City of

DEL RIO

Cienegas Creek

Cantu Branch

San Felipe Creek

Master Watershed Study Final Report

Volume 2

SEPTEMBER 2012

CP&Y

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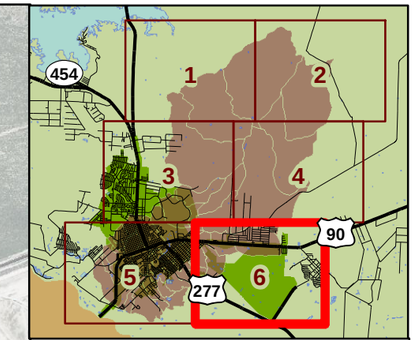


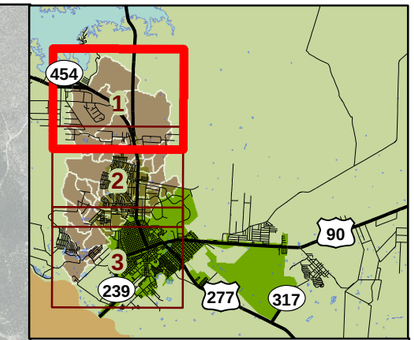
0 1,000 2,000 4,000
Feet

San Felipe Drainage Area
Time of Concentration Path

Time of Concentration Paths
San Felipe Watershed

FIGURE A-2

Base Map Sources: City of Del Rio, TNRIS Aerial Photography



0 1,000 2,000 4,000
Feet

Cienegas Drainage Area
Time of Concentration Path

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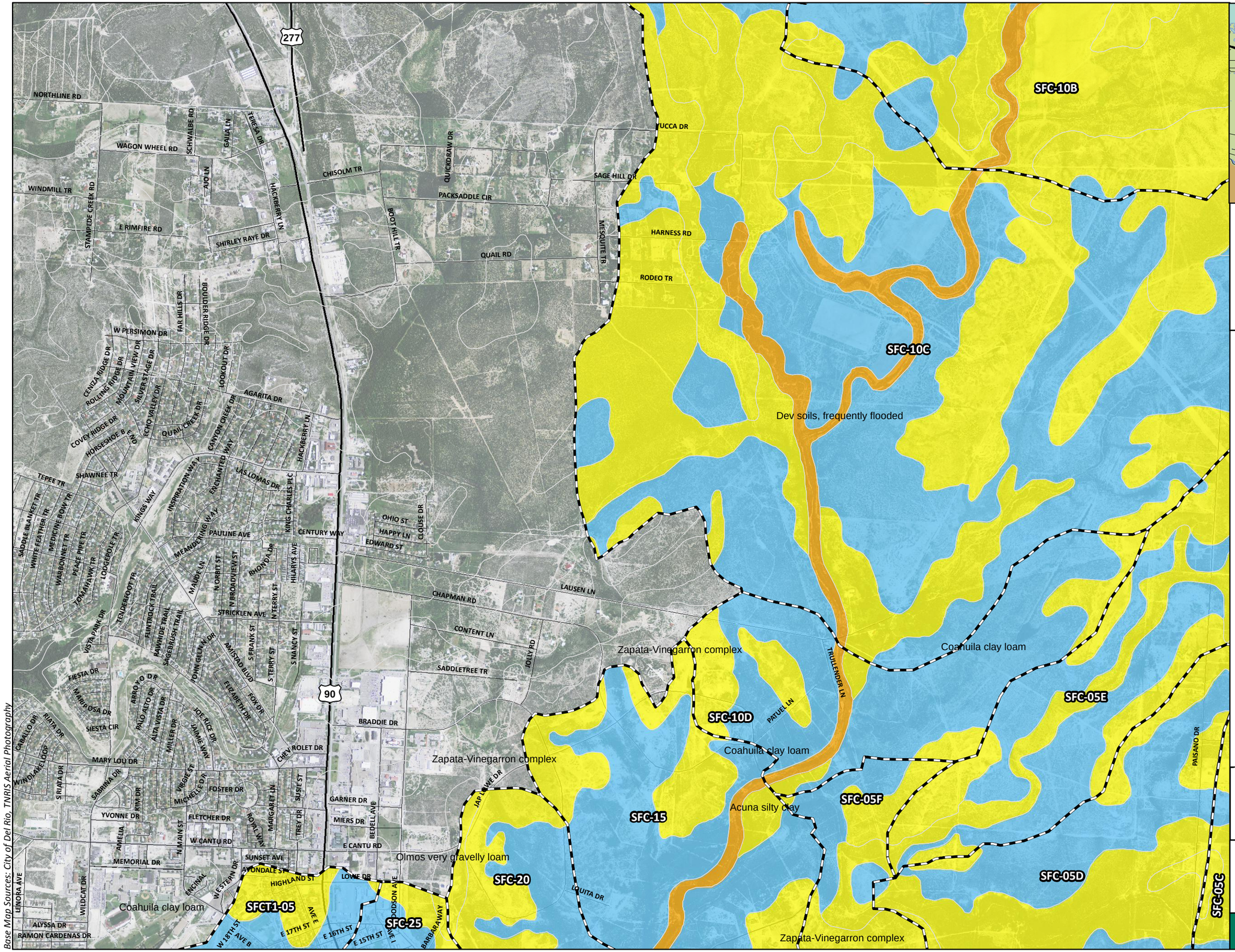
Time of Concentration Paths
Cienegas Watershed

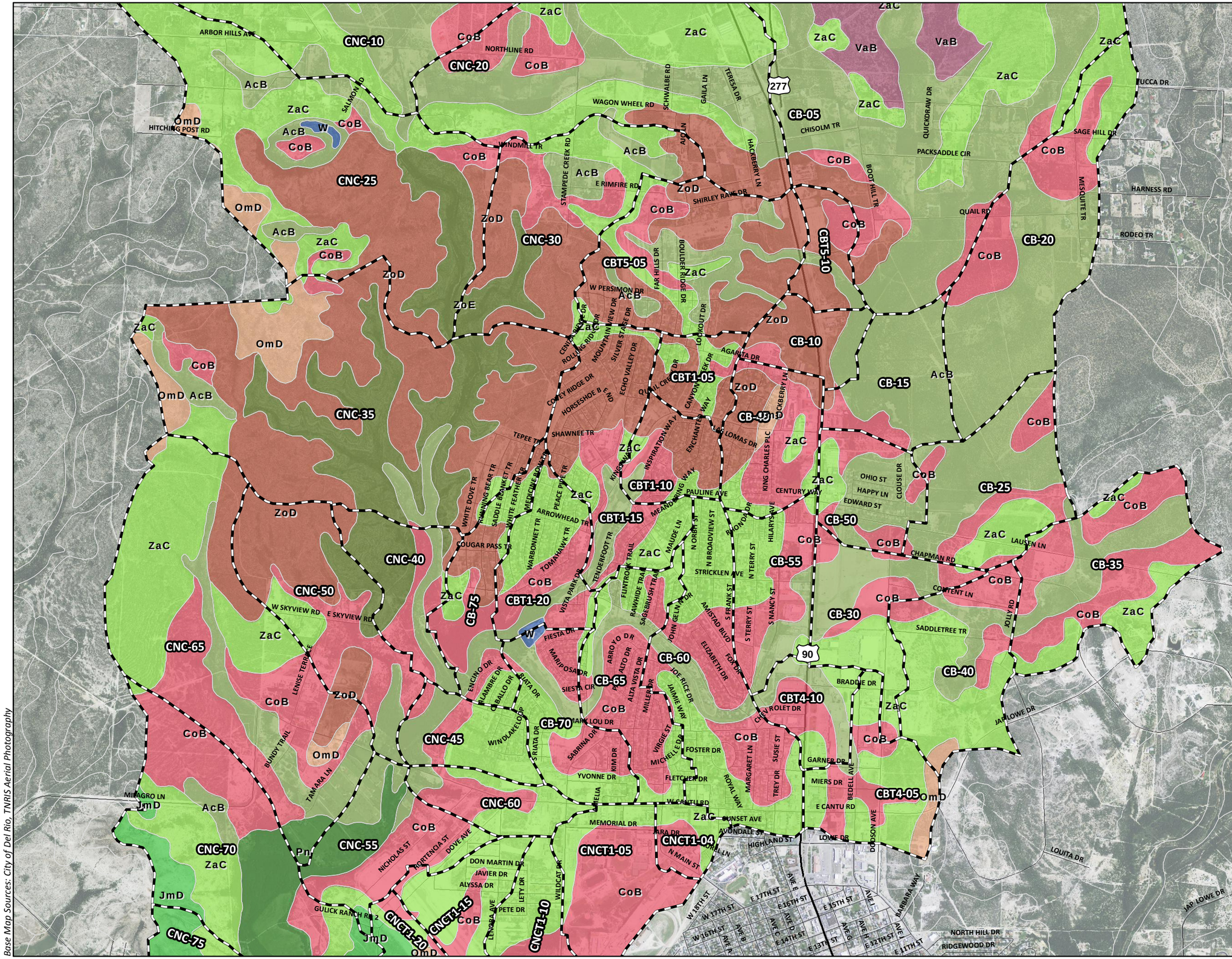
FIGURE A-3

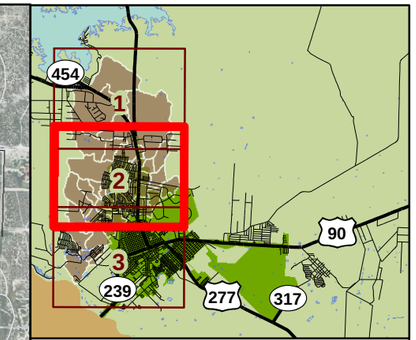
Base Map Sources: City of Del Rio, TNRIS Aerial Photography



Hydrologic Soil Classifications
San Felipe Watershed

FIGURE A-4





0 1,000 2,000 4,000

Feet

Cienegas Drainage Area

Soil Type

- AcB (Acuna silty clay)
- AmD (Amistad very flaggy clay loam)
- CoB (Cohuila clay loam)
- De (Dev soils)
- FzG (Felipe and Zorra soils)
- JmD (Jimenez-Quemado complex)
- LaB (Lagloria loam)
- LnD (Langtry very cobbly silt loam)
- LnE (Langry very cobbly silt loam)
- Ls (Laredo silty clay loam)
- Lv (Laredo variant silty clay loam)
- M-W (Miscellaneous water)
- OmD (Olmos very gravelly loam)
- Pn (Pintas clay)
- Pt (Pits)
- Ra (Reynosa silt clay loam)
- Rg (Rio Grande silt loam)
- Ro (Rio Grande soils)
- ToA (Tobosa clay)
- VaB (Valverde silty clay loam)
- W (Water)
- ZaC (Zapata-Vinegarroon complex)
- ZoD (Zorra-Rock outcrop complex)
- ZoE (Zorra-Rock outcrop complex)

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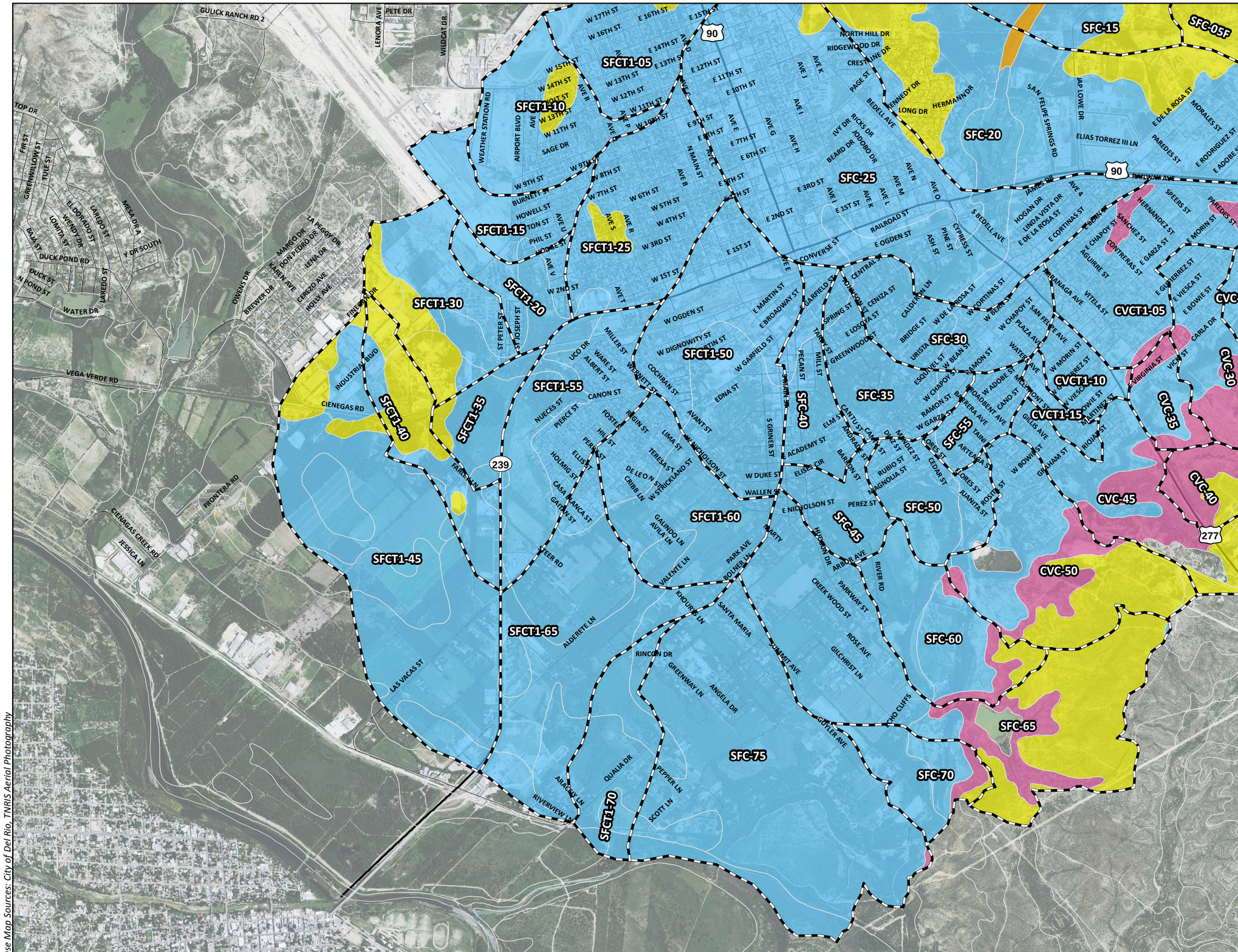
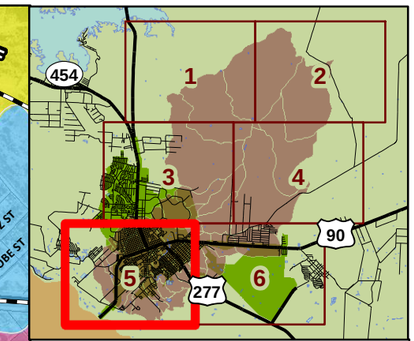
Soil Data
Cienegas Watershed

FIGURE A-5

Base Map Sources: City of Del Rio, TNRIS Aerial Photography





0 1,000 2,000 4,000

Feet

San Felipe Drainage Area

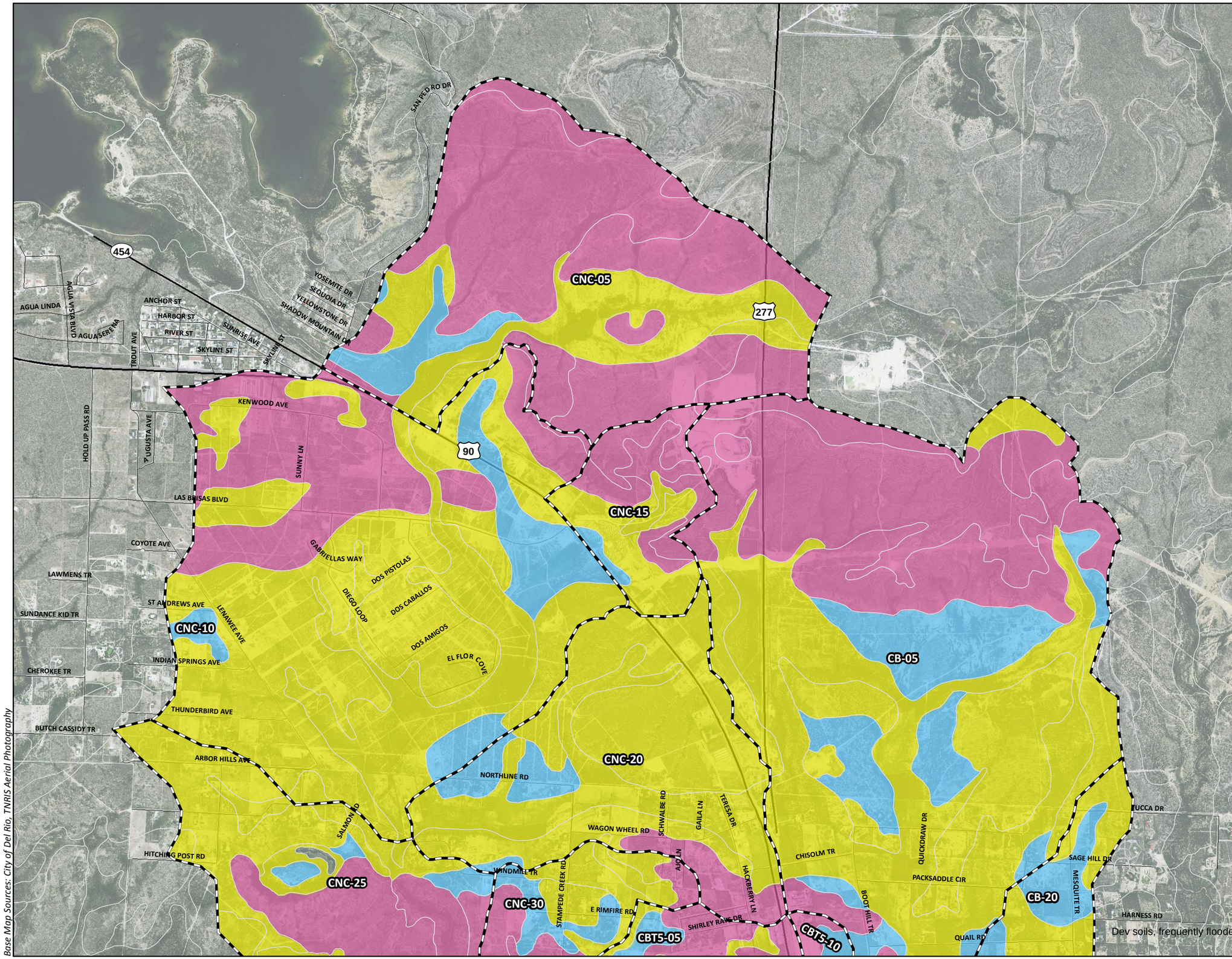
Hydrologic Soil Classification

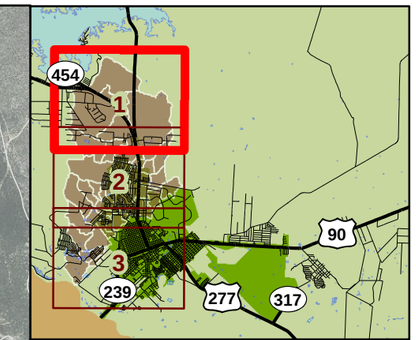
- A
- B
- C
- D

Hydrologic Soil Classifications
San Felipe Watershed

FIGURE A-6

Base Map Sources: City of Del Rio, TNRIS Aerial Photography





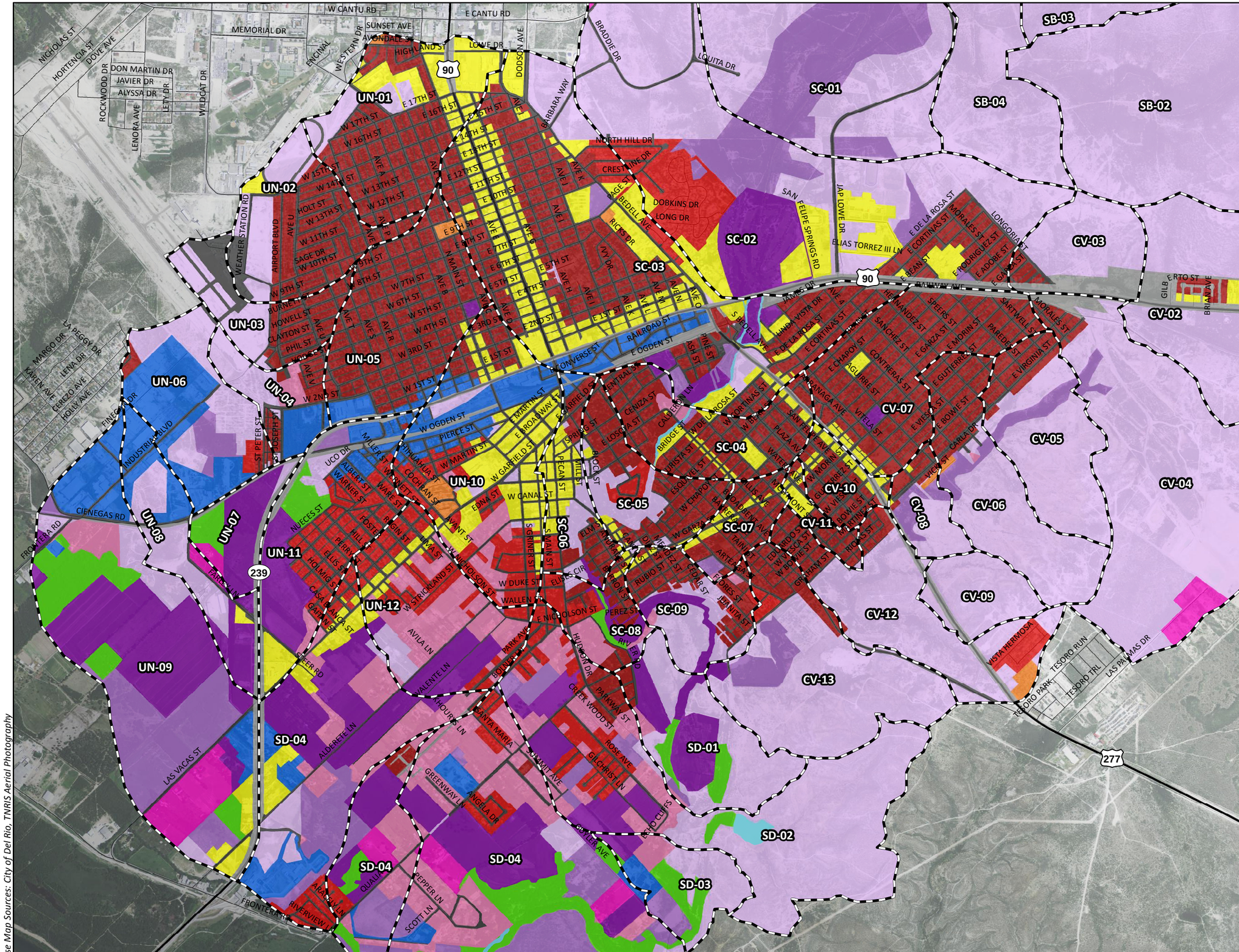
0 1,000 2,000 4,000
Feet

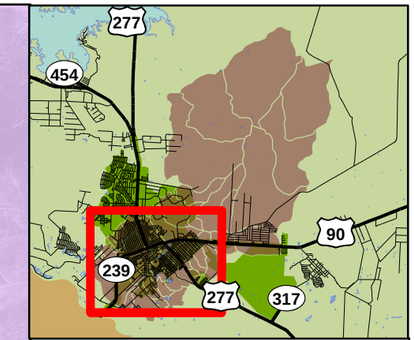
Cienegas Drainage Area
Hydrologic Soil Classification
A
B
C
D

Hydrologic Soil Classifications
Cienegas Watershed

FIGURE A-7

Base Map Sources: City of Del Rio, TNRIS Aerial Photography





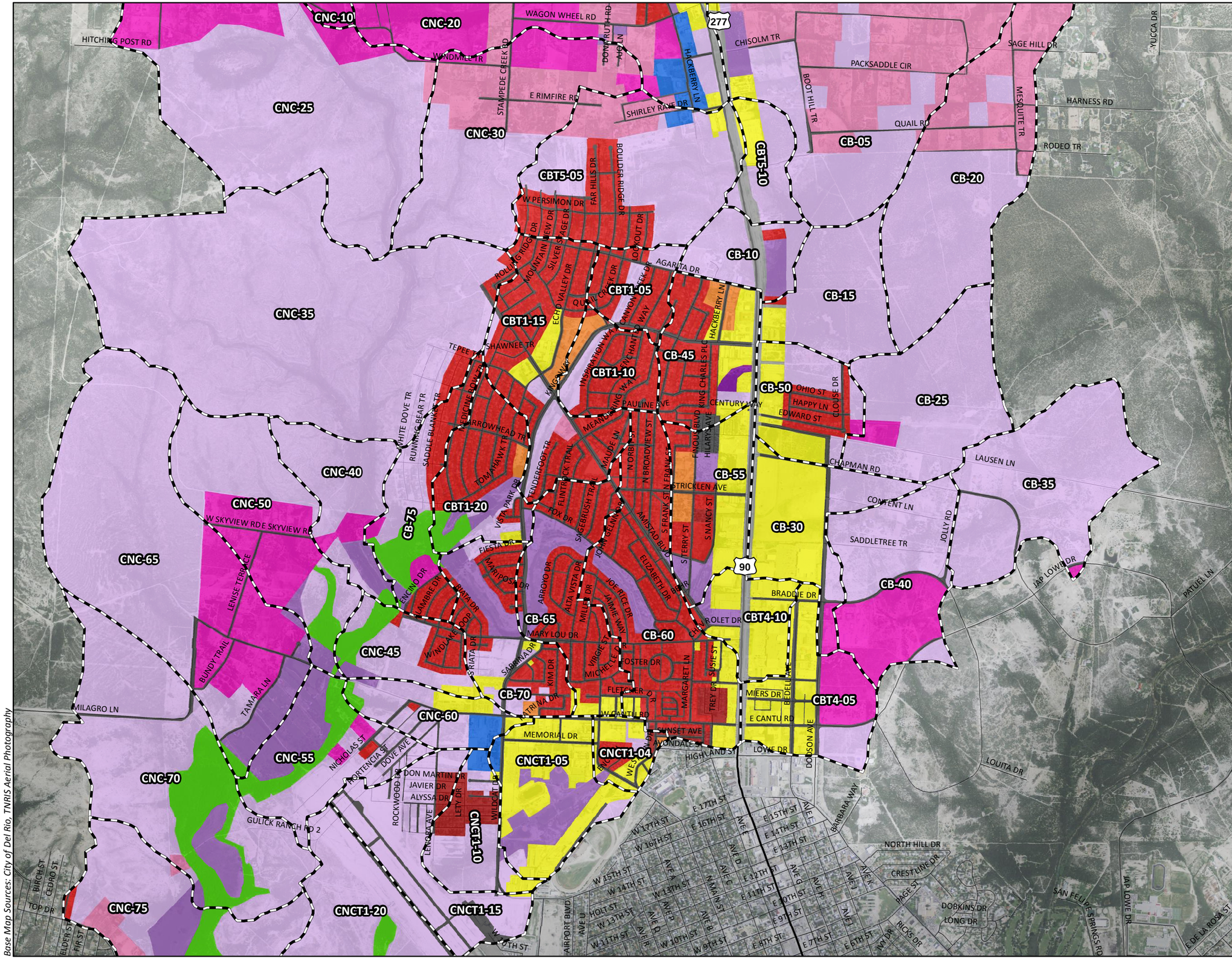
0 1,000 2,000 4,000
Feet

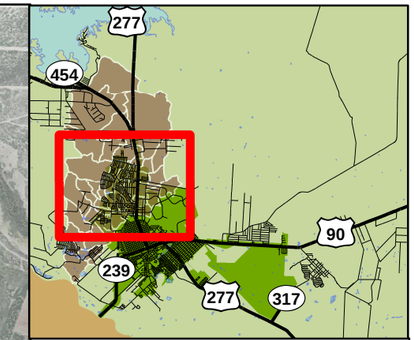
- San Felipe Drainage Area
- Open Space (Good)
- Open Space (Fair)
- Open Space (Poor)
- Brush
- Woods
- Open Water
- Single Family Residential - Estate
- Single Family Residential - 1 ac
- Single Family Residential - 1/4 ac
- Single Family Residential - 1/8 ac
- Multi Family Residential
- Commercial
- Industrial
- Streets, Roads, Parking
- Transportation (w/pervious ROW)

Existing Land Use
San Felipe Watershed

FIGURE A-8

Base Map Sources: City of Del Rio, TNRIS Aerial Photography





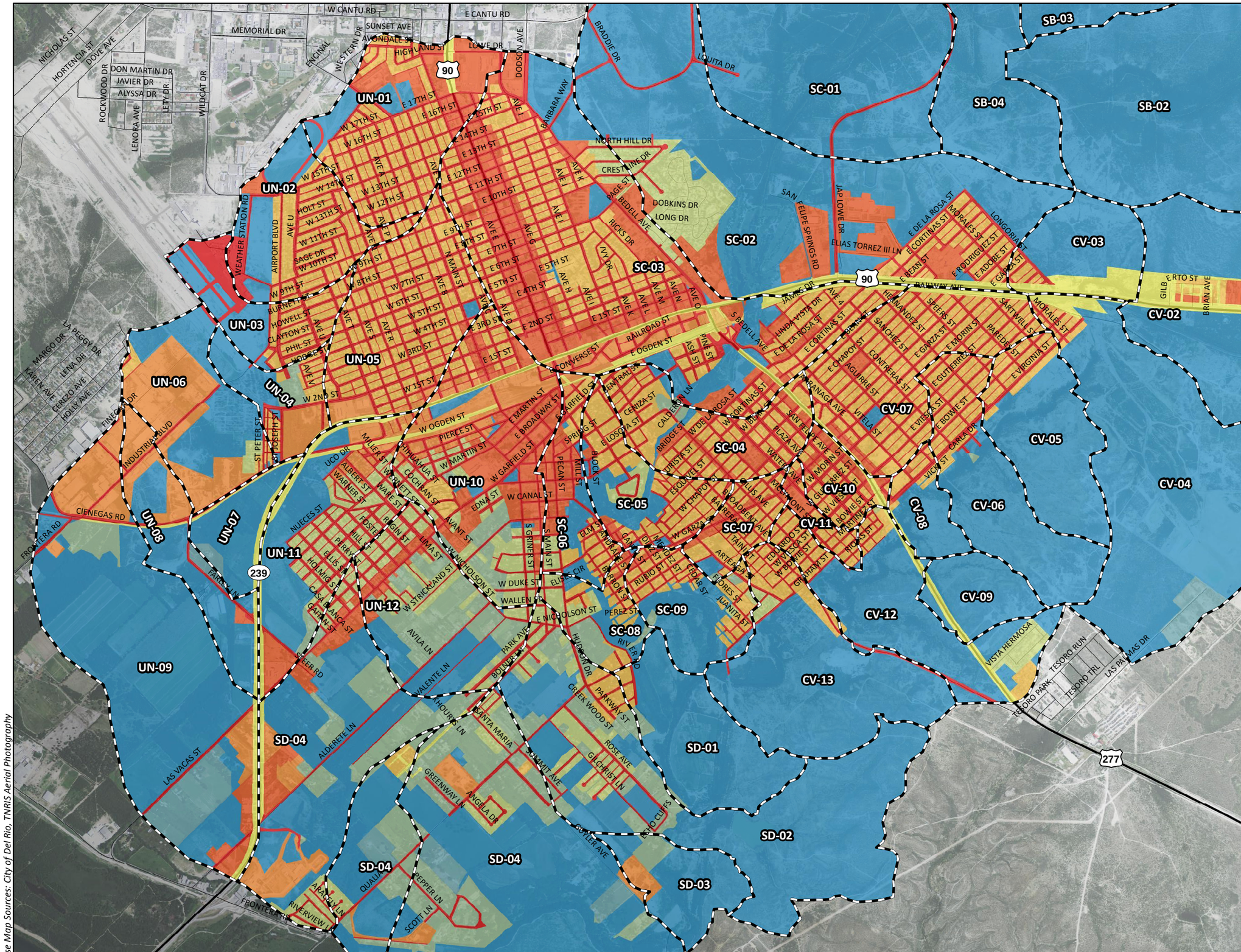
0 1,000 2,000 4,000
Feet

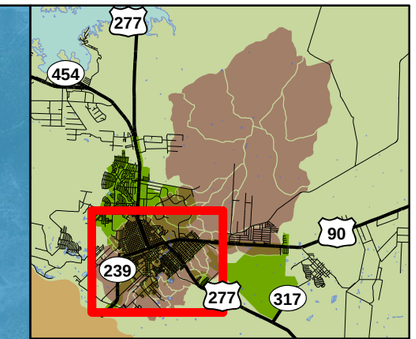
- Cienegas Drainage Area
- Open Space (Good)
- Open Space (Fair)
- Open Space (Poor)
- Brush
- Woods
- Open Water
- Single Family Residential - Estate
- Single Family Residential - 1 ac
- Single Family Residential - 1/4 ac
- Single Family Residential - 1/8 ac
- Multi Family Residential
- Commercial
- Industrial
- Streets, Roads, Parking
- Transportation (w/pervious ROW)

Existing Land Use
Cienegas Watershed

FIGURE A-9

Base Map Sources: City of Del Rio, TNRIS Aerial Photography





0 1,000 2,000 4,000
Feet

San Felipe Drainage Area

% Impervious Cover (Existing)

- 0
- 5
- 20
- 38
- 65
- 75
- 80
- 85
- 98

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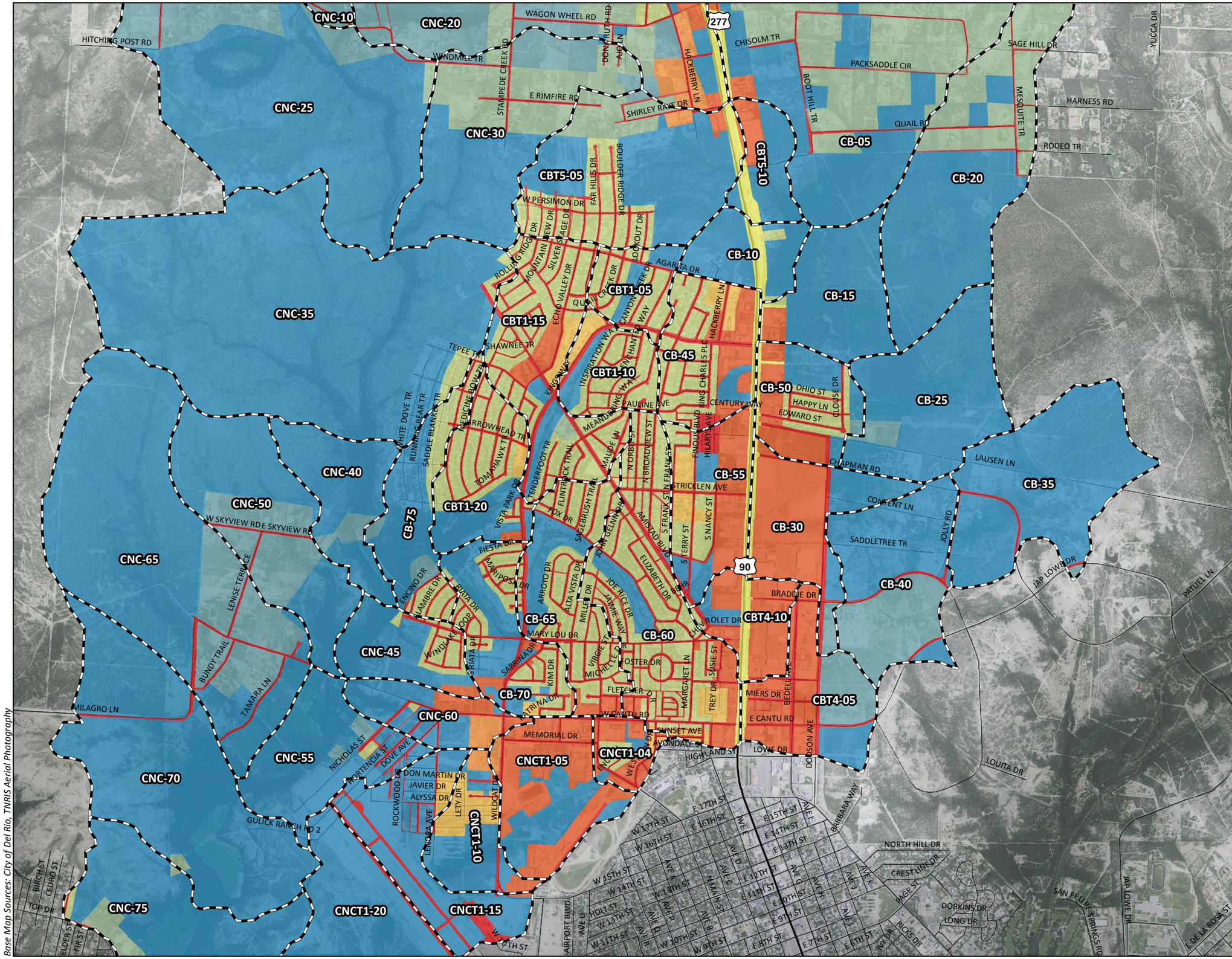
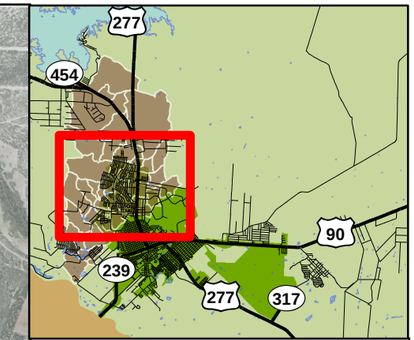
Existing Impervious Cover
San Felipe Watershed

FIGURE A-10

Base Map Sources: City of Del Rio, TNRIS Aerial Photography





0 1,000 2,000 4,000
Feet

Cienegas Drainage Area

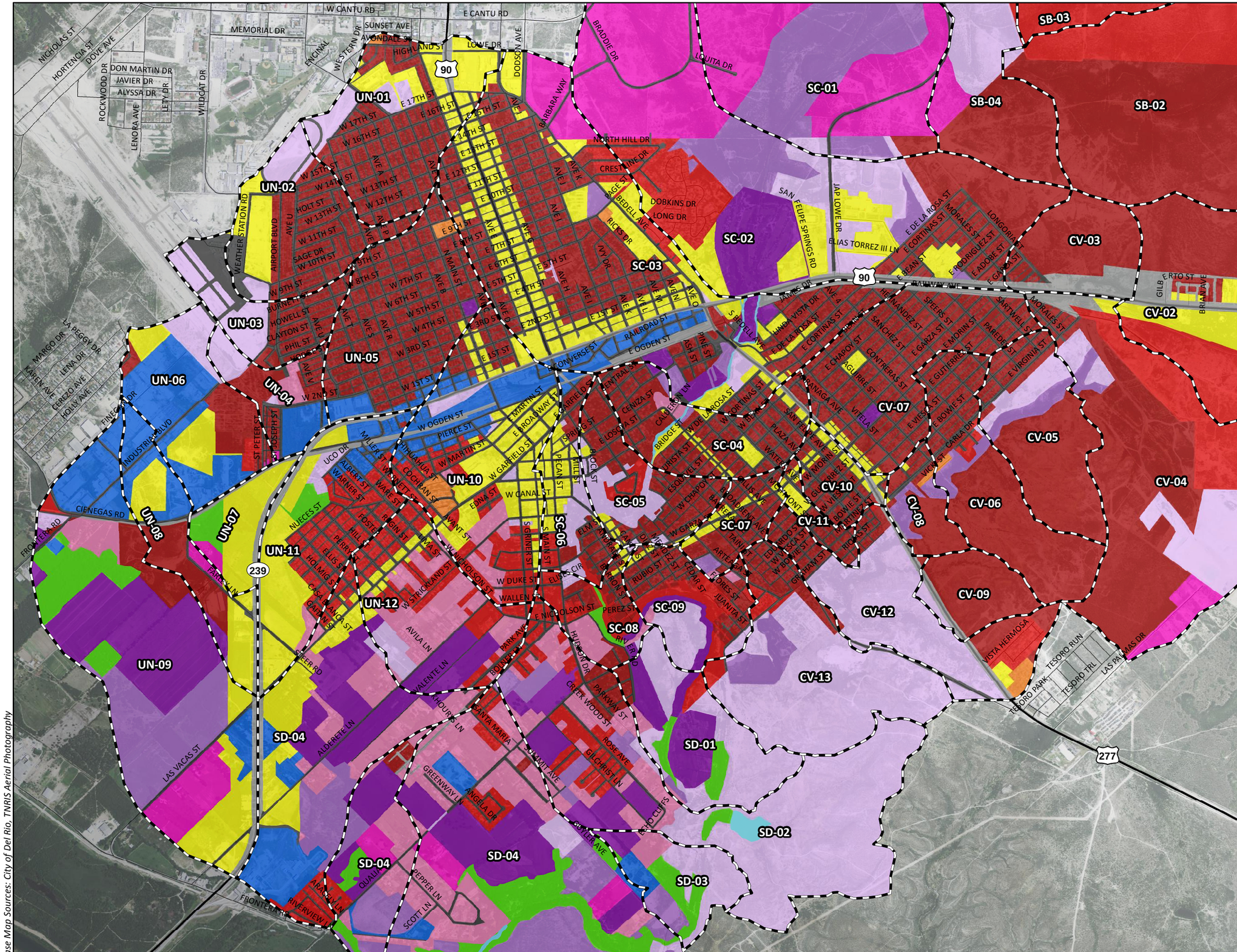
% Impervious Cover (Existing)

