	am	30	Willow Pass Rd & SR-4 EB c	AG	4	25	1,426	am	30	4.364	2.6	0.152	4.364	7.6	0.473	3.025	2.437	No	No
56	F	hot spot	Bailey Rd	AG	2	25	2,552	pm	30	SR-4 EB ramps-BART acces	AG	2	25	1,285	pm	30	4.364	7.6	0.846	4.364	2.7	0.151	3.398	2.698	No	No
57	B		Bailey Rd	AG	2	25	1,717	pm	30	SR-4 WB onramp-Canal Rd	AG	2	25	1,130	pm	30	4.364	7.6	0.569	4.364	2.7	0.133	3.103	2.492	No	No
58	A		Railroad Ave	AG	2	25	2,297	am	30	SR-4 WB onramp-California	AG	2	25	941	am	30	4.364	7.6	0.762	4.364	2.7	0.111	3.273	2.611	No	No
59	B		Railroad Ave	AG	2	25	2,732	pm	30	SR-4 EB ramps	AG	2	25	1,687	pm	30	4.364	7.6	0.906	4.364	2.7	0.199	3.505	2.773	No	No
60	C		Willow Pass Rd	AG	4	25	1,293	am	30	SR-4 WB ramps	AG	2	25	1,057	am	30	4.364	7	0.395	4.364	2.7	0.125	2.920	2.364	No	No
61	D	hot spot	Willow Pass Rd	AG	4	25	1,903	am	30	SR-4 EB ramps	AG	2	25	559	am	30	4.364	7	0.581	4.364	2.7	0.066	3.047	2.453	No	No
62	A		Port Chicago Hwy	AG	4	25	2,543	am	30	SR-4 WB ramps	AG	2	25	1,150	am	30	4.364	7	0.777	4.364	2.7	0.136	3.312	2.639	No	No

Concord Community Resource Plan **INTERSECTIONS** **CALINE4 SCREENING PER BAAQMD CEQA GUIDELINES (1999)**

2030 No Project **1-Hr Background= 2.4 ppm** **8-Hr Background= 2 ppm** **persistence: 0.7** **CO Standards: 20 9**

			Road 1 (N-S)							Road 2 (E-W)							Primary Road (Highest Volume)			Secondary Road (Intersecting Road)			Total Intersection			
Int. No.	LOS		Street Name	type	# lanes	Dist (ft)	Pk Hour Volume	am/ pm	speed (mph)	Street Name	type	# lanes	Dist (ft)	Pk Hour Volume	am/ pm	speed (mph)	EMFAC Emission Factor	Ref. CO Conc.	1-hr CO (ppm)	EMFAC Emission Factor	Ref. CO Conc.	1-hr CO (ppm)	1-hr CO (ppm)	8-hr CO (ppm)	Exceeds 1-hr standard?	Exceeds 8-hr standard?
1	D	hot spot	Port Chicago Hwy	AG	6	25	3,212	am	30	Arnold Industrial Way	AG	2	25	1,484	am	30	0.978	6.1	0.192	0.978	2.7	0.039	2.631	2.162	No	No
2	B		Port Chicago Hwy	AG	6	25	3,300	am	30	Panoramic Drive	AG	4	25	1,695	am	30	0.978	6.1	0.197	0.978	2.6	0.043	2.640	2.168	No	No
3	E	hot spot	Port Chicago Hwy	AG	4	25	1,837	pm	30	Olivera Rd	AG	4	25	1,258	pm	30	0.978	7	0.126	0.978	2.6	0.032	2.558	2.110	No	No
4	C		Olivera Rd	AG	2	25	1,038	am	30	Salvio St	AG	2	25	605	am	30	0.978	7.6	0.077	0.978	2.7	0.016	2.493	2.065	No	No
5	B		Clayton Wy	AG	2	25	372	am	30	Willow Pass Rd	AG	4	25	3,120	am	30	0.978	2.6	0.009	0.978	7.6	0.232	2.641	2.169	No	No
6	F	hot spot	Farm Bureau Rd/Olivera	AG	4	25	1,812	pm	30	Willow Pass Rd	AG	6	25	2,970	pm	30	0.978	2.3	0.041	0.978	7	0.203	2.644	2.171	No	No
7	C		Diamond Blvd	AG	4	25	2,698	pm	30	Willow Pass Rd	AG	8	25	4,314	pm	30	0.978	2.2	0.058	0.978	7	0.295	2.753	2.247	No	No
8	F	hot spot	Market St/On Ramp	AG	2	25	2,540	am	30	Concord Ave	AG	6	25	4,216	am	30	0.978	2.3	0.057	0.978	7.6	0.313	2.771	2.259	No	No
9	C		Oakland Ave	AG	2	25	1,388	pm	30	Clayton Rd	AG	6	25	3,528	pm	30	0.978	2.3	0.031	0.978	7.6	0.262	2.693	2.205	No	No
10	C		Beechwood Dr	AG	2	25	76	am	30	Landana Dr	AG	2	25	1,118	am	30	0.978	2.7	0.002	0.978	7.6	0.083	2.485	2.060	No	No
11	B		West St	AG	2	25	662	am	30	Concord Blvd	AG	4	25	3,334	am	30	0.978	2.6	0.017	0.978	7.6	0.248	2.665	2.185	No	No
12	C		West St/Laveta Wy	AG	3	25	865	am	30	Clayton Rd	AG	6	25	3,670	am	30	0.978	2.3	0.019	0.978	7.6	0.273	2.692	2.205	No	No
13	B		Denkinger Rd	AG	2	25	940	am	30	Concord Blvd	AG	4	25	3,019	am	30	0.978	2.6	0.024	0.978	7.6	0.224	2.648	2.174	No	No
14	E	hot spot	Treat Blvd/Denkinger Rd	AG	4	25	2,681	pm	30	Clayton Rd	AG	6	25	3,733	pm	30	0.978	2.3	0.060	0.978	7	0.256	2.716	2.221	No	No
15	E	hot spot	Treat Blvd	AG	4	25	3,452	am	30	Cowell Ln	AG	4	25	1,827	am	30	0.978	7	0.236	0.978	2.6	0.046	2.683	2.198	No	No
16	F	hot spot	Treat Blvd	AG	6	25	3,778	am	30	Oak Grove Rd	AG	4	25	4,882	am	30	0.978	2.6	0.096	0.978	6.1	0.291	2.787	2.271	No	No
17	F	hot spot	Oak Rd	AG	4	25	3,086	am	30	Treat Blvd	AG	6	25	5,090	am	30	0.978	2.3	0.069	0.978	7	0.348	2.818	2.293	No	No
18	A		Bailey Rd	AG	2	25	1,535	am	30	Myrtle Dr	AG	2	25	393	am	30	0.978	7.6	0.114	0.978	2.7	0.010	2.524	2.087	No	No
19	B		Bailey Rd	AG	2	25	1,202	am	30	Concord Blvd	AG	4	25	2,325	am	30	0.978	2.6	0.031	0.978	7.6	0.173	2.603	2.142	No	No
20	B		Bailey Rd	AG	4	25	745	am	30	Clayton Rd	AG	6	25	3,354	am	30	0.978	2.3	0.017	0.978	7	0.230	2.646	2.172	No	No
21	B		Kirker Pass Rd	AG	4	25	2,990	am	30	Clearbrook Dr	AG	4	25	182	am	30	0.978	7	0.205	0.978	2.6	0.005	2.609	2.147	No	No
22	E	hot spot	Kirker Pass Rd	AG	6	25	3,992	pm	30	Concord Blvd	AG	4	25	1,410	pm	30	0.978	6.1	0.238	0.978	2.6	0.036	2.674	2.192	No	No
23	D	hot spot	Kirker Pass Rd	AG	6	25	4,115	pm	30	Clayton Rd	AG	6	25	2,794	pm	30	0.978	6.1	0.245	0.978	2.3	0.063	2.708	2.216	No	No
24	F	hot spot	Cowell Ln	AG	4	25	2,257	pm	30	Ygnacio Valley Blvd	AG	4	25	5,453	pm	30	0.978	2.6	0.057	0.978	7	0.373	2.831	2.301	No	No
25	F	hot spot	Oak Grove Rd	AG	4	25	2,793	am	30	Ygnacio Valley Blvd	AG	6	25	3,927	am	30	0.978	2.3	0.063	0.978	7	0.269	2.732	2.232	No	No
26	E	hot spot	Galindo St	AG	6	25	3,214	pm	30	Willow Pass Rd	AG	4	25	2,388	pm	30	0.978	6.1	0.192	0.978	2.6	0.061	2.652	2.177	No	No
27	B		Market St	AG	4	25	2,134	am	30	Willow Pass Rd	AG	6	25	3,414	am	30	0.978	2.3	0.048	0.978	7	0.234	2.682	2.197	No	No
28	D	hot spot	I-680 NB Ramps	AG	2	25	1,388	pm	30	Willow Pass Rd	AG	6	25	5,301	pm	30	0.978	2.3	0.031	0.978	7.6	0.394	2.825	2.298	No	No
29	B		I-680 SB Ramps	AG	2	25	2,391	am	30	Willow Pass Rd	AG	6	25	4,499	am	30	0.978	2.3	0.054	0.978	7.6	0.334	2.788	2.272	No	No
30	F	hot spot	Market St	AG	4	25	2,337	am	30	Clayton Rd	AG	6	25	2,861	am	30	0.978	2.3	0.053	0.978	7	0.196	2.648	2.174	No	No
31	F	hot spot	SR-242 SB Ramps	AG	2	25	2,880	am	30	Concord Ave	AG	6	25	3,939	am	30	0.978	2.3	0.065	0.978	7.6	0.293	2.758	2.250	No	No
32	D	hot spot	Diamond Blvd	AG	2	25	2,748	pm	30	Concord Ave	AG	6	25	5,568	pm	30	0.978	2.3	0.062	0.978	7.6	0.414	2.876	2.333	No	No
33	C		Oak Grove Rd	AG	4	25	2,594	am	30	Monument Blvd	AG	6	25	3,231	am	30	0.978	2.3	0.058	0.978	7	0.221	2.680	2.196	No	No
34	F	hot spot	Walnut Blvd	AG	2	25	1,628	pm	30	Ygnacio Valley Blvd	AG	6	25	6,052	pm	30	0.978	2.3	0.037	0.978	7.6	0.450	2.886	2.341	No	No
35	E	hot spot	Bancroft Rd	AG	4	25	2,849	am	30	Ygnacio Valley Blvd	AG	6	25	4,817	am	30	0.978	2.3	0.064	0.978	7	0.330	2.794	2.276	No	No
36	E	hot spot	Alberta Wy	AG	4	25	1,470	am	30	Ygnacio Valley Blvd	AG	4	25	4,663	am	30	0.978	2.6	0.037	0.978	7	0.319	2.757	2.250	No	No
37	F	hot spot	Ayers Rd	AG	2	25	1,007	am	30	Ygnacio Valley Blvd	AG	4	25	5,024	am	30	0.978	2.6	0.026	0.978	7.6	0.373	2.799	2.279	No	No
38	F	hot spot	N Main St	AG	4	25	4,395	pm	30	Geary Rd	AG	4	25	4,251	pm	30	0.978	7	0.301	0.978	2.6	0.108	2.809	2.286	No	No
39	C		Port Chicago Hwy	AG	2	25	2,107	am	30	Bates Ave	AG	2	25	1,974	am	30	0.978	7.6	0.157	0.978	2.7	0.052	2.609	2.146	No	No
40	F	hot spot	Bancroft Rd	AG	4	25	2,618	pm	30	Treat Blvd	AG	6	25	5,474	pm	30	0.978	2.3	0.059	0.978	7	0.375	2.834	2.304	No	No
41	C		Kirker Pass Rd	AG	5	25	3,824	pm	30	Myrtle Dr	AG	4	25	175	pm	30	0.978	7	0.262	0.978	2.6	0.004	2.666	2.186	No	No
42	F	hot spot	Buskirk Ave	AG	2	25	2,115	am	30	Treat Blvd	AG	6	25	4,794	am	30	0.978	2.3	0.048	0.978	7.6	0.356	2.804	2.283	No	No
43	F	hot spot	N Main St	AG	4	25	4,263	am	30	Sunnyvale Ave	AG	2	25	2,975	am	30	0.978	7	0.292	0.978	2.7	0.079	2.770	2.259	No	No
44	F	hot spot	I-680 NB Ramps	AG	2	25	4,389	am	30	Ygnacio Valley Blvd	AG	4	25	5,883	am	30	0.978	2.6	0.112	0.978	7.6	0.437	2.949	2.384	No	No
45	C		I-680 SB Ramps	AG	2	25	2,095	am	30	Ygnacio Valley Blvd	AG	2	25	4,102	am	30	0.978	2.7	0.055	0.978	7.6	0.305	2.760	2.252	No	No
46	F	hot spot	Willow Pass Rd	AG	4	25	3,169	am	30	Evora Rd (East)-SR-4 WB of	AG	2	25	2,032	am	30	0.978	7	0.217	0.978	2.7	0.054	2.671	2.189	No	No
47	F	hot spot	Willow Pass Rd	AG	4	25	2,313	am	30	Evora Rd (West) [At Project	AG	2	25	2,181	am	30	0.978	7	0.158	0.978	2.7	0.058	2.616	2.151	No	No
48	F	hot spot	Willow Pass Rd	AG	4	25	3,463	am	30	Avila Rd	AG	2	25	1,569	am	30	0.978	7	0.237	0.978	2.7	0.041	2.679	2.195	No	No
49	D	hot spot	Bailey Rd	AG	2	25	1,965	am	30	Willow Pass Rd	AG	4	25	2,515	am	30	0.978	2.6	0.050	0.978	7.6	0.187	2.637	2.166	No	No
50	C		San Marco Blvd	AG	4	25	2,225	am	30	W Leland Rd	AG	2	25	2,917	am	30	0.978	2.7	0.059	0.978	7	0.200	2.658	2.181	No	No
51	F	hot spot	Bailey Rd	AG	2	25	2,743	am	30	W Leland Rd	AG	2	25	3,217	am	30	0.978	2.7	0.072	0.978	7.6	0.239	2.712	2.218	No	No
52	F	hot spot	Railroad Ave	AG	2	25	3,284	pm	30	W Leland Rd	AG	2	25	3,746	pm	30	0.978	2.7	0.087	0.978	7.6	0.278	2.765	2.256	No	No
53	C		Railroad Ave	AG	2	25	2,754	pm	30	Buchanan Rd	AG	2	25	1,811	pm	30	0.978	7.6	0.205	0.978	2.7	0.048	2.653	2.177	No	No
54	F	hot spot	Kirker Pass Rd	AG	2	25	3,429	am	30	James Donlon Blvd [Future e	AG	2	25	1,940	am	30	0.978	7.6	0.255	0.978	2.7	0.051	2.706	2.214	No	No
55	C		San Marco Blvd-	AG	2	25	2,700	pm	30	Willow Pass Rd & SR-4 EB c	AG	4	25	2,379	pm	30	0.978	7.6	0.201	0.978	2.6	0.060	2.661	2.183	No	No
56	F	hot spot	Bailey Rd	AG	2	25	3,772	pm	30	SR-4 EB ramps-BART acces	AG	2	25	1,766	pm	30	0.978	7.6	0.280	0.978	2.7	0.047	2.727	2.229	No	No
57	D	hot spot	Bailey Rd	AG	2	25	3,144	am	30	SR-4 WB onramp-Canal Rd	AG	2	25	1,516	am	30	0.978	7.6	0.234	0.978	2.7	0.040	2.674	2.192	No	No
58	C		Railroad Ave	AG	2	25	3,075	pm	30	SR-4 WB onramp-California	AG	2	25	1,124	pm	30	0.978	7.6	0.229	0.978	2.7	0.030	2.658	2.181	No	No
59	D	hot spot	Railroad Ave	AG	2	25	3,160	pm	30	SR-4 EB ramps	AG	2	25	1,698	pm	30	0.978	7.6	0.235	0.978	2.7	0.045	2.680	2.196	No	No
60	F	hot spot	Willow Pass Rd	AG	4	25	2,996	am	30	SR-4 WB ramps	AG	2	25	2,078	am	30	0.978	7	0.205	0.978	2.7	0.055	2.660	2.182	No	No
61	F	hot spot	Willow Pass Rd	AG	4	25	3,533	am	30	SR-4 EB ramps	AG	2	25	561	am	30	0.978	7	0.242	0.978	2.7	0.015	2.657	2.180	No	No
62	C		Port Chicago Hwy	AG	4	25	3,343	am	30	SR-4 WB ramps	AG	2	25	1,928	am	30	0.978	7	0.229	0.978	2.7	0.051	2.680	2.196	No	No

Concord Community Resource Plan **INTERSECTIONS** **CALINE4 SCREENING PER BAAQMD CEQA GUIDELINES (1999)**

2030 Clustered Villages **1-Hr Background= 2.4 ppm** **8-Hr Background= 2 ppm** **persistence: 0.7** **CO Standards: 20 9**