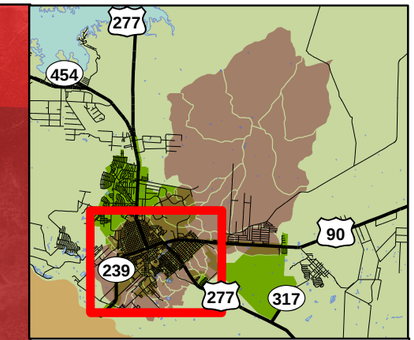
- 0
- 5
- 20
- 38
- 65
- 75
- 80
- 85
- 98

Existing Impervious Cover
Cienegas Watershed

FIGURE A-11

Base Map Sources: City of Del Rio, TNRIS Aerial Photography





0 1,000 2,000 4,000
Feet

- San Felipe Drainage Area
- Open Space (Good)
- Open Space (Fair)
- Open Space (Poor)
- Brush
- Woods
- Open Water
- Single Family Residential - Estate
- Single Family Residential - 1 ac
- Single Family Residential - 1/4 ac
- Single Family Residential - 1/8 ac
- Multi Family Residential
- Commercial
- Industrial
- Streets, Roads, Parking
- Transportation (w/pervious ROW)

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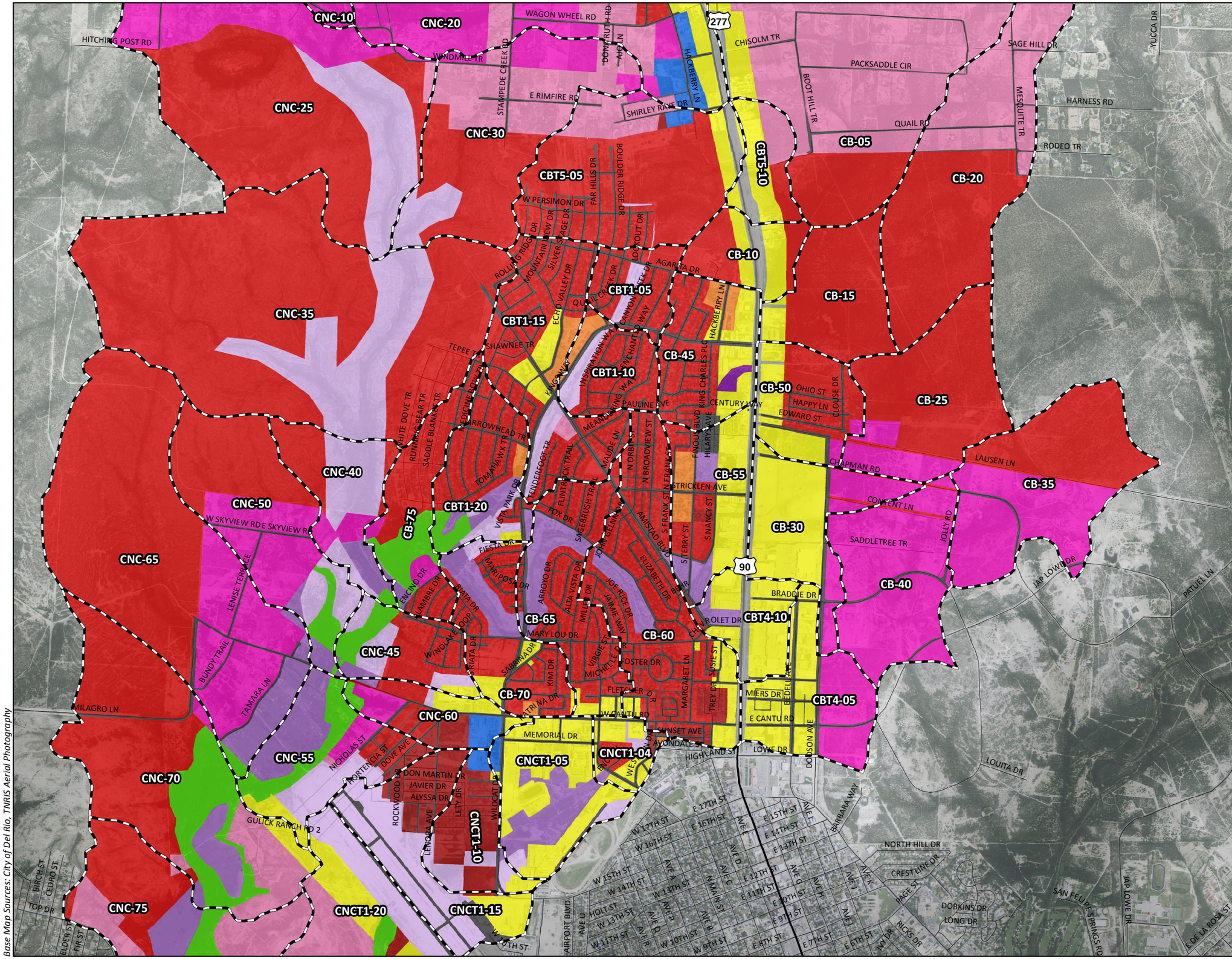
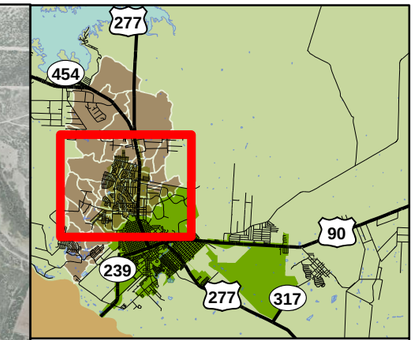
Ultimate Land Use
San Felipe Watershed

FIGURE A-12

Base Map Sources: City of Del Rio, TNRIS Aerial Photography





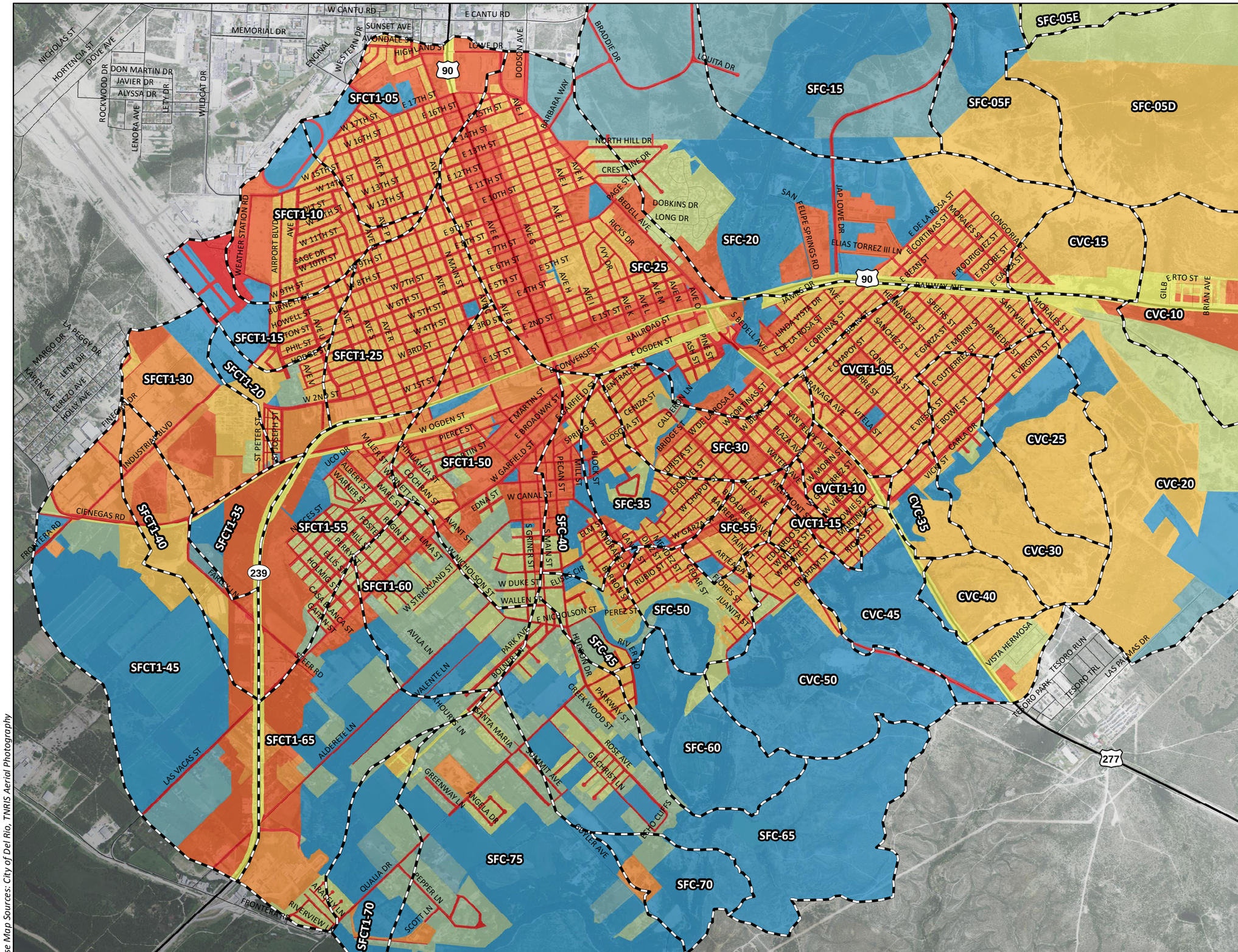
0 1,000 2,000 4,000
Feet

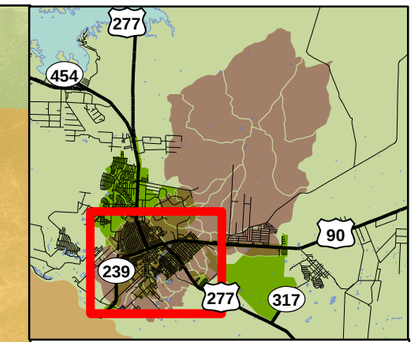
- Cienegas Drainage Area
- Open Space (Good)
- Open Space (Fair)
- Open Space (Poor)
- Brush
- Woods
- Open Water
- Single Family Residential - Estate
- Single Family Residential - 1 ac
- Single Family Residential - 1/4 ac
- Single Family Residential - 1/8 ac
- Multi Family Residential
- Commercial
- Industrial
- Streets, Roads, Parking
- Transportation (w/pervious ROW)

Ultimate Land Use
Cienegas Watershed

FIGURE A-13

Base Map Sources: City of Del Rio, TNRIS Aerial Photography





0 1,000 2,000 4,000
Feet

San Felipe Drainage Area

% Impervious Cover (Ultimate)

- 0
- 5
- 20
- 38
- 65
- 75
- 80
- 85
- 98

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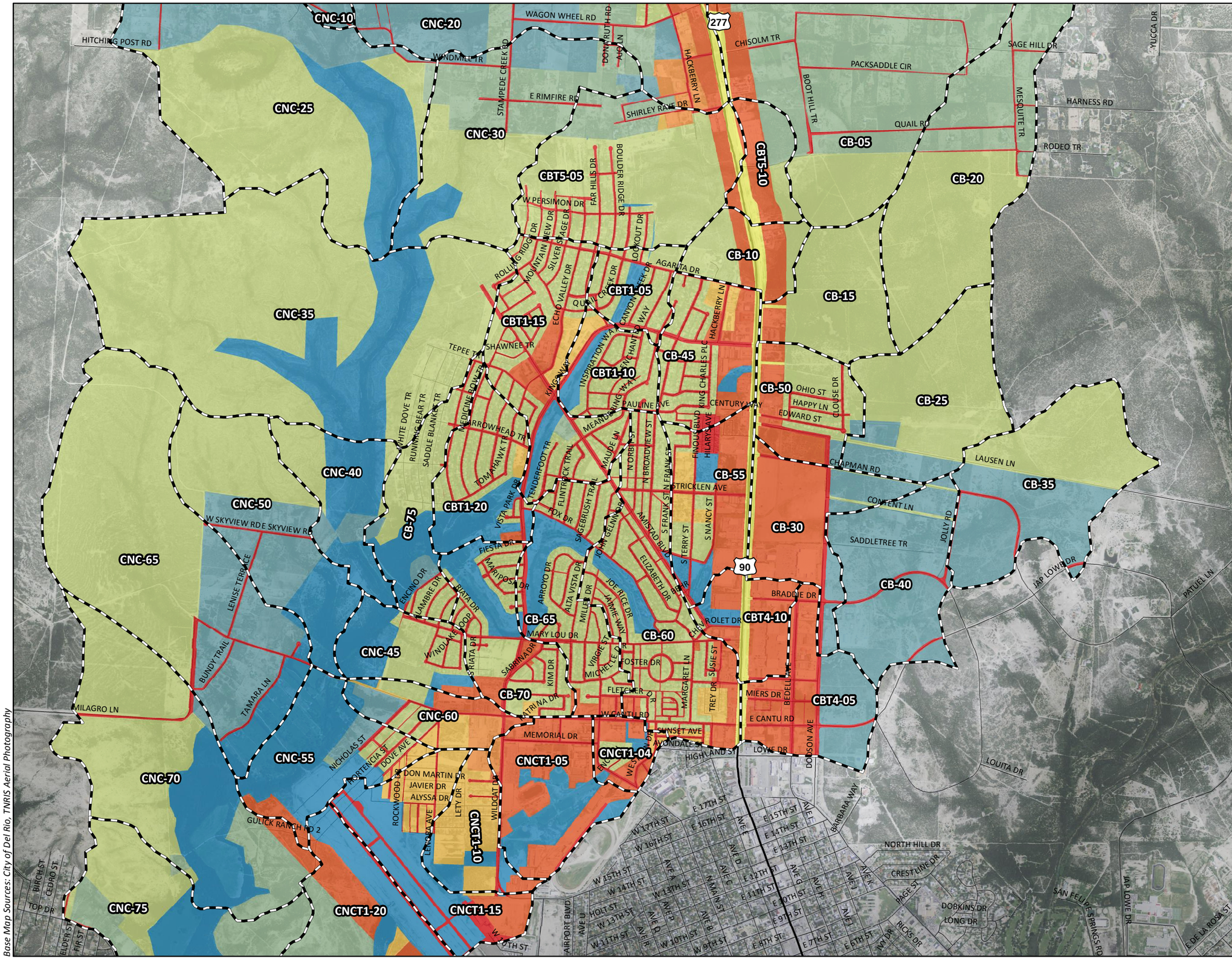
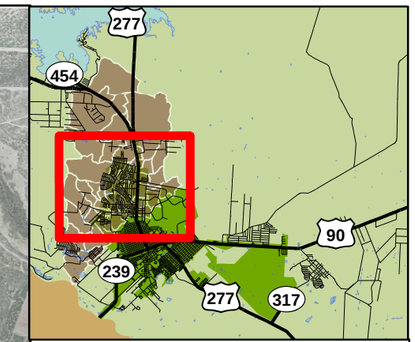
Ultimate Impervious Cover
San Felipe Watershed

FIGURE A-14

Base Map Sources: City of Del Rio, TNRIS Aerial Photography





0 1,000 2,000 4,000
Feet

Cienegas Drainage Area

% Impervious Cover (Ultimate)

- 0
- 5
- 20
- 38
- 65
- 75
- 80
- 85
- 98

Ultimate Impervious Cover
Cienegas Watershed

FIGURE A-15

Base Map Sources: City of Del Rio, TNRIS Aerial Photography

APPENDIX B - TABLES

TABLE B 3-1

PROJECT NUMBER CDR10057
TIME OF CONCENTRATION EXISTING WATESHED CONDITION SAN FELIPE CREEK

Basin ID	Basin Area (acres)	Overland Flow: $T_o = 0.42 \cdot \frac{(n_0 \cdot L_0)^{0.8}}{R_2^{0.5} \cdot S_o^{0.4}}$					Shallow Concentrated Flow: $V_s = K \cdot S_s^{0.5}$ $T_s = \frac{L_s}{60 \cdot V_s}$					Channelized Flow: $T_h = \frac{L_h}{60 \cdot V_h}$				Time of Concentration: $T_c = T_o + T_s + T_h$ $T_{lag} = 0.6 \cdot T_c$	
		L_o	n_o	S_o	$R_{2\text{-}YR}$	T_o	K	S_s	V_s	L_s	T_s	Flow Type	V_h	L_h	T_h	T_c	T_{lag}
		ft	NA	ft/ft	inches	minutes	NA	ft/ft	fps	ft	minutes		fps	ft	minutes	minutes	hours
CVC-05	1067	200	0.13	0.001	2.6	50.37	16.85	0.013	1.921	3124	27.10	Channel	3.59	6603	30.65	108.1	1.081
CVC-10	489	200	0.011	0.003	2.6	5.21	20.3	0.023	3.079	2088	11.30	Channel	3.55	4596	21.58	38.1	0.381
CVC-15	121	100	0.13	0.014	2.6	11.18	16.1	0.023	2.442	3193	21.80	N/A				33.0	0.330
CVC-20	526	171	0.13	0.003	2.6	31.80	16.1	0.012	1.764	2757	26.05	Channel	5.41	4658	14.35	72.2	0.722
CVC-25	181	100	0.13	0.010	2.6	12.79	16.1	0.044	3.377	784	3.87	Channel	6.20	3334	8.96	25.6	0.256
CVC-30	202	171	0.13	0.050	2.6	10.32	16.1	0.055	3.776	857	3.78	Channel	7.33	3235	7.36	21.5	0.215
CVC-35	60	108	0.13	0.028	2.6	9.01	16.1	0.040	3.220	1181	6.11	Channel	2.34	421	3.00	18.1	0.181
CVC-40	79	100	0.13	0.040	2.6	7.35	16.1	0.052	3.671	450	2.04	Channel	7.53	2703	5.98	15.4	0.154
CVC-45	234	100	0.13	0.010	2.6	12.79	16.1	0.034	2.969	2046	11.49	Channel	4.38	5176	19.70	44.0	0.440
CVC-50	289	100	0.015	0.010	2.6	2.27	16.1	0.023	2.442	667	4.55	Channel	6.20	5960	16.02	22.8	0.228
CVCT1-05	247	100	0.15	0.010	2.6	14.34	17.6	0.007	1.504	4035	44.72	Channel	4.05	4431	18.23	77.3	0.773
CVCT1-10	59	95	0.011	0.005	2.6	2.25						Channel	4.48	2865	10.66	12.9	0.129
CVCT1-15	30	95	0.011	0.005	2.6	2.25						Channel	4.36	2855	10.91	13.2	0.132
SFC-05A	2952	100	0.15	0.005	2.6	18.93	16.1	0.011	1.689	1260	12.44	Channel	4.70	18466	65.48	96.8	0.968
SFC-05B	2391	100	0.15	0.006	2.6	17.59	16.1	0.013	1.836	3518	31.94	Channel	4.29	19621	76.23	125.8	1.258
SFC-05C	3927	100	0.15	0.005	2.6	18.93	16.1	0.019	2.219	5984	44.94	Channel	4.92	20820	70.53	134.4	1.344
SFC-05D	791	98	**0.13**	0.020	2.6	9.54	16.1	0.019	2.219	1759	13.21	Channel	4.48	12543	46.66	69.4	0.694
SFC-05E	748	94	0.15	0.010	2.6	13.65	16.1	0.010	1.610	5123	53.03	Channel	3.50	11242	53.53	120.2	1.202
SFC-05F	257	100	0.13	0.010	2.6	12.79	16.1	0.003	0.925	2586	46.60	Channel	2.67	4668	29.14	88.5	0.885
SFC-10A	4371	100	0.15	0.005	2.6	18.93	16.1	0.020	2.277	2231	16.33	Channel	5.41	25702	79.18	114.4	1.144
SFC-10B	2937	100	0.15	0.005	2.6	18.93	16.1	0.040	3.220	1632	8.45	Channel	6.31	15908	42.02	69.4	0.694
SFC-10C	3912	100	0.15	0.005	2.6	18.93	16.1	0.040	3.220	1301	6.73	Channel	6.59	24530	62.04	87.7	0.877
SFC-10D	591	94	0.13	0.005	2.6	15.69	16.1	0.015	1.972	4643	39.24	Channel	4.15	7897	31.71	86.7	0.867
SFC-15	709	100	0.13	0.002	2.6	24.35	16.1	0.018	2.160	2898	22.36	Channel	4.67	4543	16.21	62.9	0.629
SFC-20	798	107	0.13	0.040	2.6	7.76	16.1	0.024	2.494	2069	13.83	Channel	4.28	6619	25.77	47.4	0.474
SFC-25	755	97	0.1	0.011	2.6	9.74	18.1	0.026	2.919	2162	12.35	Channel	5.36	9574	29.77	51.9	0.519
SFC-30	162	95	0.02	0.005	2.6	3.62	20.3	0.010	2.030	4290	35.22	N/A				38.8	0.388
SFC-35	130	97	0.011	0.005	2.6	2.25	17.5	0.013	1.995	2951	24.65	Channel	3.57	496	2.32	29.2	0.292
SFC-40	101	110	0.011	0.009	2.6	2.00	18.5	0.010	1.850	2650	23.87	Channel	4.93	2340	7.91	33.8	0.338
SFC-45	80	100	0.011	0.001	2.6	4.46	16.8	0.016	2.092	1437	11.45	Channel	2.70	1711	10.56	26.5	0.265
SFC-50	120	100	0.011	0.010	2.6	1.77	17.9	0.019	2.467	1233	8.33	Channel	3.46	3021	14.55	24.7	0.247
SFC-55	64	95	0.02	0.005	2.6	3.62						Channel	3.56	3622	16.96	20.6	0.206
SFC-60	176	100	0.13	0.006	2.6	15.69	16.1	0.005	1.115	1755	26.22	Channel	5.34	2508	7.83	49.7	0.497
SFC-65	520	200	0.011	0.003	2.6	5.38	16.5	0.008	1.476	4258	48.09	Channel	5.96	1676	4.69	58.2	0.582
SFC-70	101	100	0.06	0.013	2.6	6.20	16.1	0.022	2.388	415	2.90	Channel	3.22	3419	17.70	26.8	0.268
SFC-75	591	98	0.1	0.005	2.6	13.36	17.4	0.006	1.348	4980	61.58	Channel	6.80	2769	6.79	81.7	0.817
SFCT1-05	242	100	0.011	0.010	2.6	1.77						Channel	4.96	6172	20.74	22.5	0.225
SFCT1-10	185	100	0.011	0.004	2.6	2.56	20.3	0.018	2.720	2228	13.65	Channel	4.49	1779	6.60	22.8	0.228
SFCT1-15	113	100	0.02	0.008	2.6	3.13	20.3	0.010	2.045	2760	22.50	Channel	3.87	1713	7.38	33.0	0.330
SFCT1-20	85	100	0.011	0.020	2.6	1.34	20.3	0.015	2.521	2593	17.14	Channel	2.46	1069	7.24	25.7	0.257
SFCT1-25	249	100	0.03	0.005	2.6	5.22						Channel	3.32	8079	40.56	45.8	0.458
SFCT1-30	190	100	0.011	0.020	2.6	1.34	16.1	0.015	1.995	2736	22.86	Channel	3.05	2038	11.14	35.3	0.353
SFCT1-35	76	100	0.011	0.300	2.6	0.46	16.1	0.015	1.977	398	3.36	Channel	1.96	3366	28.62	32.4	0.324
SFCT1-40	138	100	0.02	0.015	2.6	2.43	16.1	0.014	1.883	5556	49.18	Channel	2.00	1473	12.28	63.9	0.639
SFCT1-45	557	100	0.02	0.020	2.6	2.17	16.1	0.009	1.564	10603	113.02	Channel	2.08	2427	19.45	134.6	1.346
SFCT1-50	338	100	0.03	0.010	2.6	3.96	20.3	0.010	2.016	710	5.87	Channel	3.57	6912	32.27	42.1	0.421
SFCT1-55	243	100	0.011	0.020	2.6	1.34	18.1	0.007	1.510	4023	44.40	Channel	2.71	3591	22.08	67.8	0.678
SFCT1-60	221	100	0.02	0.004	2.6	4.13	20.3	0.011	2.103	2423	19.20	Channel	2.03	2948	24.20	47.5	0.475
SFCT1-65	363	100	0.02	0.020	2.6	2.17	17.0	0.010	1.682	6744	66.84	Channel	2.72	3499	21.44	90.4	0.904
SFCT1-70	143	100	0.02	0.005	2.6	3.78	16.1	0.009	1.506	3316	36.71	Channel	2.64	1775	11.21	51.7	0.517

TABLE B 3-2

PROJECT NUMBER CDR10057
TIME OF CONCENTRATION EXISTING WATESHED CONDITION CIENEGAS CREEK

Basin ID	Basin Area (acres)	Overland Flow: $T_o = 0.42 \cdot \frac{(n_0 \cdot L_0)^{0.8}}{R_2^{0.5} \cdot S_o^{0.4}}$						Shallow Concentrated Flow: $V_s = K \cdot S_s^{0.5}$ $T_s = \frac{L_s}{60 \cdot V_s}$					Channelized Flow: $T_h = \frac{L_h}{60 \cdot V_h}$				Time of Concentration: $T_c = T_o + T_s + T_h$ $T_{lag} = 0.6 \cdot T_c$		
		L_o	n_o	S_o	$R_{2\text{-}YR}$	Vel	T_o	K	S_s	V_s	L_s	T_s	Flow Type	V_h	L_h	T_h	T_c	T_{lag}	T_{lag}
		ft	NA	ft/ft	inches		minutes	NA	ft/ft	fps	ft	minutes		fps	ft	minutes	minutes	minutes	hours
CB-05	2090	100	0.15	0.020	2.6		10.87	16.1	0.038	3.130	979	5.21	Channel	5.46	17539	53.54	69.6	41.8	0.696
CB-10	84	100	0.15	0.010	2.6		14.34	16.1	0.020	2.287	793	5.78	Channel	4.61	1493	5.40	25.5	15.3	0.255
CB-15	146	100	0.19	0.005	2.6		22.87	16.1	0.003	0.927	5125	92.12	N/A				115.0	69.0	1.150
CB-20	367	100	0.15	0.010	2.6		14.34	16.1	0.009	1.524	10261	112.18	N/A				126.5	75.9	1.265
CB-25	223	100	0.19	0.005	2.6		22.87	16.1	0.003	0.897	5474	101.68	N/A				124.6	74.7	1.246
CB-30	158	100	0.15	0.020	2.6		10.87	20.3	0.007	1.683	1600	15.84	Channel	2.43	3514	24.10	50.8	30.5	0.508
CB-35	272	100	0.19	0.010	2.6		17.33	16.1	0.004	0.990	5287	88.99	N/A				106.3	63.8	1.063
CB-40	208	100	0.15	0.010	2.6		14.34	16.1	0.010	1.618	4655	47.96	N/A				62.3	37.4	0.623
CB-45	146	100	0.15	0.020	2.6		10.87	18.2	0.033	3.290	1377	6.98	Channel	3.01	2264	12.54	30.4	18.2	0.304
CB-50	119	100	0.13	0.020	2.6		9.69	17	0.013	1.956	831	7.08	Channel	2.60	2131	13.66	30.4	18.3	0.304
CB-55	144	100	0.15	0.023	2.6		10.37	16.1	0.023	2.450	1728	11.76	Channel	3.18	2833	14.85	37.0	22.2	0.370
CB-60	289	100	0.13	0.015	2.6		10.88	20.3	0.020	2.899	1765	10.15	Channel	3.23	4174	21.54	42.6	25.5	0.426
CB-65	178	100	0.15	0.020	2.6		10.87	16.1	0.024	2.514	738	4.89	Channel	4.01	4172	17.34	33.1	19.9	0.331
CB-70	147	100	0.15	0.010	2.6		14.34	16.1	0.026	2.598	883	5.66	Channel	4.29	3748	14.56	34.6	20.7	0.346
CB-75	132	100	0.13	0.010	2.6		12.79	18.2	0.016	2.294	6358	46.20	N/A				59.0	35.4	0.590
CBT1-05	73	125	0.15	0.010	2.6		17.15	16.1	0.022	2.409	1072	7.42	Channel	4.17	1351	5.40	30.0	18.0	0.300
CBT1-10	89	100	0.13	0.015	2.6		10.88	18.2	0.026	2.945	1184	6.70	Channel	3.91	1872	7.98	25.6	15.3	0.256
CBT1-15	230	125	0.15	0.015	2.6		14.58	18.2	0.016	2.273	513	3.76	Channel	5.87	5479	15.56	33.9	20.3	0.339
CBT1-20	136	100	0.13	0.010	2.6		12.79	18.2	0.020	2.562	4492	29.22	N/A				42.0	25.2	0.420
CBT4-05	152	100	0.15	0.010	2.6		14.34	16.1	0.020	2.305	2293	16.58	Channel	3.17	1992	10.47	41.4	24.8	0.414
CBT4-10	86	100	0.13	0.015	2.6		10.88	20.3	0.016	2.534	1155	7.60	Channel	3.78	2154	9.50	28.0	16.8	0.280
CBT5-05	304	100	0.15	0.015	2.6		12.20	18.2	0.008	1.655	3145	31.68	Channel	2.75	2294	13.90	57.8	34.7	0.578
CBT5-10	89	100	0.13	0.010	2.6		12.79	16.1	0.012	1.751	1268	12.07	Channel	2.33	1992	14.25	39.1	23.5	0.391
CNC-05	1144	175	0.15	0.020	2.6		17.01	16.1	0.018	2.155	2791	21.59	Channel	4.95	8655	29.14	67.7	40.6	0.677
CNC-10	1675	100	0.15	0.015	2.6		12.20	16.1	0.011	1.700	5827	57.11	Channel	2.77	7930	47.71	117.0	70.2	1.170
CNC-15	231	150	0.15	0.030	2.6		12.78	16.1	0.033	2.942	599	3.39	Channel	6.12	4223	11.50	27.7	16.6	0.277
CNC-20	723	150	0.13	0.010	2.6		17.69	18.2	0.004	1.083	3388	52.13	Channel	2.77	5989	36.03	105.9	63.5	1.059
CNC-25	646	150	0.15	0.010	2.6		19.84	16.1	0.015	1.942	2061	17.68	Channel	4.22	10383	41.01	78.5	47.1	0.785
CNC-30	312	225	0.19	0.010	2.6		33.15	16.1	0.005	1.190	3112	43.59	Channel	4.45	4669	17.49	94.2	56.5	0.942
CNC-35	816	150	0.15	0.010	2.6		19.84	16.1	0.017	2.128	1946	15.24	Channel	6.77	6513	16.03	51.1	30.7	0.511
CNC-40	129	100	0.19	0.020	2.6		13.13	16.1	0.030	2.786	2838	16.98	Channel	2.38	2930	20.52	50.6	30.4	0.506
CNC-45	100	100	0.19	0.010	2.6		17.33	20.3	0.024	3.135	1342	7.14	Channel	2.61	2212	14.13	38.6	23.2	0.386
CNC-50	252	150	0.15	0.010	2.6		19.84	16.1	0.025	2.562	1895	12.33	Channel	2.73	5511	33.64	65.8	39.5	0.658
CNC-55	167	100	0.15	0.010	2.6		14.34	16.1	0.028	2.700	1209	7.46	Channel	2.35	3846	27.28	49.1	29.4	0.491
CNC-60	87	100	0.13	0.008	2.6		14.35	18.1	0.017	2.355	1004	7.10	Channel	3.30	3202	16.17	37.6	22.6	0.376
CNC-65	579	100	0.15	0.020	2.6		10.87	16.1	0.019	2.234	1506	11.23	Channel	3.10	9352	50.28	72.4	43.4	0.724
CNC-70	408	100	0.19	0.030	2.6		11.17	16.1	0.020	2.286	3224	23.50	Channel	1.95	4980	42.56	77.2	46.3	0.772
CNC-75	317	100	0.15	0.020	2.6		10.87	16.1	0.030	2.794	1627	9.71	Channel	2.41	5930	41.01	61.6	37.0	0.616
CNC-80	235	100	0.13	0.020	2.6		9.69	18.2	0.030	3.139	2118	11.25	Channel	2.16	3590	27.70	48.6	29.2	0.486
CNC-85	64	100	0.13	0.03	2.6		8.24	17.2	0.017	2.274	3775	27.66	N/A				35.9	21.5	0.359
CNC-90	516	100	0.13	0.040	2.6		7.35	17.2	0.016	2.204	5726	43.30	Channel	4.37	4284	16.34	67.0	40.2	0.670
CNCT1-04	46	100	0.15	0.010	2.6		14.34	16.1	0.019	2.241	1393	10.36	Channel	3.92	402	1.71	26.4	15.8	0.264
CNCT1-05	163	100	0.15	0.010	2.6		14.34	16.1	0.019	2.241	1393	10.36	Channel	3.92	1940	8.25	32.9	19.8	0.329
CNCT1-10	96	100	0.13	0.010	2.6		12.79	20.3	0.011	2.082	856	6.85	Channel	3.04	2464	13.51	33.2	19.9	0.332
CNCT1-15	196	100	0.15	0.010	2.6		14.34	16.1	0.020	2.282	2289	16.72	Channel	2.26	1891	13.95	45.0	27.0	0.450
CNCT1-20	365	100	0.13	0.015	2.6		10.88	16.1	0.005	1.192	1095	15.31	Channel	2.75	7126	43.19	69.4	41.6	0.694

TABLE B 3-3

PROJECT NUMBER CDR10057
TIME OF CONCENTRATION ULTIMATE WATESHED CONDITION SAN FELIPE CREEK

Basin ID	Basin Area (acres)	Overland Flow: $T_o = 0.42 \cdot \frac{(n_0 \cdot L_0)^{0.8}}{R_2^{0.5} \cdot S_o^{0.4}}$					Shallow Concentrated Flow: $V_s = K \cdot S_s^{0.5}$ $T_s = \frac{L_s}{60 \cdot V_s}$					Channelized Flow: $T_h = \frac{L_h}{60 \cdot V_h}$				Time of Concentration: $T_c = T_o + T_s + T_h$ $T_{lag} = 0.6 \cdot T_c$		
		L_o	n_o	S_o	$R_{2\text{-}YR}$	T_o	K	S_s	V_s	L_s	T_s	Flow Type	V_h	L_h	T_h	T_c	T_{lag}	T_{lag}
		ft	NA	ft/ft	inches	minutes	NA	ft/ft	fps	ft	minutes		fps	ft	minutes	minutes	minutes	hours
CVC-05	1067	200	0.13	0.001	2.6	50.37	20.3	0.013	2.315	3124	22.50	Channel	3.59	6603	30.65	103.5	62.1	1.035
CVC-10	489	200	0.011	0.003	2.6	5.21	20.3	0.023	3.079	2088	11.30	Channel	3.55	4596	21.58	38.1	22.9	0.381
CVC-15	121	100	0.13	0.014	2.6	11.18	20.3	0.023	3.079	3193	17.29	N/A				28.5	17.1	0.285
CVC-20	526	171	0.13	0.003	2.6	31.80	20.3	0.012	2.224	2757	20.66	Channel	5.41	4658	14.35	66.8	40.1	0.668
CVC-25	181	100	0.13	0.010	2.6	12.79	20.3	0.044	4.258	784	3.07	Channel	6.20	3334	8.96	24.8	14.9	0.248
CVC-30	202	171	0.13	0.050	2.6	10.32	20.3	0.055	4.761	857	3.00	Channel	7.33	3235	7.36	20.7	12.4	0.207
CVC-35	60	108	0.13	0.028	2.6	9.01	20.3	0.040	4.060	1181	4.85	Channel	2.34	421	3.00	16.9	10.1	0.169
CVC-40	79	100	0.13	0.040	2.6	7.35	20.3	0.052	4.629	450	1.62	Channel	7.53	2703	5.98	14.9	9.0	0.149
CVC-45	234	100	0.13	0.010	2.6	12.79	16.1	0.034	2.969	2046	11.49	Channel	4.38	5176	19.70	44.0	26.4	0.440
CVC-50	289	100	0.015	0.010	2.6	2.27	16.1	0.023	2.442	667	4.55	Channel	6.20	5960	16.02	22.8	13.7	0.228
CVCT1-05	247	100	0.15	0.010	2.6	14.34	17.6	0.007	1.504	4035	44.72	Channel	4.05	4431	18.23	77.3	46.4	0.773
CVCT1-10	59	95	0.011	0.005	2.6	2.25						Channel	4.48	2865	10.66	12.9	7.7	0.129
CVCT1-15	30	95	0.011	0.005	2.6	2.25						Channel	4.36	2855	10.91	13.2	7.9	0.132
SFC-05A	2952	100	0.15	0.005	2.6	18.93	16.1	0.011	1.689	1260	12.44	Channel	4.70	18466	65.48	96.8	58.1	0.968
SFC-05B	2391	100	0.15	0.006	2.6	17.59	16.1	0.013	1.836	3518	31.94	Channel	4.29	19621	76.23	125.8	75.5	1.258
SFC-05C	3927	100	0.15	0.005	2.6	18.93	16.1	0.019	2.219	5984	44.94	Channel	4.92	20820	70.53	134.4	80.6	1.344
SFC-05D	791	98	0.13	0.020	2.6	9.54	20.3	0.019	2.798	1759	10.48	Channel	4.48	12543	46.66	66.7	40.0	0.667
SFC-05E	748	94	0.13	0.010	2.6	12.17	20.3	0.010	2.030	5123	42.06	Channel	3.50	11242	53.53	107.8	64.7	1.078
SFC-05F	257	100	0.13	0.010	2.6	12.79	20.3	0.003	1.166	2586	36.96	Channel	2.67	4668	29.14	78.9	47.3	0.789
SFC-10A	4371	100	0.15	0.005	2.6	18.93	16.1	0.020	2.277	2231	16.33	Channel	5.41	25702	79.18	114.4	68.7	1.144
SFC-10B	2937	100	0.15	0.005	2.6	18.93	16.1	0.040	3.220	1632	8.45	Channel	6.31	15908	42.02	69.4	41.6	0.694
SFC-10C	3912	100	0.13	0.005	2.6	16.88	20.3	0.040	4.060	1301	5.34	Channel	6.59	24530	62.04	84.3	50.6	0.843
SFC-10D	591	94	0.13	0.005	2.6	15.69	20.3	0.015	2.486	4643	31.12	Channel	4.15	7897	31.71	78.5	47.1	0.785
SFC-15	709	100	0.13	0.002	2.6	24.35	16.1	0.018	2.160	2898	22.36	Channel	4.67	4543	16.21	62.9	37.8	0.629
SFC-20	798	107	0.13	0.040	2.6	7.76	16.1	0.024	2.494	2069	13.83	Channel	4.28	6619	25.77	47.4	28.4	0.474
SFC-25	755	97	0.1	0.011	2.6	9.74	18.1	0.026	2.919	2162	12.35	Channel	5.36	9574	29.77	51.9	31.1	0.519
SFC-30	162	95	0.02	0.005	2.6	3.62	20.3	0.010	2.030	4290	35.22	N/A				38.8	23.3	0.388
SFC-35	130	97	0.011	0.005	2.6	2.25	17.5	0.013	1.995	2951	24.65	Channel	3.57	496	2.32	29.2	17.5	0.292
SFC-40	101	110	0.011	0.009	2.6	2.00	18.5	0.010	1.850	2650	23.87	Channel	4.93	2340	7.91	33.8	20.3	0.338
SFC-45	80	100	0.011	0.001	2.6	4.46	16.8	0.016	2.092	1437	11.45	Channel	2.70	1711	10.56	26.5	15.9	0.265
SFC-50	120	100	0.011	0.010	2.6	1.77	17.9	0.019	2.467	1233	8.33	Channel	3.46	3021	14.55	24.7	14.8	0.247
SFC-55	64	95	0.02	0.005	2.6	3.62						Channel	3.56	3622	16.96	20.6	12.3	0.206
SFC-60	176	100	0.13	0.006	2.6	15.69	16.1	0.005	1.115	1755	26.22	Channel	5.34	2508	7.83	49.7	29.8	0.497
SFC-65	520	200	0.011	0.003	2.6	5.38	16.5	0.008	1.476	4258	48.09	Channel	5.96	1676	4.69	58.2	34.9	0.582
SFC-70	101	100	0.06	0.013	2.6	6.20	16.1	0.022	2.388	415	2.90	Channel	3.22	3419	17.70	26.8	16.1	0.268
SFC-75	591	98	0.1	0.005	2.6	13.36	17.4	0.006	1.348	4980	61.58	Channel	6.80	2769	6.79	81.7	49.0	0.817
SFCT1-05	242	100	0.011	0.010	2.6	1.77						Channel	4.96	6172	20.74	22.5	13.5	0.225
SFCT1-10	185	100	0.011	0.004	2.6	2.56	20.3	0.018	2.720	2228	13.65	Channel	4.49	1779	6.60	22.8	13.7	0.228
SFCT1-15	113	100	0.02	0.008	2.6	3.13	20.3	0.010	2.045	2760	22.50	Channel	3.87	1713	7.38	33.0	19.8	0.330
SFCT1-20	85	100	0.011	0.020	2.6	1.34	20.3	0.015	2.521	2593	17.14	Channel	2.46	1069	7.24	25.7	15.4	0.257
SFCT1-25	249	100	0.03	0.005	2.6	5.22						Channel	3.32	8079	40.56	45.8	27.5	0.458
SFCT1-30	190	100	0.011	0.020	2.6	1.34	20.3	0.015	2.515	2736	18.13	Channel	3.05	2038	11.14	30.6	18.4	0.306
SFCT1-35	76	100	0.011	0.300	2.6	0.46	20.3	0.015	2.492	398	2.66	Channel	1.96	3366	28.62	31.7	19.0	0.317
SFCT1-40	138	100	0.02	0.015	2.6	2.43	20.3	0.014	2.374	5556	39.00	Channel	2.00	1473	12.28	53.7	32.2	0.537
SFCT1-45	557	100	0.02	0.020	2.6	2.17	16.1	0.009	1.564	10603	113.02	Channel	2.08	2427	19.45	134.6	80.8	1.346
SFCT1-50	338	100	0.03	0.010	2.6	3.96	20.3	0.010	2.016	710	5.87	Channel	3.57	6912	32.27	42.1	25.3	0.421
SFCT1-55	243	100	0.011	0.020	2.6	1.34	20.3	0.007	1.694	4023	39.59	Channel	2.71	3591	22.08	63.0	37.8	0.630
SFCT1-60	221	100	0.02	0.004	2.6	4.13	20.3	0.011	2.103	2423	19.20	Channel	2.03	2948	24.20	47.5	28.5	0.475
SFCT1-65	363	100	0.02	0.020	2.6	2.17	17.0	0.010	1.682	6744	66.84	Channel	2.72	3499	21.44	90.4	54.3	0.904
SFCT1-70	143	100	0.02	0.005	2.6	3.78	16.1	0.009	1.506	3316	36.71	Channel	2.64	1775	11.21	51.7	31.0	0.517