			Road 1							Road 2							Primary Road (Highest Volume)			Secondary Road (Intersecting Road)			Total Intersection			
Int. No.	LOS		Street Name	type	# lanes	Dist (ft)	Pk Hour Volume	am/ pm	speed (mph)	Street Name	type	# lanes	Dist (ft)	Pk Hour Volume	am/ pm	speed (mph)	EMFAC Emission Factor	Ref. CO Conc.	1-hr CO (ppm)	EMFAC Emission Factor	Ref. CO Conc.	1-hr CO (ppm)	1-hr CO (ppm)	8-hr CO (ppm)	Exceeds 1-hr standard?	Exceeds 8-hr standard?
1	C		Port Chicago Hwy	AG	6	25	3,184	pm	30	Arnold Industrial Way	AG	2	25	1,152	pm	30	0.978	6.1	0.190	0.978	2.7	0.030	2.620	2.154	No	No
2	F	hot spot	Port Chicago Hwy	AG	6	25	5,065	pm	30	Panoramic Drive	AG	4	25	2,716	pm	30	0.978	6.1	0.302	0.978	2.6	0.069	2.771	2.260	No	No
3	F	hot spot	Port Chicago Hwy	AG	4	25	3,034	am	30	Olivera Rd	AG	4	25	1,787	am	30	0.978	7	0.208	0.978	2.6	0.045	2.653	2.177	No	No
4	A		Olivera Rd	AG	2	25	927	pm	30	Salvio St	AG	2	25	716	pm	30	0.978	7.6	0.069	0.978	2.7	0.019	2.488	2.061	No	No
5	B		Clayton Wy	AG	3	25	668	pm	30	Willow Pass Rd	AG	4	25	2,805	pm	30	0.978	2.6	0.017	0.978	7.6	0.208	2.625	2.158	No	No
6	F	hot spot	Farm Bureau Rd/Olivera	AG	4	25	1,447	pm	30	Willow Pass Rd	AG	6	25	3,025	pm	30	0.978	2.3	0.033	0.978	7	0.207	2.640	2.168	No	No
7	C		Diamond Blvd	AG	4	25	2,783	pm	30	Willow Pass Rd	AG	8	25	4,324	pm	30	0.978	2.2	0.060	0.978	7	0.296	2.756	2.249	No	No
8	E	hot spot	Market St/On Ramp	AG	2	25	2,602	pm	30	Concord Ave	AG	6	25	4,993	pm	30	0.978	2.3	0.059	0.978	7.6	0.371	2.830	2.301	No	No
9	B		Oakland Ave	AG	2	25	1,216	pm	30	Clayton Rd	AG	6	25	2,832	pm	30	0.978	2.3	0.027	0.978	7.6	0.210	2.638	2.166	No	No
10	D	hot spot	Beechwood Dr	AG	2	25	60	am	30	Landana Dr	AG	2	25	1,197	am	30	0.978	2.7	0.002	0.978	7.6	0.089	2.491	2.063	No	No
11	D	hot spot	West St	AG	2	25	602	am	30	Concord Blvd	AG	4	25	3,902	am	30	0.978	2.6	0.015	0.978	7.6	0.290	2.705	2.214	No	No
12	B		West St/Laveta Wy	AG	3	25	650	pm	30	Clayton Rd	AG	6	25	3,180	pm	30	0.978	2.3	0.015	0.978	7.6	0.236	2.651	2.176	No	No
13	C		Denkinger Rd	AG	2	25	1,146	am	30	Concord Blvd	AG	4	25	3,248	am	30	0.978	2.6	0.029	0.978	7.6	0.241	2.671	2.189	No	No
14	E	hot spot	Treat Blvd/Denkinger Rd	AG	4	25	2,849	pm	30	Clayton Rd	AG	6	25	3,675	pm	30	0.978	2.3	0.064	0.978	7	0.252	2.716	2.221	No	No
15	E	hot spot	Treat Blvd	AG	4	25	3,503	pm	30	Cowell Ln	AG	4	25	1,678	pm	30	0.978	7	0.240	0.978	2.6	0.043	2.682	2.198	No	No
16	F	hot spot	Treat Blvd	AG	6	25	3,771	am	30	Oak Grove Rd	AG	4	25	5,083	am	30	0.978	2.6	0.096	0.978	6.1	0.303	2.799	2.279	No	No
17	F	hot spot	Oak Rd	AG	4	25	3,091	pm	30	Treat Blvd	AG	6	25	5,178	pm	30	0.978	2.3	0.070	0.978	7	0.354	2.824	2.297	No	No
18	A		Bailey Rd	AG	2	25	1,307	am	30	Myrtle Dr	AG	2	25	274	am	30	0.978	7.6	0.097	0.978	2.7	0.007	2.504	2.073	No	No
19	C		Bailey Rd	AG	2	25	1,106	pm	30	Concord Blvd	AG	4	25	2,445	pm	30	0.978	2.6	0.028	0.978	7.6	0.182	2.610	2.147	No	No
20	B		Bailey Rd	AG	4	25	801	pm	30	Clayton Rd	AG	6	25	3,346	pm	30	0.978	2.3	0.018	0.978	7	0.229	2.647	2.173	No	No
21	C		Kirker Pass Rd	AG	4	25	3,964	pm	30	Clearbrook Dr	AG	4	25	218	pm	30	0.978	7	0.271	0.978	2.6	0.006	2.677	2.194	No	No
22	E	hot spot	Kirker Pass Rd	AG	6	25	3,979	pm	30	Concord Blvd	AG	4	25	1,640	pm	30	0.978	6.1	0.237	0.978	2.6	0.042	2.679	2.195	No	No
23	D	hot spot	Kirker Pass Rd	AG	6	25	4,090	pm	30	Clayton Rd	AG	6	25	2,810	pm	30	0.978	6.1	0.244	0.978	2.3	0.063	2.707	2.215	No	No
24	E	hot spot	Cowell Ln	AG	4	25	2,276	pm	30	Ygnacio Valley Blvd	AG	4	25	5,499	pm	30	0.978	2.6	0.058	0.978	7	0.376	2.834	2.304	No	No
25	F	hot spot	Oak Grove Rd	AG	4	25	2,713	pm	30	Ygnacio Valley Blvd	AG	6	25	4,057	pm	30	0.978	2.3	0.061	0.978	7	0.278	2.739	2.237	No	No
26	E	hot spot	Galindo St	AG	6	25	3,181	pm	30	Willow Pass Rd	AG	4	25	2,473	pm	30	0.978	6.1	0.190	0.978	2.6	0.063	2.653	2.177	No	No
27	C		Market St	AG	4	25	2,634	pm	30	Willow Pass Rd	AG	6	25	4,057	pm	30	0.978	2.3	0.059	0.978	7	0.278	2.737	2.236	No	No
28	D	hot spot	I-680 NB Ramps	AG	2	25	1,423	pm	30	Willow Pass Rd	AG	6	25	5,209	pm	30	0.978	2.3	0.032	0.978	7.6	0.387	2.819	2.293	No	No
29	A		I-680 SB Ramps	AG	2	25	2,118	pm	30	Willow Pass Rd	AG	6	25	4,547	pm	30	0.978	2.3	0.048	0.978	7.6	0.338	2.786	2.270	No	No
30	E	hot spot	Market St	AG	4	25	2,343	pm	30	Clayton Rd	AG	6	25	2,677	pm	30	0.978	2.3	0.053	0.978	7	0.183	2.636	2.165	No	No
31	F	hot spot	SR-242 SB Ramps	AG	2	25	1,630	pm	30	Concord Ave	AG	6	25	5,305	pm	30	0.978	2.3	0.037	0.978	7.6	0.394	2.831	2.302	No	No
32	D	hot spot	Diamond Blvd	AG	2	25	2,830	pm	30	Concord Ave	AG	6	25	5,679	pm	30	0.978	2.3	0.064	0.978	7.6	0.422	2.886	2.340	No	No
33	C		Oak Grove Rd	AG	4	25	2,627	pm	30	Monument Blvd	AG	6	25	3,470	pm	30	0.978	2.3	0.059	0.978	7	0.238	2.697	2.208	No	No
34	F	hot spot	Walnut Blvd	AG	2	25	1,647	pm	30	Ygnacio Valley Blvd	AG	6	25	6,164	pm	30	0.978	2.3	0.037	0.978	7.6	0.458	2.895	2.347	No	No
35	E	hot spot	Bancroft Rd	AG	4	25	2,677	am	30	Ygnacio Valley Blvd	AG	6	25	5,019	am	30	0.978	2.3	0.060	0.978	7	0.344	2.804	2.283	No	No
36	D	hot spot	Alberta Wy	AG	4	25	1,420	pm	30	Ygnacio Valley Blvd	AG	4	25	4,492	pm	30	0.978	2.6	0.036	0.978	7	0.308	2.744	2.241	No	No
37	E	hot spot	Ayers Rd	AG	2	25	971	pm	30	Ygnacio Valley Blvd	AG	4	25	4,897	pm	30	0.978	2.6	0.025	0.978	7.6	0.364	2.789	2.272	No	No
38	F	hot spot	N Main St	AG	4	25	4,459	pm	30	Geary Rd	AG	4	25	4,378	pm	30	0.978	7	0.305	0.978	2.6	0.111	2.817	2.292	No	No
39	C		Port Chicago Hwy	AG	2	25	2,209	am	30	Bates Ave	AG	2	25	1,811	am	30	0.978	7.6	0.164	0.978	2.7	0.048	2.612	2.148	No	No
40	F	hot spot	Bancroft Rd	AG	4	25	2,648	pm	30	Treat Blvd	AG	6	25	5,880	pm	30	0.978	2.3	0.060	0.978	7	0.403	2.862	2.323	No	No
41	C		Kirker Pass Rd	AG	5	25	3,979	pm	30	Myrtle Dr	AG	4	25	233	pm	30	0.978	7	0.272	0.978	2.6	0.006	2.678	2.195	No	No
42	F	hot spot	Buskirk Ave	AG	2	25	2,128	pm	30	Treat Blvd	AG	6	25	4,758	pm	30	0.978	2.3	0.048	0.978	7.6	0.354	2.802	2.281	No	No
43	F	hot spot	N Main St	AG	4	25	4,672	pm	30	Sunnyvale Ave	AG	2	25	2,952	pm	30	0.978	7	0.320	0.978	2.7	0.078	2.798	2.278	No	No
44	F	hot spot	I-680 NB Ramps	AG	2	25	4,422	am	30	Ygnacio Valley Blvd	AG	4	25	6,184	am	30	0.978	2.6	0.112	0.978	7.6	0.460	2.972	2.400	No	No
45	B		I-680 SB Ramps	AG	2	25	2,039	am	30	Ygnacio Valley Blvd	AG	2	25	4,238	am	30	0.978	2.7	0.054	0.978	7.6	0.315	2.769	2.258	No	No
46	F	hot spot	Willow Pass Rd	AG	4	25	3,432	am	30	Evora Rd (East)-SR-4 WB of	AG	2	25	1,804	am	30	0.978	7	0.235	0.978	2.7	0.048	2.683	2.198	No	No
47	F	hot spot	Willow Pass Rd	AG	4	25	2,279	am	30	Evora Rd (West) [At Project S	AG	2	25	2,599	am	30	0.978	2.7	0.060	0.978	7	0.178	2.638	2.167	No	No
48	F	hot spot	Willow Pass Rd	AG	4	25	4,711	am	30	Avila Rd	AG	2	25	1,653	am	30	0.978	7	0.323	0.978	2.7	0.044	2.766	2.256	No	No
49	E	hot spot	Bailey Rd	AG	2	25	1,755	am	30	Willow Pass Rd	AG	4	25	2,782	am	30	0.978	2.6	0.045	0.978	7.6	0.207	2.651	2.176	No	No
50	D	hot spot	San Marco Blvd	AG	4	25	2,635	am	30	W Leland Rd	AG	2	25	3,525	am	30	0.978	2.7	0.070	0.978	7	0.241	2.711	2.218	No	No
51	F	hot spot	Bailey Rd	AG	2	25	2,254	am	30	W Leland Rd	AG	2	25	3,245	am	30	0.978	2.7	0.060	0.978	7.6	0.241	2.701	2.210	No	No
52	F	hot spot	Railroad Ave	AG	2	25	3,365	am	30	W Leland Rd	AG	2	25	3,851	am	30	0.978	2.7	0.089	0.978	7.6	0.286	2.775	2.263	No	No
53	C		Railroad Ave	AG	2	25	2,789	am	30	Buchanan Rd	AG	2	25	1,759	am	30	0.978	7.6	0.207	0.978	2.7	0.046	2.654	2.178	No	No
54	F	hot spot	Kirker Pass Rd	AG	2	25	3,387	am	30	James Donlon Blvd [Future e	AG	2	25	1,934	am	30	0.978	7.6	0.252	0.978	2.7	0.051	2.703	2.212	No	No
55	E	hot spot	San Marco Blvd-	AG	2	25	3,560	am	30	Willow Pass Rd & SR-4 EB c	AG	4	25	2,902	am	30	0.978	7.6	0.265	0.978	2.6	0.074	2.738	2.237	No	No
56	F	hot spot	Bailey Rd	AG	2	25	4,600	am	30	SR-4 EB ramps-BART acces	AG	2	25	2,075	am	30	0.978	7.6	0.342	0.978	2.7	0.055	2.797	2.278	No	No
57	E	hot spot	Bailey Rd	AG	2	25	2,654	am	30	SR-4 WB onramp-Canal Rd	AG	2	25	1,690	am	30	0.978	7.6	0.197	0.978	2.7	0.045	2.642	2.169	No	No
58	C		Railroad Ave	AG	2	25	2,989	am	30	SR-4 WB onramp-California	AG	2	25	1,042	am	30	0.978	7.6	0.222	0.978	2.7	0.028	2.650	2.175	No	No
59	C		Railroad Ave	AG	2	25	3,298	am	30	SR-4 EB ramps	AG	2	25	1,698	am	30	0.978	7.6	0.245	0.978	2.7	0.045	2.690	2.203	No	No
60	F	hot spot	Willow Pass Rd	AG	4	25	3,266	am	30	SR-4 WB ramps	AG	2	25	1,419	am	30	0.978	7	0.224	0.978	2.7	0.037	2.661	2.183	No	No
61	F	hot spot	Willow Pass Rd	AG	4	25	4,775	am	30	SR-4 EB ramps	AG	2	25	1,470	am	30	0.978	7	0.327	0.978	2.7	0.039	2.766	2.256	No	No
62	E	hot spot	Port Chicago Hwy	AG	4	25	3,258	am	30	SR-4 WB ramps	AG	2	25	1,507	am	30	0.978	7	0.223	0.978	2.7	0.040	2.663	2.184	No	No

Concord Community Resource Plan **INTERSECTIONS** **CALINE4 SCREENING PER BAAQMD CEQA GUIDELINES (1999)**

2030 Concentration and Conservation **1-Hr Background= 2.4 ppm** **8-Hr Background= 2 ppm** **persistence: 0.7** **CO Standards: 20 9**

			Road 1							Road 2							Primary Road (Highest Volume)			Secondary Road (Intersecting Road)			Total Intersection			
Int. No.	LOS		Street Name	type	# lanes	Dist (ft)	Pk Hour Volume	am/ pm	speed (mph)	Street Name	type	# lanes	Dist (ft)	Pk Hour Volume	am/ pm	speed (mph)	EMFAC Emission Factor	Ref. CO Conc.	1-hr CO (ppm)	EMFAC Emission Factor	Ref. CO Conc.	1-hr CO (ppm)	1-hr CO (ppm)	8-hr CO (ppm)	Exceeds 1-hr standard?	Exceeds 8-hr standard?
1	C		Port Chicago Hwy	AG	6	25	3,254	pm	30	Arnold Industrial Way	AG	3	25	1,227	pm	30	0.978	6.1	0.194	0.978	2.7	0.032	2.627	2.159	No	No
2	E	hot spot	Port Chicago Hwy	AG	6	25	4,783	am	30	Panoramic Drive	AG	4	25	3,128	am	30	0.978	6.1	0.285	0.978	2.6	0.080	2.765	2.255	No	No
3	F	hot spot	Port Chicago Hwy	AG	4	25	3,213	am	30	Olivera Rd	AG	4	25	1,790	am	30	0.978	7	0.220	0.978	2.6	0.046	2.665	2.186	No	No
4	A		Olivera Rd	AG	2	25	1,060	am	30	Salvio St	AG	2	25	771	am	30	0.978	7.6	0.079	0.978	2.7	0.020	2.499	2.069	No	No
5	B		Clayton Wy	AG	3	25	739	am	30	Willow Pass Rd	AG	4	25	2,990	am	30	0.978	2.6	0.019	0.978	7.6	0.222	2.641	2.169	No	No
6	F	hot spot	Farm Bureau Rd/Olivera	AG	4	25	1,543	pm	30	Willow Pass Rd	AG	6	25	3,153	pm	30	0.978	2.3	0.035	0.978	7	0.216	2.651	2.175	No	No
7	C		Diamond Blvd	AG	4	25	2,797	pm	30	Willow Pass Rd	AG	8	25	4,313	pm	30	0.978	2.2	0.060	0.978	7	0.295	2.755	2.249	No	No
8	E	hot spot	Market St/On Ramp	AG	2	25	2,556	pm	30	Concord Ave	AG	6	25	4,854	pm	30	0.978	2.3	0.057	0.978	7.6	0.361	2.818	2.293	No	No
9	B		Oakland Ave	AG	2	25	1,225	am	30	Clayton Rd	AG	6	25	2,794	am	30	0.978	2.3	0.028	0.978	7.6	0.208	2.635	2.165	No	No
10	F	hot spot	Beechwood Dr	AG	2	25	60	am	30	Landana Dr	AG	2	25	1,381	am	30	0.978	2.7	0.002	0.978	7.6	0.103	2.504	2.073	No	No
11	C		West St	AG	2	25	590	am	30	Concord Blvd	AG	4	25	3,818	am	30	0.978	2.6	0.015	0.978	7.6	0.284	2.699	2.209	No	No
12	B		West St/Laveta Wy	AG	3	25	649	am	30	Clayton Rd	AG	6	25	3,413	am	30	0.978	2.3	0.015	0.978	7.6	0.254	2.668	2.188	No	No
13	C		Denkinger Rd	AG	2	25	958	am	30	Concord Blvd	AG	4	25	3,451	am	30	0.978	2.6	0.024	0.978	7.6	0.257	2.681	2.197	No	No
14	D	hot spot	Treat Blvd/Denkinger Rd	AG	4	25	2,684	pm	30	Clayton Rd	AG	6	25	3,747	pm	30	0.978	2.3	0.060	0.978	7	0.257	2.717	2.222	No	No
15	E	hot spot	Treat Blvd	AG	4	25	3,449	am	30	Cowell Ln	AG	4	25	1,684	am	30	0.978	7	0.236	0.978	2.6	0.043	2.679	2.195	No	No
16	F	hot spot	Treat Blvd	AG	6	25	3,832	am	30	Oak Grove Rd	AG	4	25	4,953	am	30	0.978	2.6	0.097	0.978	6.1	0.295	2.793	2.275	No	No
17	F	hot spot	Oak Rd	AG	4	25	3,114	am	30	Treat Blvd	AG	6	25	5,078	am	30	0.978	2.3	0.070	0.978	7	0.348	2.818	2.292	No	No
18	A		Bailey Rd	AG	2	25	1,688	am	30	Myrtle Dr	AG	2	25	415	am	30	0.978	7.6	0.125	0.978	2.7	0.011	2.536	2.095	No	No
19	C		Bailey Rd	AG	2	25	1,337	am	30	Concord Blvd	AG	4	25	2,682	am	30	0.978	2.6	0.034	0.978	7.6	0.199	2.633	2.163	No	No
20	B		Bailey Rd	AG	4	25	872	am	30	Clayton Rd	AG	6	25	3,346	am	30	0.978	2.3	0.020	0.978	7	0.229	2.649	2.174	No	No
21	B		Kirker Pass Rd	AG	4	25	3,015	am	30	Clearbrook Dr	AG	4	25	182	am	30	0.978	7	0.206	0.978	2.6	0.005	2.611	2.148	No	No
22	E	hot spot	Kirker Pass Rd	AG	6	25	4,151	pm	30	Concord Blvd	AG	4	25	1,638	pm	30	0.978	6.1	0.248	0.978	2.6	0.042	2.689	2.203	No	No
23	D	hot spot	Kirker Pass Rd	AG	6	25	4,277	pm	30	Clayton Rd	AG	6	25	2,817	pm	30	0.978	6.1	0.255	0.978	2.3	0.063	2.719	2.223	No	No
24	E	hot spot	Cowell Ln	AG	4	25	2,316	pm	30	Ygnacio Valley Blvd	AG	4	25	5,650	pm	30	0.978	2.6	0.059	0.978	7	0.387	2.846	2.312	No	No
25	F	hot spot	Oak Grove Rd	AG	4	25	2,881	am	30	Ygnacio Valley Blvd	AG	6	25	4,046	am	30	0.978	2.3	0.065	0.978	7	0.277	2.742	2.239	No	No
26	D	hot spot	Galindo St	AG	6	25	3,215	pm	30	Willow Pass Rd	AG	4	25	2,366	pm	30	0.978	6.1	0.192	0.978	2.6	0.060	2.652	2.176	No	No
27	C		Market St	AG	4	25	2,583	pm	30	Willow Pass Rd	AG	6	25	3,952	pm	30	0.978	2.3	0.058	0.978	7	0.271	2.729	2.230	No	No
28	D	hot spot	I-680 NB Ramps	AG	2	25	1,376	pm	30	Willow Pass Rd	AG	6	25	5,210	pm	30	0.978	2.3	0.031	0.978	7.6	0.387	2.818	2.293	No	No
29	A		I-680 SB Ramps	AG	2	25	2,250	am	30	Willow Pass Rd	AG	6	25	4,527	am	30	0.978	2.3	0.051	0.978	7.6	0.336	2.787	2.271	No	No
30	E	hot spot	Market St	AG	4	25	2,316	am	30	Clayton Rd	AG	6	25	2,655	am	30	0.978	2.3	0.052	0.978	7	0.182	2.634	2.164	No	No
31	F	hot spot	SR-242 SB Ramps	AG	2	25	1,633	pm	30	Concord Ave	AG	6	25	5,239	pm	30	0.978	2.3	0.037	0.978	7.6	0.389	2.826	2.298	No	No
32	D	hot spot	Diamond Blvd	AG	2	25	2,805	pm	30	Concord Ave	AG	6	25	5,601	pm	30	0.978	2.3	0.063	0.978	7.6	0.416	2.879	2.336	No	No
33	C		Oak Grove Rd	AG	4	25	2,612	am	30	Monument Blvd	AG	6	25	3,564	am	30	0.978	2.3	0.059	0.978	7	0.244	2.703	2.212	No	No
34	F	hot spot	Walnut Blvd	AG	2	25	1,638	pm	30	Ygnacio Valley Blvd	AG	6	25	6,162	pm	30	0.978	2.3	0.037	0.978	7.6	0.458	2.895	2.346	No	No
35	E	hot spot	Bancroft Rd	AG	4	25	2,867	am	30	Ygnacio Valley Blvd	AG	6	25	4,963	am	30	0.978	2.3	0.064	0.978	7	0.340	2.804	2.283	No	No
36	E	hot spot	Alberta Wy	AG	4	25	1,431	am	30	Ygnacio Valley Blvd	AG	4	25	4,647	am	30	0.978	2.6	0.036	0.978	7	0.318	2.755	2.248	No	No
37	F	hot spot	Ayers Rd	AG	2	25	1,019	am	30	Ygnacio Valley Blvd	AG	4	25	5,098	am	30	0.978	2.6	0.026	0.978	7.6	0.379	2.805	2.283	No	No
38	F	hot spot	N Main St	AG	4	25	4,250	am	30	Geary Rd	AG	4	25	4,342	am	30	0.978	2.6	0.108	0.978	7	0.297	2.805	2.284	No	No
39	C		Port Chicago Hwy	AG	2	25	2,184	am	30	Bates Ave	AG	2	25	1,802	am	30	0.978	7.6	0.162	0.978	2.7	0.048	2.610	2.147	No	No
40	F	hot spot	Bancroft Rd	AG	4	25	2,691	pm	30	Treat Blvd	AG	6	25	5,819	pm	30	0.978	2.3	0.061	0.978	7	0.398	2.859	2.321	No	No
41	C		Kirker Pass Rd	AG	5	25	4,085	pm	30	Myrtle Dr	AG	4	25	177	pm	30	0.978	7	0.280	0.978	2.6	0.005	2.684	2.199	No	No
42	F	hot spot	Buskirk Ave	AG	2	25	2,115	am	30	Treat Blvd	AG	6	25	4,821	am	30	0.978	2.3	0.048	0.978	7.6	0.358	2.806	2.284	No	No
43	F	hot spot	N Main St	AG	4	25	4,776	am	30	Sunnyvale Ave	AG	2	25	2,768	am	30	0.978	7	0.327	0.978	2.7	0.073	2.800	2.280	No	No
44	F	hot spot	I-680 NB Ramps	AG	2	25	4,393	am	30	Ygnacio Valley Blvd	AG	4	25	6,084	am	30	0.978	2.6	0.112	0.978	7.6	0.452	2.964	2.395	No	No
45	C		I-680 SB Ramps	AG	2	25	2,046	am	30	Ygnacio Valley Blvd	AG	2	25	4,133	am	30	0.978	2.7	0.054	0.978	7.6	0.307	2.761	2.253	No	No
46	F	hot spot	Willow Pass Rd	AG	4	25	3,770	am	30	Evora Rd (East)-SR-4 WB of	AG	2	25	1,668	am	30	0.978	7	0.258	0.978	2.7	0.044	2.702	2.211	No	No
47	F	hot spot	Willow Pass Rd	AG	4	25	2,477	am	30	Evora Rd (West) [At Project	AG	2	25	2,485	am	30	0.978	2.7	0.065	0.978	7	0.170	2.636	2.165	No	No
48	F	hot spot	Willow Pass Rd	AG	4	25	4,420	am	30	Avila Rd	AG	2	25	1,751	am	30	0.978	7	0.303	0.978	2.7	0.046	2.749	2.244	No	No
49	E	hot spot	Bailey Rd	AG	2	25	1,560	pm	30	Willow Pass Rd	AG	4	25	2,793	pm	30	0.978	2.6	0.040	0.978	7.6	0.208	2.647	2.173	No	No
50	E	hot spot	San Marco Blvd	AG	4	25	2,796	am	30	W Leland Rd	AG	2	25	3,439	am	30	0.978	2.7	0.074	0.978	7	0.235	2.709	2.216	No	No
51	F	hot spot	Bailey Rd	AG	2	25	2,313	am	30	W Leland Rd	AG	2	25	3,294	am	30	0.978	2.7	0.061	0.978	7.6	0.245	2.706	2.214	No	No
52	F	hot spot	Railroad Ave	AG	2	25	3,329	pm	30	W Leland Rd	AG	2	25	3,795	pm	30	0.978	2.7	0.088	0.978	7.6	0.282	2.770	2.259	No	No
53	C		Railroad Ave	AG	2	25	2,803	pm	30	Buchanan Rd	AG	2	25	1,760	pm	30	0.978	7.6	0.208	0.978	2.7	0.046	2.655	2.178	No	No
54	F	hot spot	Kirker Pass Rd	AG	2	25	3,454	am	30	James Donlon Blvd [Future e	AG	2	25	2,013	am	30	0.978	7.6	0.257	0.978	2.7	0.053	2.710	2.217	No	No
55	E	hot spot	San Marco Blvd-	AG	2	25	3,553	pm	30	Willow Pass Rd & SR-4 EB c	AG	4	25	2,902	pm	30	0.978	7.6	0.264	0.978	2.6	0.074	2.738	2.237	No	No
56	F	hot spot	Bailey Rd	AG	2	25	4,674	pm	30	SR-4 EB ramps-BART acces	AG	2	25	2,164	pm	30	0.978	7.6	0.347	0.978	2.7	0.057	2.805	2.283	No	No
57	E	hot spot	Bailey Rd	AG	2	25	2,450	pm	30	SR-4 WB onramp-Canal Rd	AG	2	25	1,603	pm	30	0.978	7.6	0.182	0.978	2.7	0.042	2.624	2.157	No	No
58	B		Railroad Ave	AG	2	25	3,073	am	30	SR-4 WB onramp-California	AG	2	25	1,102	am	30	0.978	7.6	0.228	0.978	2.7	0.029	2.658	2.180	No	No
59	D	hot spot	Railroad Ave	AG	2	25	3,227	pm	30	SR-4 EB ramps	AG	2	25	1,694	pm	30	0.978	7.6	0.240	0.978	2.7	0.045	2.685	2.199	No	No
60	F	hot spot	Willow Pass Rd	AG	4	25	3,005	am	30	SR-4 WB ramps	AG	2	25	1,355	am	30	0.978	7	0.206	0.978	2.7	0.036	2.642	2.169	No	No
61	F	hot spot	Willow Pass Rd	AG	4	25	4,442	am	30	SR-4 EB ramps	AG	2	25	1,414	am	30	0.978	7	0.304	0.978	2.7	0.037	2.741	2.239	No	No
62	E	hot spot	Port Chicago Hwy	AG	4	25	3,274	pm	30	SR-4 WB ramps	AG	2	25	1,525	pm	30	0.978	7	0.224	0.978	2.7	0.040	2.664	2.185	No	No