TABLE B 3-4

PROJECT NUMBER CDR10057
TIME OF CONCENTRATION ULTIMATE WATESHED CONDITION CIENEGAS CREEK

Basin ID	Basin Area (acres)	Overland Flow: $T_o = 0.42 \cdot \frac{(n_0 \cdot L_0)^{0.8}}{R_2^{0.5} \cdot S_o^{0.4}}$					Shallow Concentrated Flow: $V_s = K \cdot S_s^{0.5}$ $T_s = \frac{L_s}{60 \cdot V_s}$					Channelized Flow: $T_h = \frac{L_h}{60 \cdot V_h}$				Time of Concentration: $T_c = T_o + T_s + T_h$ $T_{lag} = 0.6 \cdot T_c$		
		L_o	n_o	S_o	$R_{2\text{-}YR}$	T_o	K	S_s	V_s	L_s	T_s	Flow Type	V_h	L_h	T_h	T_c	T_{lag}	T_{lag}
		ft	NA	ft/ft	inches	minutes	NA	ft/ft	fps	ft	minutes		fps	ft	minutes	minutes	minutes	hours
CB-05	2090	100	0.13	0.020	2.6	9.69	20.3	0.038	3.946	979	4.13	Channel	5.46	17539	53.54	67.4	40.4	0.674
CB-10	84	100	0.13	0.010	2.6	12.79	20.3	0.020	2.883	793	4.58	Channel	4.61	1493	5.40	22.8	13.7	0.228
CB-15	146	100	0.13	0.005	2.6	16.88	20.3	0.003	1.169	5125	73.06	N/A				89.9	54.0	0.899
CB-20	367	100	0.13	0.010	2.6	12.79	20.3	0.009	1.922	10261	88.97	N/A				101.8	61.1	1.018
CB-25	223	100	0.13	0.005	2.6	16.88	20.3	0.003	1.131	5474	80.65	N/A				97.5	58.5	0.975
CB-30	158	100	0.15	0.020	2.6	10.87	20.3	0.007	1.683	1600	15.84	Channel	2.43	3514	24.10	50.8	30.5	0.508
CB-35	272	100	0.13	0.010	2.6	12.79	20.3	0.004	1.249	5287	70.58	N/A				83.4	50.0	0.834
CB-40	208	100	0.15	0.010	2.6	14.34	16.1	0.010	1.618	4655	47.96	N/A				62.3	37.4	0.623
CB-45	146	100	0.15	0.020	2.6	10.87	18.2	0.033	3.290	1377	6.98	Channel	3.01	2264	12.54	30.4	18.2	0.304
CB-50	119	100	0.13	0.020	2.6	9.69	17	0.013	1.956	831	7.08	Channel	2.60	2131	13.66	30.4	18.3	0.304
CB-55	144	100	0.15	0.023	2.6	10.37	16.1	0.023	2.450	1728	11.76	Channel	3.18	2833	14.85	37.0	22.2	0.370
CB-60	289	100	0.13	0.015	2.6	10.88	20.3	0.020	2.899	1765	10.15	Channel	3.23	4174	21.54	42.6	25.5	0.426
CB-65	178	100	0.15	0.020	2.6	10.87	16.1	0.024	2.514	738	4.89	Channel	4.01	4172	17.34	33.1	19.9	0.331
CB-70	147	100	0.15	0.010	2.6	14.34	16.1	0.026	2.598	883	5.66	Channel	4.29	3748	14.56	34.6	20.7	0.346
CB-75	132	100	0.13	0.010	2.6	12.79	18.2	0.016	2.294	6358	46.20	N/A				59.0	35.4	0.590
CBT1-05	73	125	0.15	0.010	2.6	17.15	16.1	0.022	2.409	1072	7.42	Channel	4.17	1351	5.40	30.0	18.0	0.300
CBT1-10	89	100	0.13	0.015	2.6	10.88	18.2	0.026	2.945	1184	6.70	Channel	3.91	1872	7.98	25.6	15.3	0.256
CBT1-15	230	125	0.15	0.015	2.6	14.58	18.2	0.016	2.273	513	3.76	Channel	5.87	5479	15.56	33.9	20.3	0.339
CBT1-20	136	100	0.13	0.010	2.6	12.79	18.2	0.020	2.562	4492	29.22	N/A				42.0	25.2	0.420
CBT4-05	152	100	0.15	0.010	2.6	14.34	16.1	0.020	2.305	2293	16.58	Channel	3.17	1992	10.47	41.4	24.8	0.414
CBT4-10	86	100	0.13	0.015	2.6	10.88	20.3	0.016	2.534	1155	7.60	Channel	3.78	2154	9.50	28.0	16.8	0.280
CBT5-05	304	100	0.13	0.015	2.6	10.88	20.3	0.008	1.846	3145	28.40	Channel	2.75	2294	13.90	53.2	31.9	0.532
CBT5-10	89	100	0.13	0.010	2.6	12.79	20.3	0.012	2.208	1268	9.57	Channel	2.33	1992	14.25	36.6	22.0	0.366
CNC-05	1144	175	0.15	0.020	2.6	17.01	16.1	0.018	2.155	2791	21.59	Channel	4.95	8655	29.14	67.7	40.6	0.677
CNC-10	1675	100	0.13	0.015	2.6	10.88	20.3	0.011	2.144	5827	45.30	Channel	2.77	7930	47.71	103.9	62.3	1.039
CNC-15	231	150	0.13	0.030	2.6	11.40	20.3	0.033	3.709	599	2.69	Channel	6.12	4223	11.50	25.6	15.4	0.256
CNC-20	723	150	0.13	0.010	2.6	17.69	20.3	0.004	1.208	3388	46.74	Channel	2.77	5989	36.03	100.5	60.3	1.005
CNC-25	646	150	0.13	0.010	2.6	17.69	20.3	0.015	2.449	2061	14.03	Channel	4.22	10383	41.01	72.7	43.6	0.727
CNC-30	312	225	0.19	0.010	2.6	33.15	16.1	0.005	1.190	3112	43.59	Channel	4.45	4669	17.49	94.2	56.5	0.942
CNC-35	816	150	0.13	0.010	2.6	17.69	20.3	0.017	2.683	1946	12.09	Channel	6.77	6513	16.03	45.8	27.5	0.458
CNC-40	129	100	0.19	0.020	2.6	13.13	16.1	0.030	2.786	2838	16.98	Channel	2.38	2930	20.52	50.6	30.4	0.506
CNC-45	100	100	0.19	0.010	2.6	17.33	20.3	0.024	3.135	1342	7.14	Channel	2.61	2212	14.13	38.6	23.2	0.386
CNC-50	252	150	0.15	0.010	2.6	19.84	16.1	0.025	2.562	1895	12.33	Channel	2.73	5511	33.64	65.8	39.5	0.658
CNC-55	167	100	0.15	0.010	2.6	14.34	16.1	0.028	2.700	1209	7.46	Channel	2.35	3846	27.28	49.1	29.4	0.491
CNC-60	87	100	0.13	0.008	2.6	14.35	20.3	0.017	2.642	1004	6.33	Channel	3.30	3202	16.17	36.9	22.1	0.369
CNC-65	579	100	0.13	0.020	2.6	9.69	20.3	0.019	2.817	1506	8.91	Channel	3.10	9352	50.28	68.9	41.3	0.689
CNC-70	408	100	0.13	0.030	2.6	8.24	20.3	0.020	2.882	3224	18.64	Channel	1.95	4980	42.56	69.4	41.7	0.694
CNC-75	317	100	0.13	0.020	2.6	9.69	20.3	0.030	3.523	1627	7.70	Channel	2.41	5930	41.01	58.4	35.0	0.584
CNC-80	235	100	0.13	0.020	2.6	9.69	18.2	0.030	3.139	2118	11.25	Channel	2.16	3590	27.70	48.6	29.2	0.486
CNC-85	64	100	0.13	0.03	2.6	8.24	17.2	0.017	2.274	3775	27.66	N/A				35.9	21.5	0.359
CNC-90	516	100	0.13	0.040	2.6	7.35	17.2	0.016	2.204	5726	43.30	Channel	4.37	4284	16.34	67.0	40.2	0.670
CNCT1-04	46	100	0.15	0.010	2.6	14.34	16.1	0.019	2.241	1393	10.36	Channel	3.92	402	1.71	26.4	15.8	0.264
CNCT1-05	163	100	0.15	0.010	2.6	14.34	16.1	0.019	2.241	1393	10.36	Channel	3.92	1940	8.25	32.9	19.8	0.329
CNCT1-10	96	100	0.13	0.010	2.6	12.79	20.3	0.011	2.082	856	6.85	Channel	3.04	2464	13.51	33.2	19.9	0.332
CNCT1-15	196	100	**0.13**	0.010	2.6	12.79	20.3	0.020	2.878	2289	13.26	Channel	2.26	1891	13.95	40.0	24.0	0.400
CNCT1-20	365	100	0.13	0.015	2.6	10.88	20.3	0.005	1.503	1095	12.15	Channel	2.75	7126	43.19	66.2	39.7	0.662

TABLE B 3-5
WEIGHTED OPEN SPACE CN CALCULATIONS BY SUBWATERSHED
CN Calculations AMC II for good condition
SAN FELIPE WATERSHED

Basin_ID	Vegetative	HYDGRP	Poly_Area (ac)	CN	WT_CN
CVC-05	F	B	0.9224	72	0.062268081
CVC-05	F	D	3.4658	88	0.285956425
CVC-05	P	B	371.3997	79	27.50947675
CVC-05	P	D	690.7746	92	59.58512811
CVC-05 Total			**1066.56**		**87.4**
CVC-10	F	B	11.4558	72	1.685785866
CVC-10	F	D	65.4537	88	11.77230113
CVC-10	P	B	131.6002	79	21.24849278
CVC-10	P	D	280.7681	92	52.79345435
CVC-10 Total			**489.28**		**87.5**
CVC-15	F	B	0.1022	72	0.060876112
CVC-15	P	B	50.5354	79	33.02830693
CVC-15	P	D	70.2374	92	53.45886908
CVC-15 Total			**120.88**		**86.5**
CVC-20	F	B	9.9756	72	1.365015291
CVC-20	F	D	0.0026	88	0.000434833
CVC-20	P	B	168.7182	79	25.33115651
CVC-20	P	D	347.4832	92	60.75578453
CVC-20 Total			**526.18**		**87.5**
CVC-25	F	B	12.594	72	5.021903761
CVC-25	P	B	81.539	79	35.67505674
CVC-25	P	D	86.4296	92	44.03748728
CVC-25 Total			**180.56**		**84.7**
CVC-30	F	B	10.3076	72	3.671164518
CVC-30	P	B	73.3166	79	28.65122544
CVC-30	P	D	118.5315	92	53.94303799
CVC-30 Total			**202.16**		**86.3**
CVC-35	F	B	9.4312	72	11.38161333
CVC-35	P	B	27.7401	79	36.73156983
CVC-35	P	D	22.4905	92	34.68097624
CVC-35 Total			**59.66**		**82.8**
CVC-40	P	D	78.8866	92	92
CVC-40 Total			**78.89**		**92.0**

Basin_ID	Vegetative	HYDGRP	Poly_Area (ac)	CN	WT_CN
CVC-45	F	B	27.972	72	8.599276101
CVC-45	F	D	35.6374	88	13.39043116
CVC-45	P	B	58.0827	79	19.5920448
CVC-45	P	D	112.5118	92	44.19689681
CVC-45 Total			**234.20**		**85.8**
CVC-50	F	B	0.114	72	0.028448289
CVC-50	F	D	0.2197	88	0.067008753
CVC-50	P	B	115.5232	79	31.63115933
CVC-50	P	D	172.6666	92	55.05730798
CVC-50 Total			**288.52**		**86.8**
CVCT1-05	P	B	217.8418	79	69.63555878
CVCT1-05	P	D	29.2949	92	10.90542522
CVCT1-05 Total			**247.14**		**80.5**
CVCT1-10	P	B	57.7898	79	77.46083094
CVCT1-10	P	D	1.1482	92	1.792293949
CVCT1-10 Total			**58.94**		**79.3**
CVCT1-15	P	B	30.2688	79	79
CVCT1-15 Total			**30.27**		**79.00**
SFC-05A	F	B	306.5162	72	7.475253554
SFC-05A	F	D	107.7636	88	3.212142194
SFC-05A	P	B	168.1456	79	4.499379212
SFC-05A	P	D	2369.8714	92	73.8503582
SFC-05A Total			**2952.30**		**89.0**
SFC-05B	F	B	102.3685	72	3.086875623
SFC-05B	F	D	4.9073	88	0.18086127
SFC-05B	P	B	874.4264	79	28.93147978
SFC-05B	P	D	1405.9976	92	54.17422434
SFC-05B Total			**2387.70**		**86.4**
SFC-05C	F	B	79.1223	72	1.452052974
SFC-05C	G	B	162.558	61	2.527488821
SFC-05C	G	D	5.2953	83	0.112026231
SFC-05C	P	B	2201.2645	79	44.32516715
SFC-05C	P	D	1475.0367	92	34.58929532
SFC-05C Total			**3923.28**		**83.0**
SFC-05D	G	B	280.4641	61	21.61594874
SFC-05D	G	D	29.1387	83	3.055733341
SFC-05D	P	B	278.5845	79	27.8068138
SFC-05D	P	D	203.2798	92	23.62921208

Basin_ID	Vegetative	HYDGRP	Poly_Area (ac)	CN	WT_CN
SFC-05D Total			**791.47**		**76.1**
SFC-05E	G	B	1.3138	61	0.107109683
SFC-05E	P	B	414.692	79	43.78470127
SFC-05E	P	D	332.216	92	40.84867883
SFC-05E Total			**748.22**		**84.7**
SFC-05F	F	B	17.3959	72	4.878627991
SFC-05F	G	B	8.3405	61	1.981710571
SFC-05F	G	D	5.7436	83	1.856866083
SFC-05F	P	B	79.7066	79	24.52673166
SFC-05F	P	D	145.5464	92	52.15639906
SFC-05F Total			**256.73**		**85.4**
SFC-10A	P	B	1130.2507	79	20.42693445
SFC-10A	P	D	3240.9292	92	68.21167127
SFC-10A Total			**4371.18**		**88.6**
SFC-10B	F	A	92.9994	55	1.742195383
SFC-10B	F	B	373.1869	72	9.151934621
SFC-10B	F	D	32.9033	88	0.986225328
SFC-10B	P	A	28.0812	63	0.602573786
SFC-10B	P	B	515.9471	79	13.8830948
SFC-10B	P	D	1892.8139	92	59.31298297
SFC-10B Total			**2935.93**		**85.7**
SFC-10C	F	A	78.8967	55	1.109367815
SFC-10C	F	B	712.9007	72	13.12246949
SFC-10C	F	D	41.4864	88	0.93334554
SFC-10C	P	A	79.7228	63	1.284035784
SFC-10C	P	B	1708.3072	79	34.50222449
SFC-10C	P	D	1290.2099	92	30.34605435
SFC-10C Total			**3911.52**		**81.3**
SFC-10D	F	A	22.5426	55	2.099566605
SFC-10D	F	B	139.6392	72	17.02561508
SFC-10D	F	D	19.9668	88	2.975459901
SFC-10D	P	B	289.8104	79	38.77073369
SFC-10D	P	D	118.5643	92	18.47160916
SFC-10D Total			**590.52**		**79.3**
SFC-15	F	A	35.2498	55	2.736051105
SFC-15	F	B	208.4794	72	21.1836359
SFC-15	F	D	2.8623	88	0.355469776
SFC-15	P	B	239.7001	79	26.72392012
SFC-15	P	D	222.2986	92	28.86219877

Basin_ID	Vegetative	HYDGRP	Poly_Area (ac)	CN	WT_CN
SFC-15 Total			**708.59**		**79.9**
SFC-20	F	A	6.1173	55	0.421593485
SFC-20	F	B	72.831	72	6.570829395
SFC-20	F	D	2.1653	88	0.238765827
SFC-20	G	B	75.0671	61	5.737872522
SFC-20	P	B	366.0786	79	36.23872047
SFC-20	P	D	275.7879	92	31.79321574
SFC-20 Total			**798.05**		**81.0**
SFC-25	G	B	41.5443	61	3.35443871
SFC-25	P	B	676.4913	79	70.7404613
SFC-25	P	D	37.4416	92	4.559537659
SFC-25 Total			**755.48**		**78.7**
SFC-30	G	B	22.3442	61	8.389000838
SFC-30	P	B	140.13	79	68.13555629
SFC-30 Total			**162.47**		**76.5**
SFC-35	G	B	43.6163	61	20.44964017
SFC-35	P	B	86.4884	79	52.51603977
SFC-35 Total			**130.10**		**73.0**
SFC-40	G	B	27.7602	61	16.80011072
SFC-40	P	B	73.0351	79	57.24247956
SFC-40 Total			**100.80**		**74.0**
SFC-45	G	B	64.4177	61	48.9667605
SFC-45	P	B	15.8303	79	15.58412993
SFC-45 Total			**80.25**		**64.6**
SFC-50	P	B	119.1429	79	78.55658872
SFC-50	P	D	0.6725	92	0.516377694
SFC-50 Total			**119.82**		**79.1**
SFC-55	P	B	64.1154	79	79
SFC-55 Total			**64.12**		**79.0**
SFC-60	G	B	48.7913	61	16.86398635
SFC-60	P	B	92.262	79	41.29885141
SFC-60	P	D	35.4334	92	18.47092614
SFC-60 Total			**176.49**		**76.6**
SFC-65	G	B	249.6027	61	29.29935004
SFC-65	G	D	0.1286	83	0.020539881
SFC-65	P	B	8.1431	79	1.237928985

Basin_ID	Vegetative	HYDGRP	Poly_Area (ac)	CN	WT_CN
SFC-65	P	D	261.7878	92	46.34641042
SFC-65 Total			**519.66**		**76.9**
SFC-70	G	B	74.3505	61	45.01515598
SFC-70	P	B	12.1392	79	9.518361367
SFC-70	P	D	14.2626	92	13.02361534
SFC-70 Total			**100.75**		**67.6**
SFC-75	G	A	15.9889	49	1.250493761
SFC-75	G	B	442.9368	61	43.12592882
SFC-75	P	A	31.469	63	3.164392561
SFC-75	P	B	134.5722	79	16.96872872
SFC-75	P	D	1.5505	92	0.227680827
SFC-75 Total			**626.52**		**64.7**
SFCT1-05	P	B	182.6645	79	59.55843047
SFCT1-05	P	D	59.6269	92	22.64081515
SFCT1-05 Total			**242.29**		**82.2**
SFCT1-10	P	B	165.8304	79	70.81168955
SFCT1-10	P	D	19.1758	92	9.535753937
SFCT1-10 Total			**185.01**		**80.3**
SFCT1-15	P	B	112.756	79	79
SFCT1-15 Total			**112.76**		**79.0**
SFCT1-20	G	B	3.3292	61	2.381343361
SFCT1-20	P	B	81.951	79	75.91605779
SFCT1-20 Total			**85.28**		**78.3**
SFCT1-25	P	B	235.1626	79	74.77492632
SFCT1-25	P	D	13.2875	92	4.920301936
SFCT1-25 Total			**248.45**		**79.7**
SFCT1-30	G	B	6.7785	61	2.176195704
SFCT1-30	G	D	3.6009	83	1.572981687
SFCT1-30	P	B	118.0848	79	49.09707313
SFCT1-30	P	D	61.541	92	29.79798448
SFCT1-30 Total			**190.01**		**82.6**
SFCT1-35	G	B	67.4569	61	54.39756149
SFCT1-35	G	D	8.1874	83	8.983536124
SFCT1-35 Total			**75.64**		**63.4**
SFCT1-40	G	B	58.7842	61	26.04060952
SFCT1-40	G	D	28.3148	83	17.06680745

Basin_ID	Vegetative	HYDGRP	Poly_Area (ac)	CN	WT_CN
SFCT1-40	P	B	14.8261	79	8.505791141
SFCT1-40	P	D	35.7767	92	23.90280149
SFCT1-40 Total			**137.70**		**75.5**
SFCT1-45	G	B	483.1706	61	52.93305685
SFCT1-45	G	D	11.6728	83	1.740002116
SFCT1-45	P	B	32.938	79	4.67327089
SFCT1-45	P	D	29.0238	92	4.795553491
SFCT1-45 Total			**556.81**		**64.1**
SFCT1-50	G	B	53.4162	61	9.649940221
SFCT1-50	P	B	284.2427	79	66.50253644
SFCT1-50 Total			**337.66**		**76.2**
SFCT1-55	G	B	111.7608	61	28.0585057
SFCT1-55	P	B	131.2103	79	42.66190273
SFCT1-55 Total			**242.97**		**70.7**
SFCT1-60	G	B	129.174	61	35.64479757
SFCT1-60	P	B	91.8853	79	32.83706544
SFCT1-60 Total			**221.06**		**68.5**
SFCT1-65	G	B	322.5928	61	54.09879506
SFCT1-65	P	B	41.1521	79	8.937626067
SFCT1-65 Total			**363.74**		**63.0**
SFCT1-70	G	A	11.6186	49	3.978730675
SFCT1-70	G	B	129.5196	61	55.21537061
SFCT1-70	P	B	1.9505	79	1.076880984
SFCT1-70 Total			**143.09**		**60.3**

TABLE B 3-6

LANDUSE CLASSIFICATION AND PERCENT IMPERVIOUS
SAN FELIPE DRAINAGE AREA - EXISTING CONDITIONS

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
CVC-05	2	Open space - Fair	0	27.293	0.000
	3	Open space - Poor	0	427.226	0.000
	7	Single Fam Res - Estate >10 ac	5	14.967	0.070
	8	Single Fam Res - Low Den- 1 ac	20	11.720	0.220
	9	Single Fam Res - Med Den - 1/4 ac	38	361.747	12.883
	10	Single Fam Res - High Den - < 1/8 ac	75	43.420	3.052
	12	Commercial	85	41.211	3.283
	14	Streets, Roads, Parking	98	94.361	8.667
	15	Transpo (including pervious ROW)	65	44.616	2.718
CVC-05 Total				**1066.6**	**30.9**
CVC-10	3	Open space - Poor	0	332.071	0.000
	7	Single Fam Res - Estate >10 ac	5	0.762	0.008
	9	Single Fam Res - Med Den - 1/4 ac	38	30.908	2.402
	10	Single Fam Res - High Den - < 1/8 ac	75	9.513	1.459
	12	Commercial	85	65.021	11.302
	14	Streets, Roads, Parking	98	8.309	1.665
	15	Transpo (including pervious ROW)	65	42.695	5.675
CVC-10 Total				**489.3**	**22.5**
CVC-15	3	Open space - Poor	0	83.404	0.000
	10	Single Fam Res - High Den - < 1/8 ac	75	6.179	3.830
	14	Streets, Roads, Parking	98	4.065	3.292
	15	Transpo (including pervious ROW)	65	27.227	14.626
CVC-15 Total				**120.9**	**21.7**
CVC-20	2	Open space - Fair	0	7.094	0.000
	3	Open space - Poor	0	472.265	0.000
	7	Single Fam Res - Estate >10 ac	5	21.485	0.204
	10	Single Fam Res - High Den - < 1/8 ac	75	9.330	1.330
	14	Streets, Roads, Parking	98	4.467	0.832
	15	Transpo (including pervious ROW)	65	11.538	1.426
CVC-20 Total				**526.2**	**3.8**
CVC-25	2	Open space - Fair	0	14.566	0.000
	3	Open space - Poor	0	132.870	0.000
	10	Single Fam Res - High Den - < 1/8 ac	75	23.010	9.534
	14	Streets, Roads, Parking	98	10.117	5.478
CVC-25 Total				**180.6**	**15.0**
CVC-30	2	Open space - Fair	0	11.496	0.000
	3	Open space - Poor	0	131.140	0.000
	8	Single Fam Res - Low Den- 1 ac	20	0.642	0.064
	10	Single Fam Res - High Den - < 1/8 ac	75	37.749	14.016
	11	Mult Fam Res	75	1.313	0.487
	14	Streets, Roads, Parking	98	19.816	9.614
CVC-30 Total				**202.2**	**24.2**
	2	Open space - Fair	0	13.324	0.000
	3	Open space - Poor	0	28.571	0.000

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
CVC-35	10	Single Fam Res - High Den - < 1/8 ac	75	8.758	10.948
	11	Mult Fam Res	75	1.395	1.743
	12	Commercial	85	0.624	0.884
	14	Streets, Roads, Parking	98	5.556	9.076
	15	Transpo (including pervious ROW)	65	1.433	1.553
CVC-35 Total				**59.7**	**24.2**
CVC-40	3	Open space - Poor	0	73.013	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	0.004	0.002
	15	Transpo (including pervious ROW)	65	5.870	4.830
CVC-40 Total				**78.9**	**4.8**
CVC-45	3	Open space - Poor	0	158.183	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	18.145	2.947
	10	Single Fam Res - High Den - < 1/8 ac	75	26.278	8.422
	11	Mult Fam Res	75	6.838	2.192
	14	Streets, Roads, Parking	98	15.159	6.349
	15	Transpo (including pervious ROW)	65	9.602	2.667
CVC-45 Total				**234.2**	**22.6**
CVC-50	1	Open space - Good	0	3.426	0.000
	2	Open space - Fair	0	27.261	0.000
	3	Open space - Poor	0	214.825	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	5.147	0.677
	10	Single Fam Res - High Den - < 1/8 ac	75	24.896	6.461
	14	Streets, Roads, Parking	98	12.968	4.397
CVC-50 Total				**288.5**	**11.5**
CVCT1-05	1	Open space - Good	0	3.292	0.000
	10	Single Fam Res - High Den - < 1/8 ac	75	152.295	46.243
	12	Commercial	85	8.178	2.814
	14	Streets, Roads, Parking	98	72.311	28.690
	15	Transpo (including pervious ROW)	65	11.061	2.911
CVCT1-05 Total				**247.1**	**80.7**
CVCT1-10	3	Open space - Poor	0	0.005	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	0.092	0.059
	10	Single Fam Res - High Den - < 1/8 ac	75	26.151	33.243
	12	Commercial	85	8.183	11.789
	14	Streets, Roads, Parking	98	20.087	33.365
	15	Transpo (including pervious ROW)	65	4.420	4.869
CVCT1-10 Total				**58.9**	**83.3**
CVCT1-15	3	Open space - Poor	0	0.639	0.000
	10	Single Fam Res - High Den - < 1/8 ac	75	12.901	32.252
	12	Commercial	85	6.386	18.095
	14	Streets, Roads, Parking	98	10.342	33.784
CVCT1-15 Total				**30.3**	**84.1**
SFC-05A	3	Open space - Poor	0	2952.297	0.000
SFC-05A Total				**2952.3**	**0.0**
SFC-05B	3	Open space - Poor	0	2387.700	0.000
SFC-05B Total				**2387.7**	**0.0**
SFC-05C	2	Open space - Fair	0	12.730	0.000
	3	Open space - Poor	0	3430.101	0.000
	7	Single Fam Res - Estate >10 ac	5	375.163	0.478

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
SFC-05C	9	Single Fam Res - Med Den - 1/4 ac	38	68.035	0.659
	10	Single Fam Res - High Den - < 1/8 ac	75	5.761	0.110
	14	Streets, Roads, Parking	98	31.485	0.787
SFC-05C Total				**3923.3**	**2.0**
SFC-05D	3	Open space - Poor	0	788.701	0.000
SFC-05D	7	Single Fam Res - Estate >10 ac	5	2.766	0.017
SFC-05D Total				**791.5**	**0.0**
SFC-05E	3	Open space - Poor	0	748.222	0.000
SFC-05E Total				**748.2**	**0.0**
SFC-05F	2	Open space - Fair	0	0.082	0.000
	3	Open space - Poor	0	254.871	0.000
	14	Streets, Roads, Parking	98	1.779	0.679
SFC-05F Total				**256.7**	**0.7**
SFC-10A	3	Open space - Poor	0	4371.180	0.000
SFC-10A Total				**4371.2**	**0.0**
SFC-10B	3	Open space - Poor	0	2924.412	0.000
	6	Open Water	0	11.520	0.000
SFC-10B Total				**2935.9**	**0.0**
SFC-10C	3	Open space - Poor	0	3740.220	0.000
	8	Single Fam Res - Low Den- 1 ac	20	166.472	0.851
	14	Streets, Roads, Parking	98	4.832	0.121
SFC-10C Total				**3911.5**	**1.0**
SFC-10D	3	Open space - Poor	0	566.839	0.000
	7	Single Fam Res - Estate >10 ac	5	20.669	0.175
	14	Streets, Roads, Parking	98	3.014	0.500
SFC-10D Total				**590.5**	**0.7**
SFC-15	2	Open space - Fair	0	191.880	0.000
	3	Open space - Poor	0	420.501	0.000
	7	Single Fam Res - Estate >10 ac	5	71.727	0.506
	14	Streets, Roads, Parking	98	24.483	3.384
SFC-15 Total				**708.6**	**3.9**
SFC-20	1	Open space - Good	0	74.114	0.000
	2	Open space - Fair	0	75.646	0.000
	3	Open space - Poor	0	370.958	0.000
	7	Single Fam Res - Estate >10 ac	5	6.810	0.043
	9	Single Fam Res - Med Den - 1/4 ac	38	72.195	3.438
	10	Single Fam Res - High Den - < 1/8 ac	75	43.690	4.106
	12	Commercial	85	87.632	9.334
	14	Streets, Roads, Parking	98	43.330	5.321
	15	Transpo (including pervious ROW)	65	23.672	1.928
SFC-20 Total				**798.0**	**24.2**
SFC-25	1	Open space - Good	0	22.042	0.000
	2	Open space - Fair	0	14.002	0.000
	3	Open space - Poor	0	47.300	0.000
	6	Open Water	0	4.226	0.000
	8	Single Fam Res - Low Den- 1 ac	20	0.539	0.014
	9	Single Fam Res - Med Den - 1/4 ac	38	17.717	0.892
	10	Single Fam Res - High Den - < 1/8 ac	75	222.863	22.139
	11	Mult Fam Res	75	2.827	0.281

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
	12	Commercial	85	168.743	18.998
	13	Industrial	80	23.889	2.531
	14	Streets, Roads, Parking	98	196.806	25.546
	15	Transpo (including pervious ROW)	65	34.522	2.972
SFC-25 Total				**755.5**	**73.4**
SFC-30	1	Open space - Good	0	1.119	0.000
	2	Open space - Fair	0	2.865	0.000
	3	Open space - Poor	0	0.028	0.000
	6	Open Water	0	2.097	0.000
	8	Single Fam Res - Low Den- 1 ac	20	4.549	0.562
	9	Single Fam Res - Med Den - 1/4 ac	38	0.009	0.002
	10	Single Fam Res - High Den - < 1/8 ac	75	87.861	40.676
	12	Commercial	85	16.373	8.591
	13	Industrial	80	0.083	0.041
	14	Streets, Roads, Parking	98	45.242	27.369
	15	Transpo (including pervious ROW)	65	2.249	0.902
SFC-30 Total				**162.5**	**78.1**
SFC-35	3	Open space - Poor	0	30.053	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	9.263	2.708
	10	Single Fam Res - High Den - < 1/8 ac	75	57.429	33.132
	12	Commercial	85	4.215	2.756
	14	Streets, Roads, Parking	98	29.145	21.971
SFC-35 Total				**130.1**	**60.6**
SFC-40	1	Open space - Good	0	2.176	0.000
	3	Open space - Poor	0	19.585	0.000
	5	Woods	0	0.005	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	5.488	2.065
	10	Single Fam Res - High Den - < 1/8 ac	75	22.212	16.494
	12	Commercial	85	22.421	18.869
	13	Industrial	80	2.622	2.077
	14	Streets, Roads, Parking	98	25.043	24.299
	15	Transpo (including pervious ROW)	65	1.245	0.801
SFC-40 Total				**100.8**	**64.6**
SFC-45	1	Open space - Good	0	11.034	0.000
	3	Open space - Poor	0	3.649	0.000
	5	Woods	0	4.511	0.000
	8	Single Fam Res - Low Den- 1 ac	20	14.776	3.694
	9	Single Fam Res - Med Den - 1/4 ac	38	13.842	6.575
	10	Single Fam Res - High Den - < 1/8 ac	75	20.278	19.010
	12	Commercial	85	1.711	1.818
	14	Streets, Roads, Parking	98	10.446	12.796
SFC-45 Total				**80.2**	**43.9**
SFC-50	1	Open space - Good	0	13.592	0.000
	2	Open space - Fair	0	0.036	0.000
	3	Open space - Poor	0	49.033	0.000
	8	Single Fam Res - Low Den- 1 ac	20	2.656	0.443
	9	Single Fam Res - Med Den - 1/4 ac	38	2.365	0.749
	10	Single Fam Res - High Den - < 1/8 ac	75	35.156	21.972
	12	Commercial	85	1.648	1.168

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
	14	Streets, Roads, Parking	98	15.329	12.519
SFC-50 Total				**119.8**	**36.9**
SFC-55	2	Open space - Fair	0	3.453	0.000
	8	Single Fam Res - Low Den- 1 ac	20	0.895	0.280
	10	Single Fam Res - High Den - < 1/8 ac	75	34.902	40.901
	12	Commercial	85	7.649	10.159
	14	Streets, Roads, Parking	98	17.216	26.362
SFC-55 Total				**64.1**	**77.7**
SFC-60	1	Open space - Good	0	52.510	0.000
	2	Open space - Fair	0	2.052	0.000
	3	Open space - Poor	0	95.726	0.000
	5	Woods	0	15.937	0.000
	8	Single Fam Res - Low Den- 1 ac	20	4.241	0.482
	10	Single Fam Res - High Den - < 1/8 ac	75	4.252	1.812
	14	Streets, Roads, Parking	98	1.769	0.985
SFC-60 Total				**176.5**	**3.3**
SFC-65	1	Open space - Good	0	55.928	0.000
	2	Open space - Fair	0	26.121	0.000
	3	Open space - Poor	0	268.749	0.000
	5	Woods	0	4.855	0.000
	6	Open Water	0	8.134	0.000
	8	Single Fam Res - Low Den- 1 ac	20	69.820	2.685
	9	Single Fam Res - Med Den - 1/4 ac	38	47.124	3.444
	10	Single Fam Res - High Den - < 1/8 ac	75	13.609	1.963
	14	Streets, Roads, Parking	98	25.321	4.772
SFC-65 Total				**519.7**	**12.9**
SFC-70	1	Open space - Good	0	7.786	0.000
	2	Open space - Fair	0	11.974	0.000
	3	Open space - Poor	0	41.964	0.000
	5	Woods	0	19.964	0.000
	8	Single Fam Res - Low Den- 1 ac	20	9.935	1.967
	13	Industrial	80	9.129	7.231
SFC-70 Total				**100.8**	**9.2**
SFC-75	1	Open space - Good	0	118.048	0.000
	2	Open space - Fair	0	171.776	0.000
	3	Open space - Poor	0	22.470	0.000
	5	Woods	0	82.864	0.000
	6	Open Water	0	5.526	0.000
	7	Single Fam Res - Estate >10 ac	5	23.716	0.189
	8	Single Fam Res - Low Den- 1 ac	20	140.179	4.471
	9	Single Fam Res - Med Den - 1/4 ac	38	22.795	1.382
	10	Single Fam Res - High Den - < 1/8 ac	75	1.404	0.168
	13	Industrial	80	17.565	2.241
	14	Streets, Roads, Parking	98	18.002	2.814
	15	Transpo (including pervious ROW)	65	2.172	0.225
SFC-75 Total				**626.5**	**11.5**
SFCT1-05	3	Open space - Poor	0	25.866	0.000
	10	Single Fam Res - High Den - < 1/8 ac	75	95.468	29.587
	11	Mult Fam Res	75	1.092	0.338

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
SFCT1-05	12	Commercial	85	51.698	18.158
	14	Streets, Roads, Parking	98	62.983	25.505
	15	Transpo (including pervious ROW)	65	5.184	1.392
SFCT1-05 Total				**242.3**	**75.0**
SFCT1-10	3	Open space - Poor	0	51.297	0.000
	10	Single Fam Res - High Den - < 1/8 ac	75	76.353	30.954
	12	Commercial	85	4.881	2.243
	14	Streets, Roads, Parking	98	52.421	27.769
	10	Single Fam Res - High Den - < 1/8 ac	75	0.000	0.000
	14	Streets, Roads, Parking	98	0.000	0.000
SFCT1-10 Total				**185.0**	**61.0**
SFCT1-15	3	Open space - Poor	0	39.581	0.000
	8	Single Fam Res - Low Den- 1 ac	20	0.166	0.029
	10	Single Fam Res - High Den - < 1/8 ac	75	31.624	20.989
	14	Streets, Roads, Parking	98	41.366	35.875
SFCT1-15 Total				**112.7**	**56.9**
SFCT1-20	3	Open space - Poor	0	30.723	0.000
	8	Single Fam Res - Low Den- 1 ac	20	9.295	2.187
	10	Single Fam Res - High Den - < 1/8 ac	75	14.306	12.623
	13	Industrial	80	18.007	16.948
	14	Streets, Roads, Parking	98	12.125	13.979
	15	Transpo (including pervious ROW)	65	0.823	0.629
SFCT1-20 Total				**85.3**	**46.4**
SFCT1-25	1	Open space - Good	0	2.060	0.000
	10	Single Fam Res - High Den - < 1/8 ac	75	141.547	42.807
	11	Mult Fam Res	75	3.244	0.981
	12	Commercial	85	0.786	0.270
	13	Industrial	80	13.869	4.474
	14	Streets, Roads, Parking	98	83.985	33.188
	15	Transpo (including pervious ROW)	65	2.959	0.776
SFCT1-25 Total				**248.5**	**82.5**
SFCT1-30	2	Open space - Fair	0	16.632	0.000
	3	Open space - Poor	0	65.449	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	5.075	1.015
	10	Single Fam Res - High Den - < 1/8 ac	75	6.048	2.388
	13	Industrial	80	88.344	37.197
	14	Streets, Roads, Parking	98	8.419	4.342
	3	Open space - Poor	0	0.036	0.000
	13	Industrial	80	0.036	0.015
	3	Open space - Poor	0	0.001	0.000
	14	Streets, Roads, Parking	98	0.001	0.001
SFCT1-30 Total				**190.0**	**45.0**
SFCT1-35	1	Open space - Good	0	42.751	0.000
	3	Open space - Poor	0	2.203	0.000
	5	Woods	0	12.402	0.000
	7	Single Fam Res - Estate >10 ac	5	4.836	0.318
	14	Streets, Roads, Parking	98	2.264	2.920
	15	Transpo (including pervious ROW)	65	11.188	9.568
SFCT1-35 Total				**75.6**	**12.8**

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
SFCT1-40	1	Open space - Good	0	26.666	0.000
	2	Open space - Fair	0	0.377	0.000
	3	Open space - Poor	0	53.369	0.000
	5	Woods	0	0.056	0.000
	7	Single Fam Res - Estate >10 ac	5	5.106	0.185
	12	Commercial	85	1.974	1.216
	13	Industrial	80	35.603	20.640
	14	Streets, Roads, Parking	98	7.459	5.297
	15	Transpo (including pervious ROW)	65	7.091	3.340
SFCT1-40 Total				**137.7**	**30.7**
SFCT1-45	1	Open space - Good	0	161.747	0.000
	2	Open space - Fair	0	125.555	0.000
	3	Open space - Poor	0	36.820	0.000
	5	Woods	0	60.455	0.000
	7	Single Fam Res - Estate >10 ac	5	46.658	0.419
	8	Single Fam Res - Low Den- 1 ac	20	18.682	0.671
	12	Commercial	85	16.499	2.518
	13	Industrial	80	60.727	8.722
	14	Streets, Roads, Parking	98	15.625	2.749
	15	Transpo (including pervious ROW)	65	14.039	1.638
SFCT1-45 Total				**556.8**	**16.7**
SFCT1-50	1	Open space - Good	0	0.002	0.000
	2	Open space - Fair	0	0.062	0.000
	3	Open space - Poor	0	11.219	0.000
	8	Single Fam Res - Low Den- 1 ac	20	23.668	1.400
	9	Single Fam Res - Med Den - 1/4 ac	38	57.709	6.488
	10	Single Fam Res - High Den - < 1/8 ac	75	16.827	3.734
	11	Mult Fam Res	75	8.761	1.944
	12	Commercial	85	84.147	21.161
	13	Industrial	80	50.709	12.002
	14	Streets, Roads, Parking	98	74.844	21.700
	15	Transpo (including pervious ROW)	65	9.711	1.868
SFCT1-50 Total				**337.7**	**70.3**
SFCT1-55	1	Open space - Good	0	50.617	0.000
	2	Open space - Fair	0	4.544	0.000
	3	Open space - Poor	0	10.120	0.000
	5	Woods	0	16.048	0.000
	8	Single Fam Res - Low Den- 1 ac	20	4.620	0.380
	9	Single Fam Res - Med Den - 1/4 ac	38	58.766	9.190
	10	Single Fam Res - High Den - < 1/8 ac	75	0.358	0.111
	12	Commercial	85	12.100	4.233
	13	Industrial	80	19.850	6.535
	14	Streets, Roads, Parking	98	44.166	17.812
	15	Transpo (including pervious ROW)	65	21.783	5.827
SFCT1-55 Total				**243.0**	**44.1**
SFCT1-60	1	Open space - Good	0	38.196	0.000
	2	Open space - Fair	0	0.177	0.000
	3	Open space - Poor	0	13.324	0.000
	8	Single Fam Res - Low Den- 1 ac	20	76.747	6.945

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
	9	Single Fam Res - Med Den - 1/4 ac	38	51.533	8.861
	12	Commercial	85	11.509	4.427
	14	Streets, Roads, Parking	98	29.572	13.113
SFCT1-60 Total				**221.1**	**33.3**
SFCT1-65	1	Open space - Good	0	104.908	0.000
	2	Open space - Fair	0	45.060	0.000
	3	Open space - Poor	0	26.101	0.000
	5	Woods	0	0.239	0.000
	8	Single Fam Res - Low Den- 1 ac	20	69.043	3.794
	9	Single Fam Res - Med Den - 1/4 ac	38	23.764	2.481
	10	Single Fam Res - High Den - < 1/8 ac	75	0.086	0.018
	12	Commercial	85	30.621	7.151
	13	Industrial	80	37.757	8.298
	14	Streets, Roads, Parking	98	18.853	5.076
	15	Transpo (including pervious ROW)	65	7.313	1.306
SFCT1-65 Total				**363.7**	**28.1**
SFCT1-70	1	Open space - Good	0	33.357	0.000
	2	Open space - Fair	0	33.293	0.000
	5	Woods	0	11.618	0.000
	6	Open Water	0	0.155	0.000
	7	Single Fam Res - Estate >10 ac	5	12.343	0.432
	8	Single Fam Res - Low Den- 1 ac	20	33.506	4.686
	9	Single Fam Res - Med Den - 1/4 ac	38	5.546	1.474
	10	Single Fam Res - High Den - < 1/8 ac	75	5.162	2.707
	13	Industrial	80	1.902	1.064
	14	Streets, Roads, Parking	98	4.528	3.103
	15	Transpo (including pervious ROW)	65	1.679	0.763
SFCT1-70 Total				**143.1**	**14.2**

TABLE B 3-7

LANDUSE CLASSIFICATION AND PERCENT IMPERVIOUS
CIENEGAS DRAINAGE AREA - EXISTING CONDITIONS

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
CB-05	2	Open space - Fair	0	15.547	0.000
	3	Open space - Poor	0	1783.540	0.000
	8	Single Fam Res - Low Den- 1 ac	20	257.476	2.464
	12	Commercial	85	14.165	0.576
	14	Streets, Roads, Parking	98	12.624	0.592
	15	Transpo (including pervious ROW)	65	6.559	0.204
CB-05 Total				**2089.9**	**3.8**
CB-10	2	Open space - Fair	0	12.719	0.000
	3	Open space - Poor	0	55.967	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	3.384	1.531
	14	Streets, Roads, Parking	98	0.673	0.785
	15	Transpo (including pervious ROW)	65	10.989	8.503
CB-10 Total				**83.7**	**10.8**
CB-15	2	Open space - Fair	0	0.091	0.000
	3	Open space - Poor	0	134.328	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	1.183	0.308
	12	Commercial	85	8.674	5.050
	15	Transpo (including pervious ROW)	65	2.040	0.908
CB-15 Total				**146.3**	**6.3**
CB-20	3	Open space - Poor	0	236.371	0.000
	8	Single Fam Res - Low Den- 1 ac	20	120.909	6.589
	14	Streets, Roads, Parking	98	9.329	2.491
CB-20 Total				**366.6**	**9.1**
CB-25	3	Open space - Poor	0	213.128	0.000
	7	Single Fam Res - Estate >10 ac	5	9.490	0.213
	9	Single Fam Res - Med Den - 1/4 ac	38	0.221	0.038
CB-25 Total				**222.8**	**0.3**
CB-30	3	Open space - Poor	0	38.880	0.000
	7	Single Fam Res - Estate >10 ac	5	7.666	0.243
	12	Commercial	85	93.392	50.243
	14	Streets, Roads, Parking	98	11.317	7.019
	15	Transpo (including pervious ROW)	65	6.948	2.858
CB-30 Total				**158.2**	**60.4**
CB-35	3	Open space - Poor	0	265.217	0.000
	7	Single Fam Res - Estate >10 ac	5	1.566	0.029
	14	Streets, Roads, Parking	98	5.249	1.891
CB-35 Total				**272.0**	**1.9**
CB-40	3	Open space - Poor	0	118.224	0.000
	7	Single Fam Res - Estate >10 ac	5	82.623	1.986
	14	Streets, Roads, Parking	98	6.993	3.295

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
CB-40 Total				**207.8**	**5.3**
CB-45	1	Open space - Good	0	4.914	0.000
	3	Open space - Poor	0	4.031	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	61.875	16.104
	11	Mult Fam Res	75	10.238	5.259
	12	Commercial	85	31.049	18.077
	14	Streets, Roads, Parking	98	26.723	17.938
	15	Transpo (including pervious ROW)	65	6.811	3.032
CB-45 Total				**145.6**	**60.4**
CB-50	3	Open space - Poor	0	33.284	0.000
	7	Single Fam Res - Estate >10 ac	5	2.397	0.101
	9	Single Fam Res - Med Den - 1/4 ac	38	27.140	8.666
	12	Commercial	85	37.891	27.065
	14	Streets, Roads, Parking	98	12.668	10.433
	15	Transpo (including pervious ROW)	65	5.151	2.814
CB-50 Total				**118.5**	**49.1**
CB-55	2	Open space - Fair	0	19.364	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	27.337	7.214
	10	Single Fam Res - High Den - < 1/8 ac	75	2.869	1.494
	11	Mult Fam Res	75	13.700	7.136
	12	Commercial	85	49.516	29.228
	14	Streets, Roads, Parking	98	21.087	14.351
	15	Transpo (including pervious ROW)	65	9.936	4.485
CB-55 Total				**143.8**	**63.9**
CB-60	2	Open space - Fair	0	18.464	0.000
	3	Open space - Poor	0	0.243	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	166.359	21.874
	10	Single Fam Res - High Den - < 1/8 ac	75	14.239	3.695
	11	Mult Fam Res	75	0.092	0.024
	12	Commercial	85	23.310	6.856
	14	Streets, Roads, Parking	98	63.340	21.479
	15	Transpo (including pervious ROW)	65	3.149	0.708
CB-60 Total				**289.2**	**54.6**
CB-65	2	Open space - Fair	0	33.556	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	101.696	21.710
	12	Commercial	85	7.974	3.808
	14	Streets, Roads, Parking	98	34.668	19.087
CB-65 Total				**177.9**	**44.6**
CB-70	2	Open space - Fair	0	28.018	0.000
	3	Open space - Poor	0	31.633	0.000
	5	Woods	0	0.299	0.000
	7	Single Fam Res - Estate >10 ac	5	0.166	0.006
	9	Single Fam Res - Med Den - 1/4 ac	38	54.770	14.158
	10	Single Fam Res - High Den - < 1/8 ac	75	0.000	0.000
	11	Mult Fam Res	75	2.431	1.240

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
	12	Commercial	85	8.234	4.761
	14	Streets, Roads, Parking	98	21.901	14.601
CB-70 Total				**147.5**	**34.8**
CB-75	2	Open space - Fair	0	4.504	0.000
	3	Open space - Poor	0	40.379	0.000
	5	Woods	0	28.980	0.000
	7	Single Fam Res - Estate >10 ac	5	9.926	0.376
	9	Single Fam Res - Med Den - 1/4 ac	38	41.147	11.845
	12	Commercial	85	0.000	0.000
	14	Streets, Roads, Parking	98	6.962	5.169
CB-75 Total				**131.9**	**17.4**
CBT1-05	3	Open space - Poor	0	16.254	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	42.758	22.258
	14	Streets, Roads, Parking	98	13.670	18.351
CBT1-05 Total				**72.7**	**40.6**
CBT1-10	3	Open space - Poor	0	12.179	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	51.050	21.797
	11	Mult Fam Res	75	7.686	6.477
	14	Streets, Roads, Parking	98	17.867	19.674
CBT1-10 Total				**88.8**	**47.9**
CBT1-15	2	Open space - Fair	0	0.327	0.000
	3	Open space - Poor	0	20.396	0.000
	8	Single Fam Res - Low Den- 1 ac	20	3.675	0.320
	9	Single Fam Res - Med Den - 1/4 ac	38	129.254	21.355
	11	Mult Fam Res	75	10.782	3.516
	12	Commercial	85	14.956	5.527
	14	Streets, Roads, Parking	98	50.645	21.579
CBT1-15 Total				**230.0**	**52.3**
CBT1-20	2	Open space - Fair	0	17.374	0.000
	3	Open space - Poor	0	13.081	0.000
	5	Woods	0	11.779	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	67.270	18.796
	11	Mult Fam Res	75	4.107	2.265
	12	Commercial	85	2.228	1.393
	14	Streets, Roads, Parking	98	20.059	14.454
CBT1-20 Total				**135.9**	**36.9**
CBT4-05	3	Open space - Poor	0	20.995	0.000
	7	Single Fam Res - Estate >10 ac	5	37.884	1.246
	12	Commercial	85	67.909	37.975
	14	Streets, Roads, Parking	98	21.648	13.957
	15	Transpo (including pervious ROW)	65	3.583	1.532
CBT4-05 Total				**152.0**	**54.7**
CBT4-10	2	Open space - Fair	0	8.136	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	1.599	0.707
	12	Commercial	85	60.946	60.238

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
	14	Streets, Roads, Parking	98	4.213	4.801
	15	Transpo (including pervious ROW)	65	11.303	8.543
CBT4-10 Total				**86.2**	**74.3**
CBT5-05	3	Open space - Poor	0	154.635	0.000
	7	Single Fam Res - Estate >10 ac	5	2.256	0.037
	8	Single Fam Res - Low Den- 1 ac	20	38.083	2.505
	9	Single Fam Res - Med Den - 1/4 ac	38	71.216	8.902
	12	Commercial	85	5.644	1.578
	13	Industrial	80	4.452	1.172
	14	Streets, Roads, Parking	98	19.751	6.367
	15	Transpo (including pervious ROW)	65	8.042	1.720
CBT5-05 Total				**304.1**	**22.3**
CBT5-10	3	Open space - Poor	0	64.864	0.000
	12	Commercial	85	15.556	14.857
	14	Streets, Roads, Parking	98	0.076	0.084
	15	Transpo (including pervious ROW)	65	8.433	6.159
CBT5-10 Total				**88.9**	**21.1**
CNC-05	3	Open space - Poor	0	1141.385	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	0.133	0.004
	15	Transpo (including pervious ROW)	65	2.872	0.163
CNC-05 Total				**1144.4**	**0.2**
CNC-10	3	Open space - Poor	0	1502.813	0.000
	7	Single Fam Res - Estate >10 ac	5	90.276	0.269
	8	Single Fam Res - Low Den- 1 ac	20	2.231	0.027
	9	Single Fam Res - Med Den - 1/4 ac	38	0.498	0.011
	12	Commercial	85	13.827	0.702
	13	Industrial	80	4.947	0.236
	14	Streets, Roads, Parking	98	43.700	2.557
	15	Transpo (including pervious ROW)	65	17.064	0.662
CNC-10 Total				**1675.4**	**4.5**
CNC-15	3	Open space - Poor	0	224.261	0.000
	13	Industrial	80	0.001	0.000
	15	Transpo (including pervious ROW)	65	6.403	1.802
CNC-15 Total				**230.7**	**1.8**
CNC-20	2	Open space - Fair	0	3.087	0.000
	3	Open space - Poor	0	345.531	0.000
	7	Single Fam Res - Estate >10 ac	5	179.356	1.240
	8	Single Fam Res - Low Den- 1 ac	20	66.105	1.829
	9	Single Fam Res - Med Den - 1/4 ac	38	15.851	0.833
	12	Commercial	85	43.912	5.163
	13	Industrial	80	29.523	3.267
	14	Streets, Roads, Parking	98	17.744	2.405
	15	Transpo (including pervious ROW)	65	21.725	1.953
CNC-20 Total				**722.8**	**16.7**
	3	Open space - Poor	0	495.948	0.000

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
CNC-25	7	Single Fam Res - Estate >10 ac	5	137.537	1.065
	8	Single Fam Res - Low Den- 1 ac	20	4.488	0.139
	14	Streets, Roads, Parking	98	8.243	1.250
CNC-25 Total				**646.2**	**2.5**
CNC-30	2	Open space - Fair	0	0.414	0.000
	3	Open space - Poor	0	145.873	0.000
	7	Single Fam Res - Estate >10 ac	5	40.930	0.656
	8	Single Fam Res - Low Den- 1 ac	20	116.020	7.437
	9	Single Fam Res - Med Den - 1/4 ac	38	0.921	0.112
	14	Streets, Roads, Parking	98	7.479	2.349
CNC-30 Total				**311.6**	**10.6**
CNC-35	3	Open space - Poor	0	796.615	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	16.807	0.783
	14	Streets, Roads, Parking	98	2.310	0.277
CNC-35 Total				**815.7**	**1.1**
CNC-40	2	Open space - Fair	0	13.693	0.000
	3	Open space - Poor	0	100.496	0.000
	5	Woods	0	2.902	0.000
	7	Single Fam Res - Estate >10 ac	5	11.963	0.464
	14	Streets, Roads, Parking	98	0.038	0.029
CNC-40 Total				**129.1**	**0.5**
CNC-45	2	Open space - Fair	0	4.629	0.000
	3	Open space - Poor	0	49.555	0.000
	5	Woods	0	16.629	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	18.270	6.943
	12	Commercial	85	4.466	3.796
	14	Streets, Roads, Parking	98	6.763	6.628
CNC-45 Total				**100.3**	**17.4**
CNC-50	2	Open space - Fair	0	10.776	0.000
	3	Open space - Poor	0	135.965	0.000
	5	Woods	0	15.043	0.000
	7	Single Fam Res - Estate >10 ac	5	86.130	1.709
	14	Streets, Roads, Parking	98	4.114	1.600
CNC-50 Total				**252.0**	**3.3**
CNC-55	2	Open space - Fair	0	48.599	0.000
	3	Open space - Poor	0	71.159	0.000
	5	Woods	0	32.432	0.000
	7	Single Fam Res - Estate >10 ac	5	6.798	0.204
	9	Single Fam Res - Med Den - 1/4 ac	38	1.986	0.452
	14	Streets, Roads, Parking	98	5.816	3.413
	3	Open space - Poor	0	0.001	0.000
	7	Single Fam Res - Estate >10 ac	5	0.001	0.000
	3	Open space - Poor	0	0.000	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	0.000	0.000
	3	Open space - Poor	0	0.000	0.000

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
	14	Streets, Roads, Parking	98	0.000	0.000
CNC-55 Total				**166.8**	**4.1**
CNC-60	2	Open space - Fair	0	1.584	0.000
	3	Open space - Poor	0	48.908	0.000
	5	Woods	0	3.679	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	0.675	0.295
	12	Commercial	85	13.093	12.792
	13	Industrial	80	10.868	9.993
	14	Streets, Roads, Parking	98	8.189	9.224
CNC-60 Total				**87.0**	**32.3**
CNC-65	2	Open space - Fair	0	40.743	0.000
	3	Open space - Poor	0	405.746	0.000
	5	Woods	0	4.538	0.000
	7	Single Fam Res - Estate >10 ac	5	114.334	0.987
	14	Streets, Roads, Parking	98	13.295	2.250
CNC-65 Total				**578.7**	**3.2**
CNC-70	2	Open space - Fair	0	28.954	0.000
	3	Open space - Poor	0	296.464	0.000
	5	Woods	0	75.908	0.000
	8	Single Fam Res - Low Den- 1 ac	20	2.441	0.120
	14	Streets, Roads, Parking	98	4.127	0.991
CNC-70 Total				**407.9**	**1.1**
CNC-75	1	Open space - Good	0	21.574	0.000
	2	Open space - Fair	0	25.463	0.000
	3	Open space - Poor	0	153.416	0.000
	5	Woods	0	63.380	0.000
	8	Single Fam Res - Low Den- 1 ac	20	29.580	1.866
	9	Single Fam Res - Med Den - 1/4 ac	38	20.007	2.398
	14	Streets, Roads, Parking	98	3.254	1.006
CNC-75 Total				**316.7**	**5.3**
CNC-80	1	Open space - Good	0	9.424	0.000
	2	Open space - Fair	0	23.486	0.000
	3	Open space - Poor	0	16.499	0.000
	5	Woods	0	24.795	0.000
	6	Open Water	0	11.853	0.000
	7	Single Fam Res - Estate >10 ac	5	34.116	0.726
	8	Single Fam Res - Low Den- 1 ac	20	3.728	0.317
	9	Single Fam Res - Med Den - 1/4 ac	38	11.705	1.893
	10	Single Fam Res - High Den - < 1/8 ac	75	67.408	21.513
	13	Industrial	80	3.421	1.165
	14	Streets, Roads, Parking	98	28.657	11.950
CNC-80 Total				**235.1**	**37.6**
CNC-85	2	Open space - Fair	0	32.118	0.000
	3	Open space - Poor	0	1.445	0.000
	10	Single Fam Res - High Den - < 1/8 ac	75	4.883	5.722

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
	13	Industrial	80	21.622	27.027
	14	Streets, Roads, Parking	98	4.369	6.690
CNC-85 Total				**64.4**	**39.4**
CNC-90	1	Open space - Good	0	26.930	0.000
	2	Open space - Fair	0	181.299	0.000
	3	Open space - Poor	0	110.191	0.000
	5	Woods	0	0.134	0.000
	6	Open Water	0	16.200	0.000
	7	Single Fam Res - Estate >10 ac	5	27.269	0.264
	8	Single Fam Res - Low Den- 1 ac	20	28.710	1.113
	9	Single Fam Res - Med Den - 1/4 ac	38	68.672	5.057
	13	Industrial	80	28.679	4.446
	14	Streets, Roads, Parking	98	22.540	4.281
	15	Transpo (including pervious ROW)	65	5.340	0.673
CNC-90 Total				**516.0**	**15.8**
CNCT1-05	2	Open space - Fair	0	44.345	0.000
	3	Open space - Poor	0	12.489	0.000
	9	Single Fam Res - Med Den - 1/4 ac	38	8.156	1.483
	10	Single Fam Res - High Den - < 1/8 ac	75	2.066	0.741
	11	Mult Fam Res	75	0.773	0.277
	12	Commercial	85	118.049	48.010
	13	Industrial	80	3.629	1.389
	14	Streets, Roads, Parking	98	19.093	8.953
CNCT1-05 Total				**208.6**	**60.9**
CNCT1-10	2	Open space - Fair	0	0.683	0.000
	3	Open space - Poor	0	55.129	0.000
	10	Single Fam Res - High Den - < 1/8 ac	75	24.314	18.995
	12	Commercial	85	5.814	5.147
	13	Industrial	80	5.066	4.222
	14	Streets, Roads, Parking	98	5.209	5.317
CNCT1-10 Total				**96.2**	**33.7**
CNCT1-15	3	Open space - Poor	0	135.401	0.000
	10	Single Fam Res - High Den - < 1/8 ac	75	7.118	3.122
	12	Commercial	85	1.022	0.508
	13	Industrial	80	0.163	0.076
	14	Streets, Roads, Parking	98	26.872	15.400
	3	Open space - Poor	0	0.009	0.000
	14	Streets, Roads, Parking	98	0.009	0.005
CNCT1-15 Total				**170.6**	**19.1**
CNCT1-20	1	Open space - Good	0	36.275	0.000
	2	Open space - Fair	0	3.953	0.000
	3	Open space - Poor	0	272.648	0.000
	5	Woods	0	39.849	0.000
	7	Single Fam Res - Estate >10 ac	5	0.406	0.006
	10	Single Fam Res - High Den - < 1/8 ac	75	2.498	0.513

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
	14	Streets, Roads, Parking	98	9.732	2.613
	3	Open space - Poor	0	0.011	0.000
	5	Woods	0	0.011	0.000
CNCT1-20 Total				**365.4**	**3.1**

TABLE B 3-8

LANDUSE CLASSIFICATION AND PERCENT IMPERVIOUS
SAN FELIPE DRAINAGE AREA - ULTIMATE CONDITIONS

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
CVC-05	2	Open space - Fair	0	24.901	0
	3	Open space - Poor	0	3.005	0
	7	Single Fam Res - Estate >10 ac	5	14.967	0.07
	8	Single Fam Res - Low Den- 1 ac	20	8.376	0.157
	9	Single Fam Res - Med Den - 1/4 ac	38	576.676	20.538
	10	Single Fam Res - High Den - < 1/8 ac	75	43.42	3.052
	12	Commercial	20	3.344	0.063
	12	Commercial	38	104.36	3.717
	12	Commercial	85	148.536	11.833
	12	Commercial	98	27.401	2.517
	14	Streets, Roads, Parking	98	66.96	6.15
	15	Transpo (including pervious ROW)	65	44.616	2.718
CVC-05 Total				**1066.6**	**50.8**
CVC-10	7	Single Fam Res - Estate >10 ac	5	16.329	0.167
	9	Single Fam Res - Med Den - 1/4 ac	38	180.989	14.065
	10	Single Fam Res - High Den - < 1/8 ac	75	101.211	15.523
	12	Commercial	85	139.745	24.291
	14	Streets, Roads, Parking	98	8.309	1.665
	15	Transpo (including pervious ROW)	65	42.695	5.675
CVC-10 Total				**489.3**	**61.4**
CVC-15	10	Single Fam Res - High Den - < 1/8 ac	75	89.583	55.527
	14	Streets, Roads, Parking	98	4.065	3.292
	15	Transpo (including pervious ROW)	65	27.227	14.626
CVC-15 Total				**120.9**	**73.4**
CVC-20	2	Open space - Fair	0	7.094	0
	3	Open space - Poor	0	106.641	0
	7	Single Fam Res - Estate >10 ac	5	27.012	0.257
	9	Single Fam Res - Med Den - 1/4 ac	38	113.398	8.192
	10	Single Fam Res - High Den - < 1/8 ac	75	253.385	36.129
	12	Commercial	85	2.645	0.427
	14	Streets, Roads, Parking	98	4.467	0.832
	15	Transpo (including pervious ROW)	65	11.538	1.426
CVC-20 Total				**526.2**	**47.3**
CVC-25	2	Open space - Fair	0	14.566	0
	3	Open space - Poor	0	22.237	0
	9	Single Fam Res - Med Den - 1/4 ac	38	0.184	0.039
	10	Single Fam Res - High Den - < 1/8 ac	75	133.458	55.3
	14	Streets, Roads, Parking	98	10.117	5.478
CVC-25 Total				**180.6**	**60.8**
	2	Open space - Fair	0	11.496	0

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
CVC-30	3	Open space - Poor	0	0.624	0
	9	Single Fam Res - Med Den - 1/4 ac	38	4.462	0.839
	10	Single Fam Res - High Den - < 1/8 ac	75	164.445	61.056
	11	Mult Fam Res	75	1.313	0.487
	14	Streets, Roads, Parking	98	19.816	9.614
CVC-30 Total				**202.2**	**72.0**
CVC-35	2	Open space - Fair	0	13.324	0
	3	Open space - Poor	0	0.002	0
	10	Single Fam Res - High Den - < 1/8 ac	75	37.328	46.659
	11	Mult Fam Res	75	1.395	1.743
	12	Commercial	85	0.624	0.884
	14	Streets, Roads, Parking	98	5.556	9.076
	15	Transpo (including pervious ROW)	65	1.433	1.553
CVC-35 Total				**59.7**	**59.9**
CVC-40	3	Open space - Poor	0	4.996	0
	9	Single Fam Res - Med Den - 1/4 ac	38	0.004	0.002
	10	Single Fam Res - High Den - < 1/8 ac	75	68.017	64.573
	15	Transpo (including pervious ROW)	65	5.87	4.83
CVC-40 Total				**78.9**	**69.4**
CVC-45	3	Open space - Poor	0	135.525	0
	9	Single Fam Res - Med Den - 1/4 ac	38	18.232	2.961
	10	Single Fam Res - High Den - < 1/8 ac	75	45.496	14.582
	11	Mult Fam Res	75	6.838	2.192
	12	Commercial	85	3.352	1.218
	14	Streets, Roads, Parking	98	15.159	6.349
	15	Transpo (including pervious ROW)	65	9.602	2.667
CVC-45 Total				**234.2**	**30.0**
CVC-50	2	Open space - Fair	0	27.261	0
	3	Open space - Poor	0	211.923	0
	9	Single Fam Res - Med Den - 1/4 ac	38	11.475	1.509
	10	Single Fam Res - High Den - < 1/8 ac	75	24.896	6.461
	14	Streets, Roads, Parking	98	12.968	4.397
CVC-50 Total				**288.5**	**12.4**
CVCT1-05	1	Open space - Good	0	3.292	0
	10	Single Fam Res - High Den - < 1/8 ac	75	152.295	46.243
	12	Commercial	85	8.178	2.814
	14	Streets, Roads, Parking	98	72.311	28.69
	15	Transpo (including pervious ROW)	65	11.061	2.911
CVCT1-05 Total				**247.1**	**80.7**
CVCT1-10	3	Open space - Poor	0	0.005	0
	9	Single Fam Res - Med Den - 1/4 ac	38	0.092	0.059
	10	Single Fam Res - High Den - < 1/8 ac	75	26.151	33.243
	12	Commercial	85	8.183	11.789
	14	Streets, Roads, Parking	98	20.087	33.365
	15	Transpo (including pervious ROW)	65	4.42	4.869
CVCT1-10 Total				**58.9**	**83.3**

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
CVCT1-15	3	Open space - Poor	0	0.639	0
	10	Single Fam Res - High Den - < 1/8 ac	75	12.901	32.252
	12	Commercial	85	6.386	18.095
	14	Streets, Roads, Parking	98	10.342	33.784
CVCT1-15 Total				**30.3**	**84.1**
SFC-05A	3	Open space - Poor	0	2952.297	0
SFC-05A Total				**2952.3**	**0.0**
SFC-05B	3	Open space - Poor	0	2387.7	0
SFC-05B Total				**2387.7**	**0.0**
SFC-05C	2	Open space - Fair	0	12.73	0
	3	Open space - Poor	0	2538.423	0
	7	Single Fam Res - Estate >10 ac	5	660.837	0.842
	9	Single Fam Res - Med Den - 1/4 ac	38	294.774	2.855
	10	Single Fam Res - High Den - < 1/8 ac	75	5.761	0.11
	12	Commercial	38	12.534	0.121
	12	Commercial	85	366.731	7.946
	14	Streets, Roads, Parking	98	31.485	0.787
SFC-05C Total				**3923.3**	**12.7**
SFC-05D	3	Open space - Poor	0	2.677	0
	7	Single Fam Res - Estate >10 ac	5	289.167	1.828
	9	Single Fam Res - Med Den - 1/4 ac	38	179.741	8.635
	10	Single Fam Res - High Den - < 1/8 ac	75	319.883	30.33
SFC-05D Total				**791.5**	**40.8**
SFC-05E	3	Open space - Poor	0	77.947	0
	7	Single Fam Res - Estate >10 ac	5	204.326	1.366
	9	Single Fam Res - Med Den - 1/4 ac	38	395.328	20.084
	12	Commercial	85	70.621	8.025
SFC-05E Total				**748.2**	**29.5**
SFC-05F	2	Open space - Fair	0	0.082	0
	3	Open space - Poor	0	96.691	0
	7	Single Fam Res - Estate >10 ac	5	19.796	0.385
	9	Single Fam Res - Med Den - 1/4 ac	38	40.661	6.012
	10	Single Fam Res - High Den - < 1/8 ac	75	97.723	28.518
	14	Streets, Roads, Parking	98	1.779	0.679
SFC-05F Total				**256.7**	**35.6**
SFC-10A	3	Open space - Poor	0	4371.18	0
SFC-10A Total				**4371.2**	**0.0**
SFC-10B	3	Open space - Poor	0	2790.62	0
	6	Open Water	0	11.52	0
	7	Single Fam Res - Estate >10 ac	5	22.736	0.039
	12	Commercial	85	111.056	3.215
SFC-10B Total				**2935.9**	**3.3**
SFC-10C	3	Open space - Poor	0	743.492	0
	7	Single Fam Res - Estate >10 ac	5	426.818	0.546
	8	Single Fam Res - Low Den- 1 ac	20	242.336	1.239
	9	Single Fam Res - Med Den - 1/4 ac	38	2196.122	21.332

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
	12	Commercial	85	297.925	6.473
	14	Streets, Roads, Parking	98	4.832	0.121
SFC-10C Total				**3911.5**	**29.7**
SFC-10D	3	Open space - Poor	0	81.409	0
	7	Single Fam Res - Estate >10 ac	5	134.048	1.134
	9	Single Fam Res - Med Den - 1/4 ac	38	372.052	23.922
	14	Streets, Roads, Parking	98	3.014	0.5
SFC-10D Total				**590.5**	**25.6**
SFC-15	2	Open space - Fair	0	191.88	0
	3	Open space - Poor	0	14.696	0
	7	Single Fam Res - Estate >10 ac	5	468.952	3.307
	10	Single Fam Res - High Den - < 1/8 ac	75	8.58	0.908
	14	Streets, Roads, Parking	98	24.483	3.384
SFC-15 Total				**708.6**	**7.6**
SFC-20	1	Open space - Good	0	74.114	0
	2	Open space - Fair	0	74.247	0
	3	Open space - Poor	0	80.556	0
	7	Single Fam Res - Estate >10 ac	5	224.205	1.405
	9	Single Fam Res - Med Den - 1/4 ac	38	73.594	3.504
	10	Single Fam Res - High Den - < 1/8 ac	75	116.698	10.968
	12	Commercial	85	87.632	9.334
	14	Streets, Roads, Parking	98	43.33	5.321
	15	Transpo (including pervious ROW)	65	23.672	1.928
SFC-20 Total				**798.0**	**32.5**
SFC-25	1	Open space - Good	0	22.042	0
	2	Open space - Fair	0	14.002	0
	3	Open space - Poor	0	7.618	0
	6	Open Water	0	4.226	0
	7	Single Fam Res - Estate >10 ac	5	37.679	0.25
	8	Single Fam Res - Low Den- 1 ac	20	0.539	0.014
	9	Single Fam Res - Med Den - 1/4 ac	38	17.717	0.892
	10	Single Fam Res - High Den - < 1/8 ac	75	222.863	22.139
	11	Mult Fam Res	75	2.827	0.281
	12	Commercial	85	170.747	19.223
	13	Industrial	80	23.889	2.531
	14	Streets, Roads, Parking	98	196.806	25.546
	15	Transpo (including pervious ROW)	65	34.522	2.972
SFC-25 Total				**755.5**	**73.8**
SFC-30	1	Open space - Good	0	1.119	0
	2	Open space - Fair	0	2.865	0
	3	Open space - Poor	0	0.028	0
	6	Open Water	0	2.097	0
	8	Single Fam Res - Low Den- 1 ac	20	4.549	0.562
	9	Single Fam Res - Med Den - 1/4 ac	38	0.009	0.002
	10	Single Fam Res - High Den - < 1/8 ac	75	87.861	40.676
	12	Commercial	85	16.373	8.591

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
	13	Industrial	80	0.083	0.041
	14	Streets, Roads, Parking	98	45.242	27.369
	15	Transpo (including pervious ROW)	65	2.249	0.902
SFC-30 Total				**162.5**	**78.1**
SFC-35	3	Open space - Poor	0	30.053	0
	9	Single Fam Res - Med Den - 1/4 ac	38	9.263	2.708
	10	Single Fam Res - High Den - < 1/8 ac	75	57.429	33.132
	12	Commercial	85	4.215	2.756
	14	Streets, Roads, Parking	98	29.145	21.971
SFC-35 Total				**130.1**	**60.6**
SFC-40	3	Open space - Poor	0	19.585	0
	5	Woods	0	0.005	0
	9	Single Fam Res - Med Den - 1/4 ac	38	7.664	2.883
	10	Single Fam Res - High Den - < 1/8 ac	75	22.212	16.494
	12	Commercial	85	22.421	18.869
	13	Industrial	80	2.622	2.077
	14	Streets, Roads, Parking	98	25.043	24.299
	15	Transpo (including pervious ROW)	65	1.245	0.801
SFC-40 Total				**100.8**	**65.4**
SFC-45	1	Open space - Good	0	3.31	0
	3	Open space - Poor	0	3.649	0
	5	Woods	0	4.511	0
	8	Single Fam Res - Low Den- 1 ac	20	14.776	3.694
	9	Single Fam Res - Med Den - 1/4 ac	38	19.235	9.137
	10	Single Fam Res - High Den - < 1/8 ac	75	22.609	21.196
	12	Commercial	85	1.711	1.818
	14	Streets, Roads, Parking	98	10.446	12.796
SFC-45 Total				**80.2**	**48.6**
SFC-50	1	Open space - Good	0	8.749	0
	2	Open space - Fair	0	0.036	0
	3	Open space - Poor	0	32.481	0
	8	Single Fam Res - Low Den- 1 ac	20	2.656	0.443
	9	Single Fam Res - Med Den - 1/4 ac	38	23.76	7.524
	10	Single Fam Res - High Den - < 1/8 ac	75	35.156	21.972
	12	Commercial	85	1.648	1.168
	14	Streets, Roads, Parking	98	15.329	12.519
SFC-50 Total				**119.8**	**43.6**
SFC-55	2	Open space - Fair	0	3.453	0
	8	Single Fam Res - Low Den- 1 ac	20	0.895	0.28
	10	Single Fam Res - High Den - < 1/8 ac	75	34.902	40.901
	12	Commercial	85	7.649	10.159
	14	Streets, Roads, Parking	98	17.216	26.362
SFC-55 Total				**64.1**	**77.7**
	1	Open space - Good	0	51.987	0
	2	Open space - Fair	0	2.052	0
	3	Open space - Poor	0	91.019	0

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
SFC-60	5	Woods	0	15.937	0
	8	Single Fam Res - Low Den- 1 ac	20	4.241	0.482
	9	Single Fam Res - Med Den - 1/4 ac	38	5.229	1.129
	10	Single Fam Res - High Den - < 1/8 ac	75	4.252	1.812
	14	Streets, Roads, Parking	98	1.769	0.985
SFC-60 Total				**176.5**	**4.4**
SFC-65	1	Open space - Good	0	54.647	0
	2	Open space - Fair	0	26.121	0
	3	Open space - Poor	0	268.749	0
	5	Woods	0	4.855	0
	6	Open Water	0	8.134	0
	8	Single Fam Res - Low Den- 1 ac	20	71.102	2.735
	9	Single Fam Res - Med Den - 1/4 ac	38	47.124	3.444
	10	Single Fam Res - High Den - < 1/8 ac	75	13.609	1.963
	14	Streets, Roads, Parking	98	25.321	4.772
SFC-65 Total				**519.7**	**12.9**
SFC-70	1	Open space - Good	0	7.786	0
	2	Open space - Fair	0	11.974	0
	3	Open space - Poor	0	41.964	0
	5	Woods	0	19.964	0
	8	Single Fam Res - Low Den- 1 ac	20	9.935	1.967
	13	Industrial	80	9.129	7.231
SFC-70 Total				**100.8**	**9.2**
SFC-75	1	Open space - Good	0	118.048	0
	2	Open space - Fair	0	169.958	0
	3	Open space - Poor	0	22.47	0
	5	Woods	0	82.864	0
	6	Open Water	0	5.526	0
	7	Single Fam Res - Estate >10 ac	5	23.716	0.189
	8	Single Fam Res - Low Den- 1 ac	20	141.996	4.529
	9	Single Fam Res - Med Den - 1/4 ac	38	22.795	1.382
	10	Single Fam Res - High Den - < 1/8 ac	75	1.404	0.168
	13	Industrial	80	17.565	2.241
	14	Streets, Roads, Parking	98	18.002	2.814
	15	Transpo (including pervious ROW)	65	2.172	0.225
SFC-75 Total				**626.5**	**11.5**
SFCT1-05	3	Open space - Poor	0	25.866	0
	10	Single Fam Res - High Den - < 1/8 ac	75	95.468	29.587
	11	Mult Fam Res	75	1.092	0.338
	12	Commercial	85	51.698	18.158
	14	Streets, Roads, Parking	98	62.983	25.505
	15	Transpo (including pervious ROW)	65	5.184	1.392
SFCT1-05 Total				**242.3**	**75.0**
SFCT1-10	3	Open space - Poor	0	24.433	0
	10	Single Fam Res - High Den - < 1/8 ac	75	76.353	30.954
	12	Commercial	85	31.745	14.586

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
SFCT1-10	14	Streets, Roads, Parking	98	52.421	27.769
	10	Single Fam Res - High Den - < 1/8 ac	75	0	0
	14	Streets, Roads, Parking	98	0	0
SFCT1-10 Total				**185.0**	**73.3**
SFCT1-15	3	Open space - Poor	0	37.927	0
	8	Single Fam Res - Low Den- 1 ac	20	0.166	0.029
	10	Single Fam Res - High Den - < 1/8 ac	75	33.063	21.945
	12	Commercial	85	0.215	0.162
	14	Streets, Roads, Parking	98	41.366	35.875
SFCT1-15 Total				**112.7**	**58.0**
SFCT1-20	3	Open space - Poor	0	15.866	0
	7	Single Fam Res - Estate >10 ac	5	0.411	0.024
	8	Single Fam Res - Low Den- 1 ac	20	9.295	2.187
	10	Single Fam Res - High Den - < 1/8 ac	75	28.75	25.367
	13	Industrial	80	18.007	16.948
	14	Streets, Roads, Parking	98	12.125	13.979
	15	Transpo (including pervious ROW)	65	0.823	0.629
	3	Open space - Poor	0	0.003	0
	10	Single Fam Res - High Den - < 1/8 ac	75	0.003	0.002
SFCT1-20 Total				**85.3**	**59.1**
SFCT1-25	1	Open space - Good	0	2.06	0
	10	Single Fam Res - High Den - < 1/8 ac	75	141.547	42.807
	11	Mult Fam Res	75	3.244	0.981
	12	Commercial	85	0.786	0.27
	13	Industrial	80	13.869	4.474
	14	Streets, Roads, Parking	98	83.985	33.188
	15	Transpo (including pervious ROW)	65	2.959	0.776
SFCT1-25 Total				**248.5**	**82.5**
SFCT1-30	3	Open space - Poor	0	20.189	0
	7	Single Fam Res - Estate >10 ac	5	0.414	0.011
	9	Single Fam Res - Med Den - 1/4 ac	38	5.075	1.015
	10	Single Fam Res - High Den - < 1/8 ac	75	35.194	13.892
	12	Commercial	85	32.323	14.46
	13	Industrial	80	88.344	37.197
	14	Streets, Roads, Parking	98	8.419	4.342
	3	Open space - Poor	0	0.001	0
	10	Single Fam Res - High Den - < 1/8 ac	75	0.001	0
	3	Open space - Poor	0	0.008	0
	12	Commercial	85	0.008	0.004
	3	Open space - Poor	0	0.036	0
	13	Industrial	80	0.036	0.015
	3	Open space - Poor	0	0.001	0
	14	Streets, Roads, Parking	98	0.001	0.001
SFCT1-30 Total				**190.1**	**70.9**
	5	Woods	0	12.402	0
	7	Single Fam Res - Estate >10 ac	5	4.836	0.318

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
SFCT1-35	12	Commercial	85	44.955	50.278
	14	Streets, Roads, Parking	98	2.264	2.92
	15	Transpo (including pervious ROW)	65	11.188	9.568
SFCT1-35 Total				**75.6**	**63.1**
SFCT1-40	1	Open space - Good	0	4.718	0
	2	Open space - Fair	0	0.377	0
	5	Woods	0	0.056	0
	7	Single Fam Res - Estate >10 ac	5	5.106	0.185
	10	Single Fam Res - High Den - < 1/8 ac	75	36.129	19.635
	12	Commercial	85	41.162	25.354
	13	Industrial	80	35.603	20.64
	14	Streets, Roads, Parking	98	7.459	5.297
	15	Transpo (including pervious ROW)	65	7.091	3.34
SFCT1-40 Total				**137.7**	**74.5**
SFCT1-45	1	Open space - Good	0	149.189	0
	2	Open space - Fair	0	109.483	0
	3	Open space - Poor	0	4.172	0
	5	Woods	0	52.598	0
	7	Single Fam Res - Estate >10 ac	5	46.658	0.419
	8	Single Fam Res - Low Den- 1 ac	20	18.682	0.671
	9	Single Fam Res - Med Den - 1/4 ac	38	2.525	0.172
	10	Single Fam Res - High Den - < 1/8 ac	75	26.548	3.575
	12	Commercial	85	56.539	8.628
	13	Industrial	80	60.748	8.725
	14	Streets, Roads, Parking	98	15.625	2.749
	15	Transpo (including pervious ROW)	65	14.039	1.638
SFCT1-45 Total				**556.8**	**26.6**
SFCT1-50	1	Open space - Good	0	0.002	0
	2	Open space - Fair	0	0.062	0
	3	Open space - Poor	0	8.69	0
	8	Single Fam Res - Low Den- 1 ac	20	23.668	1.4
	9	Single Fam Res - Med Den - 1/4 ac	38	57.709	6.488
	10	Single Fam Res - High Den - < 1/8 ac	75	16.827	3.734
	11	Mult Fam Res	75	8.761	1.944
	12	Commercial	85	86.676	21.797
	13	Industrial	80	50.709	12.002
	14	Streets, Roads, Parking	98	74.844	21.7
	15	Transpo (including pervious ROW)	65	9.711	1.868
SFCT1-50 Total				**337.7**	**70.9**
SFCT1-55	3	Open space - Poor	0	7.745	0
	5	Woods	0	10.071	0
	8	Single Fam Res - Low Den- 1 ac	20	4.62	0.38
	9	Single Fam Res - Med Den - 1/4 ac	38	58.766	9.19
	10	Single Fam Res - High Den - < 1/8 ac	75	0.358	0.111
	12	Commercial	85	75.613	26.449
	13	Industrial	80	19.85	6.535