Existing Traffic			
	Rd 1	am/pm	Rd 2
#1 Port Chicago/Arnold Industrial Wy	2407	am	628
#2 Port Chicago/Panoramic Dr	2177	am	736
#3 Port Chicago/Olivera Rd	1562	pm	1202
#4 Olivera Rd/Salvio St	851	am	248
#5 Clayton Wy/Willow Pass Rd	170	am	1885
#6 Farm Bureau Rd/Willow Pass Rd	1118	pm	1964
#7 Diamond Blvd/Willow Pass Rd	2002	pm	3914
#8 Market St/Concord Ave	2206	am	3170
#9 Oakland Av/Clayton Rd	1176	pm	3183
#10 Beechwood Dr/Landana Dr	60	am	811
#11 West St/Concord Blvd	562	am	2595
#12 West St/Clayton Rd	637	am	2851
#13 Denkinger Rd/Concord Blvd	863	am	2430
#14 Treat Blvd/Clayton Rd	2145	pm	3054
#15 Treat Blvd/Cowell Ln	3177	am	1274
#16 Treat Blvd/Oak Grove Rd	3229	am	4289
#17 Oak Rd/Treat Blvd	2368	pm	5842
#18 Bailey Rd/Myrtle Dr	1141	am	200
#19 Bailey Rd/Concord Blvd	994	am	1758
#20 Bailey Rd/Clayton Rd	741	am	3131
#21 Kirker Pass Rd/Clearbrook Dr	2044	am	182
#22 Kirker Pass Rd/Concord Blvd	2194	am	1224
#23 Kirker Pass Rd/Clayton Rd	2851	pm	2355
#24 Cowell Ln/Ygnacio Valley Rd	1601	pm	3830
#25 Oak Grove Rd/Ygnacio Valley Rd	1942	pm	3326
#26 Galindo St/Willow Pass Rd	2711	pm	1912
#27 Market St/Willow Pass Rd	2153	pm	3560
#28 I-680 NB ramps/Willow Pass Rd	1291	pm	4742
#29 I-680 SB ramps/Willow Pass Rd	1639	am	3827
#30 Market St/Clayton Rd	2011	am	1972
#31 SR242 SB-Commerce Av/Concord Av	1616	pm	4088
#32 Diamond Blvd/Concord Ave	2177	pm	4634
#33 Oak Grove Rd/Monument Blvd	1832	am	2601
#34 Walnut Blvd/Ygnacio Valley Rd	1384	pm	5636
#35 Bancroft Rd/Ygnacio Valley Rd	2301	am	4476
#36 Alberta Wy/Ygnacio Valley Rd	1170	am	3151
#37 Ayers Rd/Ygnacio Valley Rd	821	am	3288
#38 N. Main St/Geary Rd	3217	pm	4124
#39 Port Chicago/Bates Av	1719	pm	1440
#40 Bancroft Rd/Treat Blvd	2288	am	4148
#41 Kirker Pass Rd/Myrtle Dr	2003	am	201
#42 Buskirk Ave/Treat Blvd	2110	am	4738
#43 N. Main St/Sunnyvale Ave	3220	am	2544
#44 NB I-680 Off/Ygnacio Valley Rd	3875	am	5299
#45 SB I-680 On/Ygnacio Valley Rd	1761	am	3287
#46 Willow Pass Rd & Evora Rd (East)-SR-4 WB off-ra	2269	am	492
#47 Willow Pass Rd & Evora Rd (West) [At Project Site	1044	am	912
#48 Willow Pass Rd & Avila Rd	1884	am	30
#49 Bailey Rd & Willow Pass Rd	816	am	1534
#50 San Marco Blvd & W Leland Rd	1336	am	1040
#51 Bailey Rd & W Leland Rd	1412	am	1652
#52 Railroad Ave & W Leland Rd	3000	pm	2516
#53 Railroad Ave & Buchanan Rd	2352	pm	1698
#54 Kirker Pass Rd & James Donlon Blvd [Future exter	1722	am	0
#55 San Marco Blvd-Willow Pass Rd & SR-4 EB off-ran	1336	pm	1426
#56 Bailey Rd & SR-4 EB ramps-BART access	2552	pm	1285
#57 Bailey Rd & SR-4 WB onramp-Canal Rd	1717	am	1130
#58 Railroad Ave & SR-4 WB onramp-California Ave	2297	pm	941
#59 Railroad Ave & SR-4 EB ramps	2732	pm	1687
#60 Willow Pass Rd & SR-4 WB ramps	1293	am	1057
#62 Willow Pass Rd & SR-4 EB ramps	1903	am	559
#63 Port Chicago Hwy & SR-4 WB ramps	2543	am	1150

No Project Traffic			
	Rd 1	am/pm	Rd 2
#1 Port Chicago/Arnold Industrial Wy	3212	am	1484
#2 Port Chicago/Panoramic Dr	3300	am	1695
#3 Port Chicago/Olivera Rd	1837	pm	1258
#4 Olivera Rd/Salvio St	1038	am	605
#5 Clayton Wy/Willow Pass Rd	372	am	3120
#6 Farm Bureau Rd/Willow Pass Rd	1812	pm	2970
#7 Diamond Blvd/Willow Pass Rd	2698	pm	4314
#8 Market St/Concord Ave	2540	am	4216
#9 Oakland Av/Clayton Rd	1388	pm	3528
#10 Beechwood Dr/Landana Dr	76	am	1118
#11 West St/Concord Blvd	662	am	3334
#12 West St/Clayton Rd	865	am	3670
#13 Denkinger Rd/Concord Blvd	940	am	3019
#14 Treat Blvd/Clayton Rd	2681	pm	3733
#15 Treat Blvd/Cowell Ln	3452	am	1827
#16 Treat Blvd/Oak Grove Rd	3778	am	4882
#17 Oak Rd/Treat Blvd	3086	am	5090
#18 Bailey Rd/Myrtle Dr	1535	am	393
#19 Bailey Rd/Concord Blvd	1202	am	2325
#20 Bailey Rd/Clayton Rd	745	am	3354
#21 Kirker Pass Rd/Clearbrook Dr	2990	am	182
#22 Kirker Pass Rd/Concord Blvd	3992	pm	1410
#23 Kirker Pass Rd/Clayton Rd	4115	pm	2794
#24 Cowell Ln/Ygnacio Valley Rd	2257	pm	5453
#25 Oak Grove Rd/Ygnacio Valley Rd	2793	am	3927
#26 Galindo St/Willow Pass Rd	3214	pm	2388
#27 Market St/Willow Pass Rd	2134	am	3414
#28 I-680 NB ramps/Willow Pass Rd	1388	pm	5301
#29 I-680 SB ramps/Willow Pass Rd	2391	am	4499
#30 Market St/Clayton Rd	2337	am	2861
#31 SR242 SB-Commerce Av/Concord Av	2880	am	3939
#32 Diamond Blvd/Concord Ave	2748	pm	5568
#33 Oak Grove Rd/Monument Blvd	2594	am	3231
#34 Walnut Blvd/Ygnacio Valley Rd	1628	pm	6052
#35 Bancroft Rd/Ygnacio Valley Rd	2849	am	4817
#36 Alberta Wy/Ygnacio Valley Rd	1470	am	4663
#37 Ayers Rd/Ygnacio Valley Rd	1007	am	5024
#38 N. Main St/Geary Rd	4395	pm	4251
#39 Port Chicago/Bates Av	2107	am	1974
#40 Bancroft Rd/Treat Blvd	2618	pm	5474
#41 Kirker Pass Rd/Myrtle Dr	3824	pm	175
#42 Buskirk Ave/Treat Blvd	2115	am	4794
#43 N. Main St/Sunnyvale Ave	4263	am	2975
#44 NB I-680 Off/Ygnacio Valley Rd	4389	am	5883
#45 SB I-680 On/Ygnacio Valley Rd	2095	am	4102
#46 Willow Pass Rd & Evora Rd (East)-SR-4 WB off-ran	3169	am	2032
#47 Willow Pass Rd & Evora Rd (West) [At Project Site]	2313	am	2181
#48 Willow Pass Rd & Avila Rd	3463	am	1569
#49 Bailey Rd & Willow Pass Rd	1965	am	2515
#50 San Marco Blvd & W Leland Rd	2225	am	2917
#51 Bailey Rd & W Leland Rd	2743	am	3217
#52 Railroad Ave & W Leland Rd	3284	pm	3746
#53 Railroad Ave & Buchanan Rd	2754	pm	1811
#54 Kirker Pass Rd & James Donlon Blvd [Future extens	3429	am	1940
#55 San Marco Blvd-Willow Pass Rd & SR-4 EB off-ram	2700	pm	2379
#56 Bailey Rd & SR-4 EB ramps-BART access	3772	pm	1766
#57 Bailey Rd & SR-4 WB onramp-Canal Rd	3144	am	1516
# 58 Railroad Ave & SR-4 WB onramp-California Ave	3075	pm	1124
#59 Railroad Ave & SR-4 EB ramps	3160	pm	1698
#60 Willow Pass Rd & SR-4 WB ramps	2996	am	2078
#62 Willow Pass Rd & SR-4 EB ramps	3533	am	561
#63 Port Chicago Hwy & SR-4 WB ramps	3343	am	1928

CV Traffic			
	Rd 1	am/pm	Rd 2
#1 Port Chicago/Arnold Industrial Wy	3184	pm	1152
#2 Port Chicago/Panoramic Dr	5065	am	2716
#3 Port Chicago/Olivera Rd	3034	am	1787
#4 Olivera Rd/Salvio St	927	am	716
#5 Clayton Wy/Willow Pass Rd	668	am	2805
#6 Farm Bureau Rd/Willow Pass Rd	1447	pm	3025
#7 Diamond Blvd/Willow Pass Rd	2783	pm	4324
#8 Market St/Concord Ave	2602	pm	4993
#9 Oakland Av/Clayton Rd	1216	am	2832
#10 Beechwood Dr/Landana Dr	60	am	1197
#11 West St/Concord Blvd	602	am	3902
#12 West St/Clayton Rd	650	am	3180
#13 Denkinger Rd/Concord Blvd	1146	am	3248
#14 Treat Blvd/Clayton Rd	2849	pm	3675
#15 Treat Blvd/Cowell Ln	3503	am	1678
#16 Treat Blvd/Oak Grove Rd	3771	am	5083
#17 Oak Rd/Treat Blvd	3091	am	5178
#18 Bailey Rd/Myrtle Dr	1307	am	274
#19 Bailey Rd/Concord Blvd	1106	am	2445
#20 Bailey Rd/Clayton Rd	801	am	3346
#21 Kirker Pass Rd/Clearbrook Dr	3964	pm	218
#22 Kirker Pass Rd/Concord Blvd	3979	pm	1640
#23 Kirker Pass Rd/Clayton Rd	4090	pm	2810
#24 Cowell Ln/Ygnacio Valley Rd	2276	pm	5499
#25 Oak Grove Rd/Ygnacio Valley Rd	2713	am	4057
#26 Galindo St/Willow Pass Rd	3181	pm	2473
#27 Market St/Willow Pass Rd	2634	pm	4057
#28 I-680 NB ramps/Willow Pass Rd	1423	pm	5209
#29 I-680 SB ramps/Willow Pass Rd	2118	am	4547
#30 Market St/Clayton Rd	2343	am	2677
#31 SR242 SB-Commerce Av/Concord Av	1630	pm	5305
#32 Diamond Blvd/Concord Ave	2830	pm	5679
#33 Oak Grove Rd/Monument Blvd	2627	am	3470
#34 Walnut Blvd/Ygnacio Valley Rd	1647	pm	6164
#35 Bancroft Rd/Ygnacio Valley Rd	2677	am	5019
#36 Alberta Wy/Ygnacio Valley Rd	1420	am	4492
#37 Ayers Rd/Ygnacio Valley Rd	971	am	4897
#38 N. Main St/Geary Rd	4459	am	4378
#39 Port Chicago/Bates Av	2209	am	1811
#40 Bancroft Rd/Treat Blvd	2648	pm	5880
#41 Kirker Pass Rd/Myrtle Dr	3979	pm	233
#42 Buskirk Ave/Treat Blvd	2128	am	4758
#43 N. Main St/Sunnyvale Ave	4672	am	2952
#44 NB I-680 Off/Ygnacio Valley Rd	4422	am	6184
#45 SB I-680 On/Ygnacio Valley Rd	2039	am	4238
#46 Willow Pass Rd & Evora Rd (East)-SR-4 WB off-ran	3432	am	1804
#47 Willow Pass Rd & Evora Rd (West) [At Project Site]	2279	am	2599
#48 Willow Pass Rd & Avila Rd	4711	am	1653
#49 Bailey Rd & Willow Pass Rd	1755	am	2782
#50 San Marco Blvd & W Leland Rd	2635	am	3525
#51 Bailey Rd & W Leland Rd	2254	am	3245
#52 Railroad Ave & W Leland Rd	3365	pm	3851
#53 Railroad Ave & Buchanan Rd	2789	pm	1759
#54 Kirker Pass Rd & James Donlon Blvd [Future exten	3387	am	1934
#55 San Marco Blvd-Willow Pass Rd & SR-4 EB off-ram	3560	pm	2902
#56 Bailey Rd & SR-4 EB ramps-BART access	4600	pm	2075
#57 Bailey Rd & SR-4 WB onramp-Canal Rd	2654	am	1690
# 58 Railroad Ave & SR-4 WB onramp-California Ave	2989	pm	1042
#59 Railroad Ave & SR-4 EB ramps	3298	pm	1698
#60 Willow Pass Rd & SR-4 WB ramps	3266	am	1419
#62 Willow Pass Rd & SR-4 EB ramps	4775	am	1470
#63 Port Chicago Hwy & SR-4 WB ramps	3258	am	1507

CC Traffic			
	Rd 1	am/pm	Rd 2
#1 Port Chicago/Arnold Industrial Wy	3254	pm	1227
#2 Port Chicago/Panoramic Dr	4783	am	3128
#3 Port Chicago/Olivera Rd	3213	am	1790
#4 Olivera Rd/Salvio St	1060	am	771
#5 Clayton Wy/Willow Pass Rd	739	am	2990
#6 Farm Bureau Rd/Willow Pass Rd	1543	pm	3153
#7 Diamond Blvd/Willow Pss Rd	2797	pm	4313
#8 Market St/Concord Ave	2556	pm	4854
#9 Oakland Av/Clayton Rd	1225	am	2794
#10 Beechwood Dr/Landana Dr	60	am	1381
#11 West St/Concord Blvd	590	am	3818
#12 West St/Clayton Rd	649	am	3413
#13 Denkinger Rd/Concord Blvd	958	am	3451
#14 Treat Blvd/Clayton Rd	2684	pm	3747
#15 Treat Blvd/Cowell Ln	3449	am	1684
#16 Treat Blvd/Oak Grove Rd	3832	am	4953
#17 Oak Rd/Treat Blvd	3114	am	5078
#18 Bailey Rd/Myrtle Dr	1688	am	415
#19 Bailey Rd/Concord Blvd	1337	am	2682
#20 Bailey Rd/Clayton Rd	872	am	3346
#21 Kirker Pass Rd/Clearbrook Dr	3015	am	182
#22 Kirker Pass Rd/Concord Blvd	4151	pm	1638
#23 Kirker Pass Rd/Clayton Rd	4277	pm	2817
#24 Cowell Ln/Ygnacio Valley Rd	2316	pm	5650
#25 Oak Grove Rd/Ygnacio Valley Rd	2881	am	4046
#26 Galindo St/Willow Pass Rd	3215	pm	2366
#27 Market St/Willow Pass Rd	2583	pm	3952
#28 I-680 NB ramps/Willow Pass Rd	1376	pm	5210
#29 I-680 SB ramps/Willow Pass Rd	2250	am	4527
#30 Market St/Clayton Rd	2316	am	2655
#31 SR242 SB-Commerce Av/Concord Av	1633	pm	5239
#32 Diamond Blvd/Concord Ave	2805	pm	5601
#33 Oak Grove Rd/Monument Blvd	2612	am	3564
#34 Walnut Blvd/Ygnacio Valley Rd	1638	pm	6162
#35 Bancroft Rd/Ygnacio Valley Rd	2867	am	4963
#36 Alberta Wy/Ygnacio Valley Rd	1431	am	4647
#37 Ayers Rd/Ygnacio Valley Rd	1019	am	5098
#38 N. Main St/Geary Rd	4250	am	4342
#39 Port Chicago/Bates Av	2184	am	1802
#40 Bancroft Rd/Treat Blvd	2691	pm	5819
#41 Kirker Pass Rd/Myrtle Dr	4085	pm	177
#42 Buskirk Ave/Treat Blvd	2115	am	4821
#43 N. Main St/Sunnyvale Ave	4776	am	2768
#44 NB I-680 Off/Ygnacio Valley Rd	4393	am	6084
#45 SB I-680 On/Ygnacio Valley Rd	2046	am	4133
#46 Willow Pass Rd & Evora Rd (East)-SR-4 WB off-ramp [I	3770	am	1668
#47 Willow Pass Rd & Evora Rd (West) [At Project Site]	2477	am	2485
#48 Willow Pass Rd & Avila Rd	4420	am	1751
#49 Bailey Rd & Willow Pass Rd	1560	am	2793
#50 San Marco Blvd & W Leland Rd	2796	am	3439
#51 Bailey Rd & W Leland Rd	2313	am	3294
#52 Railroad Ave & W Leland Rd	3329	pm	3795
#53 Railroad Ave & Buchanan Rd	2803	pm	1760
#54 Kirker Pass Rd & James Donlon Blvd [Future extension	3454	am	2013
#55 San Marco Blvd-Willow Pass Rd & SR-4 EB off-ramp	3553	pm	2902
#56 Bailey Rd & SR-4 EB ramps-BART access	4674	pm	2164
#57 Bailey Rd & SR-4 WB onramp-Canal Rd	2450	am	1603
# 58 Railroad Ave & SR-4 WB onramp-California Ave	3073	pm	1102
#59 Railroad Ave & SR-4 EB ramps	3227	pm	1694
#60 Willow Pass Rd & SR-4 WB ramps	3005	am	1355
#62 Willow Pass Rd & SR-4 EB ramps	4442	am	1414
#63 Port Chicago Hwy & SR-4 WB ramps	3274	am	1525

BAAQMD CEQA Guidelines (December 1999)

Average Exhaust Emission Rates
EMFAC 2007 Version 2.3; Nov. 1, 2006

(Winter, Temp= 50F, Hum= 62%)

Speed	ROG	Nox	CO	Sox	PM10	PM2.5
2007						
0	0.748	3.069	3.86	0.002	0.065	0.06
5	1.094	1.888	9.149	0.011	0.126	0.116
10	0.729	1.487	7.422	0.009	0.086	0.079
15	0.5	1.229	6.232	0.007	0.059	0.055
20	0.368	1.1	5.393	0.006	0.043	0.04
25	0.295	1.037	4.796	0.005	0.035	0.032
30	0.247	0.995	4.364	0.004	0.029	0.027
35	0.217	0.973	4.062	0.004	0.025	0.023
40	0.2	0.969	3.872	0.004	0.023	0.021
45	0.193	0.982	3.793	0.004	0.022	0.02
50	0.197	1.015	3.837	0.004	0.022	0.02
55	0.211	1.069	4.037	0.004	0.023	0.021
60	0.238	1.151	4.456	0.004	0.026	0.024
65	0.283	1.27	5.21	0.005	0.03	0.027
2030						
0	0.521	2.847	3.172	0.002	0.017	0.016
5	0.196	0.338	1.673	0.011	0.087	0.081
10	0.13	0.277	1.45	0.008	0.058	0.054
15	0.09	0.235	1.281	0.007	0.04	0.037
20	0.068	0.207	1.154	0.005	0.03	0.028
25	0.056	0.19	1.056	0.005	0.023	0.021
30	0.048	0.179	0.978	0.004	0.019	0.017
35	0.043	0.172	0.917	0.004	0.016	0.015
40	0.041	0.169	0.871	0.004	0.015	0.014
45	0.041	0.171	0.843	0.003	0.014	0.013
50	0.043	0.177	0.835	0.004	0.014	0.013
55	0.048	0.19	0.853	0.004	0.014	0.013
60	0.056	0.209	0.912	0.004	0.016	0.015
65	0.069	0.239	1.033	0.005	0.018	0.017

30mph is Default Speed in BAAQMD Guidelines for areas outside San Francisco

BAAQMD CEQA Guidelines (December 1999)

Table 12 - Reference CO Concentrations (ppm)

Roadway Type # Lanes	Primary Road (Highest Volume) Distance from edge of road (feet)						Secondary Road (Intersecting Road) Distance from Edge of Road (feet)					
	0	25	50	100	300	500	0	25	50	100	300	500
At Grade												
2	14.0	7.6	5.7	4.0	1.7	0.9	3.7	2.7	2.2	1.7	1.0	0.8
4	11.9	7.0	5.4	3.8	1.6	0.9	3.3	2.6	2.2	1.7	1.1	0.8
6	9.5	6.1	4.9	3.5	1.6	0.8	2.8	2.3	2.0	1.7	1.1	0.9
8	8.5	5.7	4.6	3.4	1.5	0.8	2.6	2.2	1.9	1.6	1.1	0.9
Depressed 15 feet												
2	20.9	8.2	4.7	3.3	1.5	0.8	4.8	2.4	1.4	1.1	0.8	0.5
8	15.4	6.3	3.6	2.7	1.3	0.7	3.7	1.9	1.1	1.0	0.7	0.6
Depressed 30 feet												
2	26.8	7.9	3.4	1.7	0.8	0.3	5.2	3.2	2.0	0.8	0.4	0.3
8	21.3	6.0	2.3	1.1	0.6	0.2	4.1	2.7	1.7	0.7	0.5	0.4
Elevated 15 feet												
2	14.0	7.3	5.7	4.0	1.7	0.9	3.7	2.6	2.2	1.7	1.0	0.8
8	8.5	5.4	4.6	3.4	1.5	0.8	2.6	2.1	1.9	1.6	1.1	0.9
Elevated 30 feet												
2	14.0	7.3	5.4	4.0	1.7	0.9	3.6	2.6	2.2	1.7	1.0	0.8
8	8.5	5.4	4.3	3.4	1.5	0.8	2.5	2.1	1.9	1.6	1.1	0.9

Appendix 12A
Measured Noise and Vibration Data

12A Measured Noise and Vibration Data

A.1 Airborne Noise Measurement Results

Table 12A-1: Measured Noise Data [dB(A) re 2.0 x 10^{-5} Pa]

	Measurement Time			Climate				Measured Parameter		Traffic Count	
Location	Date	Start Time	Measurement Duration (minutes)	Temperature (°F)	Humidity (%)	Wind Direction	Maximum Wind Speed (mph)	L_{Aeq}	L_{SAmax}	Heavy Count	BART Passes
1	11/27/07	7:38 a.m.	0:15	55	63	NW	1.7	70	86	4	2
1	11/27/07	9:01 a.m.	0:15	58	63	NW	1.6	71	91	4	3
1	11/27/07	3:53 p.m.	0:15	64	50	NW	1.3	69	81	3	1
1	11/27/07	5:13 p.m.	0:15	58	57	NW	1.6	71	83	1	3
2	11/27/07	8:12 a.m.	0:15	51	71	SE	2.4	69	80	2	N/A
2	11/27/07	4:22 p.m.	0:15	63	49	NW	2.5	70	87	0	N/A
2	11/27/07	5:48 p.m.	0:15	55	66	NW	4.1	70	79	0	N/A
3	11/27/07	8:36 a.m.	0:15	53	74	W	2.8	73	85	2	N/A
3	11/27/07	9:36 a.m.	0:15	55	68	NE	6.2	72	83	7	N/A
3	11/27/07	4:45 p.m.	0:15	61	49	SW	2.0	73	83	2	N/A
3	11/27/07	6:11 p.m.	0:15	53	64	SW	4.0	72	81	4	N/A
4	11/27/07	8:47 a.m.	0:15	53	74	W	2.8	73	88	5	N/A
4	11/27/07	10:03 a.m.	0:15	55	68	NE	6.2	71	88	3	N/A
4	11/27/07	3:51 p.m.	0:15	64	50	NW	1.3	72	82	1	N/A
4	11/27/07	4:01 p.m.	0:15	64	50	NW	1.3	72	85	1	N/A
4	11/27/07	5:31 p.m.	0:15	55	66	NW	4.1	72	80	0	N/A
5	11/27/07	7:47 a.m.	0:15	55	63	NW	1.7	76	89	17	N/A
5	11/27/07	9:09 a.m.	0:15	58	63	NW	1.6	73	88	14	N/A

(continued on next page)

Table 12A-1: Measured Noise Data [dB(A) re 2.0 x 10^{-5} Pa]

	Measurement Time			Climate				Measured Parameter		Traffic Count	
Location	Date	Start Time	Measurement Duration (minutes)	Temperature (°F)	Humidity (%)	Wind Direction	Maximum Wind Speed (mph)	L_{Aeq}	L_{SAmax}	Heavy Count	BART Passes
5	11/27/07	4:28 p.m.	0:15	63	49	NW	2.5	76	86	6	N/A
5	11/27/07	6:00 p.m.	0:15	53	64	SW	4.0	76	84	3	N/A
6	11/27/07	8:14 a.m.	0:15	51	71	SE	2.4	71	82	1	N/A
6	11/27/07	9:35 a.m.	0:15	55	68	NE	6.2	68	86	0	N/A
6	11/27/07	4:57 a.m.	0:15	61	49	SW	2.0	71	83	0	N/A
6	11/27/07	6:26 p.m.	0:15	53	64	SW	4.0	68	80	0	N/A
7	11/27/07	12:11 p.m.	0:15	68	41	N	14.4	50	60	0	N/A
7	11/27/07	12:48 p.m.	0:15	64	47	N	7.9	48	55	0	N/A
8	11/27/07	12:08 p.m.	0:15	68	41	N	14.4	47	57	0	N/A
8	11/27/07	12:46 p.m.	0:15	64	47	N	7.9	49	66	0	N/A
9	11/28/07	1:50 p.m.	0:15	66	24	E	8.0	44	65	0	N/A
9	11/28/07	2:51 p.m.	0:15	66	24	E	6.0	43	57	0	N/A
10	11/28/07	1:18 p.m.	0:15	66	24	NW	6.4	44	58	0	N/A
10	11/28/07	2:19 p.m.	0:15	66	24	NW	6.4	47	66	0	N/A
11	11/28/07	5:34 p.m.	0:15	49	48	S	3.7	67	85	0	3
11	12/5/07	10:42 a.m.	0:15	56	92	W	2.2	63	69	0	0

Notes: dB = decibels; dBA = A-weighted decibels; L_{Aeq} = equivalent continuous sound level L_{SAmax} = maximum measured sound level; mph = miles per hour; Pa = pascal. Wind directions: E = east, N = north; NE = northeast; NW = northwest; S = south; SE = southeast; SW = southwest; W = west.

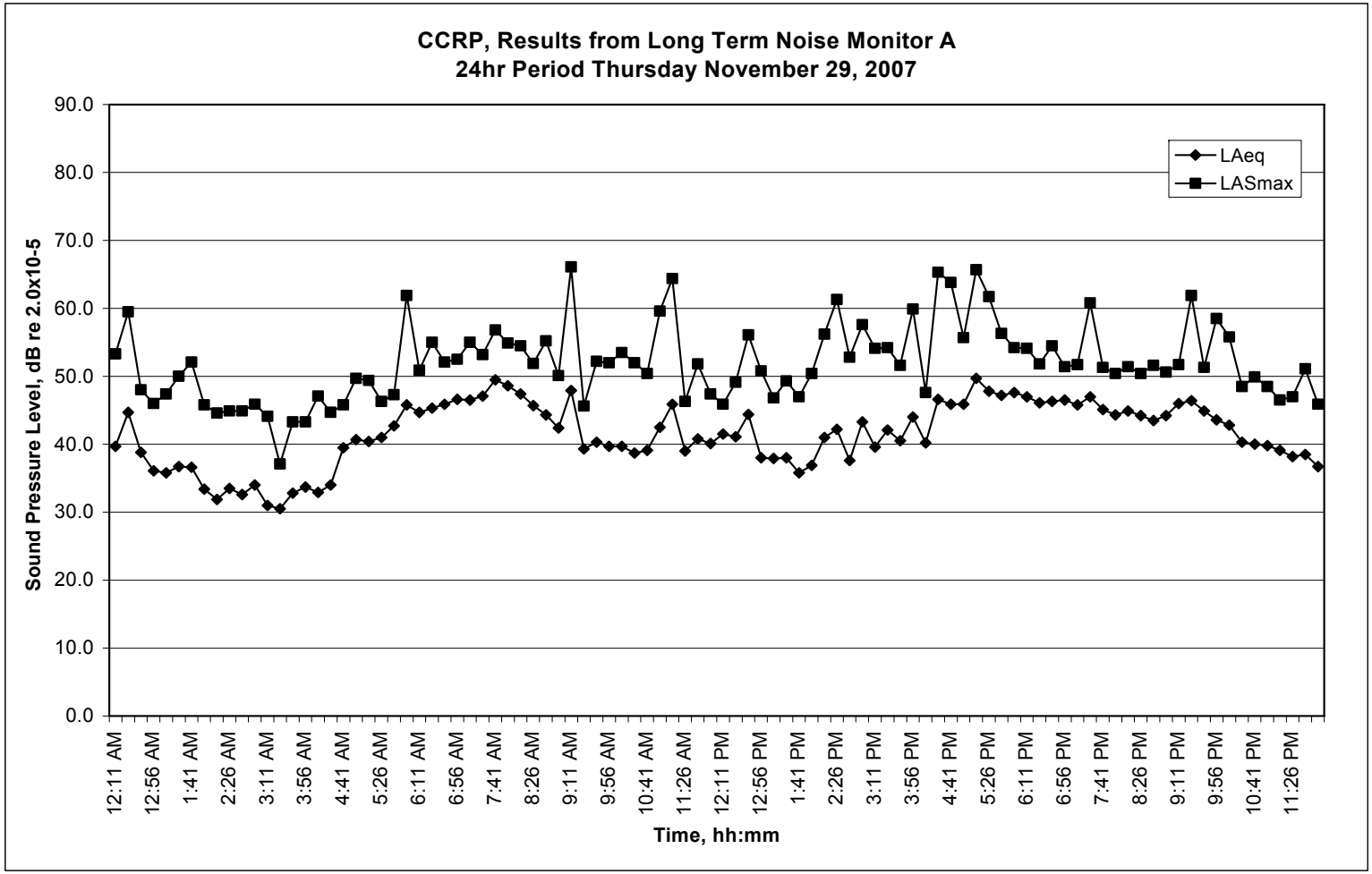

Figure 12A-1: Results from Long-Term Noise Monitor A (dB re 2.0 x 10^{-5} Pa)