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
	14	Streets, Roads, Parking	98	44.166	17.812
	15	Transpo (including pervious ROW)	65	21.783	5.827
SFCT1-55 Total				**243.0**	**66.3**
SFCT1-60	1	Open space - Good	0	38.196	0
	2	Open space - Fair	0	0.177	0
	3	Open space - Poor	0	13.324	0
	8	Single Fam Res - Low Den- 1 ac	20	69.014	6.246
	9	Single Fam Res - Med Den - 1/4 ac	38	59.266	10.19
	12	Commercial	85	11.509	4.427
	14	Streets, Roads, Parking	98	29.572	13.113
SFCT1-60 Total				**221.1**	**34.0**
SFCT1-65	1	Open space - Good	0	83.943	0
	2	Open space - Fair	0	38.615	0
	3	Open space - Poor	0	2.173	0
	5	Woods	0	0.239	0
	8	Single Fam Res - Low Den- 1 ac	20	69.043	3.794
	9	Single Fam Res - Med Den - 1/4 ac	38	23.764	2.481
	10	Single Fam Res - High Den - < 1/8 ac	75	0.086	0.018
	12	Commercial	85	62.782	14.661
	13	Industrial	80	56.934	12.513
	14	Streets, Roads, Parking	98	18.853	5.076
	15	Transpo (including pervious ROW)	65	7.313	1.306
SFCT1-65 Total				**363.7**	**39.8**
SFCT1-70	1	Open space - Good	0	33.357	0
	2	Open space - Fair	0	33.293	0
	5	Woods	0	11.618	0
	6	Open Water	0	0.155	0
	7	Single Fam Res - Estate >10 ac	5	12.343	0.432
	8	Single Fam Res - Low Den- 1 ac	20	33.506	4.686
	9	Single Fam Res - Med Den - 1/4 ac	38	5.546	1.474
	10	Single Fam Res - High Den - < 1/8 ac	75	5.162	2.707
	13	Industrial	80	1.902	1.064
	14	Streets, Roads, Parking	98	4.528	3.103
	15	Transpo (including pervious ROW)	65	1.679	0.763
SFCT1-70 Total				**143.1**	**14.2**

TABLE B 3-9

LANDUSE CLASSIFICATION AND PERCENT IMPERVIOUS
CIENEGAS DRAINAGE AREA - ULTIMATE CONDITIONS

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
CB-05	3	Open space - Poor	0	445.775	0
	7	Single Fam Res - Estate >10 ac	5	730.887	1.749
	8	Single Fam Res - Low Den- 1 ac	20	450.58	4.312
	9	Single Fam Res - Med Den - 1/4 ac	38	63.844	1.161
	12	Commercial	85	379.643	15.44
	14	Streets, Roads, Parking	98	12.624	0.592
	15	Transpo (including pervious ROW)	65	6.559	0.204
CB-05 Total				**2089.9**	**23.5**
CB-10	9	Single Fam Res - Med Den - 1/4 ac	38	42.637	19.288
	12	Commercial	85	29.433	29.784
	14	Streets, Roads, Parking	98	0.673	0.785
	15	Transpo (including pervious ROW)	65	10.989	8.503
CB-10 Total				**83.7**	**58.4**
CB-15	9	Single Fam Res - Med Den - 1/4 ac	38	134.38	34.976
	12	Commercial	85	9.896	5.762
	15	Transpo (including pervious ROW)	65	2.04	0.908
CB-15 Total				**146.3**	**41.6**
CB-20	7	Single Fam Res - Estate >10 ac	5	2.747	0.037
	8	Single Fam Res - Low Den- 1 ac	20	150.393	8.196
	9	Single Fam Res - Med Den - 1/4 ac	38	204.139	21.137
	14	Streets, Roads, Parking	98	9.329	2.491
CB-20 Total				**366.6**	**31.9**
CB-25	7	Single Fam Res - Estate >10 ac	5	40.661	0.912
	9	Single Fam Res - Med Den - 1/4 ac	38	182.179	31.044
CB-25 Total				**222.8**	**32.0**
CB-30	7	Single Fam Res - Estate >10 ac	5	42.821	1.355
	9	Single Fam Res - Med Den - 1/4 ac	38	3.725	0.896
	12	Commercial	85	93.392	50.243
	14	Streets, Roads, Parking	98	11.317	7.019
	15	Transpo (including pervious ROW)	65	6.948	2.858
CB-30 Total				**158.2**	**62.4**
CB-35	7	Single Fam Res - Estate >10 ac	5	140.398	2.581
	9	Single Fam Res - Med Den - 1/4 ac	38	126.385	17.657
	14	Streets, Roads, Parking	98	5.249	1.891
CB-35 Total				**272.0**	**22.1**
CB-40	7	Single Fam Res - Estate >10 ac	5	197.455	4.747
	9	Single Fam Res - Med Den - 1/4 ac	38	3.391	0.62
	14	Streets, Roads, Parking	98	6.993	3.295
CB-40 Total				**207.8**	**8.7**
	1	Open space - Good	0	4.914	0
	9	Single Fam Res - Med Den - 1/4 ac	38	61.875	16.104

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
CB-45	11	Mult Fam Res	75	10.238	5.259
	12	Commercial	85	35.08	20.423
	14	Streets, Roads, Parking	98	26.723	17.938
	15	Transpo (including pervious ROW)	65	6.811	3.032
CB-45 Total				**145.6**	**62.8**
CB-50	7	Single Fam Res - Estate >10 ac	5	6.064	0.255
	9	Single Fam Res - Med Den - 1/4 ac	38	56.757	18.124
	12	Commercial	85	37.891	27.065
	14	Streets, Roads, Parking	98	12.668	10.433
	15	Transpo (including pervious ROW)	65	5.151	2.814
CB-50 Total				**118.5**	**58.7**
CB-55	2	Open space - Fair	0	19.364	0
	9	Single Fam Res - Med Den - 1/4 ac	38	27.337	7.214
	10	Single Fam Res - High Den - < 1/8 ac	75	2.869	1.494
	11	Mult Fam Res	75	13.7	7.136
	12	Commercial	85	49.516	29.228
	14	Streets, Roads, Parking	98	21.087	14.351
	15	Transpo (including pervious ROW)	65	9.936	4.485
CB-55 Total				**143.8**	**63.9**
CB-60	2	Open space - Fair	0	18.464	0
	3	Open space - Poor	0	0.243	0
	9	Single Fam Res - Med Den - 1/4 ac	38	166.359	21.874
	10	Single Fam Res - High Den - < 1/8 ac	75	14.239	3.695
	11	Mult Fam Res	75	0.092	0.024
	12	Commercial	85	23.31	6.856
	14	Streets, Roads, Parking	98	63.34	21.479
	15	Transpo (including pervious ROW)	65	3.149	0.708
CB-60 Total				**289.2**	**54.6**
CB-65	2	Open space - Fair	0	33.556	0
	9	Single Fam Res - Med Den - 1/4 ac	38	101.696	21.71
	12	Commercial	85	7.974	3.808
	14	Streets, Roads, Parking	98	34.668	19.087
CB-65 Total				**177.9**	**44.6**
CB-70	2	Open space - Fair	0	28.018	0
	3	Open space - Poor	0	4.612	0
	5	Woods	0	0.299	0
	7	Single Fam Res - Estate >10 ac	5	0.166	0.006
	9	Single Fam Res - Med Den - 1/4 ac	38	77.875	20.131
	10	Single Fam Res - High Den - < 1/8 ac	75	0	0
	11	Mult Fam Res	75	2.431	1.24
	12	Commercial	85	12.151	7.026
	14	Streets, Roads, Parking	98	21.901	14.601
CB-70 Total				**147.5**	**43.0**
CB-75	2	Open space - Fair	0	4.504	0
	5	Woods	0	28.98	0
	7	Single Fam Res - Estate >10 ac	5	9.926	0.376

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
CB-75	9	Single Fam Res - Med Den - 1/4 ac	38	81.526	23.47
	12	Commercial	85	0	0
	14	Streets, Roads, Parking	98	6.962	5.169
CB-75 Total				**131.9**	**29.0**
CBT1-05	3	Open space - Poor	0	8.578	0
	9	Single Fam Res - Med Den - 1/4 ac	38	50.434	26.253
	14	Streets, Roads, Parking	98	13.67	18.351
CBT1-05 Total				**72.7**	**44.6**
CBT1-10	3	Open space - Poor	0	12.179	0
	9	Single Fam Res - Med Den - 1/4 ac	38	51.05	21.797
	11	Mult Fam Res	75	7.686	6.477
	14	Streets, Roads, Parking	98	17.867	19.674
CBT1-10 Total				**88.8**	**47.9**
CBT1-15	2	Open space - Fair	0	0.327	0
	3	Open space - Poor	0	13.273	0
	8	Single Fam Res - Low Den- 1 ac	20	3.675	0.32
	9	Single Fam Res - Med Den - 1/4 ac	38	132.337	21.864
	11	Mult Fam Res	75	10.782	3.516
	12	Commercial	85	18.996	7.02
	14	Streets, Roads, Parking	98	50.645	21.579
CBT1-15 Total				**230.0**	**54.3**
CBT1-20	2	Open space - Fair	0	17.374	0
	3	Open space - Poor	0	13.081	0
	5	Woods	0	11.779	0
	9	Single Fam Res - Med Den - 1/4 ac	38	67.27	18.796
	11	Mult Fam Res	75	4.107	2.265
	12	Commercial	85	2.228	1.393
	14	Streets, Roads, Parking	98	20.059	14.454
CBT1-20 Total				**135.9**	**36.9**
CBT4-05	7	Single Fam Res - Estate >10 ac	5	58.878	1.937
	12	Commercial	85	67.909	37.975
	14	Streets, Roads, Parking	98	21.648	13.957
	15	Transpo (including pervious ROW)	65	3.583	1.532
CBT4-05 Total				**152.0**	**55.4**
CBT4-10	2	Open space - Fair	0	8.136	0
	9	Single Fam Res - Med Den - 1/4 ac	38	1.599	0.707
	12	Commercial	85	60.946	60.238
	14	Streets, Roads, Parking	98	4.213	4.801
	15	Transpo (including pervious ROW)	65	11.303	8.543
CBT4-10 Total				**86.2**	**74.3**
CBT5-05	3	Open space - Poor	0	1.053	0
	7	Single Fam Res - Estate >10 ac	5	2.256	0.037
	8	Single Fam Res - Low Den- 1 ac	20	38.083	2.505
	9	Single Fam Res - Med Den - 1/4 ac	38	214.943	26.868
	10	Single Fam Res - High Den - < 1/8 ac	75	1.243	0.307
	12	Commercial	85	14.256	3.986

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
	13	Industrial	80	4.452	1.172
	14	Streets, Roads, Parking	98	19.751	6.367
	15	Transpo (including pervious ROW)	65	8.042	1.72
CBT5-05 Total				**304.1**	**43.0**
CBT5-10	8	Single Fam Res - Low Den- 1 ac	20	19.266	4.329
	9	Single Fam Res - Med Den - 1/4 ac	38	28.361	12.109
	12	Commercial	85	32.793	31.319
	14	Streets, Roads, Parking	98	0.076	0.084
	15	Transpo (including pervious ROW)	65	8.433	6.159
CBT5-10 Total				**88.9**	**54.0**
CNC-05	3	Open space - Poor	0	950.351	0
	9	Single Fam Res - Med Den - 1/4 ac	38	158.318	5.259
	12	Commercial	85	32.849	2.441
	15	Transpo (including pervious ROW)	65	2.872	0.163
CNC-05 Total				**1144.4**	**7.9**
CNC-10	3	Open space - Poor	0	26.096	0
	7	Single Fam Res - Estate >10 ac	5	99.48	0.297
	8	Single Fam Res - Low Den- 1 ac	20	581.786	6.947
	9	Single Fam Res - Med Den - 1/4 ac	38	746.688	16.94
	10	Single Fam Res - High Den - < 1/8 ac	75	0.698	0.031
	12	Commercial	85	154.898	7.861
	13	Industrial	80	4.947	0.236
	14	Streets, Roads, Parking	98	43.7	2.557
	15	Transpo (including pervious ROW)	65	17.064	0.662
CNC-10 Total				**1675.4**	**35.5**
CNC-15	3	Open space - Poor	0	48.774	0
	9	Single Fam Res - Med Den - 1/4 ac	38	103.156	16.969
	12	Commercial	85	72.331	26.615
	13	Industrial	80	0.001	0
	15	Transpo (including pervious ROW)	65	6.403	1.802
CNC-15 Total				**230.7**	**45.4**
CNC-20	7	Single Fam Res - Estate >10 ac	5	176.363	1.22
	8	Single Fam Res - Low Den- 1 ac	20	124.231	3.437
	9	Single Fam Res - Med Den - 1/4 ac	38	223.209	11.732
	10	Single Fam Res - High Den - < 1/8 ac	75	0.021	0.002
	12	Commercial	85	130.017	15.286
	13	Industrial	80	29.523	3.267
	14	Streets, Roads, Parking	98	17.744	2.405
	15	Transpo (including pervious ROW)	65	21.725	1.953
CNC-20 Total				**722.8**	**39.3**
CNC-25	3	Open space - Poor	0	102.415	0
	7	Single Fam Res - Estate >10 ac	5	177.487	1.374
	8	Single Fam Res - Low Den- 1 ac	20	30.595	0.947
	9	Single Fam Res - Med Den - 1/4 ac	38	327.477	19.263
	14	Streets, Roads, Parking	98	8.243	1.25
CNC-25 Total				**646.2**	**22.8**

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
CNC-30	3	Open space - Poor	0	28.444	0
	7	Single Fam Res - Estate >10 ac	5	40.93	0.656
	8	Single Fam Res - Low Den- 1 ac	20	116.434	7.464
	9	Single Fam Res - Med Den - 1/4 ac	38	118.349	14.414
	14	Streets, Roads, Parking	98	7.479	2.349
CNC-30 Total				**311.6**	**24.9**
CNC-35	3	Open space - Poor	0	160.036	0
	9	Single Fam Res - Med Den - 1/4 ac	38	653.386	30.427
	14	Streets, Roads, Parking	98	2.31	0.277
CNC-35 Total				**815.7**	**30.7**
CNC-40	2	Open space - Fair	0	13.693	0
	3	Open space - Poor	0	58.44	0
	5	Woods	0	2.902	0
	7	Single Fam Res - Estate >10 ac	5	15.76	0.611
	9	Single Fam Res - Med Den - 1/4 ac	38	38.259	11.27
	14	Streets, Roads, Parking	98	0.038	0.029
CNC-40 Total				**129.1**	**11.9**
CNC-45	2	Open space - Fair	0	4.629	0
	3	Open space - Poor	0	25.466	0
	5	Woods	0	16.629	0
	9	Single Fam Res - Med Den - 1/4 ac	38	42.309	16.077
	10	Single Fam Res - High Den - < 1/8 ac	75	0.05	0.037
	12	Commercial	85	4.466	3.796
	14	Streets, Roads, Parking	98	6.763	6.628
CNC-45 Total				**100.3**	**26.5**
CNC-50	2	Open space - Fair	0	10.776	0
	3	Open space - Poor	0	25.837	0
	5	Woods	0	15.043	0
	7	Single Fam Res - Estate >10 ac	5	87.414	1.734
	9	Single Fam Res - Med Den - 1/4 ac	38	108.779	16.403
	10	Single Fam Res - High Den - < 1/8 ac	75	0.065	0.019
	14	Streets, Roads, Parking	98	4.114	1.6
CNC-50 Total				**252.0**	**19.8**
CNC-55	2	Open space - Fair	0	48.599	0
	3	Open space - Poor	0	35.161	0
	5	Woods	0	32.432	0
	7	Single Fam Res - Estate >10 ac	5	12.515	0.375
	8	Single Fam Res - Low Den- 1 ac	20	1.289	0.154
	9	Single Fam Res - Med Den - 1/4 ac	38	12.968	2.951
	10	Single Fam Res - High Den - < 1/8 ac	75	6.238	2.802
	12	Commercial	85	11.757	5.984
	14	Streets, Roads, Parking	98	5.816	3.413
	3	Open space - Poor	0	0.001	0
	7	Single Fam Res - Estate >10 ac	5	0.001	0
	3	Open space - Poor	0	0	0
	8	Single Fam Res - Low Den- 1 ac	20	0	0

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
	3	Open space - Poor	0	0	0
	9	Single Fam Res - Med Den - 1/4 ac	38	0	0
	3	Open space - Poor	0	0.014	0
	12	Commercial	85	0.014	0.007
	3	Open space - Poor	0	0	0
	14	Streets, Roads, Parking	98	0	0
CNC-55 Total				**166.8**	**15.7**
CNC-60	2	Open space - Fair	0	1.584	0
	3	Open space - Poor	0	1.64	0
	5	Woods	0	3.679	0
	7	Single Fam Res - Estate >10 ac	5	12.394	0.712
	9	Single Fam Res - Med Den - 1/4 ac	38	19.388	8.468
	10	Single Fam Res - High Den - < 1/8 ac	75	15.373	13.253
	12	Commercial	85	13.881	13.562
	13	Industrial	80	10.868	9.993
	14	Streets, Roads, Parking	98	8.189	9.224
CNC-60 Total				**87.0**	**55.2**
CNC-65	2	Open space - Fair	0	40.743	0
	3	Open space - Poor	0	0.038	0
	5	Woods	0	4.538	0
	7	Single Fam Res - Estate >10 ac	5	135.214	1.168
	9	Single Fam Res - Med Den - 1/4 ac	38	384.828	25.256
	14	Streets, Roads, Parking	98	13.295	2.25
CNC-65 Total				**578.7**	**28.7**
CNC-70	2	Open space - Fair	0	28.954	0
	5	Woods	0	75.908	0
	7	Single Fam Res - Estate >10 ac	5	3.591	0.044
	8	Single Fam Res - Low Den- 1 ac	20	53.397	2.617
	9	Single Fam Res - Med Den - 1/4 ac	38	229.126	21.34
	12	Commercial	85	12.791	2.665
	14	Streets, Roads, Parking	98	4.127	0.991
CNC-70 Total				**407.9**	**27.7**
CNC-75	2	Open space - Fair	0	25.463	0
	5	Woods	0	63.38	0
	8	Single Fam Res - Low Den- 1 ac	20	90.822	5.73
	9	Single Fam Res - Med Den - 1/4 ac	38	112.18	13.448
	10	Single Fam Res - High Den - < 1/8 ac	75	21.574	5.104
	14	Streets, Roads, Parking	98	3.254	1.006
CNC-75 Total				**316.7**	**25.3**
CNC-80	2	Open space - Fair	0	0.021	0
	3	Open space - Poor	0	1.918	0
	5	Woods	0	24.795	0
	6	Open Water	0	11.853	0
	7	Single Fam Res - Estate >10 ac	5	34.116	0.726
	8	Single Fam Res - Low Den- 1 ac	20	3.728	0.317
	9	Single Fam Res - Med Den - 1/4 ac	38	36.822	5.954

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
	10	Single Fam Res - High Den - < 1/8 ac	75	87.796	28.02
	12	Commercial	85	1.964	0.711
	13	Industrial	80	3.421	1.165
	14	Streets, Roads, Parking	98	28.657	11.95
CNC-80 Total				**235.1**	**48.8**
CNC-85	3	Open space - Poor	0	1.445	0
	9	Single Fam Res - Med Den - 1/4 ac	38	32.118	19.07
	10	Single Fam Res - High Den - < 1/8 ac	75	4.883	5.722
	13	Industrial	80	21.622	27.027
	14	Streets, Roads, Parking	98	4.369	6.69
CNC-85 Total				**64.4**	**58.5**
CNC-90	1	Open space - Good	0	26.919	0
	2	Open space - Fair	0	149.949	0
	3	Open space - Poor	0	66.225	0
	6	Open Water	0	16.2	0
	7	Single Fam Res - Estate >10 ac	5	27.269	0.264
	8	Single Fam Res - Low Den- 1 ac	20	28.71	1.113
	9	Single Fam Res - Med Den - 1/4 ac	38	144.122	10.614
	10	Single Fam Res - High Den - < 1/8 ac	75	0.012	0.002
	13	Industrial	80	28.679	4.446
	14	Streets, Roads, Parking	98	22.54	4.281
	15	Transpo (including pervious ROW)	65	5.34	0.673
CNC-90 Total				**516.0**	**21.4**
CNCT1-05	2	Open space - Fair	0	44.345	0
	3	Open space - Poor	0	12.489	0
	9	Single Fam Res - Med Den - 1/4 ac	38	8.156	1.483
	10	Single Fam Res - High Den - < 1/8 ac	75	2.066	0.741
	11	Mult Fam Res	75	0.773	0.277
	12	Commercial	85	118.049	48.01
	13	Industrial	80	3.629	1.389
	14	Streets, Roads, Parking	98	19.093	8.953
CNCT1-05 Total				**208.6**	**60.9**
CNCT1-10	2	Open space - Fair	0	0.683	0
	3	Open space - Poor	0	20.607	0
	10	Single Fam Res - High Den - < 1/8 ac	75	58.836	45.966
	12	Commercial	85	5.814	5.147
	13	Industrial	80	5.066	4.222
	14	Streets, Roads, Parking	98	5.209	5.317
CNCT1-10 Total				**96.2**	**60.7**
CNCT1-15	3	Open space - Poor	0	80.782	0
	10	Single Fam Res - High Den - < 1/8 ac	75	42.416	18.604
	12	Commercial	85	20.343	10.112
	13	Industrial	80	0.163	0.076
	14	Streets, Roads, Parking	98	26.872	15.4
	3	Open space - Poor	0	0.001	0
	10	Single Fam Res - High Den - < 1/8 ac	75	0.001	0

Basin ID	Land Use ID	Description	Percent IMP	Poly_Area (ac)	WT PCT IMP
	3	Open space - Poor	0	0.009	0
	14	Streets, Roads, Parking	98	0.009	0.005
CNCT1-15 Total				**170.6**	**44.2**
CNCT1-20	3	Open space - Poor	0	69.273	0
	5	Woods	0	39.849	0
	7	Single Fam Res - Estate >10 ac	5	0.406	0.006
	8	Single Fam Res - Low Den- 1 ac	20	98.465	5.395
	10	Single Fam Res - High Den - < 1/8 ac	75	57.767	11.87
	12	Commercial	85	89.74	20.898
	14	Streets, Roads, Parking	98	9.732	2.613
	3	Open space - Poor	0	0.011	0
	5	Woods	0	0.011	0
	3	Open space - Poor	0	0.011	0
	9	Single Fam Res - Med Den - 1/4 ac	38	0.011	0.001
	3	Open space - Poor	0	0.01	0
	10	Single Fam Res - High Den - < 1/8 ac	75	0.01	0.002
	3	Open space - Poor	0	0.107	0
	12	Commercial	85	0.107	0.025
CNCT1-20 Total				**365.5**	**40.8**

TABLE B 3-10
SUMMARY OF AREAL REDUCTIONS - SAN FELIPE CREEK

2-Yr Peak Flows Under Existing Conditions								
Hydrologic Element	DA (mi^2)	Storm Area 10 mi^2	Storm Area 20 mi^2	Storm Area 30 mi^2	Storm Area 40 mi^2	Storm Area 50 mi^2	Storm Area 60 mi^2	Interpolated Q at Combine pt
CMB-SFC10B	11.4	1794	1250	1011	963	928	905	1717
CMB-SFC10C	17.5	2127	1449	1159	1102	1059	1032	1616
CMB-SFC10D	18.5	2146	1459	1165	1107	1062	1032	1565
CMB-SFC05C	14.5	1810	1214	969	921	885	862	1543
CMB-SFC05D	15.7	1814	1216	973	925	889	865	1472
CMB-SFC05F	17.3	1847	1232	986	934	895	870	1399
CMB-SFC15	36.8	3017	2024	1594	1511	1449	1409	1537
CMB-SFC20	38.1	3073	2019	1596	1512	1453	1413	1528
CMB-SFC25	39.3	3128	2059	1627	1544	1484	1444	1550
CMB-SFC30	39.5	3133	2065	1632	1547	1487	1447	1551
CMB-SFC35	39.7	3127	2064	1632	1547	1487	1447	1550
CMB-SFC40	39.9	3118	2063	1629	1546	1486	1446	1547
CMB-SFC-45	40.0	3106	2057	1623	1538	1478	1438	1538
CMB-SFC50	40.3	3104	2058	1623	1539	1479	1439	1537
CMB-CVC50 & SFC50	45.9	3753	2495	1975	1876	1807	1761	1835
CMB-SFC60	46.2	3746	2492	1972	1874	1805	1759	1831
CMB-SFC65	47.0	3770	2510	1987	1888	1818	1772	1839
CMB-SFC70	47.1	3770	2510	1987	1888	1819	1773	1838
CMB-SFC75 & SFCT170	53.0	4102	3131	2771	2689	2630	2592	2619

5-Yr Peak Flows Under Existing Conditions								
Hydrologic Element	DA (mi^2)	Storm Area 10 mi^2	Storm Area 20 mi^2	Storm Area 30 mi^2	Storm Area 40 mi^2	Storm Area 50 mi^2	Storm Area 60 mi^2	Interpolated Q at Combine pt
CMB-SFC10B	11.4	4071	3043	2573	2475	2395	2363	3926
CMB-SFC10C	17.5	5243	3782	3133	3004	2899	2857	4143
CMB-SFC10D	18.5	5357	3833	3179	3048	2939	2897	4069
CMB-SFC05C	14.5	4324	3190	2671	2563	2473	2438	3817
CMB-SFC05D	15.7	4373	3208	2681	2571	2482	2446	3708
CMB-SFC05F	17.3	4479	3287	2744	2632	2540	2502	3611
CMB-SFC15	36.8	7586	5460	4520	4328	4172	4110	4389
CMB-SFC20	38.1	7664	5529	4591	4398	4239	4175	4435
CMB-SFC25	39.3	7774	5612	4663	4461	4286	4211	4476
CMB-SFC30	39.5	7786	5625	4673	4468	4290	4215	4478
CMB-SFC35	39.7	7791	5627	4671	4463	4284	4209	4469
CMB-SFC40	39.9	7787	5623	4659	4450	4269	4196	4452
CMB-SFC-45	40.0	7784	5620	4651	4439	4260	4189	4439
CMB-SFC50	40.3	7782	5622	4649	4437	4259	4190	4432
CMB-CVC50 & SFC50	45.9	9027	6604	5512	5272	5068	4986	5152
CMB-SFC60	46.2	9026	6604	5507	5266	5063	4983	5140
CMB-SFC65	47.0	9083	6646	5541	5299	5096	5016	5157
CMB-SFC70	47.1	9086	6648	5542	5299	5096	5017	5154
CMB-SFC75 & SFCT170	53.0	9837.3	7221.7	6027.8	5762	5543	5456	5517

10-Yr Peak Flows Under Existing Conditions								
Hydrologic Element	DA (mi^2)	Storm Area 10 mi^2	Storm Area 20 mi^2	Storm Area 30 mi^2	Storm Area 40 mi^2	Storm Area 50 mi^2	Storm Area 60 mi^2	Interpolated Q at Combine pt
CMB-SFC10B	11.4	5921	4542	3905	3759	3668	3614	5725
CMB-SFC10C	17.5	8016	5936	5001	4790	4660	4583	6450
CMB-SFC10D	18.5	8207	6066	5108	4888	4754	4674	6398
CMB-SFC05C	14.5	6409	4851	4140	3976	3876	3815	5712
CMB-SFC05D	15.7	6496	4904	4182	4006	3904	3842	5587
CMB-SFC05F	17.3	6711	5045	4280	4111	4004	3941	5498
CMB-SFC15	36.8	11545	8584	7239	6938	6750	6638	7033
CMB-SFC20	38.1	11567	8666	7312	7010	6819	6705	7068
CMB-SFC25	39.3	11705	8785	7419	7114	6921	6805	7136
CMB-SFC30	39.5	11665	8785	7432	7126	6934	6819	7140
CMB-SFC35	39.7	11676	8790	7436	7131	6939	6823	7139
CMB-SFC40	39.9	11682	8790	7434	7125	6933	6818	7129
CMB-SFC-45	40.0	11683	8786	7431	7121	6929	6814	7121
CMB-SFC50	40.3	11693	8785	7430	7120	6928	6813	7115
CMB-CVC50 & SFC50	45.9	13352	10144	8630	8290	8073	7944	8162
CMB-SFC60	46.2	13358	10142	8631	8289	8073	7944	8156
CMB-SFC65	47.0	13436	10205	8684	8341	8123	7993	8189
CMB-SFC70	47.1	13443	10208	8687	8343	8126	7996	8188
CMB-SFC75 & SFCT170	53.0	14441	11029	9409	9038	8807	8669	8765

25-Yr Peak Flows Under Existing Conditions								
Hydrologic Element	DA (mi^2)		Storm Area 20 mi^2	Storm Area 30 mi^2	Storm Area 40 mi^2	Storm Area 50 mi^2	Storm Area 60 mi^2	Interpolated Q at Combine pt
CMB-SFC10B	11.4	8462	6622	5758	5558	5438	5378	8201
CMB-SFC10C	17.5	11891	9081	7771	7465	7283	7194	9775
CMB-SFC10D	18.5	12166	9288	7954	7641	7453	7358	9734
CMB-SFC05C	14.5	9291	7199	6223	5998	5863	5794	8355
CMB-SFC05D	15.7	9438	7304	6307	6078	5940	5871	8220
CMB-SFC05F	17.3	9818	7549	6511	6265	6119	6047	8166
CMB-SFC15	36.8	17120	13085	11195	10756	10498	10369	10895
CMB-SFC20	38.1	17410	12897	11233	10866	10607	10479	10936
CMB-SFC25	39.3	18299	12996	11375	11003	10742	10615	11030
CMB-SFC30	39.5	18272	12922	11344	10949	10703	10579	10968
CMB-SFC35	39.7	17126	12935	11355	10960	10714	10591	10971
CMB-SFC40	39.9	17090	12944	11361	10962	10716	10592	10967
CMB-SFC-45	40.0	17070	12948	11363	10963	10716	10588	10962
CMB-SFC50	40.3	17056	12964	11370	10967	10716	10591	10959
CMB-CVC50 & SFC50	45.9	19362	14678	13006	12567	12289	12149	12403
CMB-SFC60	46.2	19342	14692	13012	12572	12291	12152	12398
CMB-SFC65	47.0	19453	14772	13089	12647	12364	12224	12449
CMB-SFC70	47.1	19461	14783	13095	12652	12369	12230	12450
CMB-SFC75 & SFCT170	53	20994	15765	14084	13628	13334	13190	13290

50-Yr Peak Flows Under Existing Conditions								
Hydrologic Element	DA (mi^2)		Storm Area 20 mi^2	Storm Area 30 mi^2	Storm Area 40 mi^2	Storm Area 50 mi^2	Storm Area 60 mi^2	Interpolated Q at Combine pt
CMB-SFC10B	11.4	10687	8462	7425	7190	7042	6958	10371
CMB-SFC10C	17.5	15327	11891	10304	9947	9719	9590	12740
CMB-SFC10D	18.5	15735	12166	10551	10182	9946	9812	12719
CMB-SFC05C	14.5	12133	9291	8108	7842	7674	7579	10861
CMB-SFC05D	15.7	12316	9438	8232	7959	7790	7692	10673
CMB-SFC05F	17.3	12781	9818	8532	8241	8049	7944	10624
CMB-SFC15	36.8	22751	17120	14826	14315	13994	13814	14477
CMB-SFC20	38.1	22615	17410	14698	14217	13862	13648	14309
CMB-SFC25	39.3	22730	18299	14821	14320	13954	13737	14357
CMB-SFC30	39.5	22720	18272	14808	14125	13781	13601	14158
CMB-SFC35	39.7	22709	17126	14660	14127	13787	13608	14142
CMB-SFC40	39.9	22644	17090	14641	14129	13792	13613	14135
CMB-SFC-45	40.0	22623	17070	14641	14128	13796	13618	14128
CMB-SFC50	40.3	22610	17056	14647	14140	13808	13631	14130
CMB-CVC50 & SFC50	45.9	25278	19362	16636	16046	15659	15440	15818
CMB-SFC60	46.2	25267	19342	16633	16047	15664	15448	15811
CMB-SFC65	47.0	25408	19453	16720	16131	15747	15530	15863
CMB-SFC70	47.1	25409	19461	16728	16139	15756	15539	15865
CMB-SFC75 & SFCT170	53	27235	20994	17793	17146	16741	16512	16672

100-Yr Peak Flows Under Existing Conditions								
Hydrologic Element	DA (mi^2)	Storm Area 10 mi^2	Storm Area 20 mi^2	Storm Area 30 mi^2	Storm Area 40 mi^2	Storm Area 50 mi^2	Storm Area 60 mi^2	Interpolated Q at Combine pt
CMB-SFC10B	11.4	13532	10777	9522	9233	9055	8945	13142
CMB-SFC10C	17.5	19658	15470	13503	13072	12801	12632	16505
CMB-SFC10D	18.5	20014	15882	13837	13400	13132	12957	16522
CMB-SFC05C	14.5	15463	12245	10551	10174	9972	9842	14023
CMB-SFC05D	15.7	15743	12437	10720	10342	10131	10004	13855
CMB-SFC05F	17.3	16419	12904	11146	10753	10537	10402	13860
CMB-SFC15	36.8	29790	22988	19615	18878	18455	18201	19111
CMB-SFC20	38.1	29886	22869	19610	19434	19146	18529	19468
CMB-SFC25	39.3	30020	22991	20098	19813	19371	19533	19834
CMB-SFC30	39.5	30006	22990	19907	19563	19310	18876	19579
CMB-SFC35	39.7	29977	22981	19881	19403	19027	18730	19416
CMB-SFC40	39.9	29874	22908	19888	19375	18894	18555	19381
CMB-SFC-45	40.0	29827	22890	19890	19350	18840	18477	19350
CMB-SFC50	40.3	29764	22876	19912	19328	18765	18442	19312
CMB-CVC50 & SFC50	45.9	32812	25551	22676	22104	21490	21052	21742
CMB-SFC60	46.2	32810	25539	22688	22028	21378	20967	21627
CMB-SFC65	47.0	32939	25682	22830	22151	21503	21079	21698
CMB-SFC70	47.1	32953	25688	22844	22143	21493	21074	21679
CMB-SFC75 & SFCT170	53.0	35310	27538	24752	23963	23252	22800	23115

500-Yr Peak Flows Under Existing Conditions								
Hydrologic Element	DA (mi^2)	Storm Area 10 mi^2	Storm Area 20 mi^2	Storm Area 30 mi^2	Storm Area 40 mi^2	Storm Area 50 mi^2	Storm Area 60 mi^2	Interpolated Q at Combine pt
CMB-SFC10B	11.4	19394	15879	14068	13636	13317	13153	18895
CMB-SFC10C	17.5	29117	23178	20401	19806	19399	19174	24645
CMB-SFC10D	18.5	30411	23920	20649	20126	19873	19680	24925
CMB-SFC05C	14.5	21757	17974	16006	15573	15273	15110	20065
CMB-SFC05D	15.7	22232	18326	16307	15858	15551	15382	20002
CMB-SFC05F	17.3	23481	19143	17027	16544	16210	16030	20322
CMB-SFC15	36.8	44747	34952	30930	30023	29372	29000	30309
CMB-SFC20	38.1	43684	34945	30969	30125	29478	29115	30287
CMB-SFC25	39.3	43882	35182	31134	30254	29622	29266	30318
CMB-SFC30	39.5	43918	35209	31142	30245	29602	29252	30288
CMB-SFC35	39.7	43936	35229	31049	30217	29582	29229	30240
CMB-SFC40	39.9	43927	35233	30996	30127	29392	29020	30138
CMB-SFC-45	40.0	43928	35238	30938	30090	29367	28996	30090
CMB-SFC50	40.3	43964	35272	30921	30014	29348	28980	29994
CMB-CVC50 & SFC50	45.9	47938	38727	34068	33080	32376	31988	32665
CMB-SFC60	46.2	47969	38755	34068	33078	32370	31985	32641
CMB-SFC65	47.0	48159	38921	34257	33207	32502	32111	32715
CMB-SFC70	47.1	48173	38936	34269	33212	32498	32117	32702
CMB-SFC75 & SFCT170	53.0	51594	41637	36769	35602	34791	34352	34658

TABLE B 3-11
SUMMARY OF AREAL REDUCTIONS - CIENEGAS CREEK

2-Yr Peak Flows Under Existing Conditions					
Hydrologic Element	DA (mi^2)	Storm Area 10 mi^2	Storm Area 20 mi^2	Storm Area 30 mi^2	Interpolated Q at Combine pt
CMB-CNC40	18.0	2333	1753	1520	1867
CMB-CNC45	18.6	2455	1838	1590	1926
CMB-CNC55	19.9	2689	1990	1713	1999
CMB-CNC70	20.5	2748	2028	1743	1991
CMB-CNC75	22.3	3113	2282	1958	2089
CMB-CNC80	22.7	3143	2308	1977	2083
CMB-CNC90	23.6	3208	2348	2010	2039
5-Yr Peak Flows Under Existing Conditions					
Hydrologic Element	DA (mi^2)	Storm Area 10 mi^2	Storm Area 20 mi^2	Storm Area 30 mi^2	Interpolated Q at Combine pt
CMB-CNC40	18.0	4767	3592	3102	3824
CMB-CNC45	18.6	4829	3775	3281	3925
CMB-CNC55	19.9	5369	4183	3620	4198
CMB-CNC70	20.5	5567	4320	3730	4289
CMB-CNC75	22.3	6372	4911	4226	4752
CMB-CNC80	22.7	6444	4959	4268	4773
CMB-CNC90	23.6	6630	5090	4374	4833
10-Yr Peak Flows Under Existing Conditions					
Hydrologic Element	DA (mi^2)	Storm Area 10 mi^2	Storm Area 20 mi^2	Storm Area 30 mi^2	Interpolated Q at Combine pt
CMB-CNC40	18.0	7424	5475	4518	5860
CMB-CNC45	18.6	7488	5515	4660	5796
CMB-CNC55	19.9	7625	5909	5189	5930
CMB-CNC70	20.5	7669	6129	5380	6091
CMB-CNC75	22.3	8858	7003	6146	6804
CMB-CNC80	22.7	8963	7088	6213	6853
CMB-CNC90	23.6	9262	7290	6392	6967
25-Yr Peak Flows Under Existing Conditions					
Hydrologic Element	DA (mi^2)	Storm Area 10 mi^2	Storm Area 20 mi^2	Storm Area 30 mi^2	Interpolated Q at Combine pt
CMB-CNC40	18.0	11039	8438	7196	8951
CMB-CNC45	18.6	11135	8507	7259	8882
CMB-CNC55	19.9	11380	8668	7390	8701
CMB-CNC70	20.5	11482	8733	7497	8669
CMB-CNC75	22.3	12094	9765	8653	9507
CMB-CNC80	22.7	12272	9887	8754	9582
CMB-CNC90	23.6	12715	10206	9033	9784

50-Yr Peak Flows Under Existing Conditions					
Hydrologic Element	DA (mi^2)	Storm Area 10 mi^2	Storm Area 20 mi^2	Storm Area 30 mi^2	Interpolated Q at Combine pt
CMB-CNC40	18.0	14166	11039	9631	11657
CMB-CNC45	18.6	14312	11135	9697	11587
CMB-CNC55	19.9	14624	11380	9879	11420
CMB-CNC70	20.5	14764	11482	9958	11404
CMB-CNC75	22.3	15190	12094	10805	11794
CMB-CNC80	22.7	15397	12272	10935	11913
CMB-CNC90	23.6	16017	12715	11334	12218
100-Yr Peak Flows Under Existing Conditions					
Hydrologic Element	DA (mi^2)	Storm Area 10 mi^2	Storm Area 20 mi^2	Storm Area 30 mi^2	Interpolated Q at Combine pt
CMB-CNC40	18.0	18135	14304	9715	15060
CMB-CNC45	18.6	18331	14428	9795	14983
CMB-CNC55	19.9	18797	14754	9972	14803
CMB-CNC70	20.5	18995	14892	10047	14643
CMB-CNC75	22.3	19583	15338	10844	14294
CMB-CNC80	22.7	19651	15544	10977	14316
CMB-CNC90	23.6	20284	16184	11381	14457
500-Yr Peak Flows Under Existing Conditions					
Hydrologic Element	DA (mi^2)	Storm Area 10 mi^2	Storm Area 20 mi^2	Storm Area 30 mi^2	Interpolated Q at Combine pt
CMB-CNC40	18.0	26355	21212	18829	22228
CMB-CNC45	18.6	26638	21436	19003	22177
CMB-CNC55	19.9	27427	22016	19496	22082
CMB-CNC70	20.5	27785	22261	19721	22130
CMB-CNC75	22.3	28726	22977	20337	22364
CMB-CNC80	22.7	28797	23041	20394	22329
CMB-CNC90	23.6	29262	23673	21017	22718