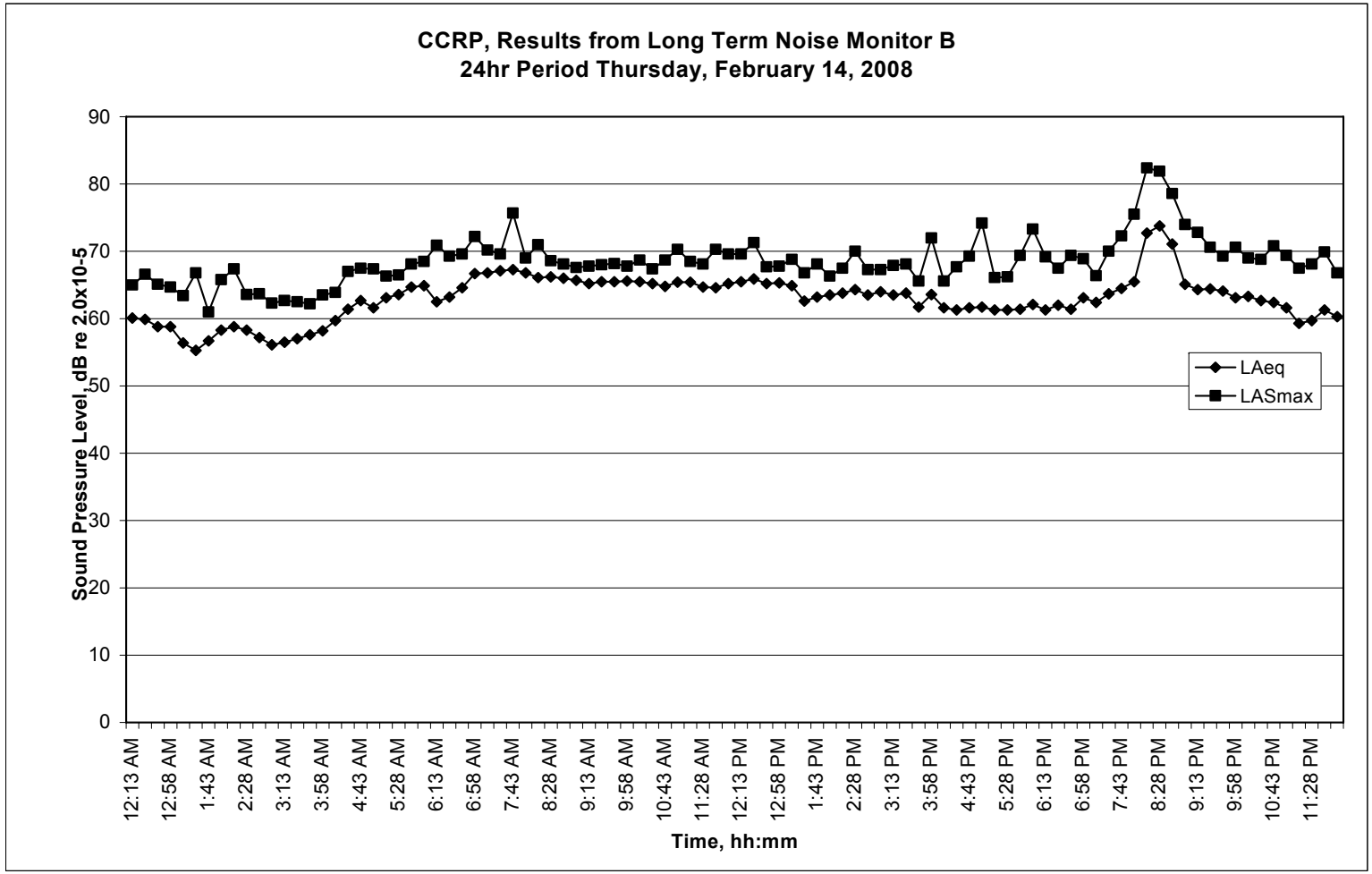

Figure 12A-2: Results from Long-Term Noise Monitor B (dB re 2.0 x 10^{-5} Pa)

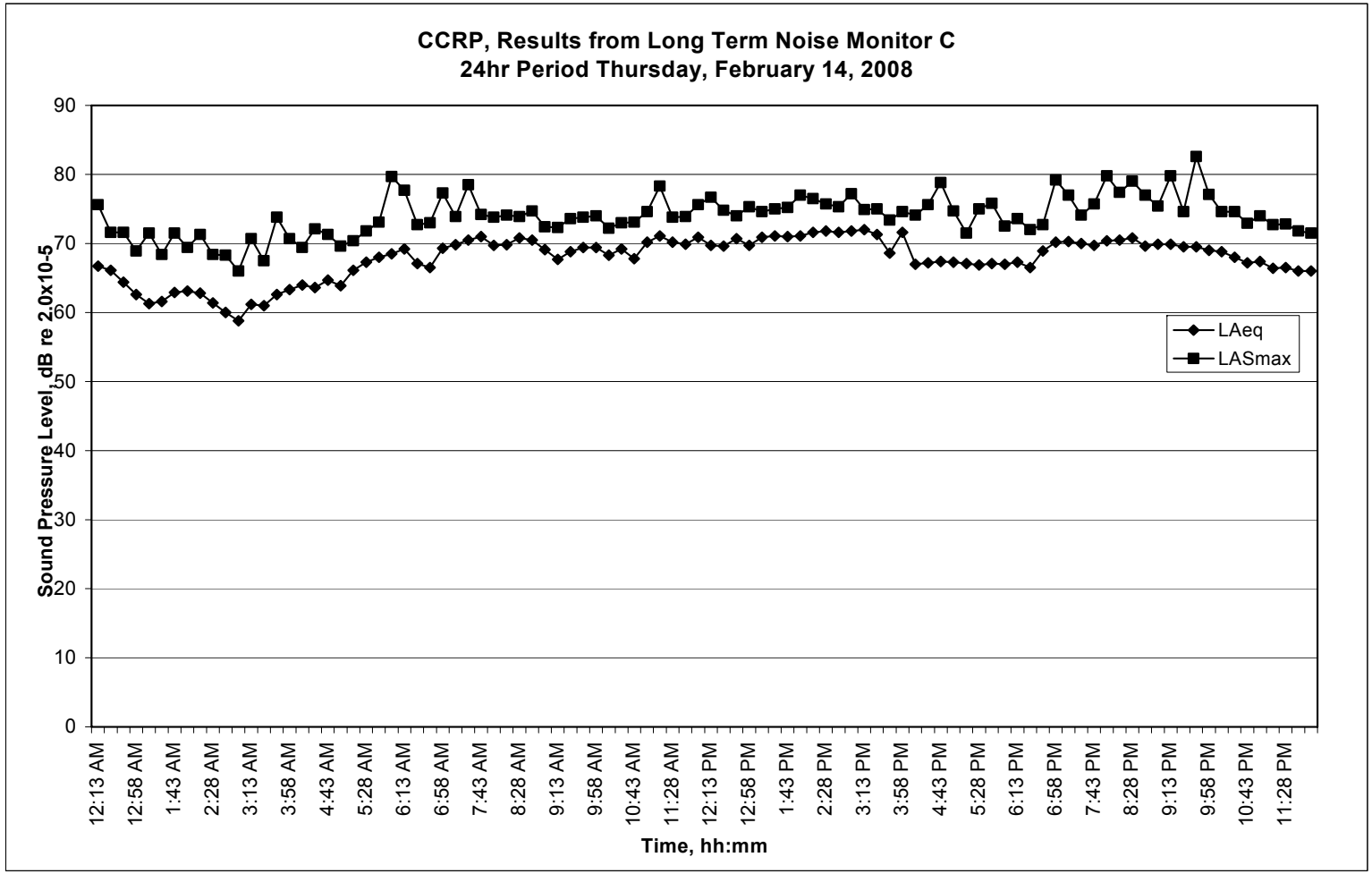

Figure 12A-3: Results from Long-Term Noise Monitor C (dB re 2.0 x 10^{-5} Pa)

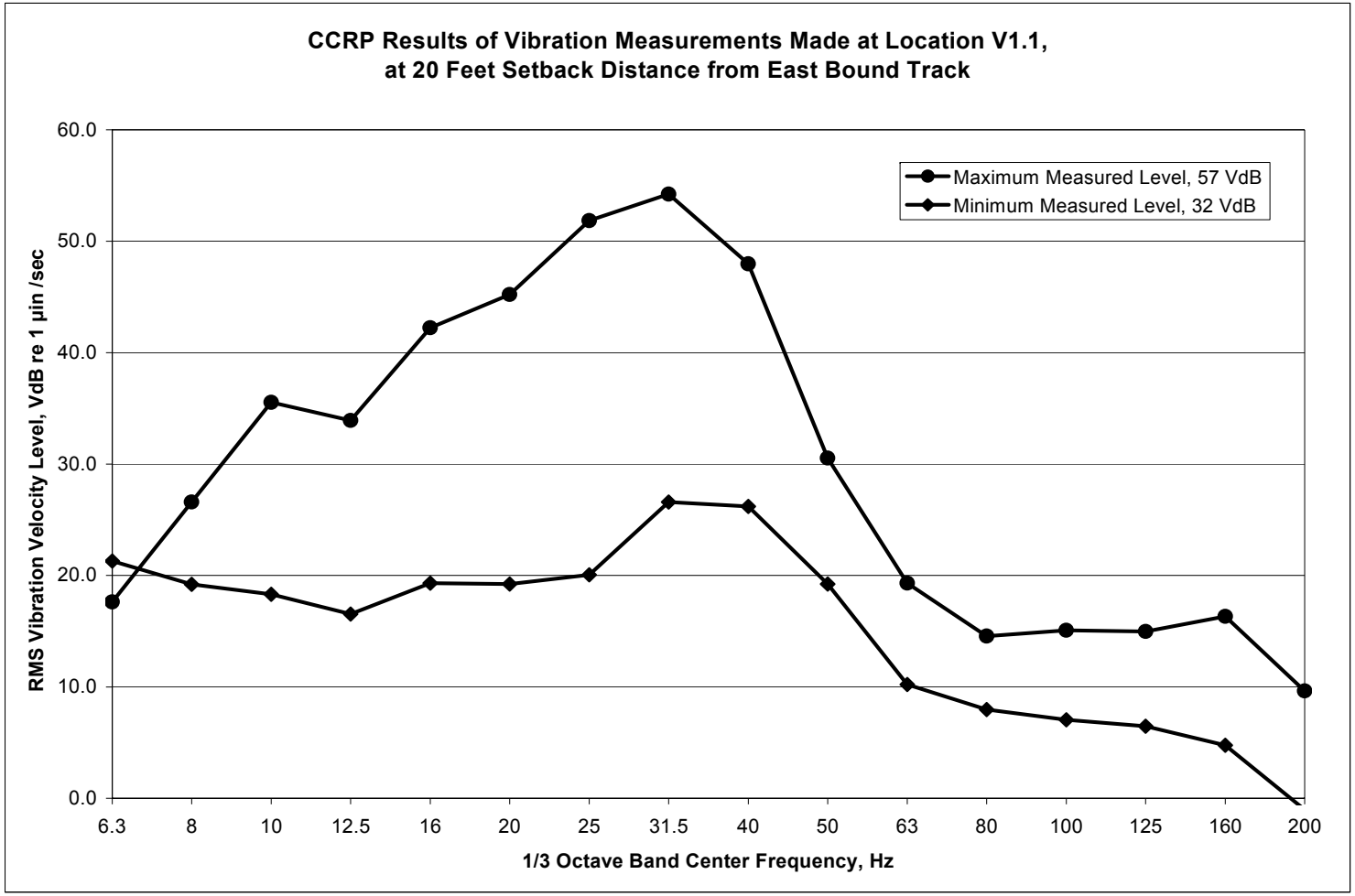

Figure 12A-4: Results from Vibration Measurement at Location V1.1 (VdB re 1 µin/sec)

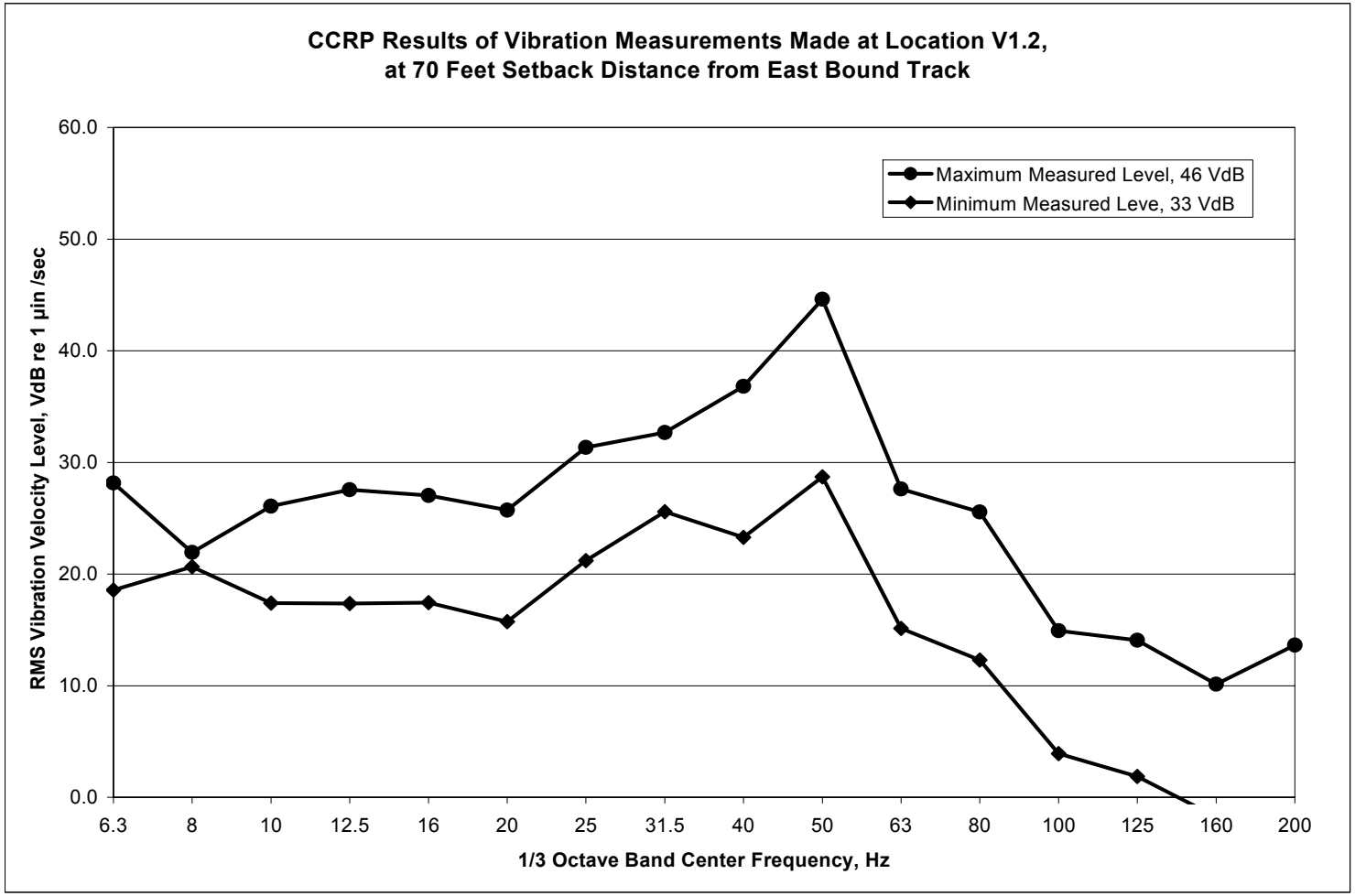

Figure 12A-5: Results from Vibration Measurement at Location V1.2 (VdB re 1 µin/sec)

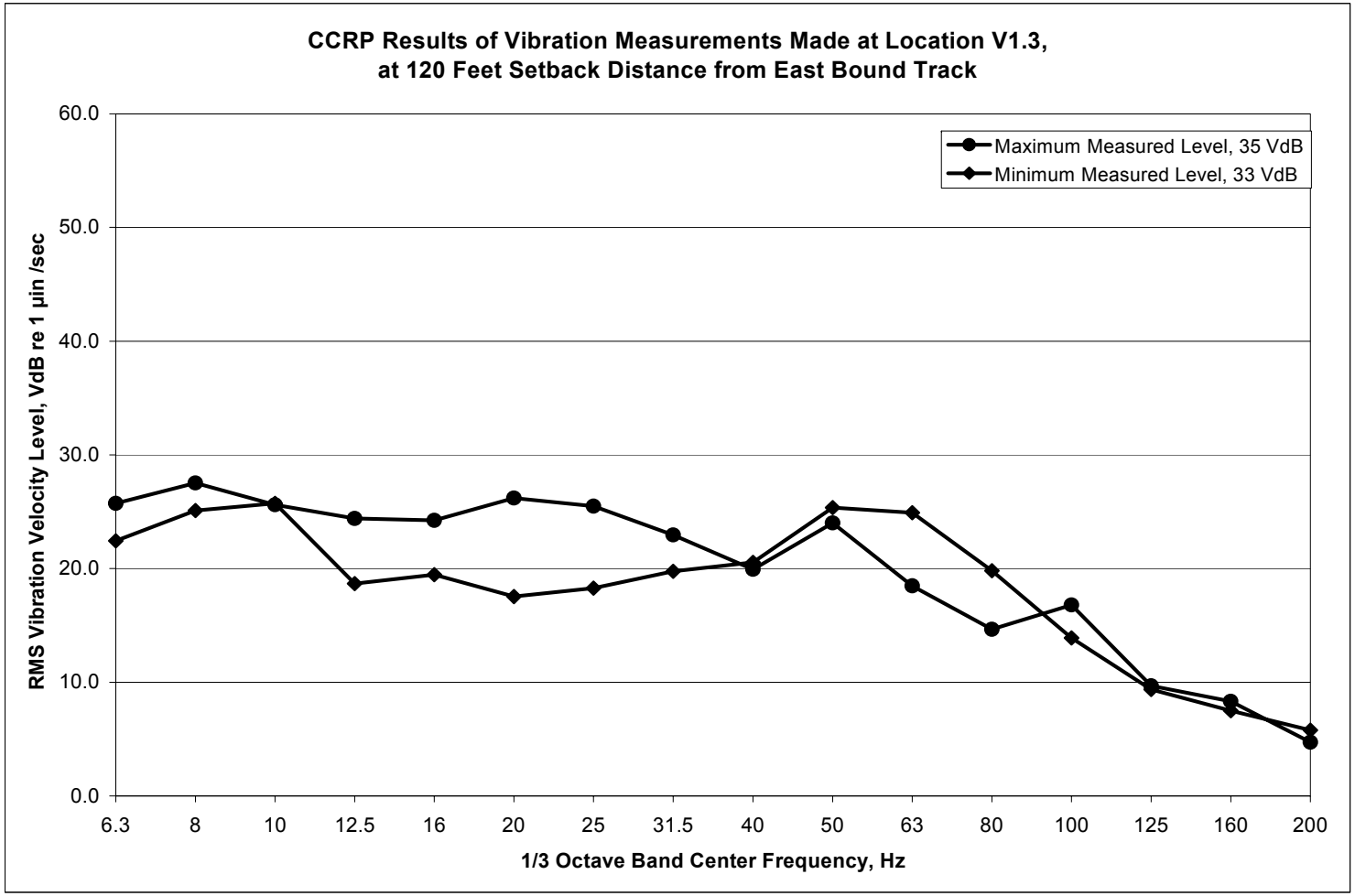

Figure 12A-6: Results from Vibration Measurement at Location V1.3 (VdB re 1 µin/sec)