TABLE B 3-12
SUMMARY OF MUSKINGUM-CUNGE CALCULATIONS - SAN FELIPE WATERSHED

Basin	Sub Basin	Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope (ft/ft)	n value	Calculated Vel (ft/s)	Final Velocity (ft/s)
SFC-05A		18466	1230	1110	0.0065	0.055	4.70	**4.70**
SFC-05B		19621	1190	1075	0.0059			**4.29**
	SFC-05B-1	9810	1190	1120	0.0071	0.055	4.94	
	SFC-05B-2	9811	1120	1075	0.0046	0.055	3.65	
SFC-05C		20820	1095	1010	0.0041	0.055	4.92	**4.92**
SFC-05D		12543	1080	990	0.0072	0.055	4.48	**4.48**
SFC-05E		11242	1082	996	0.0076	0.055	3.50	**3.50**
SFC-05F		4668	998	978	0.0043	0.055	2.67	**2.67**
SFC-10A		25702	1290	1110	0.0070			**5.41**
	SFC-10A-1	16618	1290	1160	0.0078	0.055	5.21	
	SFC-10A-2	9084	1160	1110	0.0055	0.055	5.79	
SFC-10B		15908	1195	1050	0.0091			**6.31**
	SFC-10B-1	5237	1195	1120	0.0143	0.055	9.45	
	SFC-10B-2	10671	1120	1050	0.0066	0.055	4.77	
SFC-10C		24530	1220	980	0.0098			**6.59**
	SFC-10C-1	8469	1220	1080	0.0165	0.055	5.77	
	SFC-10C-2	16061	1080	980	0.0062	0.055	7.03	
SFC-10D		7897	1035	980	0.0070	0.055	4.15	**4.15**
SFC-15		4543	1018	960	0.0128			**4.67**
	SFC-15-1	2271	1018	980	0.0167	0.055	5.84	
	SFC-15-2	2272	980	960	0.0088	0.055	3.51	
SFC-20		6620	1028	954	0.0112	0.055	4.28	**4.28**
SFC-25		9574	1042	944	0.0102	0.025	5.36	**5.36**
SFC-30	It is flat - cant get channel section - all shallow concentrated flow							**-**
SFC-35		496	930	927	0.0060	0.035	3.57	**3.57**
SFC-40		2340	942	920	0.0094	0.035	4.93	**4.93**
SFC-45		1712	922	916	0.0035	0.035	2.70	**2.70**
SFC-50		3021	918	907	0.0036	0.035	3.46	**3.46**
SFC-55		3622	968	928	0.0110	0.035	3.56	**3.56**
SFC-60		2508	919	900	0.0076	0.035	5.34	**5.34**
SFC-65		1676	910	898	0.0072			**5.96**
	SFC-65-1	1326	910	902	0.0060	0.025	5.71	
	SFC-65-2	350	902	898	0.0114	0.055	6.92	
SFC-70		3418	918	888	0.0088	0.055	3.22	**3.22**
SFC-75		2769	907	874	0.0119			**6.80**
	SFC-75-1	1385	907	886	0.0152	0.055	7.68	
	SFC-75-2	1384	886	874	0.0087	0.055	5.92	
SFCT1-05		6172	1076	1000	0.0123	0.025	4.96	**4.96**
SFCT1-10		1779	1002	972	0.0169	0.035	4.49	**4.49**
SFCT1-15		1713	986	959	0.0158	0.035	3.87	**3.87**
SFCT1-20		1069	952	948	0.0037	0.035	2.46	**2.46**
SFCT1-25		8079	1030	962	0.0084	0.025	3.32	**3.32**
SFCT1-30		2038	954	942	0.0059	0.025	3.05	**3.05**
SFCT1-35		3366	944	924	0.0059	0.035	1.96	**1.96**
SFCT1-40		1473	924	919	0.0034	0.035	2.00	**2.00**
SFCT1-45		2427	902	899	0.0012	0.035	2.08	**2.08**
SFCT1-50		6911	992	932	0.0087	0.035	3.57	**3.57**
SFCT1-55		3591	933	918	0.0042	0.035	2.71	**2.71**
SFCT1-60		2948	931	918	0.0044	0.035	2.03	**2.03**
SFCT1-65		3499	898	890	0.0023	0.035	2.72	**2.72**
SFCT1-70		1775	898	888	0.0056	0.035	2.64	**2.64**
CVC-05		6603	1135	1038	0.0147	0.055	3.59	**3.59**
CVC-10		4596	1040	1008	0.0070	0.055	3.55	**3.55**
CVC-15	did not identify channel - all shallow concentrated flow							**-**
CVC-20		4658	1060	980	0.0172	0.055	5.41	**5.41**
CVC-25		3334	1044	966	0.0234	0.055	6.20	**6.20**
CVC-30		3235	1044	952	0.0284	0.055	7.33	**7.33**
CVC-35		421	948	946	0.0048	0.035	2.34	**2.34**
CVC-40		2703	1062	956	0.0392	0.055	7.53	**7.53**

Basin	Sub Basin	Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope (ft/ft)	n value	Calculated Vel (ft/s)	Final Velocity (ft/s)
CVC-45		5176	1034	930	0.0201	0.055	4.38	**4.38**
CVC-50		5960	1032	906	0.0211	0.055	6.20	**6.20**
CVCT1-05		4428	980	958	0.0050	0.025	4.05	**4.05**
CVCT1-10		2865	971	944	0.0094	0.025	4.48	**4.48**
CVCT1-15		2855	969	938	0.0109	0.025	4.36	**4.36**

TABLE B 3-13
SUMMARY OF MUSKINGUM-CUNGE CALCULATION - CIENEGAS WATERSHED

Basin	Sub Basin	Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope (ft/ft)	n value	Calculated Vel (ft/s)	Final Velocity (ft/s)
CB-05		17539	1260	1045				**5.46**
	CB-05-1	3600	1260	1150	0.0306	0.055	11.13	
	CB-05-2	13939	1150	1045	0.0075	0.055	3.99	
CB-10		1493	1070	1042	0.0188	0.035	4.61	**4.61**
CB-15	all shallow concentrated flow							**-**
CB-20	all shallow concentrated flow							**-**
CB-25	all shallow concentrated flow							**-**
CB-30		3514	1052	1028	0.0068	0.025	2.43	**2.43**
CB-35	all shallow concentrated flow							**-**
CB-40	all shallow concentrated flow							**-**
CB-45		2264	1059	1046	0.0057	0.035	3.01	**3.01**
CB-50		2131	1039	1032	0.0033	0.025	2.60	**2.6**
CB-55		2833	1040	1024	0.0056	0.035	3.18	**3.18**
CB-60		4174	1036	1010	0.0062	0.035	3.23	**3.23**
CB-65		4172	1038	998	0.0096	0.035	4.01	**4.01**
CB-70		3748	1036	990	0.0123	0.035	4.29	**4.29**
CB-75		6358	1082	984	0.0154	0.03	4.13	**4.13**
CBT1-05		1351	1086	1064	0.0163	0.035	4.17	**4.17**
CBT1-10		1872	1059	1028	0.0166	0.035	3.91	**3.91**
CBT1-15		5479	1098	1010	0.0161	0.03		**5.87**
	CBT1-15-1	2647	1098	1040	0.0219	0.025	8.09	
	CBT1-15-2	2832	1040	1010	0.0106	0.035	3.79	
CBT1-20		4492	1079	990	0.0198	0.03	4.94	**4.94**
CBT4-05		1992	1052	1042	0.0050	0.025	3.17	**3.17**
CBT4-10		2154	1040	1026	0.0065	0.025	3.78	**3.78**
CBT5-05		2294	1083	1068	0.0065	0.055	2.75	**2.75**
CBT5-10		1992	1070	1046	0.0120	0.055	2.33	**2.33**
CNC-05		8655	1200	1130	0.0081	0.055	4.95	**4.95**
CNC-10		7930	1095	1050	0.0057	0.055	2.77	**2.77**
CNC-15		4223	1230	1120	0.0260	0.035	6.12	**6.12**
CNC-20		5989	1075	1045	0.0050	0.055	2.77	**2.77**
CNC-25		10383	1105	1026	0.0076	0.055	4.22	**4.22**
CNC-30		4669	1074	1026	0.0103	0.055	4.45	**4.45**
CNC-35		6513	1086	1000	0.0132	0.055	6.77	**6.77**
CNC-40		2930	996	982	0.0048	0.055	2.38	**2.38**
CNC-45		2212	1006	978	0.0127	0.055	2.61	**2.61**
CNC-50		5511	1048	978	0.0127	0.055	2.73	**2.73**
CNC-55		3846	1000	966	0.0088	0.055	2.35	**2.35**
CNC-60		3202	1036	976	0.0187	0.035	3.30	**3.3**
CNC-65		9352	1078	966	0.0120	0.055	3.10	**3.1**
CNC-70		4980	986	956	0.0060	0.055	1.95	**1.95**
CNC-75		5930	984	932	0.0088	0.055	2.41	**2.41**
CNC-80		3590	942	921	0.0058	0.055	2.16	**2.16**
CNC-85	all shallow concentrated flow							**-**
CNC-90		4284	910	878	0.0075	0.055	4.37	**4.37**
CNCT1-05		2960	1040	1002	0.0128	0.035	3.92	**3.92**
CNCT1-10		2464	1034	984	0.0203	0.035	3.04	**3.04**
CNCT1-15		1892	996	990	0.0032	0.035	2.26	**2.26**
CNCT1-20		7126	994	932	0.0087	0.055	2.75	**2.75**

TABLE B 4-1
SUMMARY OF EXISTING CONDITIONS HEC-HMS RESULTS - SAN FELIPE CREEK

HYDROLOGIC ELEMENT	DA (sq mi)	2-yr (CFS)	5-yr (CFS)	10-yr (CFS)	25-yr (CFS)	50-yr (CFS)	100-yr (CFS)	500-yr (CFS)
SFC-10A	6.8	2748	4661	6025	7746	9176	10885	14281
RT-SFC10B	6.8	2739	4648	6006	7721	9158	10863	14252
SFC-10B	4.6	2324	4131	5438	7099	8483	10140	13436
CMB-SFC10B	11.4	3865	6864	9063	11876	14399	17390	23076
RT-SFC10C	11.4	3857	6844	9030	11833	14301	17319	23014
SFC-10C	6.1	2075	3986	5412	7254	8805	10673	14411
CMB-SFC10C	17.5	5190	9854	13320	17788	21663	26469	36108
RT-SFC10D	17.5	5164	9778	13199	17642	21192	26330	36066
SFC-10D	0.9	280	560	773	1050	1284	1567	2137
CMB-SFC10D	18.5	5329	10144	13721	18381	21987	27551	37947
RT-SFC15-1	18.5	5316	10115	13681	18339	21886	27450	36536
SFC-05A	4.6	2143	3609	4649	5963	7053	8356	10946
RT-SFC-05B	4.6	2116	3566	4595	5916	6998	8288	10855
SFC-05B	3.7	1257	2213	2903	3780	4510	5386	7130
CMB-SFC05B	8.3	3302	5709	7430	9671	11485	13660	17970
RT-SFC05C	8.3	3178	5509	7176	9394	11179	13293	17464
SFC-05C	6.1	1673	3106	4163	5521	6661	8034	10777
CMB-SFC05C	14.5	4088	7446	9966	13620	16448	19783	26213
RT-SFC05D	14.5	4055	7413	9926	13552	16388	19722	26126
SFC-05D	1.2	387	838	1188	1650	2045	2526	3496
CMB-SFC05D	15.7	4109	7533	10100	13814	16730	20146	26712
RT-SFC05F-2	15.7	4050	7436	10003	13626	16539	19973	26559
SFC-05E	1.2	374	678	900	1183	1420	1704	2271
RT-SFC05F-1	1.2	372	675	896	1178	1415	1698	2263
SFC-05F	0.4	168	300	396	518	619	741	984
CMB-SFC05F	17.3	4217	7790	10511	14387	17491	21186	28256
RT-SFC15-2	17.3	4193	7758	10464	14289	17401	21065	28159
SFC-15	1.1	457	887	1210	1630	1984	2411	3268
CMB-SFC15	36.8	7570	14312	19480	26236	32231	39998	55719
RT-SFC20	36.8	7531	14022	19270	25978	32076	39430	54671
SFC-20	1.2	810	1419	1866	2440	2923	3503	4663
CMB-SFC20	38.1	7630	14181	19514	26291	32427	39722	55185
RT-SFC25	38.1	7601	14089	19782	26243	32390	39605	54637
SFC-25	1.2	1012	1560	1953	2453	2872	3376	4384
CMB-SFC25	39.3	7708	14244	20165	26558	32737	39886	55109
RT-SFC30	39.3	7694	14009	19705	26525	32716	39842	55046
SFC-30	0.3	267	409	510	639	747	878	1138
CMB-SFC30	39.5	7712	14034	19747	26577	32776	39895	55128
RT-SFC35	39.5	7702	14013	19695	26519	32741	39854	55081
SFC-35	0.2	212	340	434	555	657	781	1029
CMB-SFC35	39.7	7714	14031	19723	26554	32781	39893	55140

HYDROLOGIC ELEMENT	DA (sq mi)	2-yr (CFS)	5-yr (CFS)	10-yr (CFS)	25-yr (CFS)	50-yr (CFS)	100-yr (CFS)	500-yr (CFS)
RT-SFC40	39.7	7698	14015	19703	26443	32749	39851	55031
SFC-40	0.2	158	250	318	404	477	565	742
CMB-SFC40	39.9	7708	14029	19725	26470	32781	39881	55076
RT-SFC45	39.9	7695	14016	19706	26437	32743	39855	55038
SFC-45	0.1	97	167	223	296	359	437	597
CMB-SFC-45	40.0	7701	14025	19720	26455	32763	39876	55069
RT-SFC50-2	40.0	7680	14005	19698	26395	32721	39850	54939
SFC-50	0.2	192	325	423	548	653	780	1033
SFC-55	0.1	152	232	289	361	422	495	640
RT-SFC50-1	0.1	151	230	287	358	418	489	636
CMB-SFC50	40.3	7696	14029	19734	26438	32772	39902	55012
CVC-05	1.7	634	1031	1313	1671	1969	2326	3038
RT-CVC10	1.7	633	1028	1311	1668	1965	2322	3032
CVC-10	0.8	682	1120	1432	1826	2153	2544	3323
CMB-CVC10	2.4	750	1258	1621	2084	2477	2955	3908
RT-CVC15	2.4	735	1233	1575	1963	2236	2517	4137
CVC-15	0.2	185	307	394	504	596	706	924
CMB-CVC15	2.6	890	1485	1891	2323	2601	2855	4844
RT-CVC20	2.6	861	1442	1911	2301	2576	2836	4293
CVC-20	0.8	450	770	999	1288	1528	1815	2385
CMB-CVC20	3.4	1287	2176	2780	3550	4085	4623	6594
RT-CVC25	3.4	1244	2120	2741	3533	4194	4605	6388
CVC-25	0.3	289	497	646	836	995	1184	1561
CMB-CVC25	3.7	1309	2232	2939	3755	4525	4873	6770
RT-CVC30	3.7	1272	2217	2951	3729	4351	4865	6686
CVC-30	0.3	395	651	833	1064	1256	1485	1941
CMB-CVC30	4.0	1321	2307	3106	3904	4581	5142	6982
RT-CVC35	4.0	1291	2212	2759	3827	4516	5116	6923
CVC-35	0.1	113	192	250	323	384	457	604
CMB-CVC35	4.1	1301	2228	2780	3859	4561	5176	6988
RT-CVC45-2	4.1	1276	2194	2734	3730	4487	5154	6775
CVCT1-05	0.4	266	404	501	625	729	853	1102
SFC-05B	3.7	1257	2213	2903	3780	4510	5386	7130
CMB-SFC05B	8.3	3302	5709	7430	9671	11485	13660	17970
RT-SFC05C	8.3	3178	5509	7176	9394	11179	13293	17464
SFC-05C	6.1	1673	3106	4163	5521	6661	8034	10777
CMB-SFC05C	14.5	4088	7446	9966	13620	16448	19783	26213
RT-SFC05D	14.5	4055	7413	9926	13552	16388	19722	26126
SFC-05D	1.2	387	838	1188	1650	2045	2526	3496
CMB-SFC05D	15.7	4109	7533	10100	13814	16730	20146	26712
RT-SFC05F-2	15.7	4050	7436	10003	13626	16539	19973	26559
SFC-05E	1.2	374	678	900	1183	1420	1704	2271
RT-SFC05F-1	1.2	372	675	896	1178	1415	1698	2263
SFC-05F	0.4	168	300	396	518	619	741	984

HYDROLOGIC ELEMENT	DA (sq mi)	2-yr (CFS)	5-yr (CFS)	10-yr (CFS)	25-yr (CFS)	50-yr (CFS)	100-yr (CFS)	500-yr (CFS)
CVC-50	0.5	523	882	1138	1461	1729	2050	2688
CMB-CVC50	5.6	1617	2729	3362	4462	5593	7388	8854
CMB-CVC50 & SF	45.9	8722	15602	22185	29499	36290	43850	59758
RT-SFC60	45.9	8708	15581	22140	29449	36150	43787	59699
SFC-60	0.3	110	229	320	440	543	667	917
CMB-SFC60	46.2	8721	15602	22176	29494	36204	43858	59777
RT-SFC65	46.2	8715	15595	22165	29481	36182	43846	59759
SFC-65	0.8	341	661	903	1221	1491	1818	2477
CMB-SFC65	47.0	8756	15662	22287	29630	36359	44084	60018
RT-SFC70	47.0	8751	15658	22276	29609	36327	44065	59994
SFC-70	0.2	60	141	208	298	377	475	678
CMB-SFC70	47.1	8756	15667	22290	29628	36350	44094	60030
RT-SFC75	47.1	8730	15632	22208	29547	36231	43997	59939
SFCT1-05	0.4	556	848	1057	1321	1541	1805	2333
RT-SFCT110	0.4	549	835	1040	1301	1514	1779	2305
SFCT1-10	0.3	380	599	757	958	1126	1328	1731
CMB-SFCT110	0.7	858	1349	1699	2113	2490	2943	3841
RT-SFCT115	0.7	851	1340	1683	2099	2467	2909	3817
SFCT1-15	0.2	180	288	366	466	550	651	852
CMB-SFCT115	0.8	1025	1624	2043	2557	3007	3560	4669
RT-SFCT120-1	0.8	1017	1606	2035	2544	2995	3532	4631
SFCT1-25	0.4	386	584	724	902	1051	1230	1588
RT-SFCT120-2	0.4	337	517	646	811	948	1116	1454
SFCT1-20	0.1	143	235	303	390	464	552	728
CMB-SFCT120	1.4	1432	2262	2868	3603	4244	5011	6576
RT-SFCT135-1	1.4	1383	2182	2757	3487	4091	4895	6422
SFCT1-30	0.3	285	463	592	755	892	1057	1385
RT-SFCT135-2	0.3	274	448	578	740	874	1033	1357
SFCT1-35	0.1	34	82	124	181	232	296	429
CMB-SFCT135	1.8	1673	2673	3401	4322	5103	6120	8066
RT-SFCT140	1.8	1601	2573	3281	4184	4928	5875	7783
SFCT1-40	0.2	101	181	241	319	385	466	628
CMB-SFCT140	2.0	1688	2738	3512	4496	5306	6335	8411
RT-SFCT145-1	2.0	1495	2431	3121	4043	4843	5778	7601
SFCT1-45	0.9	116	248	361	518	658	832	1196
SFCT1-55	0.4	181	309	407	535	644	777	1048
RT-SFCT145-2	0.4	173	300	398	524	631	762	1027
CMB-SFCT145	3.2	1780	2968	3862	5046	6054	7260	9602
RT-SFCT165-2	3.2	1737	2890	3768	4965	5946	7142	9460
SFCT1-50	0.5	495	771	970	1225	1438	1696	2213
RT-SFCT160	0.5	486	758	953	1205	1414	1669	2178
SFCT1-60	0.3	168	307	416	561	686	839	1153
CMB-SFCT160	0.9	629	1028	1327	1721	2052	2454	3270
RT-SFCT165-1	0.9	602	1001	1298	1682	2013	2412	3213

HYDROLOGIC ELEMENT	DA (sq mi)	2-yr (CFS)	5-yr (CFS)	10-yr (CFS)	25-yr (CFS)	50-yr (CFS)	100-yr (CFS)	500-yr (CFS)
SFCT1-65	0.6	136	257	359	498	621	774	1092
CMB-SFCT165	4.7	2133	3757	4947	6604	8010	9688	13061
RT-SFCT170	4.7	2130	3751	4938	6596	7998	9671	13050
SFC-75	1.0	158	373	558	816	1045	1330	1924
SFCT1-70	0.2	43	102	155	231	299	385	566
CMB-SFC75 & SF(	53.0	9325	16459	23887	31479	38459	47095	63011

TABLE B 4-2
SUMMARY OF EXISTING CONDITIONS HEC-HMS RESULTS - CIENEGAS CREEK

HYDROLOGIC ELEMENT	DA (sq mi)	2-yr (CFS)	5-yr (CFS)	10-yr (CFS)	25-yr (CFS)	50-yr (CFS)	100-yr (CFS)	500-yr (CFS)
CB-05	3.294	1667	2935	3849	5011	5979	7144	9462
CBT5-05	0.4751	329	539	688	877	1034	1221	1594
RT-CBT5-10	0.4751	327	535	684	872	1030	1222	1597
CBT5-10	0.1105	94	156	201	257	304	360	472
CMB-CBT5-10	0.5856	398	655	839	1070	1263	1496	1956
CMB-CB-05	3.8796	2042	3560	4654	6044	7202	8587	11346
RT-CB-10	3.8796	1961	3481	4585	5968	7124	8498	11226
CB-10	0.1308	132	226	293	378	449	534	703
CMB-CB-10	4.0104	1985	3526	4651	6052	7224	8616	11383
RT-CB-15	4.0104	1858	3357	4459	5862	7021	8409	11176
CB-20	0.5728	123	247	342	467	574	705	968
CB-15	0.2286	41	89	128	179	224	279	391
CMB-CB-15	4.8118	2021	3688	4916	6478	7785	9323	12446
RT-CB-25	4.8118	1879	3486	4667	6165	7426	8849	12209
CB-25	0.3482	71	149	208	286	353	433	597
CMB-CB-25	5.16	1940	3625	4868	6446	7771	9272	12806
RT-CB-30	5.16	1175	1953	2369	4088	5698	7497	9083
CB-35	0.425	129	245	330	440	533	645	868
RT-CB-40	0.425	129	243	328	438	530	641	864
CB-40	0.3247	189	325	423	547	651	774	1020
CMB-CB-40	0.7497	229	431	582	775	939	1135	1545
RT-CB30-2	0.7497	226	427	575	767	930	1125	1528
CB-45	0.2276	265	410	514	644	753	884	1145
RT-CB-50	0.2276	260	405	508	638	744	872	1125
CB-50	0.1852	182	296	379	485	573	680	893
CMB-CB-50	0.4128	429	678	861	1098	1293	1527	1978
RT-CB30-3	0.4128	313	511	654	846	1010	1200	1606
CB-30	0.2472	203	318	401	505	592	697	907
CMB-CB-30	6.5697	1273	2091	2543	4555	6377	8300	9940
RT-CB-55	6.5697	1269	2088	2541	4440	6174	8113	9987
CB-55	0.2247	229	357	448	564	660	776	1007
CMB-CB-55	6.7944	1279	2103	2561	4473	6216	8161	10050
CBT4-05	0.2375	234	363	455	570	667	782	1011
RT-CBT4-10	0.2375	207	332	420	535	630	745	970
CBT4-10	0.1347	169	259	323	404	471	553	715
CMB-CBT4-10	0.3722	297	485	622	793	942	1119	1477
MB-CB-55_CBT4-	7.1666	1298	2130	2595	4532	6294	8252	10170
RT-CB-60	7.1666	1291	2125	2592	4360	6090	8095	10075
CB-60	0.4519	419	659	829	1045	1225	1441	1872
CMB-CB-60	7.6185	1311	2154	2630	4423	6169	8189	10195
RT-CB-65	7.6185	1306	2151	2629	4333	6067	8046	10168

HYDROLOGIC ELEMENT	DA (sq mi)	2-yr (CFS)	5-yr (CFS)	10-yr (CFS)	25-yr (CFS)	50-yr (CFS)	100-yr (CFS)	500-yr (CFS)
CB-65	0.278	272	441	562	717	846	1001	1311
CMB-CB-65	7.8965	1317	2167	2650	4369	6111	8099	10236
RT-CB-70	7.8965	1315	2166	2649	4346	6084	8066	10225
CB-70	0.2304	213	351	450	576	682	808	1059
CMB-CB-70	8.1269	1324	2180	2666	4376	6120	8110	10280
CBT1-15	0.3594	397	618	774	972	1136	1332	1724
CBT1-10	0.1387	174	273	343	432	506	594	770
CBT1-05	0.1136	137	212	264	330	385	451	582
RT-CBT1-10	0.1136	126	201	254	319	373	438	565
CMB-CBT1-10	0.2523	275	441	558	707	828	977	1266
RT-CBT1-15	0.2523	256	411	519	656	774	922	1202
CMB-CBT1-15	0.6117	632	1003	1262	1589	1863	2200	2857
RT-CBT1-20	0.6117	599	959	1210	1528	1795	2123	2777
CBT1-20	0.2123	166	277	357	460	546	649	855
CMB-CBT1-20	0.824	754	1221	1558	1981	2332	2761	3616
MB-CB-70_CBT1-	8.9509	1617	2772	3630	4730	6259	8278	10497
RT-CB-75	8.9509	1613	2768	3624	4723	6234	8275	10492
CNC-10	2.6177	1022	1734	2241	2882	3415	4053	5321
CNC-05	1.7881	1045	1767	2280	2927	3464	4105	5379
RT-CNC-10	1.7881	1072	1708	2212	2841	3361	3973	5208
CNC-20	1.1294	281	552	761	1037	1273	1563	2150
CNC-15	0.3604	404	659	838	1063	1250	1472	1914
RT-CNC10-2	0.3604	343	496	732	966	1087	1308	1716
CMB-CNC-10	5.8956	1955	3707	5236	6820	8199	9897	13233
RT-CNC-25	5.8956	1850	3649	5110	6744	8121	9796	13107
CNC-25	1.0097	569	938	1198	1526	1798	2123	2768
CNC-30	0.4869	233	388	498	637	753	891	1166
CMB-CNC-25	7.3922	2052	4115	5789	7668	9322	11297	15374
RT-CNC-35	7.3922	2010	4070	5733	7650	9293	11267	15272
CNC-35	1.2746	997	1621	2058	2607	3062	3606	4686
CMB-CNC-35	8.6668	2233	4273	6016	8051	9795	11900	16235
RT-CNC-40	8.6668	2220	4136	5789	7832	9588	11685	15963
CB-75	0.2061	103	187	249	329	396	478	640
CNC-40	0.2017	94	184	251	337	411	499	675
CMB-CNC-40	18.0255	3491	5975	7988	10538	12735	15653	21584
RT-CNC-45	18.0255	3487	5971	7984	10536	12732	15612	21518
CNC-50	0.3938	211	370	484	629	750	895	1182
CNC-45	0.1567	105	189	251	331	398	479	640
CMB-CNC-45	18.576	3707	6178	8354	11098	13433	16247	22000
RT-CNC-55	18.576	3696	6170	8349	11090	13421	16227	21982
CNC-65	0.9041	417	752	996	1307	1567	1878	2499
CNC-55	0.2606	71	168	246	350	441	552	782
CNC-60	0.1359	111	187	242	312	370	440	580
RT-CNC-55_2	0.1359	109	184	235	306	364	431	549

HYDROLOGIC ELEMENT	DA (sq mi)	2-yr (CFS)	5-yr (CFS)	10-yr (CFS)	25-yr (CFS)	50-yr (CFS)	100-yr (CFS)	500-yr (CFS)
CMB-CNC-55	19.8766	4142	7070	9340	12505	15158	18389	24931
RT-CNC-70	19.8766	4130	7032	9298	12479	15111	18341	24890
CNC-70	0.6373	218	430	588	794	968	1178	1598
CMB-CNC-70	20.5139	4290	7414	9740	13127	15949	19360	26348
RT-CNC-75	20.5139	4283	7380	9722	13105	15917	19307	26279
CNCT1-05	0.2546	273	429	540	681	799	940	1223
CNCT1-04	0.0713	90	139	175	219	257	301	390
RT-CNCT1-05	0.0713	62	87	104	123	141	181	310
CMB-CNCT1-05	0.3259	318	483	598	744	867	1016	1326
RT-CNCT1-10	0.3259	270	342	374	416	522	589	624
CNCT1-10	0.1503	152	246	313	397	467	551	718
CMB-CNCT1-10	0.4762	370	512	594	691	774	871	1058
RT-CNCT1-15	0.4762	368	503	587	685	763	861	1026
CNCT1-15	0.2666	195	331	429	554	658	782	1030
CMB-CNCT1-15	0.7428	552	833	1016	1239	1421	1637	2056
RT-CNCT1-20	0.7428	292	378	461	589	616	664	1049
CNCT1-20	0.5711	252	466	622	823	991	1194	1600
CMB-CNCT1-20	1.3139	381	639	827	1057	1250	1477	1908
CNC-75	0.4948	207	398	541	727	885	1075	1456
CMB-CNC-75	22.3226	4752	8167	10598	14314	17358	21086	28740
RT-CNC-80	22.3226	4737	8130	10580	14284	17317	21019	28670
CNC-80	0.3673	256	429	555	716	851	1014	1340
CMB-CNC-80	22.6899	4795	8256	10723	14489	17587	21338	29140
RT-CNC90-1	22.6899	4775	8213	10703	14460	17535	21277	29083
CNC-90	0.8062	250	507	707	976	1207	1491	2068
CNC-85	0.1007	90	148	190	244	289	342	450
RT-CNC90-2	0.1007	86	143	185	236	279	332	434
CMB-CNC-90	23.5968	4899	8496	11079	15001	18241	22214	30480

TABLE B 4-3
SUMMARY OF ULTIMATE CONDITIONS HEC-HMS RESULTS - SAN FELIPE CREEK

HYDROLOGIC ELEMENT	DA (sq mi)	2-yr (CFS)	5-yr (CFS)	10-yr (CFS)	25-yr (CFS)	50-yr (CFS)	100-yr (CFS)	500-yr (CFS)
SFC-10A	6.8	2748	4661	6025	7746	9176	10885	14281
RT-SFC10B	6.8	2739	4648	6006	7721	9158	10863	14252
SFC-10B	4.6	2372	4180	5485	7143	8525	10179	13471
CMB-SFC10B	11.4	3887	6893	9092	11905	14425	17418	23101
RT-SFC10C	11.4	3880	6873	9059	11862	14328	17346	23039
SFC-10C	6.1	2795	4793	6255	8131	9706	11603	15400
CMB-SFC10C	17.5	5584	10309	13797	18280	22155	26897	36650
RT-SFC10D	17.5	5548	10236	13673	18106	21705	26921	36581
SFC-10D	0.9	401	710	939	1235	1485	1786	2390
CMB-SFC10D	18.5	5757	10641	14217	18847	22515	28258	38513
RT-SFC15-1	18.5	5741	10614	14180	18801	22379	27987	37217
SFC-05A	4.6	2143	3609	4649	5963	7053	8356	10946
RT-SFC-05B	4.6	2116	3566	4595	5916	6998	8288	10855
SFC-05B	3.7	1257	2213	2903	3780	4510	5386	7130
CMB-SFC05B	8.3	3302	5709	7430	9671	11485	13660	17970
RT-SFC05C	8.3	3178	5509	7176	9394	11179	13293	17464
SFC-05C	6.1	1834	3273	4328	5680	6816	8183	10913
CMB-SFC05C	14.5	4154	7530	10060	13727	16555	19891	26310
RT-SFC05D	14.5	4127	7498	10019	13655	16495	19828	26223
SFC-05D	1.2	645	1099	1437	1874	2245	2693	3594
CMB-SFC05D	15.7	4203	7647	10234	13972	16900	20327	26901
RT-SFC05F-2	15.7	4134	7547	10133	13783	16706	20151	26752
SFC-05E	1.2	495	825	1063	1366	1619	1923	2529
RT-SFC05F-1	1.2	492	821	1058	1360	1612	1914	2517
SFC-05F	0.4	226	369	472	602	711	841	1100
CMB-SFC05F	17.3	4302	7887	10611	14486	17582	21265	28284
RT-SFC15-2	17.3	4275	7854	10564	14384	17487	21142	28186
SFC-15	1.1	477	909	1232	1651	2004	2431	3286
CMB-SFC15	36.8	8273	15130	20335	27141	33018	40234	55859
RT-SFC20	36.8	8228	15012	20061	26864	32828	39711	55101
SFC-20	1.2	869	1480	1927	2499	2980	3557	4712
CMB-SFC20	38.1	8337	15214	20297	27201	33193	40193	55630
RT-SFC25	38.1	8306	14996	20271	27149	33140	40088	55262
SFC-25	1.2	1015	1563	1956	2456	2875	3379	4387
CMB-SFC25	39.3	8420	15199	20510	27474	33496	40543	55758
RT-SFC30	39.3	8395	14837	20475	27448	33467	40495	55676
SFC-30	0.3	267	409	510	639	747	878	1138
CMB-SFC30	39.5	8415	14867	20515	27503	33526	40570	55762
RT-SFC35	39.5	8404	14766	20420	27459	33492	40529	55726
SFC-35	0.2	212	340	434	555	657	781	1029
CMB-SFC35	39.7	8417	14785	20446	27496	33533	40581	55786

HYDROLOGIC ELEMENT	DA (sq mi)	2-yr (CFS)	5-yr (CFS)	10-yr (CFS)	25-yr (CFS)	50-yr (CFS)	100-yr (CFS)	500-yr (CFS)
RT-SFC40	39.7	8403	14757	20423	27398	33502	40522	55642
SFC-40	0.2	159	252	319	406	479	567	744
CMB-SFC40	39.9	8413	14772	20444	27426	33534	40562	55690
RT-SFC45	39.9	8402	14754	20422	27387	33507	40532	55647
SFC-45	0.1	105	177	233	307	370	448	608
CMB-SFC-45	40.0	8408	14763	20435	27405	33529	40559	55680
RT-SFC50-2	40.0	8387	14733	20407	27314	33511	40532	55509
SFC-50	0.2	203	337	434	559	664	790	1043
SFC-55	0.1	152	232	289	361	422	495	640
RT-SFC50-1	0.1	151	230	287	358	418	489	636
CMB-SFC50	40.3	8403	14759	20441	27359	33564	40598	55585
CVC-05	1.7	865	1357	1707	2149	2517	2958	3837
RT-CVC10	1.7	861	1352	1699	2140	2507	2946	3822
CVC-10	0.8	829	1277	1594	1995	2329	2728	3525
CMB-CVC10	2.4	987	1556	1962	2477	2910	3428	4464
RT-CVC15	2.4	984	1548	1935	2372	2699	3495	4412
CVC-15	0.2	251	382	474	590	687	803	1035
CMB-CVC15	2.6	1117	1726	2115	2486	2754	3595	5093
RT-CVC20	2.6	1084	1682	2097	2463	2752	3518	4858
CVC-20	0.8	578	912	1148	1447	1695	1993	2586
CMB-CVC20	3.4	1642	2576	3212	3906	4384	5045	7417
RT-CVC25	3.4	1621	2559	3144	3923	4374	5024	7329
CVC-25	0.3	376	584	733	921	1078	1265	1640
CMB-CVC25	3.7	1727	2734	3362	4276	4681	5222	7704
RT-CVC30	3.7	1763	2670	3334	4138	4654	5213	7635
CVC-30	0.3	491	748	930	1159	1350	1579	2036
CMB-CVC30	4.0	1855	2790	3517	4341	4933	5532	7924
RT-CVC35	4.0	1631	2565	3357	4296	4892	5458	7887
CVC-35	0.1	143	225	284	358	420	494	642
CMB-CVC35	4.1	1644	2583	3382	4334	4942	5534	7950
RT-CVC45-2	4.1	1609	2551	3178	4260	4902	5501	7877
CVCT1-05	0.4	266	404	501	625	729	853	1102
RT-CVCT110	0.4	261	398	495	616	719	840	1086
CVCT1-10	0.1	173	261	323	403	469	549	708
CMB-CVCT110	0.5	275	418	521	648	756	883	1142
RT-CVCT1115	0.5	274	417	519	645	754	881	1139
CVCT1-15	0.0	88	133	165	205	239	279	360
CMB-CVCT115	0.5	301	455	570	722	841	995	1297
RT-CVC45-3	0.5	293	449	563	713	831	983	1276
CVC-45	0.4	304	500	641	819	967	1145	1499
CVC-40	0.1	231	345	426	528	612	714	916
RT-CVC45-1	0.1	224	323	402	522	595	693	890
CMB-CVC45	5.1	1975	3045	3767	5249	6163	7119	9651
RT-CVC50	5.1	1936	3018	3729	5038	6299	7394	9587

HYDROLOGIC ELEMENT	DA (sq mi)	2-yr (CFS)	5-yr (CFS)	10-yr (CFS)	25-yr (CFS)	50-yr (CFS)	100-yr (CFS)	500-yr (CFS)
CVC-50	0.5	525	884	1140	1463	1731	2052	2690
CMB-CVC50	5.6	1980	3084	3810	5160	6498	7740	9863
CMB-CVC50 & SF	45.9	9721	16703	23366	31016	37559	45349	60591
RT-SFC60	45.9	9705	16664	23355	30962	37488	45274	60491
SFC-60	0.3	112	231	322	442	545	669	919
CMB-SFC60	46.2	9718	16687	23390	31009	37544	45348	60573
RT-SFC65	46.2	9713	16676	23385	30994	37525	45331	60556
SFC-65	0.8	341	661	903	1221	1491	1818	2477
CMB-SFC65	47.0	9757	16753	23502	31149	37710	45581	60830
RT-SFC70	47.0	9752	16745	23497	31133	37693	45560	60810
SFC-70	0.2	60	141	208	298	377	475	678
CMB-SFC70	47.1	9757	16755	23511	31152	37716	45591	60848
RT-SFC75	47.1	9729	16698	23484	31054	37617	45473	60717
SFCT1-05	0.4	556	848	1057	1321	1541	1805	2333
RT-SFCT110	0.4	549	835	1040	1301	1514	1779	2305
SFCT1-10	0.3	411	631	788	988	1155	1356	1757
CMB-SFCT110	0.7	882	1377	1727	2139	2516	2967	3863
RT-SFCT115	0.7	875	1367	1708	2125	2490	2935	3839
SFCT1-15	0.2	181	289	367	467	551	652	854
CMB-SFCT115	0.8	1054	1652	2070	2585	3032	3587	4693
RT-SFCT120-1	0.8	1045	1636	2063	2572	3017	3551	4655
SFCT1-25	0.4	386	584	724	902	1051	1230	1588
RT-SFCT120-2	0.4	337	517	646	811	948	1116	1454
SFCT1-20	0.1	158	252	320	406	479	567	742
CMB-SFCT120	1.4	1470	2303	2908	3642	4277	5041	6611
RT-SFCT135-1	1.4	1418	2223	2794	3522	4129	4931	6457
SFCT1-30	0.3	362	557	696	872	1019	1196	1548
RT-SFCT135-2	0.3	346	534	676	846	990	1163	1501
SFCT1-35	0.1	109	174	222	286	341	407	543
CMB-SFCT135	1.8	1790	2825	3551	4483	5269	6320	8315
RT-SFCT140	1.8	1717	2725	3427	4334	5100	6062	8008
SFCT1-40	0.2	177	273	342	431	505	594	774
CMB-SFCT140	2.0	1833	2936	3706	4702	5550	6612	8746
RT-SFCT145-1	2.0	1625	2600	3302	4276	5065	6013	7898
SFCT1-45	0.9	155	296	413	574	715	891	1256
SFCT1-55	0.4	249	393	499	636	752	892	1175
RT-SFCT145-2	0.4	238	383	487	621	734	871	1148
CMB-SFCT145	3.2	2017	3264	4175	5413	6430	7652	10061
RT-SFCT165-2	3.2	1977	3188	4086	5315	6319	7535	9928
SFCT1-50	0.5	498	773	973	1227	1441	1699	2215
RT-SFCT160	0.5	489	760	956	1208	1417	1673	2181
SFCT1-60	0.3	170	310	419	564	689	842	1155
CMB-SFCT160	0.9	633	1033	1333	1726	2055	2459	3275
RT-SFCT165-1	0.9	607	1006	1303	1687	2017	2417	3217

HYDROLOGIC ELEMENT	DA (sq mi)	2-yr (CFS)	5-yr (CFS)	10-yr (CFS)	25-yr (CFS)	50-yr (CFS)	100-yr (CFS)	500-yr (CFS)
SFCT1-65	0.6	177	308	414	558	683	837	1156
CMB-SFCT165	4.7	2508	4153	5373	7109	8525	10228	13694
RT-SFCT170	4.7	2497	4146	5364	7092	8507	10204	13662
SFC-75	1.0	158	373	558	816	1045	1330	1924
SFCT1-70	0.2	43	102	155	231	299	385	566
CMB-SFC75 & SF(	53.0	10445	17727	25193	33110	40018	48810	64092

TABLE B 4-4
SUMMARY OF ULTIMATE CONDITIONS HEC-HMS RESULTS - CIENEGAS CREEK

HYDROLOGIC ELEMENT	DA (sq mi)	2-yr (CFS)	5-yr (CFS)	10-yr (CFS)	25-yr (CFS)	50-yr (CFS)	100-yr (CFS)	500-yr (CFS)
CB-05	3.294	2130	3423	4348	5520	6496	7667	10002
CBT5-05	0.4751	350	572	731	930	1096	1295	1690
RT-CBT5-10	0.4751	347	568	726	924	1090	1286	1682
CBT5-10	0.1105	113	177	222	280	328	386	500
CMB-CBT5-10	0.5856	435	705	902	1148	1359	1592	2090
CMB-CB-05	3.8796	2538	4084	5184	6579	7738	9141	11912
RT-CB-10	3.8796	2458	4014	5102	6495	7672	9066	11822
CB-10	0.1308	173	269	337	424	496	582	755
CMB-CB-10	4.0104	2486	4064	5165	6588	7781	9193	11985
RT-CB-15	4.0104	2319	3849	4978	6369	7555	8955	11713
CB-20	0.5728	197	348	461	609	734	885	1190
CB-15	0.2286	89	152	201	263	317	382	514
CMB-CB-15	4.8118	2590	4339	5634	7238	8601	10217	13404
RT-CB-25	4.8118	2427	4109	5327	6892	8102	9639	12969
CB-25	0.3482	129	226	298	391	470	566	757
CMB-CB-25	5.16	2511	4276	5562	7217	8468	10106	13658
RT-CB-30	5.16	1482	2184	2678	5027	6589	7973	9475
CB-35	0.425	186	325	426	556	666	797	1060
RT-CB-40	0.425	184	321	422	552	660	792	1055
CB-40	0.3247	192	329	426	550	654	777	1022
CMB-CB-40	0.7497	319	565	745	975	1169	1417	1900
RT-CB30-2	0.7497	312	554	732	962	1152	1392	1872
CB-45	0.2276	268	413	516	646	755	886	1147
RT-CB-50	0.2276	262	408	511	639	746	874	1127
CB-50	0.1852	195	310	392	498	586	692	904
CMB-CB-50	0.4128	442	693	876	1111	1308	1541	1991
RT-CB30-3	0.4128	325	525	668	862	1015	1216	1610
CB-30	0.2472	206	321	403	507	594	699	908
CMB-CB-30	6.5697	1579	2315	2953	5535	7284	8688	10348
RT-CB-55	6.5697	1575	2313	2927	5373	7125	8585	10472
CB-55	0.2247	219	346	438	554	650	767	999
CMB-CB-55	6.7944	1585	2328	2951	5408	7169	8634	10551
CBT4-05	0.2375	242	371	462	577	673	787	1016
RT-CBT4-10	0.2375	214	339	427	542	637	750	974
CBT4-10	0.1347	169	259	323	404	471	553	715
CMB-CBT4-10	0.3722	306	493	629	800	949	1125	1483
MB-CB-55_CBT4-	7.1666	1605	2356	2995	5473	7254	8725	10703
RT-CB-60	7.1666	1597	2351	2967	5264	6970	8615	10516
CB-60	0.4519	419	659	829	1045	1225	1441	1872
CMB-CB-60	7.6185	1617	2382	3015	5331	7052	8709	10647
RT-CB-65	7.6185	1612	2378	3001	5234	6922	8642	10623

HYDROLOGIC ELEMENT	DA (sq mi)	2-yr (CFS)	5-yr (CFS)	10-yr (CFS)	25-yr (CFS)	50-yr (CFS)	100-yr (CFS)	500-yr (CFS)
CB-65	0.278	272	441	562	717	846	1001	1311
CMB-CB-65	7.8965	1623	2395	3028	5271	6968	8694	10695
RT-CB-70	7.8965	1622	2394	3025	5245	6929	8666	10683
CB-70	0.2304	225	363	462	588	692	818	1068
CMB-CB-70	8.1269	1631	2408	3047	5276	6967	8710	10742
CBT1-15	0.3594	390	612	769	967	1131	1328	1720
CBT1-10	0.1387	178	277	347	435	509	597	772
CBT1-05	0.1136	137	212	265	331	386	452	583
RT-CBT1-10	0.1136	127	201	254	320	373	438	565
CMB-CBT1-10	0.2523	280	445	562	711	832	980	1269
RT-CBT1-15	0.2523	260	415	522	660	778	926	1205
CMB-CBT1-15	0.6117	631	1003	1261	1588	1863	2199	2856
RT-CBT1-20	0.6117	598	958	1209	1527	1794	2122	2776
CBT1-20	0.2123	166	277	357	460	546	649	855
CMB-CBT1-20	0.824	753	1220	1557	1980	2331	2760	3615
MB-CB-70_CBT1-	8.9509	1738	2930	3799	5397	7115	8878	10974
RT-CB-75	8.9509	1734	2929	3795	5371	7114	8859	10970
CNC-10	2.6177	1134	1909	2461	3158	3738	4432	5810
CNC-05	1.7881	1246	1955	2457	3090	3616	4246	5502
RT-CNC-10	1.7881	1203	1895	2379	2991	3509	4119	5348
CNC-20	1.1294	386	678	899	1187	1434	1733	2339
CNC-15	0.3604	467	727	909	1139	1329	1557	2011
RT-CNC10-2	0.3604	392	504	794	1005	1175	1382	1792
CMB-CNC-10	5.8956	2214	3935	5384	7008	8401	10076	13491
RT-CNC-25	5.8956	2144	3867	5263	6900	8287	9979	13384
CNC-25	1.0097	642	1028	1300	1642	1927	2267	2943
CNC-30	0.4869	247	401	511	649	764	901	1175
CMB-CNC-25	7.3922	2380	4349	5914	7852	9493	11516	15548
RT-CNC-35	7.3922	2344	4298	5892	7769	9423	11429	15490
CNC-35	1.2746	1162	1823	2288	2872	3357	3936	5090
CMB-CNC-35	8.6668	2638	4507	6168	8157	9906	12036	16336
RT-CNC-40	8.6668	2599	4469	5950	7959	9689	11809	16078
CB-75	0.2061	115	200	262	341	408	489	650
CNC-40	0.2017	106	197	264	350	423	510	685
CMB-CNC-40	18.0255	4005	6733	8808	11467	13776	16580	22320
RT-CNC-45	18.0255	4005	6732	8808	11465	13775	16573	22296
CNC-50	0.3938	232	391	504	648	768	911	1196
CNC-45	0.1567	114	198	260	340	407	487	647
CMB-CNC-45	18.576	4250	6979	9214	12067	14504	17450	23394
RT-CNC-55	18.576	4244	6974	9210	12055	14487	17436	23381
CNC-65	0.9041	599	946	1193	1508	1771	2086	2714
CNC-55	0.2606	121	225	305	412	503	615	844
CNC-60	0.1359	100	176	231	302	362	434	577
RT-CNC-55_2	0.1359	98	173	226	297	357	426	548

HYDROLOGIC ELEMENT	DA (sq mi)	2-yr (CFS)	5-yr (CFS)	10-yr (CFS)	25-yr (CFS)	50-yr (CFS)	100-yr (CFS)	500-yr (CFS)
CMB-CNC-55	19.8766	4848	7710	10360	13633	16412	19780	26556
RT-CNC-70	19.8766	4831	7674	10318	13599	16376	19714	26493
CNC-70	0.6373	312	543	713	933	1117	1340	1788
CMB-CNC-70	20.5139	5034	8100	10804	14307	17233	20816	27974
RT-CNC-75	20.5139	5028	8079	10781	14274	17212	20759	27943
CNCT1-05	0.2546	273	428	538	679	797	938	1220
CNCT1-04	0.0713	90	139	175	219	257	301	390
RT-CNCT1-05	0.0713	62	87	104	123	141	181	310
CMB-CNCT1-05	0.3259	318	481	596	742	865	1014	1324
RT-CNCT1-10	0.3259	269	342	373	416	521	589	624
CNCT1-10	0.1503	171	264	329	412	482	565	730
CMB-CNCT1-10	0.4762	382	527	608	706	787	884	1069
RT-CNCT1-15	0.4762	379	517	601	697	775	873	1035
CNCT1-15	0.2666	242	389	494	627	738	870	1136
CMB-CNCT1-15	0.7428	593	893	1082	1320	1512	1744	2169
RT-CNCT1-20	0.7428	303	389	486	594	620	673	1060
CNCT1-20	0.5711	346	569	730	935	1106	1312	1723
CMB-CNCT1-20	1.3139	461	742	935	1169	1361	1591	2030
CNC-75	0.4948	265	467	617	809	971	1166	1556
CMB-CNC-75	22.3226	5558	8937	11729	15560	18731	22608	30401
RT-CNC-80	22.3226	5543	8898	11711	15520	18684	22562	30306
CNC-80	0.3673	278	452	578	738	873	1035	1359
CMB-CNC-80	22.6899	5610	9043	11876	15753	18959	22926	30842
RT-CNC90-1	22.6899	5586	9005	11840	15701	18901	22845	30754
CNC-90	0.8062	465	752	963	1238	1470	1752	2320
CNC-85	0.1007	79	137	180	234	279	333	441
RT-CNC90-2	0.1007	77	134	175	227	269	323	427
CMB-CNC-90	23.5968	5776	9398	12326	16388	19773	23893	32305

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-1

Road: CIP No. S1 - Railway Ave at CVC
Limits:
Description: Raise roadway profile 4-ft; upgrade cross culverts from 1 - 48" x 36" CMP to 2 - 6' x 5' SBC

Length: 500 FT
Profile Raised: 4 FT

Item Code		Description	Quantity	Unit	Unit Price	Amount
ROADWAY						
100	2002	**PREP ROW**	5.0	STA	$1,200.00	$6,000.00
110	2001	**EXCAVATION (RDWY)**	0	CY	$4.00	$0.00
132	2003	**EMBANKMENT (FINAL)(ORD COMP)(TYB)**	1,481	CY	$8.00	$11,851.85
247	2044	**FL BS (CMP IN PLC) (TY A GR 4) (FNAL POS)**	667	CY	$40.00	$26,666.67
310	2005	**PRIME COAT (MC-30 OR AE-P)**	444	GAL	$4.00	$1,777.78
0316	2425	**AGGR (TY-E GR-3 OR TY-L GR-3)**	49	CY	$100.00	$4,900.00
0316	2566	**ASPH (AC-15P OR AC-10-2TR OR CRS-2P)**	1,867	GAL	$4.00	$7,466.67
462	2010	**CONC BOX CULV (6FT X 5FT)**	120	LF	$475.00	$57,000.00
		WINGWALL	2	EA	$11,500.00	$23,000.00
502	2001	**BARC, SIGN, AND TRAF HAND**	2	MO	$1,500.00	$3,000.00
				ROADWAY SUBTOTAL		**$141,662.96**
LUMP SUM ITEMS						
		DRAINAGE	1	LS	0.00%	$0.00
		SIGNING	1	LS	1.00%	$1,000.00
		STRIPING	1	LS	1.00%	$1,000.00
		EROSION CONTROL	1	LS	3.00%	$4,000.00
		TRAFFIC CONTROL	1	LS	2.00%	$3,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$14,000.00
					Subtotal	**$164,662.96**
					Contingency 20%	$33,000.00
					Total	**$197,662.96**

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-2

Road: CIP No. S2 - Plaza Dr at CVCT1
Limits:
Description: Replace 1-24" CMP with 2-6'x4' MBC

Length: 50 FT
Profile Raised: 0 FT

Item Code		Description	Quantity	Unit	Unit Price	Amount
ROADWAY						
100	2002	**PREP ROW**	0.5	STA	$1,200.00	$600.00
110	2001	**EXCAVATION (RDWY)**	0	CY	$4.00	$0.00
132	2003	**EMBANKMENT (FINAL)(ORD COMP)(TYB)**	0	CY	$8.00	$0.00
247	2044	**FL BS (CMP IN PLC) (TY A GR 4) (FNAL POS)**	100	CY	$40.00	$4,000.00
310	2005	**PRIME COAT (MC-30 OR AE-P)**	67	GAL	$4.00	$266.67
0316	2425	**AGGR (TY-E GR-3 OR TY-L GR-3)**	7	CY	$100.00	$700.00
0316	2566	**ASPH (AC-15P OR AC-10-2TR OR CRS-2P)**	280	GAL	$4.00	$1,120.00
		CONC BOX CULV (2-6'x4' MBC)	240	LF	$325.00	$78,000.00
		WINGWALL	2	EA	$7,500.00	$15,000.00
502	2001	**BARC, SIGN, AND TRAF HAND**	2	MO	$1,500.00	$3,000.00
				ROADWAY SUBTOTAL		**$102,686.67**
LUMP SUM ITEMS						
		DRAINAGE	1	LS	0.00%	$0.00
		SIGNING	1	LS	1.00%	$1,000.00
		STRIPING	1	LS	1.00%	$1,000.00
		EROSION CONTROL	1	LS	3.00%	$3,000.00
		TRAFFIC CONTROL	1	LS	2.00%	$2,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$10,000.00
					Subtotal	**$119,686.67**
					Contingency 20%	$24,000.00
					Total	**$143,686.67**

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-3

Road: CIP No. S3 - Bowie at CVCT1
Limits:
Description: Replace 1-60" CMP with 2-8'x4' MBC

Length: 50 FT
Profile Raised: 0 FT

Item Code		Description	Quantity	Unit	Unit Price	Amount
ROADWAY						
100	2002	**PREP ROW**	0.5	STA	$1,200.00	$600.00
110	2001	**EXCAVATION (RDWY)**	593	CY	$4.00	$2,372.00
132	2003	**EMBANKMENT (FINAL)(ORD COMP)(TYB)**	830	CY	$8.00	$6,637.04
247	2044	**FL BS (CMP IN PLC) (TY A GR 4) (FNAL POS)**	67	CY	$40.00	$2,666.67
310	2005	**PRIME COAT (MC-30 OR AE-P)**	44	GAL	$4.00	$177.78
0316	2425	**AGGR (TY-E GR-3 OR TY-L GR-3)**	5	CY	$100.00	$500.00
0316	2566	**ASPH (AC-15P OR AC-10-2TR OR CRS-2P)**	187	GAL	$4.00	$746.67
		CONC BOX CULV (2-8'x4' MBC)	140	LF	$400.00	$56,000.00
		WINGWALL	2	EA	$7,500.00	$15,000.00
502	2001	**BARC, SIGN, AND TRAF HAND**	2	MO	$1,500.00	$3,000.00
				ROADWAY SUBTOTAL		**$87,700.15**
LUMP SUM ITEMS						
		DRAINAGE	1	LS	0.00%	$0.00
		SIGNING	1	LS	1.00%	$1,000.00
		STRIPING	1	LS	1.00%	$1,000.00
		EROSION CONTROL	1	LS	3.00%	$3,000.00
		TRAFFIC CONTROL	1	LS	2.00%	$2,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$9,000.00
					Subtotal	**$103,700.15**
					Contingency 20%	$21,000.00
					Total	**$124,700.15**

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-4

Detention Facility: **CIP No. S4 - Vitela St. Off-Channel**
Limits:
Description:

Footprint **2.1 AC**
Avg Depth **5 FT**

Item Code		Description	Quantity	Unit	Unit Price	Amount
Detention Facility:						
		LAND ACQUISITION	2.1	AC	$46,619.40	$97,900.74
110	2001	**EXCAVATION**	16,940	CY	$6.00	$101,640.00
		OUTFALL PIPE	100	LF	$300.00	$30,000.00
		OUTFALL STRUCTURE WINGWALL	2	EA	$7,500.00	$15,000.00
		DIVERSION WEIR	1.00	EA	$10,000.00	$10,000.00
					SUBTOTAL	**$254,540.74**
LUMP SUM ITEMS						
		EROSION CONTROL	1	LS	3.00%	$8,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$25,000.00
					Subtotal	**$287,540.74**
					Contingency 20%	$58,000.00
					Total	**$345,540.74**

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-5

Project: CIP No. S5 - Flood Control Reservoir Site A
Location: Headwaters of San Felipe Creek Trib 1
Description: 3800 -ft long dam providing 5,740 ac-ft of storage; 38-ft maximum embankment height

Item Code		Description	Quantity	Unit	Unit Price	Amount
		FILL MATERIAL (CORE)	19,227	CY	$6.00	$115,362.00
		FILL MATERIAL (EMBANKMENT)	9,614	CY	$6.00	$57,684.00
		GRADING/EARTHWORK		CY		$0.00
		DESIGN COSTS	1	LS	$100,000.00	$100,000.00
		ENVIRONMENTAL/DAM SAFETY PERMITTING	1	LS	$250,000.00	$250,000.00
		LAND ACQUISITION/EASEMENT - EMBANKMENT	12.7	AC	$5,000.00	$63,500.00
		LAND ACQUISITION/EASEMENT - INUNDATION AREA	338	AC	$5,000.00	$1,690,000.00
		OUTLET STRUCTURE	1	EA	$50,000.00	$50,000.00
					SUBTOTAL	**$2,326,546.00**
LUMP SUM ITEMS						
		DRAINAGE	1	LS	0.00%	$0.00
		EROSION CONTROL	1	LS	3.00%	$70,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$233,000.00
					Subtotal	**$2,629,546.00**
					Contingency 20%	$526,000.00
					Total	**$3,155,546.00**

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-6

Project: CIP No. S6 - Flood Control Reservoir Site B
Location: Headwaters of San Felipe Creek and San Felipe Creek Trib 1
Description: 5500 -ft long dam providing 12,835 ac-ft of storage; 78-ft maximum embankment height

Item Code		Description	Quantity	Unit	Unit Price	Amount
		FILL MATERIAL (CORE)	68,106	CY	$6.00	$408,636.00
		FILL MATERIAL (EMBANKMENT)	34,053	CY	$6.00	$204,318.00
		GRADING/EARTHWORK		CY		$0.00
		DESIGN COSTS	1	LS	$150,000.00	$150,000.00
		ENVIRONMENTAL/DAM SAFETY PERMITTING	1	LS	$250,000.00	$250,000.00
		LAND ACQUISITION/EASEMENT - EMBANKMENT	42.0	AC	$5,000.00	$210,000.00
		LAND ACQUISITION/EASEMENT - INUNDATION AREA	2,476	AC	$5,000.00	$12,380,000.00
		OUTLET STRUCTURE	1	EA	$50,000.00	$50,000.00
					SUBTOTAL	**$13,652,954.00**
LUMP SUM ITEMS						
		DRAINAGE	1	LS	0.00%	$0.00
		EROSION CONTROL	1	LS	3.00%	$410,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$1,365,000.00
					Subtotal	**$15,427,954.00**
					Contingency 20%	$3,086,000.00
					Total	**$18,513,954.00**

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-8

Road: CIP No. S8 - Johnson at San Felipe Creek
Limits:
Description: Raise road deck and approaches 9.5-ft; replace existing crossing with 150-ft long bridge

Road Length : 220 FT
Bridge Length : 150 FT
Approach Profile Raised: 9.5 FT

Item Code		Description	Quantity	Unit	Unit Price	Amount
ROADWAY						
100	2002	**PREP ROW**	2.2	STA	$1,200.00	$2,640.00
110	2001	**EXCAVATION (RDWY)**	0	CY	$4.00	$0.00
132	2003	**EMBANKMENT (FINAL)(ORD COMP)(TYB)**	1,355	CY	$8.00	$10,837.04
247	2044	**FL BS (CMP IN PLC) (TY A GR 4) (FNAL POS)**	257	CY	$40.00	$10,266.67
310	2005	**PRIME COAT (MC-30 OR AE-P)**	171	GAL	$4.00	$684.44
0316	2425	**AGGR (TY-E GR-3 OR TY-L GR-3)**	19	CY	$100.00	$1,900.00
0316	2566	**ASPH (AC-15P OR AC-10-2TR OR CRS-2P)**	719	GAL	$4.00	$2,874.67
		BRIDGE (CONCRETE SLAB; 40 FT SPANS)	5,250	SF	$50.00	$262,500.00
		WINGWALL	0	EA	$7,500.00	$0.00
502	2001	**BARC, SIGN, AND TRAF HAND**	2	MO	$1,500.00	$3,000.00
				ROADWAY SUBTOTAL		**$294,702.81**
LUMP SUM ITEMS						
		DRAINAGE	1	LS	0.00%	$0.00
		SIGNING	1	LS	1.00%	$3,000.00
		STRIPING	1	LS	1.00%	$3,000.00
		EROSION CONTROL	1	LS	3.00%	$9,000.00
		TRAFFIC CONTROL	1	LS	2.00%	$6,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$29,000.00
					Subtotal	**$344,702.81**
					Contingency 20%	$69,000.00
					Total	**$413,702.81**

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-9

Road: CIP No. S9 - E Canal St at San Felipe Creek
Limits:
Description: Replace existing bridge with 260-ft long structure; raise profile 2-ft

Road Length : 1,020 FT
Bridge Length : 260 FT
Approach Profile Raised: 2 FT

Item Code		Description	Quantity	Unit	Unit Price	Amount
ROADWAY						
100	2002	**PREP ROW**	10.2	STA	$1,200.00	$12,240.00
110	2001	**EXCAVATION (RDWY)**	0	CY	$4.00	$0.00
132	2003	**EMBANKMENT (FINAL)(ORD COMP)(TYB)**	1,700	CY	$8.00	$13,600.00
247	2044	**FL BS (CMP IN PLC) (TY A GR 4) (FNAL POS)**	1,530	CY	$40.00	$61,200.00
310	2005	**PRIME COAT (MC-30 OR AE-P)**	1,020	GAL	$4.00	$4,080.00
0316	2425	**AGGR (TY-E GR-3 OR TY-L GR-3)**	113	CY	$100.00	$11,300.00
0316	2566	**ASPH (AC-15P OR AC-10-2TR OR CRS-2P)**	4,284	GAL	$4.00	$17,136.00
		BRIDGE (CONCRETE SLAB; 30 FT SPANS)	11,700	SF	$50.00	$585,000.00
		WINGWALL	0	EA	$7,500.00	$0.00
502	2001	**BARC, SIGN, AND TRAF HAND**	2	MO	$1,500.00	$3,000.00
				ROADWAY SUBTOTAL		**$707,556.00**
LUMP SUM ITEMS						
		DRAINAGE	1	LS	0.00%	$0.00
		SIGNING	1	LS	1.00%	$7,000.00
		STRIPING	1	LS	1.00%	$7,000.00
		EROSION CONTROL	1	LS	3.00%	$21,000.00
		TRAFFIC CONTROL	1	LS	2.00%	$14,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$71,000.00
					Subtotal	**$827,556.00**
					Contingency 20%	$166,000.00
					Total	**$993,556.00**

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-10

Road: CIP No. S10 - E Academy at San Felipe Creek
Limits:
Description: Raise road deck 7.5-ft at crossing, raise road approches 5-ft; replace bridge class culverts with slab bridge

Road Length : 250 FT
Bridge Length : 150 FT
Approach Profile Raised: 5 FT

Item Code		Description	Quantity	Unit	Unit Price	Amount
ROADWAY						
100	2002	**PREP ROW**	2.5	STA	$1,200.00	$3,000.00
110	2001	**EXCAVATION (RDWY)**	0	CY	$4.00	$0.00
132	2003	**EMBANKMENT (FINAL)(ORD COMP)(TYB)**	694	CY	$8.00	$5,555.56
247	2044	**FL BS (CMP IN PLC) (TY A GR 4) (FNAL POS)**	250	CY	$40.00	$10,000.00
310	2005	**PRIME COAT (MC-30 OR AE-P)**	167	GAL	$4.00	$666.67
0316	2425	**AGGR (TY-E GR-3 OR TY-L GR-3)**	19	CY	$100.00	$1,900.00
0316	2566	**ASPH (AC-15P OR AC-10-2TR OR CRS-2P)**	700	GAL	$4.00	$2,800.00
		BRIDGE (CONCRETE SLAB; 30 FT SPANS)	4,500	SF	$50.00	$225,000.00
		WINGWALL	0	EA	$7,500.00	$0.00
502	2001	**BARC, SIGN, AND TRAF HAND**	2	MO	$1,500.00	$3,000.00
				ROADWAY SUBTOTAL		**$251,922.22**
LUMP SUM ITEMS						
		DRAINAGE	1	LS	0.00%	$0.00
		SIGNING	1	LS	1.00%	$3,000.00
		STRIPING	1	LS	1.00%	$3,000.00
		EROSION CONTROL	1	LS	3.00%	$8,000.00
		TRAFFIC CONTROL	1	LS	2.00%	$5,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$25,000.00
					Subtotal	**$295,922.22**
					Contingency 20%	$59,000.00
					Total	**$354,922.22**

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-10b

Project Limits: CIP No. S11 - W 10th St Storm Sewer Improvements

Description: Add area inlets at Ave Q and 13 th St and 3,110 LF of 3'x2' RBC storm sewer along Ave Q and W 10th to an outfall at W 10th and Airport Blvd; resurface portion of roadway impacted by construction

Length: 3,110 FT

Item Code		Description	Quantity	Unit	Unit Price	Amount
ROADWAY						
100	2002	**PREP ROW**	0.0	STA	$1,200.00	$0.00
110	2001	**EXCAVATION (TRENCHING)**	5,529	CY	$8.00	$44,231.11
400	2006	**CUT AND RESTORE PAVING**	2,073	SY	$60.00	$124,400.00
		CONC BOX CULV (3x2 RBC)	3,110	LF	$200.00	$622,000.00
465	2001	**INLET (COMPL)(TY C)**	2	EA	$3,375.00	$6,750.00
465	2008	**INLET EXT (TY E)**	10	MO	$2,400.00	$24,000.00
502	2001	**BARC, SIGN, AND TRAF HAND**	2	MO	$1,500.00	$3,000.00
					SUBTOTAL	**$824,381.11**
LUMP SUM ITEMS						
		DRAINAGE	0	LS	0.00%	$0.00
		SIGNING	0	LS	1.00%	$0.00
		STRIPING	0	LS	1.00%	$0.00
		EROSION CONTROL	1	LS	3.00%	$25,000.00
		TRAFFIC CONTROL	1	LS	2.00%	$16,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$82,000.00
					Subtotal	**$947,381.11**
					Contingency 20%	$189,000.00
					Total	**$1,136,381.11**

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-11

Road: CIP No. C1 - Wildcat Dr at CNCT1
Limits:
Description: Raise roadway profile 2-ft; upgrade cross culverts from 2- 36" CMP to 4- 72" RCP **Length:** 400 FT
Profile Raised: 2 FT

Item Code		Description	Quantity	Unit	Unit Price	Amount
ROADWAY						
100	2002	**PREP ROW**	4.0	STA	$1,200.00	$4,800.00
110	2001	**EXCAVATION (RDWY)**	0	CY	$4.00	$0.00
132	2003	**EMBANKMENT (FINAL)(ORD COMP)(TYB)**	741	CY	$8.00	$5,925.93
247	2044	**FL BS (CMP IN PLC) (TY A GR 4) (FNAL POS)**	667	CY	$40.00	$26,666.67
310	2005	**PRIME COAT (MC-30 OR AE-P)**	444	GAL	$4.00	$1,777.78
0316	2425	**AGGR (TY-E GR-3 OR TY-L GR-3)**	49	CY	$100.00	$4,900.00
0316	2566	**ASPH (AC-15P OR AC-10-2TR OR CRS-2P)**	1,867	GAL	$4.00	$7,466.67
		CONC PIPE CULV (4)	200	LF	$300.00	$60,000.00
		WINGWALL	2	EA	$7,500.00	$15,000.00
502	2001	**BARC, SIGN, AND TRAF HAND**	2	MO	$1,500.00	$3,000.00
				ROADWAY SUBTOTAL		**$129,537.04**
LUMP SUM ITEMS						
		DRAINAGE	1	LS	0.00%	$0.00
		SIGNING	1	LS	1.00%	$1,000.00
		STRIPING	1	LS	1.00%	$1,000.00
		EROSION CONTROL	1	LS	3.00%	$4,000.00
		TRAFFIC CONTROL	1	LS	2.00%	$3,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$13,000.00
					Subtotal	**$151,537.04**
					Contingency 20%	$30,000.00
					Total	**$181,537.04**

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-12

Project: CIP No. C2 - Flood Control Reservoir Site D
Location: Headwaters of Cantu Branch
Description: 5400 -ft long dam providing 828ac-ft of storage; 9-ft maximum embankment height

Item Code		Description	Quantity	Unit	Unit Price	Amount
		FILL MATERIAL (CORE)	9,188	CY	$6.00	$55,128.00
		FILL MATERIAL (EMBANKMENT)	4,594	CY	$6.00	$27,564.00
		GRADING/EARTHWORK		CY		$0.00
		DESIGN COSTS	1	LS	$75,000.00	$75,000.00
		ENVIRONMENTAL/DAM SAFETY PERMITTING	1	LS	$250,000.00	$250,000.00
		LAND ACQUISITION/EASEMENT - EMBANKMENT	7.0	AC	$5,000.00	$35,000.00
		LAND ACQUISITION/EASEMENT - INUNDATION AREA	204	AC	$5,000.00	$1,019,000.00
		OUTLET STRUCTURE	1	EA	$25,000.00	$25,000.00
					SUBTOTAL	**$1,486,692.00**
LUMP SUM ITEMS						
		DRAINAGE	1	LS	0.00%	$0.00
		EROSION CONTROL	1	LS	3.00%	$45,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$149,000.00
					Subtotal	**$1,680,692.00**
					Contingency 20%	$336,000.00
					Total	**$2,016,692.00**

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-13

Road: CIP No. C3 - King's Way at Cantu Branch
Limits:
Description: Replace low water crossing with 7 - 6 x 5 RCB

Length: 60 FT
Profile Raised: 6 FT

Item Code		Description	Quantity	Unit	Unit Price	Amount
ROADWAY						
100	2002	**PREP ROW**	0.6	STA	$1,200.00	$720.00
110	2001	**EXCAVATION (RDWY)**	0	CY	$4.00	$0.00
132	2003	**EMBANKMENT (FINAL)(ORD COMP)(TYB)**	310	CY	$8.00	$2,480.00
247	2044	**FL BS (CMP IN PLC) (TY A GR 4) (FNAL POS)**	750	CY	$40.00	$30,000.00
310	2005	**PRIME COAT (MC-30 OR AE-P)**	500	GAL	$4.00	$2,000.00
0316	2425	**AGGR (TY-E GR-3 OR TY-L GR-3)**	56	CY	$100.00	$5,600.00
0316	2566	**ASPH (AC-15P OR AC-10-2TR OR CRS-2P)**	2,100	GAL	$4.00	$8,400.00
		CONC BOX CULV (7-6'x5' MBC)	420	LF	$350.00	$147,000.00
		WINGWALL	2	EA	$7,500.00	$15,000.00
502	2001	**BARC, SIGN, AND TRAF HAND**	2	MO	$1,500.00	$3,000.00
				ROADWAY SUBTOTAL		**$214,200.00**
LUMP SUM ITEMS						
		DRAINAGE	1	LS	0.00%	$0.00
		SIGNING	1	LS	1.00%	$2,000.00
		STRIPING	1	LS	1.00%	$2,000.00
		EROSION CONTROL	1	LS	3.00%	$6,000.00
		TRAFFIC CONTROL	1	LS	2.00%	$4,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$21,000.00
					Subtotal	**$249,200.00**
					Contingency 20%	$50,000.00
					Total	**$299,200.00**

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-14

Road: CIP No. C5 - Margaret at Cantu Branch
Limits:
Description: Replace low water crossing with 5 - 7 x 4 RCB

Length: 25 FT
Profile Raised: 5 FT

Item Code		Description	Quantity	Unit	Unit Price	Amount
ROADWAY						
100	2002	**PREP ROW**	0.3	STA	$1,200.00	$300.00
110	2001	**EXCAVATION (RDWY)**	0	CY	$4.00	$0.00
132	2003	**EMBANKMENT (FINAL)(ORD COMP)(TYB)**	58	CY	$8.00	$462.96
247	2044	**FL BS (CMP IN PLC) (TY A GR 4) (FNAL POS)**	364	CY	$40.00	$14,566.67
310	2005	**PRIME COAT (MC-30 OR AE-P)**	243	GAL	$4.00	$971.11
0316	2425	**AGGR (TY-E GR-3 OR TY-L GR-3)**	27	CY	$100.00	$2,700.00
0316	2566	**ASPH (AC-15P OR AC-10-2TR OR CRS-2P)**	1,020	GAL	$4.00	$4,078.67
		CONC BOX CULV (5-7'x4' MBC)	125	LF	$350.00	$43,750.00
		WINGWALL	2	EA	$7,500.00	$15,000.00
502	2001	**BARC, SIGN, AND TRAF HAND**	2	MO	$1,500.00	$3,000.00
				ROADWAY SUBTOTAL		**$84,829.41**
LUMP SUM ITEMS						
		DRAINAGE	1	LS	0.00%	$0.00
		SIGNING	1	LS	1.00%	$1,000.00
		STRIPING	1	LS	1.00%	$1,000.00
		EROSION CONTROL	1	LS	3.00%	$3,000.00
		TRAFFIC CONTROL	1	LS	2.00%	$2,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$8,000.00
					Subtotal	**$99,829.41**
					Contingency 20%	$20,000.00
					Total	**$119,829.41**

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-15

Road: CIP No. C6 - Amistad at Cantu Branch
Limits:
Description: Replace 7-24" pipes with 6 - 8 x 5 RCB

Length: 45 FT
Profile Raised: 6 FT

Item Code		Description	Quantity	Unit	Unit Price	Amount
ROADWAY						
100	2002	**PREP ROW**	0.5	STA	$1,200.00	$540.00
110	2001	**EXCAVATION (RDWY)**	0	CY	$4.00	$0.00
132	2003	**EMBANKMENT (FINAL)(ORD COMP)(TYB)**	225	CY	$8.00	$1,800.00
247	2044	**FL BS (CMP IN PLC) (TY A GR 4) (FNAL POS)**	806	CY	$40.00	$32,220.00
310	2005	**PRIME COAT (MC-30 OR AE-P)**	537	GAL	$4.00	$2,148.00
0316	2425	**AGGR (TY-E GR-3 OR TY-L GR-3)**	60	CY	$100.00	$6,000.00
0316	2566	**ASPH (AC-15P OR AC-10-2TR OR CRS-2P)**	2,255	GAL	$4.00	$9,021.60
		CONC BOX CULV (6-8'x5' MBC)	270	LF	$350.00	$94,500.00
		WINGWALL	2	EA	$7,500.00	$15,000.00
502	2001	**BARC, SIGN, AND TRAF HAND**	2	MO	$1,500.00	$3,000.00
				ROADWAY SUBTOTAL		**$164,229.60**
LUMP SUM ITEMS						
		DRAINAGE	1	LS	0.00%	$0.00
		SIGNING	1	LS	1.00%	$2,000.00
		STRIPING	1	LS	1.00%	$2,000.00
		EROSION CONTROL	1	LS	3.00%	$5,000.00
		TRAFFIC CONTROL	1	LS	2.00%	$3,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$16,000.00
					Subtotal	**$192,229.60**
					Contingency 20%	$38,000.00
					Total	**$230,229.60**

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-16

Road: CIP No. 7 - King's Way at CBT1 (downstream)
Limits:
Description: Replace low water crossing with 3- 5'x3'

Length: 46 FT
Profile Raised: 5 FT

Item Code		Description	Quantity	Unit	Unit Price	Amount
ROADWAY						
100	2002	**PREP ROW**	0.5	STA	$1,200.00	$552.00
110	2001	**EXCAVATION (RDWY)**	0	CY	$4.00	$0.00
132	2003	**EMBANKMENT (FINAL)(ORD COMP)(TYB)**	192	CY	$8.00	$1,533.33
247	2044	**FL BS (CMP IN PLC) (TY A GR 4) (FNAL POS)**	1,200	CY	$40.00	$48,000.00
310	2005	**PRIME COAT (MC-30 OR AE-P)**	800	GAL	$4.00	$3,200.00
0316	2425	**AGGR (TY-E GR-3 OR TY-L GR-3)**	89	CY	$100.00	$8,900.00
0316	2566	**ASPH (AC-15P OR AC-10-2TR OR CRS-2P)**	3,360	GAL	$4.00	$13,440.00
		CONC BOX CULV (3-5'x3' MBC)	322	LF	$350.00	$112,700.00
		WINGWALL	2	EA	$7,500.00	$15,000.00
502	2001	**BARC, SIGN, AND TRAF HAND**	2	MO	$1,500.00	$3,000.00
				ROADWAY SUBTOTAL		**$206,325.33**
LUMP SUM ITEMS						
		DRAINAGE	1	LS	0.00%	$0.00
		SIGNING	1	LS	1.00%	$2,000.00
		STRIPING	1	LS	1.00%	$2,000.00
		EROSION CONTROL	1	LS	3.00%	$6,000.00
		TRAFFIC CONTROL	1	LS	2.00%	$4,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$21,000.00
					Subtotal	**$241,325.33**
					Contingency 20%	$48,000.00
					Total	**$289,325.33**

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-17

Road: CIP No. C8 - King's Way at CBT1 (upstream)
Limits:
Description: Replace low water crossing with 2- 7' x3' RCB

Length: 93 FT
Profile Raised: 4 FT

Item Code		Description	Quantity	Unit	Unit Price	Amount
ROADWAY						
100	2002	**PREP ROW**	0.9	STA	$1,200.00	$1,116.00
110	2001	**EXCAVATION (RDWY)**	0	CY	$4.00	$0.00
132	2003	**EMBANKMENT (FINAL)(ORD COMP)(TYB)**	386	CY	$8.00	$3,086.22
247	2044	**FL BS (CMP IN PLC) (TY A GR 4) (FNAL POS)**	840	CY	$40.00	$33,600.00
310	2005	**PRIME COAT (MC-30 OR AE-P)**	560	GAL	$4.00	$2,240.00
0316	2425	**AGGR (TY-E GR-3 OR TY-L GR-3)**	62	CY	$100.00	$6,200.00
0316	2566	**ASPH (AC-15P OR AC-10-2TR OR CRS-2P)**	2,352	GAL	$4.00	$9,408.00
		CONC BOX CULV (2- 7' x 3' RCB)	186	LF	$350.00	$65,100.00
		WINGWALL	2	EA	$7,500.00	$15,000.00
502	2001	**BARC, SIGN, AND TRAF HAND**	2	MO	$1,500.00	$3,000.00
				ROADWAY SUBTOTAL		**$138,750.22**
LUMP SUM ITEMS						
		DRAINAGE	1	LS	0.00%	$0.00
		SIGNING	1	LS	1.00%	$1,000.00
		STRIPING	1	LS	1.00%	$1,000.00
		EROSION CONTROL	1	LS	3.00%	$4,000.00
		TRAFFIC CONTROL	1	LS	2.00%	$3,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$14,000.00
					Subtotal	**$161,750.22**
					Contingency 20%	$32,000.00
					Total	**$193,750.22**

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-18a

Road: CIP No. C9a - Amistad at CBT1 (Culvert Option)
Limits:
Description: Replace Low Water Crossing with 6 - 8 x 3 RCB

Length: 42 FT
Profile Raised: 4 FT

Item Code		Description	Quantity	Unit	Unit Price	Amount
ROADWAY						
100	2002	**PREP ROW**	0.4	STA	$1,200.00	$504.00
110	2001	**EXCAVATION (RDWY)**	0	CY	$4.00	$0.00
132	2003	**EMBANKMENT (FINAL)(ORD COMP)(TYB)**	124	CY	$8.00	$995.56
247	2044	**FL BS (CMP IN PLC) (TY A GR 4) (FNAL POS)**	847	CY	$40.00	$33,866.67
310	2005	**PRIME COAT (MC-30 OR AE-P)**	564	GAL	$4.00	$2,257.78
0316	2425	**AGGR (TY-E GR-3 OR TY-L GR-3)**	63	CY	$100.00	$6,300.00
0316	2566	**ASPH (AC-15P OR AC-10-2TR OR CRS-2P)**	2,371	GAL	$4.00	$9,482.67
		CONC BOX CULV (6-8'x3' MBC)	254	LF	$350.00	$88,900.00
		WINGWALL	2	EA	$7,500.00	$15,000.00
502	2001	**BARC, SIGN, AND TRAF HAND**	2	MO	$1,500.00	$3,000.00
				ROADWAY SUBTOTAL		**$160,306.67**
LUMP SUM ITEMS						
		DRAINAGE	1	LS	0.00%	$0.00
		SIGNING	1	LS	1.00%	$2,000.00
		STRIPING	1	LS	1.00%	$2,000.00
		EROSION CONTROL	1	LS	3.00%	$5,000.00
		TRAFFIC CONTROL	1	LS	2.00%	$3,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$16,000.00
					Subtotal	**$188,306.67**
					Contingency 20%	$38,000.00
					Total	**$226,306.67**

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-18b

Road: CIP No. C9b - Amistad at CBT1 (Bridge Option)
Limits:
Description: Replace existing low water crossing with 100-ft long structure; raise profile 5-ft

Road Length :	**660**	**FT**
Bridge Length :	**100**	**FT**
Approach Profile Raised:	**5**	**FT**

Item Code		Description	Quantity	Unit	Unit Price	Amount
ROADWAY						
100	2002	**PREP ROW**	6.6	STA	$1,200.00	$7,920.00
110	2001	**EXCAVATION (RDWY)**	0	CY	$4.00	$0.00
132	2003	**EMBANKMENT (FINAL)(ORD COMP)(TYB)**	2,750	CY	$8.00	$22,000.00
247	2044	**FL BS (CMP IN PLC) (TY A GR 4) (FNAL POS)**	990	CY	$40.00	$39,600.00
310	2005	**PRIME COAT (MC-30 OR AE-P)**	660	GAL	$4.00	$2,640.00
0316	2425	**AGGR (TY-E GR-3 OR TY-L GR-3)**	73	CY	$100.00	$7,300.00
0316	2566	**ASPH (AC-15P OR AC-10-2TR OR CRS-2P)**	2,772	GAL	$4.00	$11,088.00
		BRIDGE (CONCRETE SLAB; 30 FT SPANS)	4,500	SF	$50.00	$225,000.00
		WINGWALL	0	EA	$7,500.00	$0.00
502	2001	**BARC, SIGN, AND TRAF HAND**	2	MO	$1,500.00	$3,000.00
				ROADWAY SUBTOTAL		**$318,548.00**
LUMP SUM ITEMS						
		DRAINAGE	1	LS	0.00%	$0.00
		SIGNING	1	LS	1.00%	$3,000.00
		STRIPING	1	LS	1.00%	$3,000.00
		EROSION CONTROL	1	LS	3.00%	$10,000.00
		TRAFFIC CONTROL	1	LS	2.00%	$6,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$32,000.00
					Subtotal	**$372,548.00**
					Contingency 20%	$75,000.00
					Total	**$447,548.00**

PRELIMINARY CONSTRUCTION COST ESTIMATE
Table B 9-19

Project Limits: CIP No. C10 - Kings Way/Amistad Intersection Storm Sewer Improvements

Description: Add 30' grate inlet across Echo Valley Dr and 526-LF of 5x5 SBC along the property line between La Vida Serena Nursing & Rehab and the Grace Comm. Church to outfall into Cantu Branch Trib 1 (Stream 3)

Length of Road Replacement: 70 FT

Length of Trunkline Installation: 526 FT

Item Code		Description	Quantity	Unit	Unit Price	Amount
ROADWAY						
100	2002	**PREP ROW**	5.3	STA	$1,200.00	$6,312.00
110	2001	**EXCAVATION (TRENCHING)**	935	CY	$8.00	$7,480.89
162	2002	**BLOCK SODDING**	2,736	SY	$2.25	$6,156.00
400	2006	**CUT AND RESTORE PAVING**	47	SY	$60.00	$2,800.00
462	2009	**CONC BOX CULV (5x5 SBC)**	526	LF	$377.00	$198,302.00
465	214X	**INLET (COMPL)(TRAFFIC)(TY X-6)**	1	EA	$30,000.00	$30,000.00
466	2330	**WINGWALL (PW-1)(HW=7 FT)**	1	EA	$11,500.00	$11,500.00
502	2001	**BARC, SIGN, AND TRAF HAND**	2	MO	$1,500.00	$3,000.00
					SUBTOTAL	**$265,550.89**
LUMP SUM ITEMS						
		DRAINAGE	0	LS	0.00%	$0.00
		SIGNING	0	LS	1.00%	$0.00
		STRIPING	0	LS	1.00%	$0.00
		EROSION CONTROL	1	LS	3.00%	$8,000.00
		TRAFFIC CONTROL	1	LS	2.00%	$5,000.00
		MOBILIZATION (10%)	1	LS	10.00%	$27,000.00
					Subtotal	**$305,550.89**
					Contingency 20%	$61,000.00
					Total	**$366,550.89**

APPENDIX C – CD CONTAINING HYDRAULIC MODELS AND RESULTS

APPENDIX D – HYDRAULIC MODEL RESULTS

APPENDIX E – ENVIRONMENTAL AND CULTURAL RESOURCE REPORT

ENVIRONMENTAL AND CULTURAL RESOURCE REPORT
MASTER WATERSHED STUDY

Prepared by:

Austin, Texas
October 2012

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APPENDIX B – PHOTO LOG

I. PROJECT DESCRIPTION

Drainage problems in the City of Del Rio are a recurring issue as the city has a history of flooding problems that commonly occur because of inadequate surface drainage capacity, lack of storm drainage infrastructure, flat topography, lack of positive overflow, and problems associated with individual lots such as grading and finished floor elevations. Although Del Rio is a medium-sized city, it shares many, if not most, of the drainage problems experienced by much larger municipalities, as well as some unique issues such as the local canal network and the existence of environmentally-sensitive areas such as San Felipe Springs.