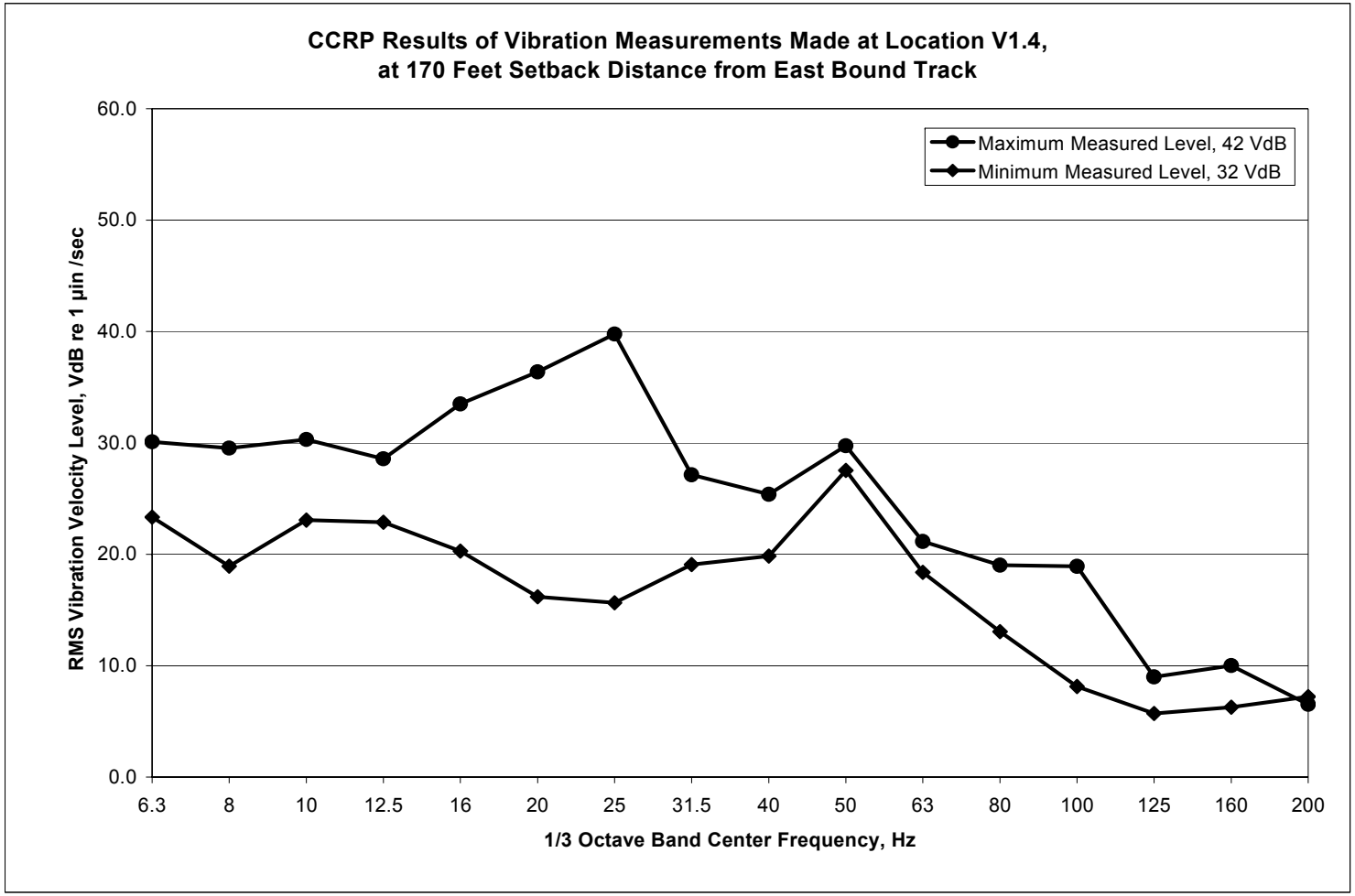

Figure 12A-7: Results from Vibration Measurement at Location V1.4 (VdB re 1 µin/sec)

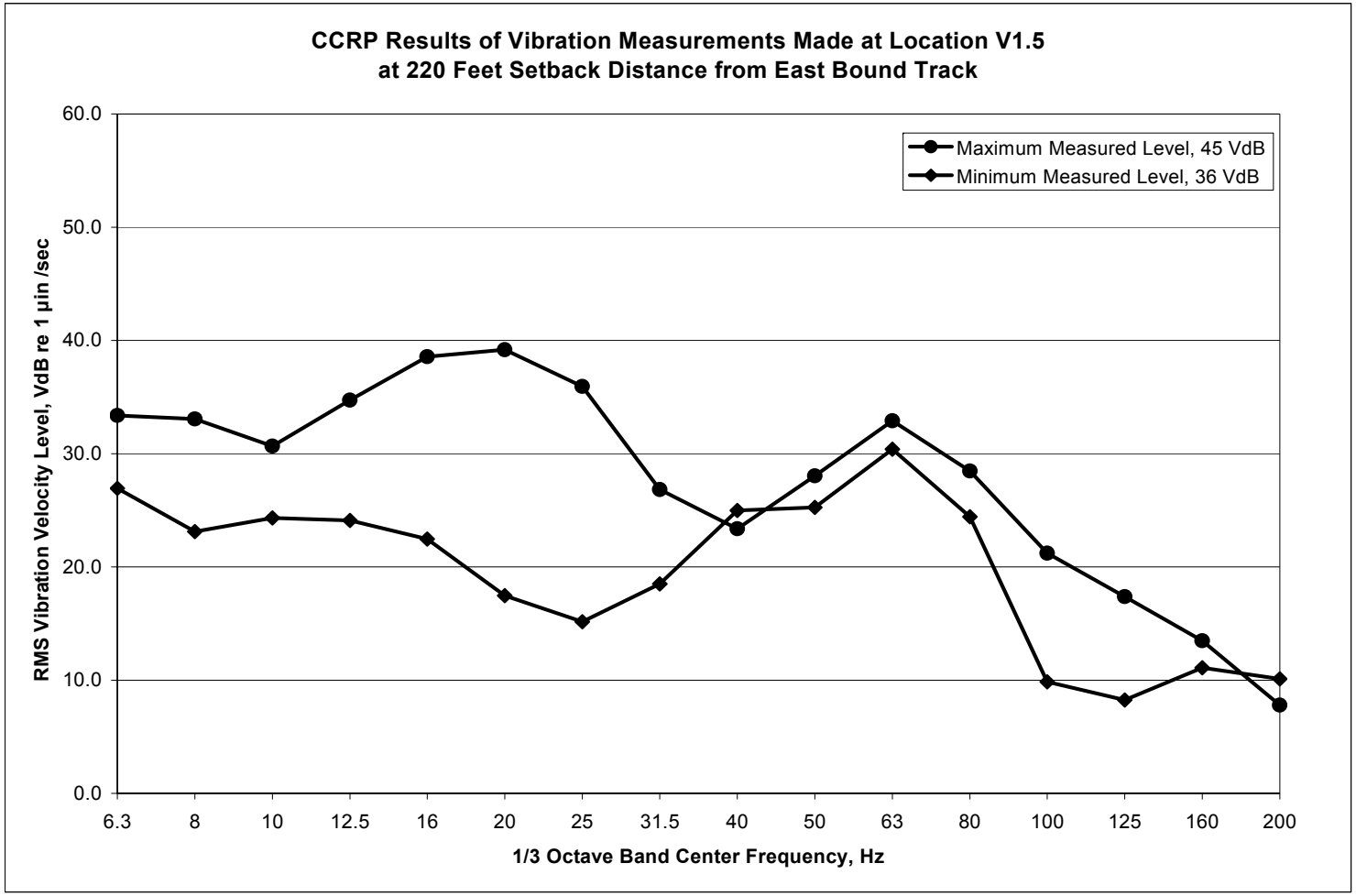

Figure 12A-8: Results from Vibration Measurement at Location V1.5 (VdB re 1 µin/sec)

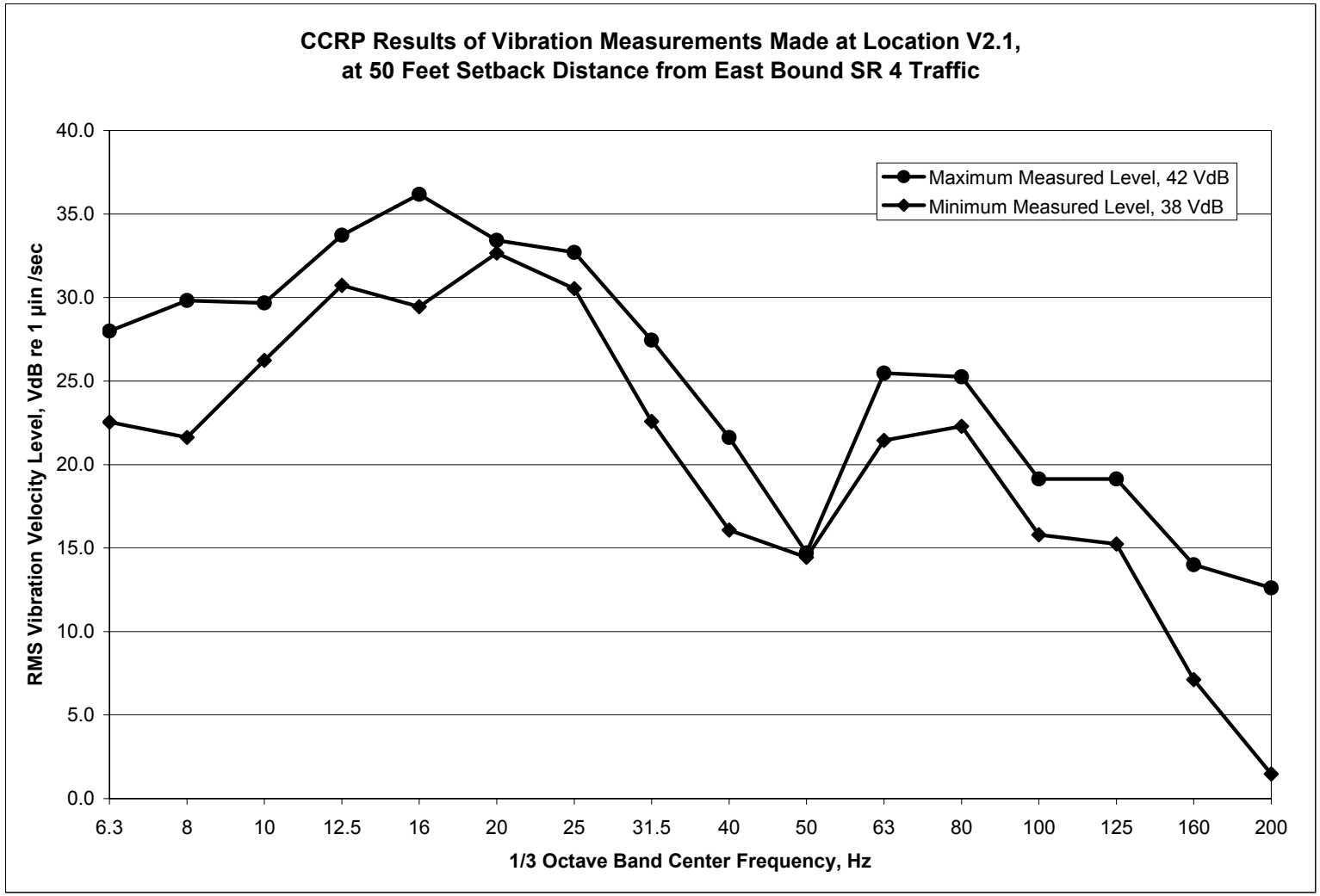

Figure 12A-9: Results from Vibration Measurement Location V2.1, VdB re 1 µin /sec

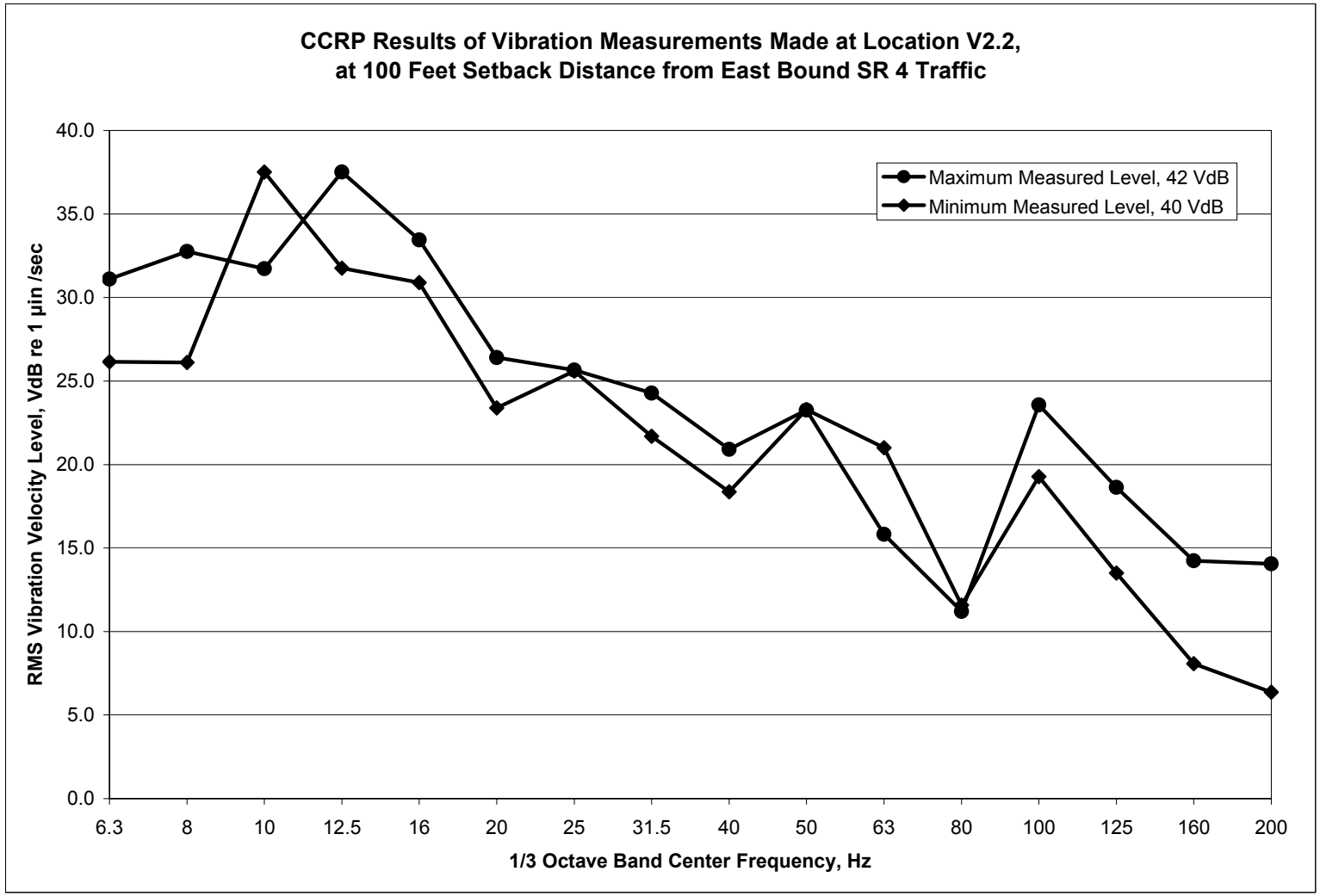

Figure 12A-10: Results from Vibration Measurement Location V2.2, VdB re 1 µin /sec

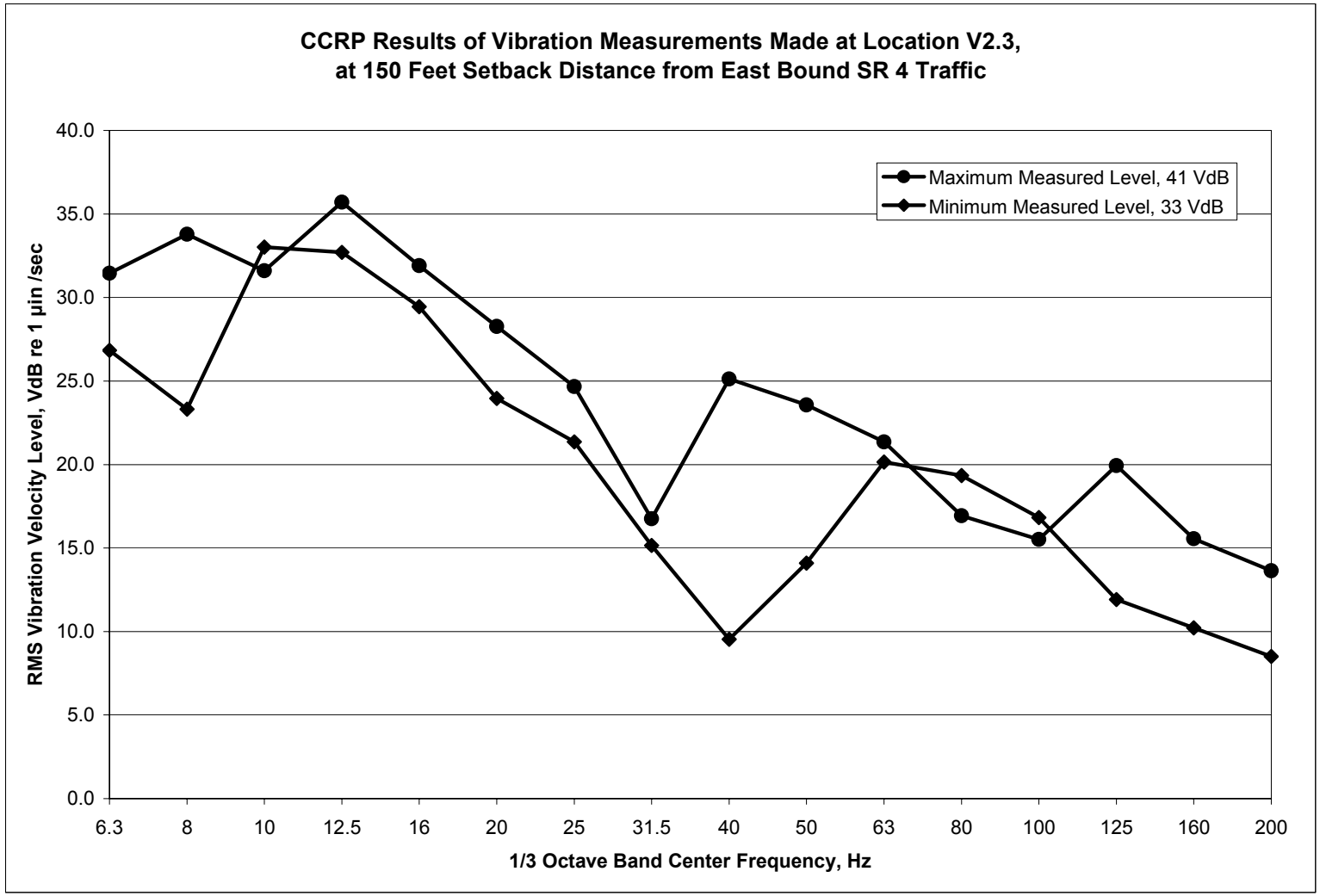

Figure 12A-11: Results from Vibration Measurement Location V2.3, VdB re 1 µin /sec

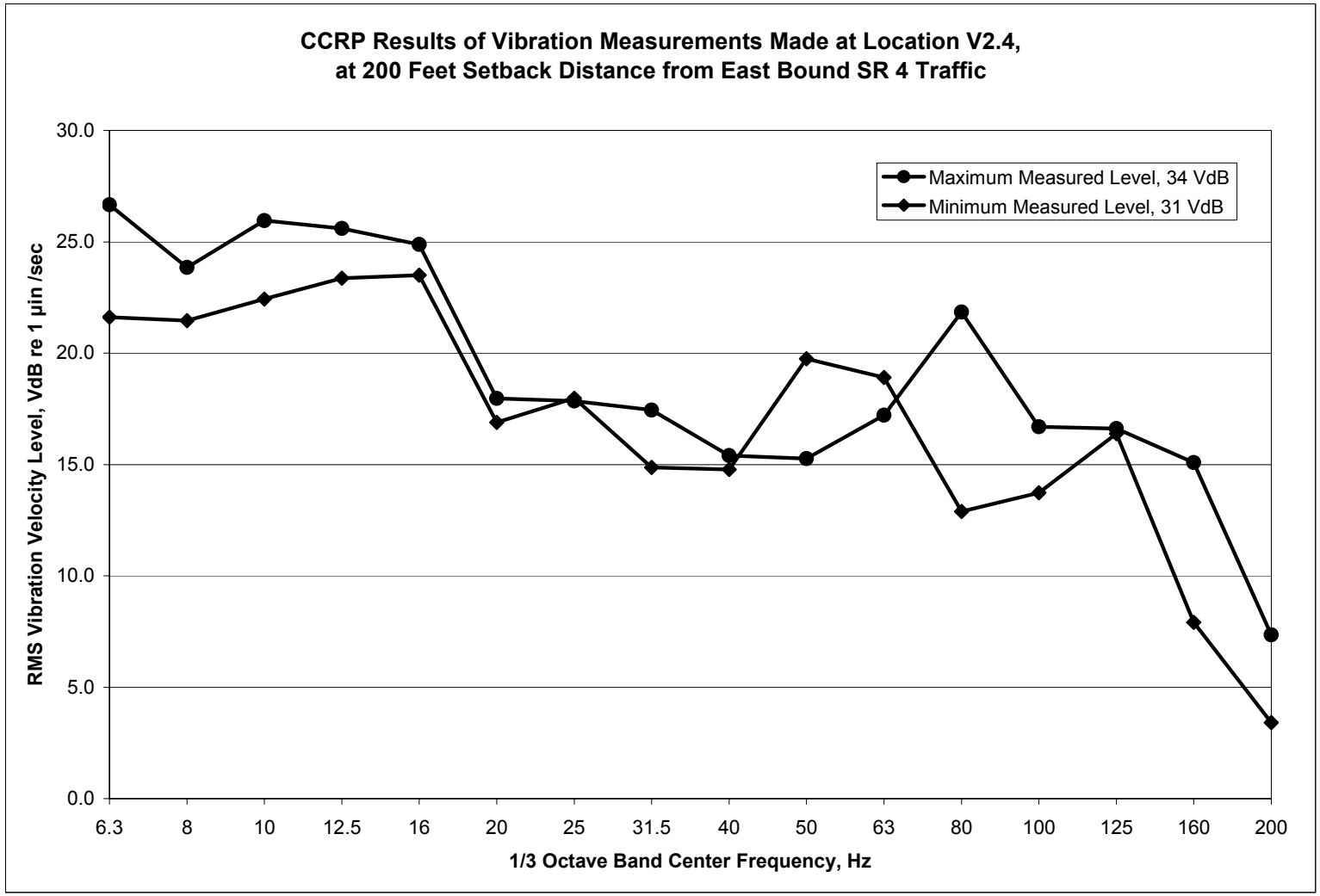

Figure 12A-12: Results from Vibration Measurement Location V2.4, VdB re 1 µin /sec

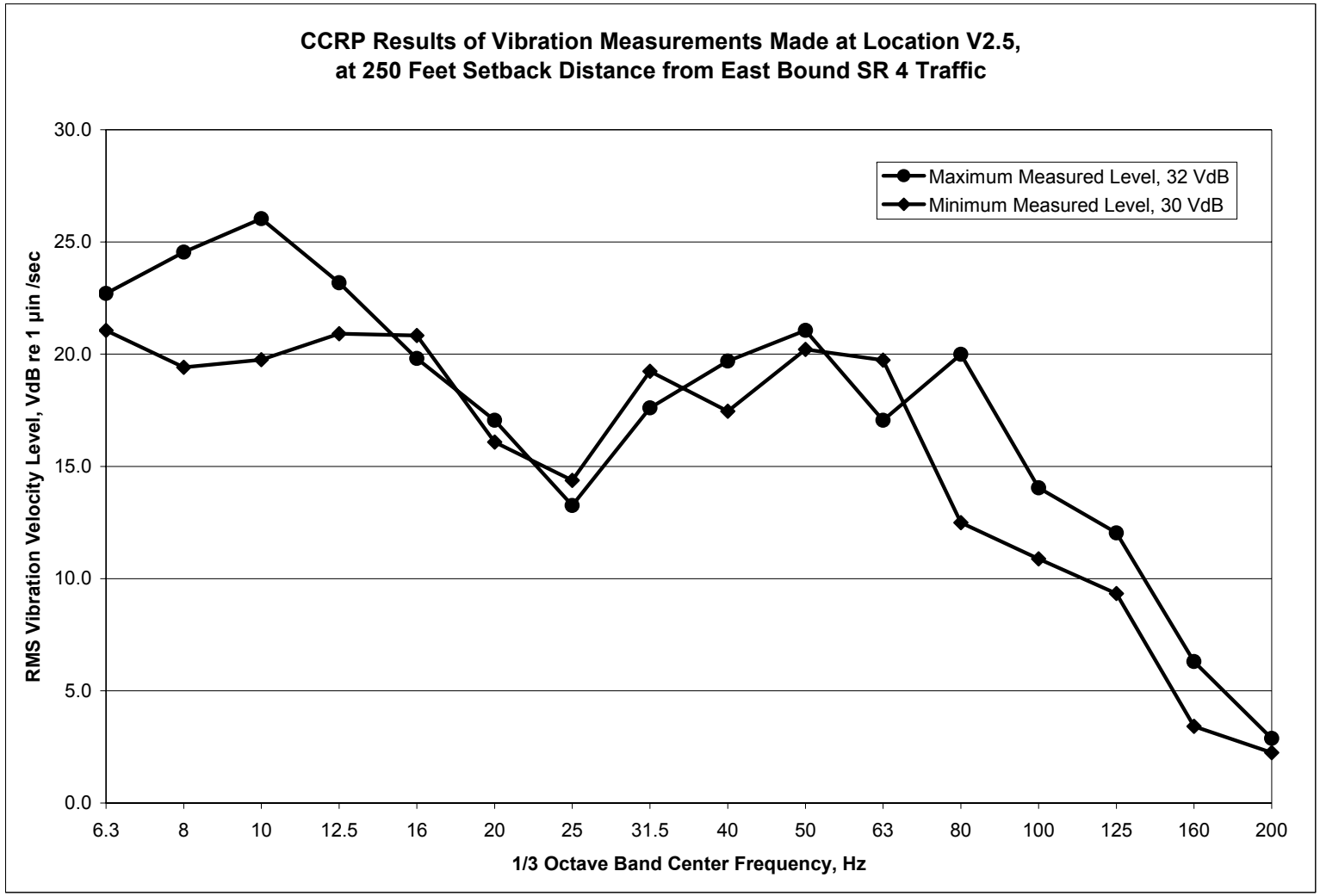

Figure 12A-13: Results from Vibration Measurement Location V2.5, VdB re 1 µin /sec

Appendix 12B
Measurement Equipment

12B Measurement Equipment

B.1 Airborne Noise Measurement Equipment

The following sound level meters were used:

- Brüel & Kjær 2250 Class I Precision Sound Level Meter (S/N 2579707)
- Larson Davis 824 Class I Sound Level Meter (S/N 432)
- Rion NL22 Class II Sound Level Meter / Environmental Noise Logger (S/N 00762874)
- Rion NL22 Class II Sound Level Meter / Environmental Noise Logger (S/N 00762875)
- Brüel & Kjær 4231 Class I Sound Level Meter Calibrator (S/N 2579166)
- Larson Davis CAL200 Class I Sound Level Meter Calibrator (S/N 2643)
- BSWA Class II Sound Level Meter Calibrator (S/N 44084)
- BSWA Class II Sound Level Meter Calibrator (S/N 44077)

All sound level meters were checked for field calibration before, during, and after each monitoring session.

The sound level meters were calibrated in conformance with International Standards Organization (ISO) 17025, American National Standards Institute (ANSI) Z540, ANSI S1.40-1984, and International Electrotechnical Commission 60942 (2003) Class 1 and Laboratory standards.

B.2 Groundborne Vibration Measurement Equipment

The vibration survey was conducted using the following instrumentation:

- PCB 393B12 ICP Accelerometer (S/N 23423)
- PCB 393B12 ICP Accelerometer (S/N 23446)
- PCB 393B12 ICP Accelerometer (S/N 23447)
- Data Physics 20817 Quattro – 4C1S A/D Converter (S/N D44-020/A62-020)

The accelerometers were calibrated in conformance with ISO 9001, ISO 10012-1, ISO 17025, and ANSI/National Conference of Standards Laboratories Z540-1-1994 standards.

Appendix 17A

Current Projects List

Table 17A: Current Projects List

Project Name	Development Type	Status	Map Location on Figure 17-1	Location (nearest cross street)	SIZE (Building Square Footage / No. of Units)	SIZE (Gross Parcel Acreage)	Other Information (where available)
Contra Costa County – Unincorporated Area							
Willow Pass Business Park	Mixed-use Business Park	Under Construction	CC-1	Willow Pass Road and Evora Road	Total business park is 357,500 square feet	66.55	Mixed-use area of 31 acres includes light industrial, warehouse, commercial office, restaurant, and retail uses. Includes a gas station, convenience store, and drive-through fast-food building. Will comprise 10 to 14 buildings. Remaining acreage zoned for open space, agricultural uses.
Bay Harbor Commerce Center	Industrial / Office	Approved	CC-2	Port Chicago Highway (Pacifica Avenue)	409,000 s.f.	40	No further information available.
City of Concord							
BP/ARCO AM/PM Mini-Mart	Retail	Approved by C.C. 2/23/09		Arnold Industrial Place at Highway 4 (Olivera Road)	2,900	0.94	No further information available.
Chuck E. Cheese's	Restaurant	Under Construction	R	1611 Willow Pass Road (Market Street)	12,105	3.62	Chuck E. Cheese's restaurant, a pizza restaurant/family entertainment center.
Conco Industrial Building	Commercial	Under Construction		5141 Commercial Circle (Dean Lesher Drive)	13,056	3.90	No further information available.
Concord Business Center	Commercial	Approved by D.R.B 9/27/07	B	2040 Commerce Avenue (Royal Industrial Way)	27,868	1.89	Light industrial building.
Estates Shopping Center	Retail	Under Construction		2150 Solano Way (Broadmoor Avenue)	30,586	2.60	No further information available.
Industrial Condominiums	Industrial	Under Construction	T	Arnold Industrial Way (Industrial Way)	54,272	2.80	Three multi-tenant light industrial buildings totaling 54,272 square feet on a 2.80-acre site at the northwest corner of Arnold Industrial Way and Industrial Way.
John Muir Medical Center - Hospital Tower and Medical Office Building	Medical	Under Construction	U	2540 East Street and Almond Avenue (High School Avenue)	234,000	13.64	Five story 174,000-square foot patient-care tower hospital tower and a 40,000-square foot Medical Office Building.
La Clinica	Service	Approved by P.C. 2/4/09		1040 Oak Grove Road (Sierra Road)	14,122	0.84	No further information available.
Lexus Dealership	Retail	Approval extended by P.C. to 1/16/10	O	2180 Diamond Boulevard (Burnett Avenue)	177,704	3.26	Car dealership replacing the former Chrysler dealership
Lowe's Shopping Center	Retail	Under Construction		1923-1985 and 2001 Arnold Industrial Way (Laura Alice Way)	334,112	28.00	No further information available.
Rite Aid	Retail	Approved by C.C. 7/14/08	C	1990 Monument Boulevard and 1075 Oak Grove Road (Oak Grove Road)	14,546	1.53	No further information available.
Seafood City	Retail	Approved by P.C. 2/4/09		2030 Diamond Boulevard (Willow Way)	63,300	5.70	No further information available.
St. Bonaventure Catholic Community Addition	Religious	Demolition permit issued 9/8/08		5562 Clayton Road (El Camino Drive)	17,000	8.84	No further information available.
Centre Pointe Residential Subdivision	Residential	Under Construction	12	2945 Clayton Road (The Alameda)	99	9.90	99 single-family detached homes on a 9.9-acre site at the northeast intersection of Clayton Road and The Alameda.
Farry Grove Residential Subdivision	Residential	Approved by P.C. 4/1/09		1856 Lynwood Drive (Dana Court)	5	0.95	5 single-family homes.
Kings Crest	Residential	Approved by P.C. 2/20/08	4	1024 and 1040 Peppermill Court (Court Lane)	3	1.35	Three single-family homes including 1 affordable unit on a 1.35-acre hillside site.
Palmero Condominiums	Residential	Approval extended by P.C. to 3/15/13	5	Enea Circle (Waterworld Parkway)	224	4.64	224 multi-family residential condominiums.
Poetry Garden Townhomes	Residential	Approved by P.C. 8/20/08		1250 Detroit Avenue (Walters Way)	28	1.44	28 multi-family units.

Project Name	Development Type	Status	Map Location on Figure 17-1	Location (nearest cross street)	SIZE (Building Square Footage / No. of Units)	SIZE (Gross Parcel Acreage)	Other Information (where available)
Renaissance Condominiums	Residential	Under Construction (Phase 1 of 2 complete)	2	1851 Galindo Street (Willow Pass Road)	309	5.16	Mixed-use multi-family condominium and retail project with 309 condominiums and 4,500 sq. ft. of commercial tenants on the first floor.
Ridgeview Estates	Residential	Under Construction	18	1170-1191 Vista Ridge Court (Cowell Road)	5	2.04	Five single-family homes.
Sendera Residential Subdivision	Residential	Under Construction	8	Systron Drive (San Miguel Road)	76	6.20	76 single-family homes.
Villa De La Vista Residential Subdivision	Residential	Approved by C.C. 6/2/08	1	1491 La Vista Avenue (Clayton Road)	12	0.85	Twelve detached single-family homes on a 0.85-acre (including one affordable unit).
Wisteria Residential Subdivision	Residential	Under Construction	3	Beach Street (Willow Pass Road)	39	2.56	Subdivision of four parcels totaling 2.56 acres into 39 single-family residential lots (including 4 affordable units) at 2611 Willow Pass Road, and 1935 Beach Street, and 1954 Beach Street.
City of Pittsburg							
Bailey Estates		Approved	P-1	West of Bailey Road	249	122.0	Low-density, large lot, single-family homes (½ acre sites); lakes (detention ponds), shopping, and recreation areas on site.
SAN MARCO DEVELOPMENTS:			P-2				Mix of single-family homes and affordable condominiums/apartments.
San Marco - part 1	Single-family Residential	Under Construction		South of SR 4 at Willow Pass Road	1,412	421.0	
San Marco Development - part 2	Apartments/ Condominiums	Approved		South of SR 4 at Willow Pass Road	1,526	141.0	
San Marco Villas - part 3	Apartments/ Condominiums	Under Construction		Northwest corner, San Marco Boulevard and West Leland Road	330	18.2	
VISTA DEL MAR DEVELOPMENTS:			P-3				Mix of single-family homes and affordable condominiums/apartments.
Vista del Mar - part 1	Single-family Residential	Under Construction		South of West Leland Road at Alves Ranch Road	540	104.0	
Vista del Mar - part 2	Apartments/ Condominiums	Approved		North of West Leland Road at Alves Ranch Road	537	32.1	
Vista del Mar – part 3	Commercial Component	Approved		Western terminus of West Leland Road		14.8	
EMPIRE BUSINESS PARK DEVELOPMENTS:			P-4				Eight industrial condominiums.
Empire Business Park	Industrial / Office	Under Construction		701 Willow Pass Road	104,433	36.2	
Empire Business Park II	Industrial / Office	Approved		702 Willow Pass Road	326,000	36.2	
Empire Business Park Rezoning	Industrial / Office	Approved		703 Willow Pass Road		40.6	

Notes:

DRB – Design Review Board
PC – Planning Commission
CC – City Council

Appendix 17B
Urbemis Outputs for the Preferred Alternative

5/15/2009 4:09:47 PM

Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\Kimberly.Seigel\Application Data\Urbemis\Version9a\Projects\Clustered Villages Total Land Uses.urb924

Project Name: Clustered Villages -- Total Land Uses

Project Location: Contra Costa County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (tons/year unmitigated)	30.39	109.49	470.43	0.46	1,545.91	4.53	1,550.44	323.17	4.06	327.23	50,218.07
2010 TOTALS (tons/year mitigated)	21.49	109.49	470.43	0.46	1,545.91	4.53	1,550.44	323.17	4.06	327.23	50,218.07
Percent Reduction	29.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2011 TOTALS (tons/year unmitigated)	28.67	99.25	433.33	0.46	1,539.99	4.19	1,544.17	321.94	3.74	325.67	50,050.24
2011 TOTALS (tons/year mitigated)	19.63	99.25	433.33	0.46	1,539.99	4.19	1,544.17	321.94	3.74	325.67	50,050.24
Percent Reduction	31.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2012 TOTALS (tons/year unmitigated)	27.13	90.36	401.35	0.46	1,545.91	3.90	1,549.81	323.17	3.48	326.65	50,267.41
2012 TOTALS (tons/year mitigated)	18.07	90.36	401.35	0.46	1,545.91	3.90	1,549.81	323.17	3.48	326.65	50,267.41
Percent Reduction	33.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2013 TOTALS (tons/year unmitigated)	25.65	81.90	369.61	0.46	1,545.91	3.63	1,549.54	323.17	3.23	326.40	50,291.32

2013 TOTALS (tons/year mitigated)	16.58	81.90	369.61	0.46	1,545.91	3.63	1,549.54	323.17	3.23	326.40	50,291.32
Percent Reduction	35.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2014 TOTALS (tons/year unmitigated)	24.26	74.02	340.88	0.46	1,545.91	3.37	1,549.28	323.17	2.99	326.16	50,311.16
2014 TOTALS (tons/year mitigated)	15.19	74.02	340.88	0.46	1,545.91	3.37	1,549.28	323.17	2.99	326.16	50,311.16
Percent Reduction	37.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2015 TOTALS (tons/year unmitigated)	23.01	66.90	314.74	0.46	1,545.91	3.16	1,549.07	323.17	2.79	325.96	50,325.85
2015 TOTALS (tons/year mitigated)	13.94	66.90	314.74	0.46	1,545.91	3.16	1,549.07	323.17	2.79	325.96	50,325.85
Percent Reduction	39.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2016 TOTALS (tons/year unmitigated)	21.90	60.69	292.38	0.46	1,545.91	2.96	1,548.87	323.17	2.61	325.78	50,333.07
2016 TOTALS (tons/year mitigated)	12.83	60.69	292.38	0.46	1,545.91	2.96	1,548.87	323.17	2.61	325.78	50,333.07
Percent Reduction	41.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2017 TOTALS (tons/year unmitigated)	20.83	54.93	270.59	0.46	1,539.99	2.76	1,542.75	321.94	2.43	324.36	50,146.29
2017 TOTALS (tons/year mitigated)	11.80	54.93	270.59	0.46	1,539.99	2.76	1,542.75	321.94	2.43	324.36	50,146.29
Percent Reduction	43.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018 TOTALS (tons/year unmitigated)	20.01	50.12	252.75	0.46	1,545.91	2.60	1,548.51	323.17	2.29	325.46	50,343.83
2018 TOTALS (tons/year mitigated)	10.94	50.12	252.75	0.46	1,545.91	2.60	1,548.51	323.17	2.29	325.46	50,343.83
Percent Reduction	45.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2019 TOTALS (tons/year unmitigated)	19.22	45.65	235.37	0.46	1,545.91	2.45	1,548.36	323.17	2.14	325.32	50,348.21

2019 TOTALS (tons/year mitigated)	10.16	45.65	235.37	0.46	1,545.91	2.45	1,548.36	323.17	2.14	325.32	50,348.21
Percent Reduction	47.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2020 TOTALS (tons/year unmitigated)	18.49	41.75	219.63	0.46	1,551.83	2.33	1,554.16	324.41	2.03	326.45	50,545.19
2020 TOTALS (tons/year mitigated)	9.39	41.75	219.63	0.46	1,551.83	2.33	1,554.16	324.41	2.03	326.45	50,545.19
Percent Reduction	49.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2021 TOTALS (tons/year unmitigated)	16.08	32.28	156.95	0.46	1,545.91	2.12	1,548.03	323.17	1.84	325.01	50,376.38
2021 TOTALS (tons/year mitigated)	7.01	32.28	156.95	0.46	1,545.91	2.12	1,548.03	323.17	1.84	325.01	50,376.38
Percent Reduction	56.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2022 TOTALS (tons/year unmitigated)	16.02	32.16	156.35	0.46	1,539.99	2.11	1,542.09	321.94	1.83	323.77	50,183.37
2022 TOTALS (tons/year mitigated)	6.99	32.16	156.35	0.46	1,539.99	2.11	1,542.09	321.94	1.83	323.77	50,183.37
Percent Reduction	56.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2023 TOTALS (tons/year unmitigated)	16.02	32.16	156.35	0.46	1,539.99	2.11	1,542.09	321.94	1.83	323.77	50,183.37
2023 TOTALS (tons/year mitigated)	6.99	32.16	156.35	0.46	1,539.99	2.11	1,542.09	321.94	1.83	323.77	50,183.37
Percent Reduction	56.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2024 TOTALS (tons/year unmitigated)	16.14	32.41	157.56	0.46	1,551.83	2.12	1,553.96	324.41	1.84	326.26	50,569.39
2024 TOTALS (tons/year mitigated)	7.04	32.41	157.56	0.46	1,551.83	2.12	1,553.96	324.41	1.84	326.26	50,569.39
Percent Reduction	56.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2025 TOTALS (tons/year unmitigated)	16.08	32.28	156.95	0.46	1,545.91	2.12	1,548.03	323.17	1.84	325.01	50,376.38

2025 TOTALS (tons/year mitigated)	7.01	32.28	156.95	0.46	1,545.91	2.12	1,548.03	323.17	1.84	325.01	50,376.38
Percent Reduction	56.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2026 TOTALS (tons/year unmitigated)	14.69	27.79	121.49	0.46	1,545.91	2.03	1,547.94	323.17	1.76	324.94	50,407.00
2026 TOTALS (tons/year mitigated)	5.62	27.79	121.49	0.46	1,545.91	2.03	1,547.94	323.17	1.76	324.94	50,407.00
Percent Reduction	61.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2027 TOTALS (tons/year unmitigated)	14.69	27.79	121.49	0.46	1,545.91	2.03	1,547.94	323.17	1.76	324.94	50,407.00
2027 TOTALS (tons/year mitigated)	5.62	27.79	121.49	0.46	1,545.91	2.03	1,547.94	323.17	1.76	324.94	50,407.00
Percent Reduction	61.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2028 TOTALS (tons/year unmitigated)	14.63	27.68	121.03	0.46	1,539.99	2.03	1,542.01	321.94	1.76	323.69	50,213.87
2028 TOTALS (tons/year mitigated)	5.60	27.68	121.03	0.46	1,539.99	2.03	1,542.01	321.94	1.76	323.69	50,213.87
Percent Reduction	61.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2029 TOTALS (tons/year unmitigated)	14.69	27.79	121.49	0.46	1,545.91	2.03	1,547.94	323.17	1.76	324.94	50,407.00
2029 TOTALS (tons/year mitigated)	5.62	27.79	121.49	0.46	1,545.91	2.03	1,547.94	323.17	1.76	324.94	50,407.00
Percent Reduction	61.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030 TOTALS (tons/year unmitigated)	14.69	27.79	121.49	0.46	1,545.91	2.03	1,547.94	323.17	1.76	324.94	50,407.00
2030 TOTALS (tons/year mitigated)	5.62	27.79	121.49	0.46	1,545.91	2.03	1,547.94	323.17	1.76	324.94	50,407.00
Percent Reduction	61.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2031 TOTALS (tons/year unmitigated)	13.90	25.66	98.93	0.46	1,545.91	2.00	1,547.91	323.17	1.73	324.90	50,431.51

2031 TOTALS (tons/year mitigated)	4.84	25.66	98.93	0.46	1,545.91	2.00	1,547.91	323.17	1.73	324.90	50,431.51
Percent Reduction	65.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2032 TOTALS (tons/year unmitigated)	13.96	25.76	99.31	0.46	1,551.83	2.01	1,553.84	324.41	1.74	326.15	50,624.73
2032 TOTALS (tons/year mitigated)	4.86	25.76	99.31	0.46	1,551.83	2.01	1,553.84	324.41	1.74	326.15	50,624.73
Percent Reduction	65.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2033 TOTALS (tons/year unmitigated)	13.85	25.56	98.55	0.46	1,539.99	1.99	1,541.98	321.94	1.72	323.66	50,238.28
2033 TOTALS (tons/year mitigated)	4.82	25.56	98.55	0.46	1,539.99	1.99	1,541.98	321.94	1.72	323.66	50,238.28
Percent Reduction	65.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2034 TOTALS (tons/year unmitigated)	13.85	25.56	98.55	0.46	1,539.99	1.99	1,541.98	321.94	1.72	323.66	50,238.28
2034 TOTALS (tons/year mitigated)	4.82	25.56	98.55	0.46	1,539.99	1.99	1,541.98	321.94	1.72	323.66	50,238.28
Percent Reduction	65.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2035 TOTALS (tons/year unmitigated)	13.90	25.66	98.93	0.46	1,545.91	2.00	1,547.91	323.17	1.73	324.90	50,431.51
2035 TOTALS (tons/year mitigated)	4.84	25.66	98.93	0.46	1,545.91	2.00	1,547.91	323.17	1.73	324.90	50,431.51
Percent Reduction	65.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2036 TOTALS (tons/year unmitigated)	13.60	25.00	87.51	0.46	1,551.83	2.00	1,553.84	324.41	1.73	326.15	50,629.71
2036 TOTALS (tons/year mitigated)	4.49	25.00	87.51	0.46	1,551.83	2.00	1,553.84	324.41	1.73	326.15	50,629.71
Percent Reduction	66.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2037 TOTALS (tons/year unmitigated)	13.54	24.90	87.18	0.46	1,545.91	1.99	1,547.90	323.17	1.73	324.90	50,436.46

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2037 TOTALS (tons/year mitigated)	4.48	24.90	87.18	0.46	1,545.91	1.99	1,547.90	323.17	1.73	324.90	50,436.46
Percent Reduction	66.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2038 TOTALS (tons/year unmitigated)	13.54	24.90	87.18	0.46	1,545.91	1.99	1,547.90	323.17	1.73	324.90	50,436.46
2038 TOTALS (tons/year mitigated)	4.48	24.90	87.18	0.46	1,545.91	1.99	1,547.90	323.17	1.73	324.90	50,436.46
Percent Reduction	66.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2039 TOTALS (tons/year unmitigated)	13.49	24.80	86.84	0.46	1,539.99	1.99	1,541.97	321.94	1.72	323.66	50,243.22
2039 TOTALS (tons/year mitigated)	4.46	24.80	86.84	0.46	1,539.99	1.99	1,541.97	321.94	1.72	323.66	50,243.22
Percent Reduction	66.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2040 TOTALS (tons/year unmitigated)	4.16	24.90	87.16	0.46	1,545.91	1.99	1,547.90	323.17	1.73	324.90	50,425.24
2040 TOTALS (tons/year mitigated)	4.16	24.90	87.16	0.46	1,545.91	1.99	1,547.90	323.17	1.73	324.90	50,425.24
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	218.60	36.07	295.54	0.79	42.63	41.03	45,577.79

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	380.72	440.10	4,029.55	2.98	550.13	105.68	299,588.93
TOTALS (tons/year, mitigated)	310.04	348.88	3,194.25	2.36	436.08	83.78	237,481.72
Percent Reduction	18.56	20.73	20.73	20.81	20.73	20.72	20.73

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SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	599.32	476.17	4,325.09	3.77	592.76	146.71	345,166.72

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

Appendix 17C

Urbemis Outputs for the Concentration and Conservation Alternative

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Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\Kimberly.Seigel\Application Data\Urbemis\Version9a\Projects\Concentration and Conservation Total Land Uses.urb924

Project Name: Concentration and Conservation

Project Location: Contra Costa County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (tons/year unmitigated)	25.75	98.27	396.08	0.39	1,227.64	4.09	1,231.73	256.65	3.68	260.33	42,716.58
2010 TOTALS (tons/year mitigated)	18.64	98.27	396.08	0.39	1,227.64	4.09	1,231.73	256.65	3.68	260.33	42,716.58
Percent Reduction	27.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2011 TOTALS (tons/year unmitigated)	24.12	89.19	364.90	0.39	1,222.93	3.78	1,226.71	255.67	3.38	259.05	42,573.22
2011 TOTALS (tons/year mitigated)	17.03	89.19	364.90	0.39	1,222.93	3.78	1,226.71	255.67	3.38	259.05	42,573.22
Percent Reduction	29.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2012 TOTALS (tons/year unmitigated)	22.80	81.31	338.05	0.39	1,227.64	3.52	1,231.16	256.65	3.15	259.80	42,757.53
2012 TOTALS (tons/year mitigated)	15.69	81.31	338.05	0.39	1,227.64	3.52	1,231.16	256.65	3.15	259.80	42,757.53
Percent Reduction	31.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2013 TOTALS (tons/year unmitigated)	21.53	73.81	311.39	0.39	1,227.64	3.27	1,230.91	256.65	2.91	259.57	42,777.47

2013 TOTALS (tons/year mitigated)	14.42	73.81	311.39	0.39	1,227.64	3.27	1,230.91	256.65	2.91	259.57	42,777.47
Percent Reduction	33.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2014 TOTALS (tons/year unmitigated)	20.34	66.77	287.27	0.39	1,227.64	3.03	1,230.67	256.65	2.70	259.35	42,794.03
2014 TOTALS (tons/year mitigated)	13.22	66.77	287.27	0.39	1,227.64	3.03	1,230.67	256.65	2.70	259.35	42,794.03
Percent Reduction	34.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2015 TOTALS (tons/year unmitigated)	19.26	60.40	265.31	0.39	1,227.64	2.84	1,230.47	256.65	2.51	259.17	42,806.30
2015 TOTALS (tons/year mitigated)	12.15	60.40	265.31	0.39	1,227.64	2.84	1,230.47	256.65	2.51	259.17	42,806.30
Percent Reduction	36.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2016 TOTALS (tons/year unmitigated)	18.30	54.83	246.54	0.39	1,227.64	2.65	1,230.29	256.65	2.35	259.00	42,812.34
2016 TOTALS (tons/year mitigated)	11.19	54.83	246.54	0.39	1,227.64	2.65	1,230.29	256.65	2.35	259.00	42,812.34
Percent Reduction	38.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2017 TOTALS (tons/year unmitigated)	17.38	49.65	228.23	0.39	1,222.93	2.47	1,225.40	255.67	2.18	257.85	42,653.38
2017 TOTALS (tons/year mitigated)	10.29	49.65	228.23	0.39	1,222.93	2.47	1,225.40	255.67	2.18	257.85	42,653.38
Percent Reduction	40.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018 TOTALS (tons/year unmitigated)	16.66	45.32	213.26	0.39	1,227.64	2.32	1,229.96	256.65	2.05	258.70	42,821.34
2018 TOTALS (tons/year mitigated)	9.55	45.32	213.26	0.39	1,227.64	2.32	1,229.96	256.65	2.05	258.70	42,821.34
Percent Reduction	42.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2019 TOTALS (tons/year unmitigated)	15.98	41.29	198.66	0.39	1,227.64	2.18	1,229.82	256.65	1.91	258.57	42,825.02

2019 TOTALS (tons/year mitigated)	8.87	41.29	198.66	0.39	1,227.64	2.18	1,229.82	256.65	1.91	258.57	42,825.02
Percent Reduction	44.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2020 TOTALS (tons/year unmitigated)	15.34	37.77	185.46	0.39	1,232.34	2.07	1,234.41	257.64	1.81	259.45	42,992.52
2020 TOTALS (tons/year mitigated)	8.20	37.77	185.46	0.39	1,232.34	2.07	1,234.41	257.64	1.81	259.45	42,992.52
Percent Reduction	46.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2021 TOTALS (tons/year unmitigated)	13.32	29.62	133.02	0.39	1,227.64	1.88	1,229.52	256.65	1.64	258.29	42,848.60
2021 TOTALS (tons/year mitigated)	6.20	29.62	133.02	0.39	1,227.64	1.88	1,229.52	256.65	1.64	258.29	42,848.60
Percent Reduction	53.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2022 TOTALS (tons/year unmitigated)	13.27	29.51	132.51	0.39	1,222.93	1.87	1,224.81	255.67	1.63	257.30	42,684.43
2022 TOTALS (tons/year mitigated)	6.18	29.51	132.51	0.39	1,222.93	1.87	1,224.81	255.67	1.63	257.30	42,684.43
Percent Reduction	53.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2023 TOTALS (tons/year unmitigated)	13.27	29.51	132.51	0.39	1,222.93	1.87	1,224.81	255.67	1.63	257.30	42,684.43
2023 TOTALS (tons/year mitigated)	6.18	29.51	132.51	0.39	1,222.93	1.87	1,224.81	255.67	1.63	257.30	42,684.43
Percent Reduction	53.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2024 TOTALS (tons/year unmitigated)	13.37	29.74	133.53	0.39	1,232.34	1.89	1,234.23	257.64	1.65	259.28	43,012.77
2024 TOTALS (tons/year mitigated)	6.23	29.74	133.53	0.39	1,232.34	1.89	1,234.23	257.64	1.65	259.28	43,012.77
Percent Reduction	53.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2025 TOTALS (tons/year unmitigated)	13.32	29.62	133.02	0.39	1,227.64	1.88	1,229.52	256.65	1.64	258.29	42,848.60

2025 TOTALS (tons/year mitigated)	6.20	29.62	133.02	0.39	1,227.64	1.88	1,229.52	256.65	1.64	258.29	42,848.60
Percent Reduction	53.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2026 TOTALS (tons/year unmitigated)	12.15	25.77	103.36	0.39	1,227.64	1.81	1,229.45	256.65	1.57	258.23	42,874.18
2026 TOTALS (tons/year mitigated)	5.03	25.77	103.36	0.39	1,227.64	1.81	1,229.45	256.65	1.57	258.23	42,874.18
Percent Reduction	58.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2027 TOTALS (tons/year unmitigated)	12.15	25.77	103.36	0.39	1,227.64	1.81	1,229.45	256.65	1.57	258.23	42,874.18
2027 TOTALS (tons/year mitigated)	5.03	25.77	103.36	0.39	1,227.64	1.81	1,229.45	256.65	1.57	258.23	42,874.18
Percent Reduction	58.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2028 TOTALS (tons/year unmitigated)	12.10	25.68	102.97	0.39	1,222.93	1.80	1,224.73	255.67	1.57	257.24	42,709.91
2028 TOTALS (tons/year mitigated)	5.02	25.68	102.97	0.39	1,222.93	1.80	1,224.73	255.67	1.57	257.24	42,709.91
Percent Reduction	58.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2029 TOTALS (tons/year unmitigated)	12.15	25.77	103.36	0.39	1,227.64	1.81	1,229.45	256.65	1.57	258.23	42,874.18
2029 TOTALS (tons/year mitigated)	5.03	25.77	103.36	0.39	1,227.64	1.81	1,229.45	256.65	1.57	258.23	42,874.18
Percent Reduction	58.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030 TOTALS (tons/year unmitigated)	12.15	25.77	103.36	0.39	1,227.64	1.81	1,229.45	256.65	1.57	258.23	42,874.18
2030 TOTALS (tons/year mitigated)	5.03	25.77	103.36	0.39	1,227.64	1.81	1,229.45	256.65	1.57	258.23	42,874.18
Percent Reduction	58.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2031 TOTALS (tons/year unmitigated)	11.49	23.96	84.50	0.39	1,227.64	1.78	1,229.41	256.65	1.55	258.20	42,894.64

2031 TOTALS (tons/year mitigated)	4.38	23.96	84.50	0.39	1,227.64	1.78	1,229.41	256.65	1.55	258.20	42,894.64
Percent Reduction	61.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2032 TOTALS (tons/year unmitigated)	11.53	24.06	84.82	0.39	1,232.34	1.79	1,234.13	257.64	1.55	259.19	43,058.99
2032 TOTALS (tons/year mitigated)	4.39	24.06	84.82	0.39	1,232.34	1.79	1,234.13	257.64	1.55	259.19	43,058.99
Percent Reduction	61.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2033 TOTALS (tons/year unmitigated)	11.44	23.87	84.17	0.39	1,222.93	1.77	1,224.70	255.67	1.54	257.21	42,730.30
2033 TOTALS (tons/year mitigated)	4.36	23.87	84.17	0.39	1,222.93	1.77	1,224.70	255.67	1.54	257.21	42,730.30
Percent Reduction	61.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2034 TOTALS (tons/year unmitigated)	11.44	23.87	84.17	0.39	1,222.93	1.77	1,224.70	255.67	1.54	257.21	42,730.30
2034 TOTALS (tons/year mitigated)	4.36	23.87	84.17	0.39	1,222.93	1.77	1,224.70	255.67	1.54	257.21	42,730.30
Percent Reduction	61.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2035 TOTALS (tons/year unmitigated)	11.49	23.96	84.50	0.39	1,227.64	1.78	1,229.41	256.65	1.55	258.20	42,894.64
2035 TOTALS (tons/year mitigated)	4.38	23.96	84.50	0.39	1,227.64	1.78	1,229.41	256.65	1.55	258.20	42,894.64
Percent Reduction	61.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2036 TOTALS (tons/year unmitigated)	11.23	23.41	74.95	0.39	1,232.34	1.78	1,234.12	257.64	1.55	259.18	43,063.17
2036 TOTALS (tons/year mitigated)	4.09	23.41	74.95	0.39	1,232.34	1.78	1,234.12	257.64	1.55	259.18	43,063.17
Percent Reduction	63.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2037 TOTALS (tons/year unmitigated)	11.19	23.32	74.67	0.39	1,227.64	1.77	1,229.41	256.65	1.54	258.20	42,898.81

2037 TOTALS (tons/year mitigated)	4.07	23.32	74.67	0.39	1,227.64	1.77	1,229.41	256.65	1.54	258.20	42,898.81
Percent Reduction	63.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2038 TOTALS (tons/year unmitigated)	11.19	23.32	74.67	0.39	1,227.64	1.77	1,229.41	256.65	1.54	258.20	42,898.81
2038 TOTALS (tons/year mitigated)	4.07	23.32	74.67	0.39	1,227.64	1.77	1,229.41	256.65	1.54	258.20	42,898.81
Percent Reduction	63.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2039 TOTALS (tons/year unmitigated)	11.14	23.23	74.38	0.39	1,222.93	1.77	1,224.70	255.67	1.54	257.21	42,734.44
2039 TOTALS (tons/year mitigated)	4.06	23.23	74.38	0.39	1,222.93	1.77	1,224.70	255.67	1.54	257.21	42,734.44
Percent Reduction	63.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2040 TOTALS (tons/year unmitigated)	11.19	23.32	74.67	0.39	1,227.64	1.77	1,229.41	256.65	1.54	258.20	42,898.81
2040 TOTALS (tons/year mitigated)	4.08	23.32	74.67	0.39	1,227.64	1.77	1,229.41	256.65	1.54	258.20	42,898.81
Percent Reduction	63.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	180.22	28.86	242.41	0.65	35.32	34.00	36,518.46
TOTALS (tons/year, mitigated)	180.22	28.86	242.41	0.65	35.32	34.00	36,518.46
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	302.09	350.81	3,214.08	2.39	441.29	84.75	240,237.20
TOTALS (tons/year, mitigated)	252.06	285.16	2,612.42	1.95	358.70	68.88	195,267.14
Percent Reduction	16.56	18.71	18.72	18.41	18.72	18.73	18.72

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	482.31	379.67	3,456.49	3.04	476.61	118.75	276,755.66
TOTALS (tons/year, mitigated)	432.28	314.02	2,854.83	2.60	394.02	102.88	231,785.60
Percent Reduction	10.37	17.29	17.41	14.47	17.33	13.36	16.25

Appendix 17D
Urbemis Outputs for the No Project Alternative

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Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\Kimberly.Seigel\Application Data\Urbemis\Version9a\Projects\No Project.urb924

Project Name: No Project Alternative

Project Location: Contra Costa County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.04	0.02	0.31	0.00	0.00	0.00	26.39

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.93	1.28	11.47	0.01	1.50	0.29	814.00

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.97	1.30	11.78	0.01	1.50	0.29	840.39