The Master Watershed Study was developed in order to identify and prioritize recurring drainage problem areas. This study will lead to the recommendation of specific drainage infrastructure improvements that are shown to have significant benefits in comparison to cost. It will also aid in providing the City with pertinent information to support or reject proposed actions. The eight study areas identified for this resource review are located throughout the City of Del Rio in Val Verde County, Texas. These study areas are detailed in **Table 1** below and illustrated in **Figure 1** (**Appendix A**).

Table 1. Description of Project Study Areas

Study Area	Description	Location	Area (acres)
A	Cantu Branch and the Tributary of Cantu Branch (CBT4)	From the intersection of Encino Drive and Cantu Branch meandering upstream until just south of Qualia Road; From approximately 0.3 miles west of Kings Way upstream northeast of Kings Way (also known as FEMA Stream 3)	1,381
B	Tributary of San Felipe Creek (SFCT1)	From the confluence with San Felipe Creek upstream to the northern end of Riverview Drive	416
C	Tributary to Cienegas Creek (CNCT1)	From the confluence with Cienegas Creek upstream through the Del Rio International Airport to near Main Street (also known as FEMA Stream 2)	156
D	Del Rio Airport Area	Drainagetoi Cienegas Creek near the Airport from 15th Street to West Gibbs	237
E	Tributary to Cienegas Creek (CNCT1)	From the confluence with Cienegas Creek upstream through the Del Rio International Airport to near Main Street (also known as FEMA Stream 2)	144
F	San Felipe Creek	From the confluence with the Rio Grande floodplain upstream to the northern end of the San Felipe Country Club	364
G	Tributary to Calaveras Creek (CVCT1)	From the confluence with the Calaveras Creek mainstem upstream to US 277 (also known as FEMA Stream 1)	207
H	Calaveras Creek	At the bend in Calavaras Creek near Railway Avenue and US 90	6
		TOTAL	**2,911**

This environmental and cultural resource report was completed by evaluating information obtained during the desktop survey of U.S. Geological Survey (USGS) 7.5' quadrangle maps, National Wetland Inventory (NWI) maps, Federal Emergency Management Agency (FEMA) maps, National Resources Conservation Service (NRCS) soil survey maps, the Texas Parks and Wildlife Department's (TPWD)

National Diversity Database (NDD), the United States Fish and Wildlife Service (USFWS) Critical Habitat Mapper, National Hydrography Dataset (NHD) maps, and 2010 Texas Natural Resources Information Systems (TNRIS) aerial photography. Field investigations were also performed by certified environmental and historic specialists on July 30, 31 and August 1, 2012 to confirm findings from the desktop review. While right-of-entry was not obtained to all properties in the study areas, the information acquired in the field, together with results of the desktop review, were sufficient to make environmental and cultural determinations for the purposes of this review.

II. VEGETATION AND ECOLOGY

According to TPWD's *Vegetation Types of Texas* (TPWD, 1984), Study Areas C through H, about half of area A, and a portion of area B lie within the Ceniza-Blackbrush-Creosotebush Brush vegetation cover. This area is distributed throughout the slopes of the Rio Grande River Basin from near Langtry in Val Verde County to near San Ygnacio in Zapata County. Some commonly associated plants include the Texas Pricklypear, goatbush, yucca, curly mesquite, pink pappusgrass, and catclaw.

The remainder of areas A and B are within the Mesquite-Blackbrush Brush vegetation region. This classification of vegetation is located principally on shallow, gravelly or loamy soils in the South Texas Plains. It is made up of plants such as lotebush, desert olive, bluewood, leatherstem, and dogweed.

According to Environmental Protection Agency's ecoregion maps (2010), the eight study areas lie within three Level IV ecoregion classifications. The majority of the Study Areas A through G, are fully or partially in the Southern Texas Plains and the Texas-Tamaulipan Thornscrub (Level IV) ecoregions. This land is made up of gently rolling plains that are covered in low-growing vegetation and arroyos and streams. The increase of brush and decrease in grasses is due to three centuries of grazing, suppression of fire, and drought. Peak rainfall occurs in the spring and fall and droughts are common and quite often severe. There is little cultivated land and most of the land is used to raise cattle.

A small portion of area A is located within the Chihuahuan Deserts Level III region and more specifically the Chihuahuan Basins and Plains Level IV region. This ecoregion includes internally drained basins, alluvial fans, and river valleys below 3,500 feet. These are some of the hottest and most arid habitats in Texas and get less than 12 inches of rain per year. Precipitation is sparse in the winter and highest during the summer months. Grazing is limited in these areas, but in locations where irrigation waters are present, cotton, pecans, tomatoes, onions, and chile peppers may be harvested.

The remainder of Study Areas A and B, and the entirety of area H are located in the Level IV ecoregion known as the Semiarid Edwards Bajada. This ecoregion is mostly composed of alluvial fan and slope wash deposits below the escarpment of the Edwards Plateau. Elevations in this region are lower than the Edwards Plateau and the climate is warmer. Vegetation primarily consists of blackbrush and honey mesquite which is typical of the Southern Texas Plains (US EPA, 2010).

All project study areas are located within the outcrop of the Edwards-Trinity (Plateau) aquifer. This aquifer extends across much of the southwestern part of Texas. Most of the water pumped from the aquifer is used for irrigation, while the remainder is for municipal use and livestock (TWDB, 1995).

III. WATERS OF THE U.S. AND WETLANDS

Waters of the U.S.

The term "Waters of the U.S." includes intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, ponds, etc; and tributaries of these waters. Three named creeks cross the study areas: Cienegas Creek, San Felipe Creek, and Calaveras Creek. The project study areas cross numerous tributaries and NHD waterbodies as shown in **Figures 2A through 2D** in **Appendix A** and on the USGS topographic map in **Figures 3A through 3D** in **Appendix A**). A summary of these NHD waterbody crossings is described per segment in **Table 2** below. More detailed information taken by GPS in and around Study Areas A through H and used to complete **Table 2** can be viewed in **Figures 9A through 9D** in **Appendix A**.

Table 2. Potential Waters of the U.S. within the Project Study Area

Study Area	Associated Waterbody(-ies)	Flow Regime	Length (linear feet)*	OHWM Width
A	Cienegas Creek, Cantu Branch, Cantu Branch Tributary 1 (Stream 3), Cantu Branch Tributary 4	Intermittent	44,500	None
B	San Felipe Creek and San Felipe Creek Tributary 1	Intermittent	41,000	2 – 12 ft
C	Cienegas Creek Tributary 1 (Stream 2)	Intermittent	5,400	1 – 2 ft
D	None	NA	NA	1 – 6 ft
E	None	NA	NA	None
F	San Felipe Creek and small connecting tributaries	Main branch is perennial, connecting tributaries are intermittent	28,800	1 – 150 ft
G	Calaveras Creek and Calaveras Creek Tributary 1	Intermittent	17,600	2 – 12 ft
H	None	NA	NA	None

**NOTE: Length was calculated using NHD data since the entire study area was not accessible in the field. The stream length reported for each study area is the sum of those waterbodies listed in the second column; smaller feeder streams outside of the study area are not included in the total.*
Source: USGS, 2012; Field data collected July 30 – August 1, 2012.
NA = Not Applicable

Since the study areas total almost 3,000 acres, it was not feasible to investigate the extent of all eight study areas. CP&Y conducted field work in and around Del Rio on various projects since 2008. Information gathered during previous field surveys was used to supplement data taken in the field during the July 2012 field survey. As seen in **Figures 9A through 9D in Appendix A**, CP&Y has taken

numerous waters of the U.S. data in many areas around Del Rio. Photos of each study area are included in **Appendix B**.

Investigations in the areas where access was granted indicated that many of the waterways shown on the topographic map and NHD map were dry and did not exhibit a discernible ordinary high water mark (OHWM). The majority of the waterways with no discernible OHWM had slightly greener grass than adjacent areas and showed a very gradual elevation change. Dry waterways that exhibited OHWMs were no more than 12 feet wide. Some waterways were grass-lined, concrete-lined, had no vegetation, had giant reed (*Arundo donax*) growing on the banks, or was eroded down to the bedrock. Although Study Area A had named creeks, no OHWM was visible during the field event. It is likely that an OHWM exists further downstream; however, since Study Area A includes the headwaters and/or is further upstream, a well-defined channel was not visible. The only waterway with flowing water during the July field survey was San Felipe Creek, south of US 90 (Study Area F). According to field observations, Study Area D has a discontinuous OHWM. Numerous field observations over the past four years in Del Rio have shown that waterways here are rain-fed; following rain, the water drains or dries quickly.

Wetlands

Based on the U.S. Army Corps of Engineers (USACE) definition, wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of wetland vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. USGS 7.5-minute topographic maps, NHD information, NWI maps, and soil survey maps were used to search for potential effects to wetlands in the area of the project.

NWI wetlands in the vicinity of the study areas are shown on **Figures 4A through 4D** (**Appendix A**); the NWI wetlands that lie within the eight study areas are listed in **Table 3**.

Table 3. NWI Wetlands that Intersect the Study Areas

Area	Wetland Type(s) Present
A	PUSJh, PUSAx
B	R2UBH, R4SBC
C	-
D	-
E	-
F	PUBHh, R2UBH
G	R45BA
H	-

Source: USFWS, 2012

Study Area A contains three NWI-labeled wetlands: two classified as PUSAx (palustrine, unconsolidated shore, temporary flooded, excavated), and one as PUSJh (palustrine, unconsolidated shore, intermittently flooded, diked/impounded).

Study area B is associated with San Felipe Creek and San Felipe Creek Tributary 1. San Felipe Creek is classified as R2UBH (riverine, lower perennial, unconsolidated bottom, permanently flooded) and its tributary is classified as R4SBC (riverine, intermittent, streambed, seasonally flooded).

The NWI wetlands associated with Study Area F include R2UBH (riverine, lower perennial, unconsolidated bottom, permanently flooded) which stretches the entire length of San Felipe Creek. The wetland type PUBHh (palustrine, unconsolidated bottom, permanently flooded, diked/impounded) has two occurrences in the study area as well.

Study Area G includes Calaveras Creek, which is classified as R4SBA (riverine, intermittent, streambed, temporary flooded) for much of its length.

No jurisdictional wetlands were identified within the study areas where access was granted. One wet area was identified in Study Area A, east of the swimming pool on Kings Way (**Photo 24** in **Appendix B**). According to staff at the swimming pool, the pool filter backwash water is washed out every Monday and released into the grassy area east of the swimming pool. CP&Y field staff visited the site on Tuesday and standing water was observed. Hydric vegetation was noted around the standing water; however, the soil samples taken were not hydric. This site was determined to be a recently man-made wet area, but not a jurisdictional wetland.

IV. SOIL SURVEY

According to the NRCS (2011), the project study areas cross eleven different types of soil. These soils are shown on **Figures 5A through 5D** in **Appendix A** and are described in **Table 4.** The last column in the table refers to the study areas located on a particular soil.

Table 4. NRCS Soils in Study Areas

Soil Symbol	Soil Name	Description	Study Areas on Soil Types
AcB	Acuna silty clay	0-3% slopes	A, B
CoB	Coahuila clay loam	0-3% slopes	A, B, C, D, E, F, G, H
De	Dev soils (hydric)	Frequently flooded	B
FzG	Felipe and Zorra soils, very rocky	8-40% slopes	G
Pn	Pintas clay (hydric)	Frequently flooded	D
Ra	Reynosa silty clay loam	n/a	E, F
ZaC	Zapata-Venegarroon complex	1-5% slopes	A, B, C, D
ZoD	Zorra-Rock outcrop complex	1-5% slopes	A

Source: NRCS, 2012

Hydric soils are soils that are formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. The NRCS database identifies four hydric soils in Val Verde County: Dev soils (De), Pintas clay (Pn), Rio Grande soils (Ro), and Riverwash and Dev soils (Rv). Two of these soil types, Dev soils and Pintas clay are within the project's study areas (as seen in **Figures 5A through 5D, Appendix A**). Dev soils are found along San Felipe Creek north of US 90. Pintas clay is found along Cienegas Creek on the west side of Del Rio between Cienegas Road and Cantu Road.

V. FEDERALLY-LISTED THREATENED AND ENDANGERED SPECIES

According to the endangered species list maintained by the USFWS, seven federally-listed endangered, threatened, candidate, and proposed threatened species occur within Val Verde County (**Table 5**). Habitat descriptions for each federally-listed species are provided in this section.

Table 5. Federally-Listed Threatened and Endangered Species in Val Verde County

Common Name	Scientific Name	Species Group	Federal Status
Black-capped vireo	*Vireo atricapilla*	Birds	E
Devils River minnow	*Dionda diaboli*	Fishes	T
Interior least tern	*Sterna antillarum*	Birds	E
Mountain plover	*Charadrius montanus*	Birds	PT
Texas hornshell (mussel)	*Popenaias popei*	Clams	C
Texas snowbells	*Styrax texama*	Flowering plants	E
Tobusch fishhook cactus	*Ancistrocactus tobuschii*	Flowering plants	E

Source: USFWS, 2012
C – candidate; E – endangered; T – threatened; PT – proposed threatened

TPWD maintains a database of rare, threatened, and endangered species sightings referred to as the NDD. According to the NDD data obtained from TPWD on December 22, 2010, there are two occurrences of federally-listed species that intersect or are near to the study areas. The federally-listed endangered interior least tern (*Sterna antillarum*) has been recorded approximately 3.5 miles northwest of Study Area A near Amistad Reservoir. The NDD and USFWS critical habitat mapper also indicates that the federally-listed threatened Devils River minnow (*Dionda diaboli*) has critical habitat located within San Felipe Creek (**Figure 6** in **Appendix A**), which is located within Study Area F.

Black-capped vireo *(Vireo atricapilla)*

Black-capped vireo habitat includes rangelands with scattered clumps of shrubs separated by open grassland. These birds nest between March and late summer. There is no suitable habitat for this species in the study areas.

Devils River minnow *(Dionda diaboli)*

The Devils River minnow is found in small spring-fed streams of fast flowing waters over gravel substrates often associated with emergent aquatic vegetation. This species has been found in the San Felipe Creek located in the eastern part of Del Rio (as seen in **Figure 6 in Appendix A**). A voluntary Conservation Agreement for the Devils River minnow between TPWD, USFWS, and the City of Del Rio was developed in 1998 in order to expedite conservation measures needed to ensure the continued existence and facilitate recovery of the species.

In September 2005, the USFWS developed a recovery plan with the intent to reduce threats to the species by securing adequate habitat conditions (clean, free-flowing springs and streams), allowing viable, self-sustaining populations to persist in the wild throughout its remaining range (includes controlling non-native species), and where feasible, to restore populations within the historic range. The

primary focus is to protect naturally functioning spring and stream ecosystems within its current and potentially restorable historic range.

Since critical habitat was identified within the study area F, the project engineers were consulted. It was determined that no work would be completed in the OHWM of San Felipe Creek and therefore, the Devils River minnow would not be adversely affected by the proposed project. Because the study area includes segments of San Felipe Creek, coordination with USFWS may be necessary regarding the conservation of the Devils River minnow.

Interior least tern *(Sterna antillarum)*

The interior least tern is migratory, breeding along inland river systems in the U.S. and wintering along the Central American coast and northern coast of South America (TPWD, 2006). Nesting habitat for this species includes bare or sparsely vegetated sand, shell, and gravel beaches, sandbars, islands, and salt flats associated with rivers and reservoirs. This species prefers open habitat and tends to avoid thick vegetation and narrow beaches. There is no suitable habitat for this species in the study area.

Mountain Plover (*Charadrius montanu*)

The mountain plover's breeding habitat consists of nests on high plains, shortgrass prairies, or on ground in shallow depressions. The nonbreeding habitat includes shortgrass plains and bare, dirt (plowed) fields. There is no suitable habitat for this species in the study areas.

Texas hornshell *(Popenaias popei)*

The Texas hornshell is a freshwater mussel found in Val Verde County. This species is found in both ends of narrow shallow runs over bedrock, in areas where small-grained materials collect in crevices, along river banks, and at the base of boulders. It is not known to be found in impoundments. It has been observed in the Rio Grande Basin and several rivers in Mexico. The only area with appropriate habitat would be San Felipe Creek. San Felipe Creek will not be impacted by the proposed flood control solutions; therefore, this species would not be adversely affected by the proposed project.

Texas snowbells *(Styrax texama)*

Texas snowbells grow out of crevices on steep limestone bluffs or cliff faces along streams and dry creek beds. It can also grow in the dry gravels of streambeds or in thin soils overlaying limestone ledges. These plants flower from March to November. Per the Geologic Atlas of Texas (GAT) (Bureau of Economic Geography, 1977), no limestone is mapped in the study areas. This plant was not observed during the July field event; therefore, it is assumed that this species would not be impacted by the proposed project.

Tobusch fishhook cactus *(Ancistrocactus tobuschii)*

The Tobusch fishhook cactus grows in very shallow gravelly soil over limestone in shortgrass areas within live oak-juniper shrublands. These plants flower beginning in late January until late March or sometimes early April. Per the GAT, no limestone is mapped in the study areas. This plant was not observed during the July field event and suitable habitat was not identified for this species; therefore, it is assumed that this species would not be adversely impacted by the proposed project.

The only federally-listed species with appropriate habitat in the project area is the Devils River minnow and Texas hornshell. After consultation with project engineers, it was determined that no work was

proposed in San Felipe Creek and thus, these two species would not be impacted by the proposed project. Photographs showing the habitat in the study areas can be seen in **Appendix B**.

VI. CULTURAL RESOURCES

Historical Background

San Felipe Springs is the third largest spring in Texas and extends two miles along the San Felipe Creek northeast of Del Rio. Archeological evidence, including cave paintings and artifacts, suggest human occupation of the area for over 11,000 years, likely due in part by the presence of the springs and creek. The San Felipe Creek Archeological District was established as an area of documented archeological sites near the creek (exact location is restricted, but documentation is located at the Texas Historical Commission [THC] office). In 1535, Spanish Explorer Cabeza De Vaca brought the first European-descent people through this area of the Edwards Plateau, probably crossing paths with Lipan Apaches, Coahuiltecans, Jumanos and Tamaulipan tribes. In 1590, Spanish Explorer Gaspar Catano de Sosa stopped at the springs while en route to New Mexico. Later, Comanches camped at the springs on their war trail into Mexico. It is believed that in 1675, Franciscan priests celebrated a Mass at San Felipe Springs as they traveled through northern Mexico and named the springs after the King of Spain. A historical marker in the City of Del Rio marks the supposed location of the Mass, which is now located on the golf course (San Felipe Creek Commissioners, 2007).

The rugged terrain and remote location of San Felipe Springs thwarted attempts made by the Spanish Government of New Spain to establish a permanent settlement in this area. Other Spanish explorers followed and by 1808, a mission was established near San Felipe Springs, on San Felipe Creek. In 1849, explorer Captain S.G. French described the San Felipe Springs as a "beautiful spring of water, fifty feet in diameter at the surface, the sides of which incline towards a centre, like an inverted cone, and then, sinking into a cylindrical form to a depth of twenty-eight feet, through a soil of hard clay, afford a passage for the water to rise" (French, 1850). By 1852, San Antonio banker and entrepreneur John Twohig, purchased three large tracks of land, recorded as the Sostenes Carrasco Survey No. 184, which included the two largest springs (Prewitt and Associates, 2002). By 1856-57, the San Felipe Springs were a stop of the 1,470-mile San Antonio to San Diego mail route. The springs were on the Chihuahua Road for wagons hauling silver and gold from Mexico to Indianola, an early Texas port. The first recorded settlement of San Felipe Creek would not come until 1859, after the Mexican War (1846-1848), when a man named Johnson and his wife and two children established a homestead, though 1862 marks the first permanent settlement when James Taylor and his wife Paula Losoya Taylor planted the seed for the soon-to-be prosperous community of Del Rio along San Felipe Springs (San Felipe Creek Commissioners, 2007). The Taylors are reported to have built a large hacienda in the vicinity of the springs. Many people settled at the hacienda, which grew into San Felipe. The community was known as San Felipe del Rio, which was later shortened to Del Rio (Prewitt and Associates, 2002).

Perhaps the largest endeavor undertaken to utilize the springs was the establishment of the intricate canal irrigation system which transformed this Rio Grande Valley community from a dry landscape into a thriving agricultural region and provided means to sustain the economy. As settlers flocked to Texas and the Rio Grande Valley, irrigation ditches fed by San Felipe Springs

and San Felipe Creek were dug. The Taylors are credited with digging the first irrigation canal, called the Old San Felipe Ditch, which was used to divert water for sugar cane fields, sustain livestock, and power a grist and cane mill (Prewitt and Associates, 2002).

By 1869, a group of landowners founded the San Felipe Agricultural, Manufacturing and Irrigation Company (SFAM&I). The San Felipe Creek was damned just below the springs and canals were built to divert water to 1,500 acres of land. The company promoted settlement by offering land along the Creek to employees (THC, 1975). The canal system consisted of the five-mile-long Madre Ditch and the one-mile-long San Felipe Ditch, along with a lateral canal. In 1870, a dam was built to divert springs into a main irrigation ditch, called the Acequia Madre, which branched off into smaller channels, irrigating around 3,000 acres. The SFAM&I is the oldest continuously operating irrigation corporation in Texas.

In 1876, the SFAM&I also donated 200 acres for the establishment of Camp San Felipe, a military subpost of Fort Clark, which was built to provide protection of the Rio Grande frontier. The camp became known as Camp Del Rio with the change of the community name and was occupied by the 10th Calvary, populated by African-American enlisted men, until it was abandoned in 1891 (Prewitt and Associates, 2002).

In 1883, the population of Del Rio grew exponentially with the arrival of the Galveston, Harrisburg and San Antonio Railroad in Del Rio. By 1884, two gristmills utilized the springs for power and railroad lines reached Del Rio, furthering population growth, and the need for additional irrigated acreage. Del Rio became the Val Verde County Seat in 1885. By 1901, a hydroelectric and ice plant also reaped benefits of the water source (Brune, 2011). During the Mexican Revolution (1910-1916), a military camp was established near the site of the original Camp Del Rio to patrol the border. The camp became known as Camp Michie after World War I. Cavalry and infantry troops were stationed at the camp until it was disbanded in 1921.

By 1920, the population of Del Rio increased to over 12,000 people, over double the size it was in 1910. The construction of the international bridge to Acuna in 1929 transformed the city into a gateway to and from Mexico. The land that the springs are located on was eventually sold to the City of Del Rio and pump stations were established along the creeks to supply the growing community. The early Hispanic, Mexican, Italian, and German settlements are reflected today in many surviving historical structures. Houses, plazas, parks, civic buildings and engineering structures provide insight into the rich and diverse history of the community.

Archeological Resources

An archeologist completed an archival review for the study areas. Archival research was conducted by using the THC Texas Archeological Sites Atlas database (Atlas). Listings of known archeological resources present within the boundaries of each of the eight study areas is presented below (**Table 6**) followed by a general listing of additional cultural resources present within a 1.0-mile radius surrounding the combined study areas (see **Table 8**).

Table 6. Previously Recorded Archeological Resources within the Study Areas

Site ID	Site Type	NRHP Eligibility Status	Distance/Direction from Study areas	Potential Impact?
Study Area A (US 90 North)				
41VV1985	Late PaleoIndian to Archaic campsite	Ineligible	Within Study Area A	Yes
Study Area B (Jap Lowe Drive)				
41VV433	Unknown prehistoric aboriginal campsite	Unknown	Within Study Area B	Yes
41VV434	Unknown prehistoric aboriginal campsite	Unknown	Within Study Area B	Yes
41VV435	Unknown prehistoric aboriginal campsite	Unknown	Within Study Area B	Yes
41VV436	Unknown prehistoric aboriginal campsite	Unknown	Within Study Area B	Yes
41VV438	Unknown prehistoric aboriginal campsite	Unknown	Within Study Area B	Yes
41VV439	Unknown prehistoric aboriginal campsite	Unknown	Within Study Area B	Yes
41VV440	Unknown prehistoric aboriginal campsite	Unknown	Within Study Area B	Yes
41VV442	Unknown prehistoric aboriginal campsite	Unknown	Within Study Area B	Yes
41VV443	Unknown prehistoric aboriginal campsite	Unknown	Within Study Area B	Yes
San Felipe Archeological District	PaleoIndian	Listed NRHP district that incorporates all of the sites listed above	Within Study Area B	Yes
Study Area C (Small Tributary of Cienegas Creek)				
None	N/A	N/A	N/A	N/A
Study Area D (Airport to West Gibbs Street)				
Masonic Cemetery (VV-C013)	19th- to 20th-century cemetery	Listed Texas Historic Cemetery	Within Study Area D	Yes
Del Rio Cemeteries Historic District	Historic-age cemeteries	Listed NRHP district	Within and adjacent to Study Area D	Yes
Study Area E (Veterans Blvd. at US 90)				
None	N/A	N/A	N/A	N/A

Table 6. Previously Recorded Archeological Resources within the Study Areas

Site ID	Site Type	NRHP Eligibility Status	Distance/Direction from Study areas	Potential Impact?
Study Area F (San Felipe Creek)				
None	N/A	N/A	N/A	N/A
Study Area G (Calaveras Creek SW of US 277)				
41VV1680	Unknown prehistoric aboriginal campsite	Ineligible	Within Study Area G	Yes
41VV1823	Unknown (no data available)	Unknown (no data available)	Within Study Area G	Yes
41VV1830	Unknown prehistoric lithic scatter/ Early 20th-century trash dump	Unknown	Within Study Area G	Yes
41VV1831	Unknown prehistoric lithic quarry	Unknown	Within Study Area G	Yes
San Felipe Cemetery (VV-C007)	Late 19th- to early 20th-century cemetery	Listed Texas Historic Cemetery	Within Study Area G	Yes
Study Area H (US 90 at Calaveras Creek)				
41VV810	Unknown prehistoric lithic scatter	Ineligible	Within Study Area H	Yes

Source: NRHP, National Register of Historic Place, accessed July 2012.

Study Area A

One previously recorded archeological site, 41VV1985, occurs within the boundaries of Study Area A. This site consists of a Late PaleoIndian to Archaic period aboriginal campsite. Based on the extent of prior construction-related disturbance to the site, it was recommended as ineligible for inclusion in the National Register of Historic Places (NRHP).

No previous cultural resources surveys have been conducted in Study Area A.

Study Area B

Nine previously recorded archeological sites occur within the boundaries of Study Area B. These sites are aboriginal campsites variously consisting of scatters of lithic artifacts, burned rock middens, and/or hearth features dated to unspecified prehistoric timeframes. All nine sites are contributing elements of the San Felipe Archeological District, a listed National Register Historic District (NRHD). This NRHD covers all of Study Area B and extends beyond it. An additional five aboriginal archeological sites located just beyond the boundaries of Study Area B are also contributing elements of the NRHD.

Approximately 75% of Study Area B was previously surveyed for cultural resources in 1974. This survey resulted in the documentation of the aboriginal sites that compose the San Felipe Archeological District and the NRHD was listed as a result of this survey.

Study Area C

No known cultural resources occur within the boundaries of Study Area C. No previous cultural resources surveys have been conducted in Study Area C.

Study Area D

A small portion of the Del Rio Cemeteries Historic District extends into the southwestern corner of Study Area D. The Del Rio Cemeteries Historic District incorporates three individual historic-age cemeteries—Sacred Heart Cemetery, Masonic Cemetery, and Westlawn Cemetery—that collectively represent a NRHD that was designated in 2003. The eastern half of the Masonic Cemetery extends into Study Area D and the remaining two cemeteries are located immediately west of the study area's western boundary.

A small portion of Study Area D, located just north of the Del Rio Cemeteries Historic District, has been previously surveyed for cultural resources. This survey was conducted in 1975 and no cultural resources were recorded as a result.

Study Area E

No known cultural resources occur within the boundaries of Study Area E. One historic marker associated with the First Baptist Church of Del Rio is present within Study Area E. No specific cultural resources are delineated on the Atlas associated with this church, though the church is located within the boundaries of the study area.

No previous cultural resources surveys have been conducted in Study Area E.

Study Area F

No previously recorded archeological resources are present within the boundaries of Study Area F. Nine historical markers are present within Study Area F associated with Val Verde County, U.S. Army Camel Corps, Camp Michie, Site of Camp Del Rio, Cal Rodgers and the Vin Fiz, Brown Plaza, Seminole-Negro Scouts, Roy Bean C.S.A., and Old Perry Building. No specific cultural resources associated with the historical markers have been documented on the Atlas.

Two small cultural resources surveys have been conducted in Study Area F, including a survey of the Margarite Avenue Bridge across San Felipe Creek conducted in 1983 and a linear survey along the eastern bank of San Felipe Creek conducted in 1999. These two prior surveys were quite limited in extent and the vast majority of Study Area F has not been surveyed for cultural resources.

Study Area G

Four previously recorded archeological sites are present within the boundaries of Study Area G. Two of the sites are aboriginal campsites and raw material procurement sites (i.e., "quarries") dating to unspecified prehistoric timeframes, one site is a multiple-component undated prehistoric lithic artifact scatter and early 20th-century trash dump, and no data were available on the Atlas regarding the

cultural affiliation or age for one site. One of the four sites is ineligible for inclusion in the NRHP and the eligibility of the remaining three sites is unknown.

The northeastern edge of the San Felipe Cemetery is located within the southwestern corner of Study Area G. This listed Texas Historic Cemetery is a Mexican cemetery dating to the late 19th to early 20th centuries. Two previous cultural resources surveys have covered small portions of Study Area G, including a linear survey conducted along Margarite Avenue in 2003 and a linear survey than ran along the bank of Calaveras Creek conducted in 1994. The vast majority of Study Area G has not been previously surveyed for cultural resources.

Study Area H

One previously recorded archeological site, 41VV810, occurs within the boundaries of Study Area H. This site consists of a sparse surficial scatter of aboriginal lithic debris and was recommended as ineligible for inclusion in the NRHP.

Two previous cultural resources surveys have covered small portions of Study Area H, both of which consist of linear surveys conducted in 1994. The vast majority of Study Area H has not been previously surveyed for cultural resources.

Recorded Architectural Resources

An architectural historian conducted a database search to identify previously recorded historic resources in the study areas. Archival research was conducted by using THC's Historical Sites Atlas database. Listings of known architectural resources present within the boundaries of each of the eight study areas are presented below in **Table 7** and displayed on **Figures 7A and 7B in Appendix A.**

Table 7. Previously Recorded Architectural Resources within Study Areas

Map ID	Site Type	NRHP Eligibility Status	Distance/Direction from Study areas	Potential Impact?
Study Area A (US 90 North)				
None	N/A	N/A	N/A	N/A
Study Area B (Jap Lowe Drive)				
None	N/A	N/A	N/A	N/A
Study Area C (Small Tributary of Cienegas Creek)				
None	N/A	N/A	N/A	N/A
Study Area D (Airport to West Gibbs Street)				
Map ID 1	Del Rio Cemeteries Historic District	NRHP Listed	Within Study Area D	Yes
Study Area E (Veterans Blvd. at US 90)				
Map ID 3	First Baptist Church of Del Rio	OTHM	Marker within Study Area E	No
Study Area F (San Felipe Creek)				

Table 7. Previously Recorded Architectural Resources within Study Areas

Map ID	Site Type	NRHP Eligibility Status	Distance/Direction from Study areas	Potential Impact?
Map ID 6	Val Verde County	OTHM	Marker within Study Area F	No
Map ID 7	U.S. Army Camel Corps	OTHM	Marker within Study Area F	No
Map ID 8	Camp Mitchie	OTHM	Marker within Study Area F	No
Map ID 9	Site of Camp Del Rio	OTHM	Marker within Study Area F	No
Map ID 10	Cal Rogers and the Vin Fiz	OTHM	Marker within Study Area F	No
Map ID 11	Brown Plaza	OTHM	Marker within Study Area F	No
Canal System of Del Rio	Madre Ditch, Old San Felipe Ditch, New San Felipe Ditch	NRHP Eligible	Portions within Study Area F	Yes
Study Area G (Calaveras Creek SW of US 277)				
None	N/A	N/A	N/A	N/A
Study Area H (US 90 at Calaveras Creek)				
None	N/A	N/A	N/A	N/A

Source: NRHP, National Register of Historic Place, accessed July 2012
OTHM: Official Texas Historical Marker

A review of the National Register of Historic Places (NRHP) revealed four listings in Del Rio: Del Rio Cemeteries Historic District (Map Resource 1 on Figure 7A), San Felipe Creek Archeological District (location restricted), the Cassinelli Gin House (Map Resource 30), and the Val Verde County Courthouse and Jail (Map Resource 29, Figure 7A). The Cassinelli Gin House and the Val Verde County Courthouse and Jail are located in downtown Del Rio. The cemetery district is located to the west of town and partially within Study Area D.

The Texas Historic Sites Atlas indicates that six Official Texas Historical Markers (OTHMs) are located in Study Area F. Brown Plaza (Map Resource 11, Figure 7A) is identified with an OTHM posting and remains as a central park for city events and recreation. Located in Study Area E, Map ID 3 is the OTHM designating where the First Baptist Church of Del Rio once stood. The other markers indicate either historical events that took place at the particular site, or where a site was once located. These areas will not likely be impacted by water management efforts.

A character-defining historic resource for the city is the Canal System of Del Rio (Map ID 5). The OTHM for the canal system is located at 608 Griner Street. Built in the 1870s, the canal system originally consisted of the five-mile-long Madre Ditch and the one-mile-long San Felipe Ditch. Four main irrigation

ditches of the historic canal system run through Study Area F. Originated from the spring-fed San Felipe Creek, the Madre Ditch, St. Mary's Ditch, the Old San Felipe Ditch, and the New San Felipe Ditch are gravity fed systems that meander along streets, under streets, and through neighborhoods to irrigate the southeastern portion of Del Rio down to near the Rio Grande. **Figure 7** indicates the location of these ditches in relation to the study areas. The ditches are systems composed of features designed to channel and distribute water. Many of the features have undergone rehabilitation and significant changes, though impressively, much of the channels continue to perform the same functions that they were designed for over 100 years ago. However, rather than supporting agricultural efforts, the ditches now primarily support residential lawn maintenance. In addition, the ditches are all privately owned and operated. The system of ditches is comprised of several intact, character-defining historic features. Examples of these include dams, diversion gates, lined and unlined ditches, overflow gates, pedestrian bridges, and culverts (see photos 3, 4, 5, 8, 11, 13 and 14 in Figure xx). Some of these features date from the original 1870s construction period. Tardy Dam, located at the convergence of the Madre Ditch and the Old San Felipe Ditch, is one such historic feature of the canal system (see Photo 16, Figure XX).

The Canal System of Del Rio is not currently listed as an NRHP or a RTHL. However, the Texas Department of Transportation (TxDOT) is currently conducting NRHP evaluations of select irrigation systems of the Rio Grande Valley. The Del Rio system has not yet been formally assessed for eligibility for inclusion in the NRHP, though the THC and TxDOT have agreed to treat the historic-age South Texas irrigation system as an eligible and historically significant resource (see Photo 10, Figure XX).

Study Area A is comprised of newer residential communities and has a low potential for historic-age structures. Study Areas B and C are relatively undeveloped and also hold a low potential for historic-age resources. Study Area D is comprised of mid-20th century residential structures and would need to be surveyed to determine the presence of historically significant resources or historic districts. Study Area E has a dense concentration of historic-age buildings and structures. A neighborhood architectural survey was conducted in the 1970s and included portions of this study area and Study Area F. However, many of the buildings surveyed at that time are no longer extant. Specific areas of impact (or areas of potential affect [APE]), should be established and surveyed to determine the presence of historic age resources and historically-significant resources within the study areas. Historically-significant resources are defined as those considered eligible for listing in the NRHP.

Study Area F has the highest concentration of historic resources. The Southern Pacific Railroad line runs through this area, including the historic metal truss bridge (see Photo 1, Figure XX). The NRHP-listed Val Verde County Courthouse and Casellini Gin House are located in close proximity to the study area. In addition to historic houses and civic buildings, the Canal System of Del Rio runs through this study area. Many of the original features, including portions of the ditches, date from 1870s construction period and define the historic character of the system. During planning efforts for the water management improvements, the extent of the Canal System of Del Rio would need to be established to see whether components of the system falls within the project location areas or intersects with one or more of the study areas. If so, the system would need to be formally evaluated for NRHP eligibility if eligibility of the system has not yet been coordinated with the THC. TxDOT is currently preparing a comprehensive map of all primary and secondary components of the system. TxDOT also published a historical context and guidelines to evaluate irrigation systems for listing in the NRHP, which will aid in the evaluation of the Canal System of Del Rio.

Several roadway bridges over San Felipe Creek (and associated ditches) are present in Study Area F. The Gibbs Street Bridge (US 90), Dr. Fermin Calderon Blvd Bridge, the Canal Street Bridge, and the Gillis

Street Bridge were likely all constructed (or reconstructed) within the past 50 years. The Johnston Street Bridge may have been constructed in the 1950s. (See Photo 19, Figure XX). Should any project work involve the use or alteration of these bridges, they should first be surveyed for historical significance.

Study Areas G and H are comprised of recently-constructed residential neighborhoods. These areas have a low potential for the presence of historic-age architectural resources.

Additional Cultural Resources with 0.5 Mile of Study Areas

An additional 22 cultural resources have been previously recorded within one mile of the study areas, including 19 archeological sites, two listed NRHP properties, and one historic cemetery (**Table 8**). Of the 19 archeological sites, nine sites consist of aboriginal campsites, most of which date to unspecified prehistoric timeframes, though Middle Archaic to Late Prehistoric components were observed on two of these sites. One site (41VV444) is a multiple-component site containing a Middle Archaic to Late Prehistoric aboriginal campsite and an early 20th-century pump house, and one site consists of a 20th-century ranch and industrial water tank storage facility. No information is available about the remaining eight sites. Three of the 19 sites were recommended as ineligible for inclusion in the NRHP, but the NRHP eligibility of the remaining 16 sites is unknown.

Two listed NRHP historic properties (the Val Verde County Courthouse and Jail and the Cassinelli Gin House) and one listed Texas Historic Cemetery (the Old San Felipe Cemetery) are located within one mile of the study areas. **Figure 7** indicates the location of historic structures or markers that are currently outside the defined study areas, though within a one-mile radius of the study areas. **Table 8** lists both archeological and architectural resources within a one-mile radius of the study areas.

Table 8. Previously Recorded Cultural Resources within 1.0 Mile of Study Areas

Site (or Map) ID	Site Type	NRHP Eligibility Status	Distance/Direction from Study areas	Potential Impact?
41VV431	Unknown prehistoric aboriginal campsite	Unknown	0.5 miles SW of Study Area B	No
41VV432	Unknown prehistoric aboriginal campsite	Unknown	0.1 miles SW of Study Area B	No
41VV437	Unknown prehistoric aboriginal campsite	Unknown	0.1 miles NE of Study Area B	No
41VV441	Unknown prehistoric aboriginal campsite	Unknown	0.1 miles SW of Study Area B	No
41VV444	Early 20th-century San Felipe Springs Pump House/ Middle Archaic to Late Prehistoric aboriginal campsite	Unknown	0.7 miles SW of Study Area B 0.1 miles north of Study Area F	No
41VV445	Unknown prehistoric aboriginal campsite	Unknown	0.4 miles NE of Study Area B	No

Table 8. Previously Recorded Cultural Resources within 1.0 Mile of Study Areas

Site (or Map) ID	Site Type	NRHP Eligibility Status	Distance/Direction from Study areas	Potential Impact?
41VV1251	Unknown (no data available)	Unknown (no data available)	0.8 miles E of Study Area G	No
41VV1252	Unknown (no data available)	Unknown (no data available)	0.7 miles SE of Study Area G	No
41VV1677	Unknown prehistoric aboriginal campsite	Ineligible	0.7 miles NE of Study Area G 250 feet SW of Study Area H	No
41VV1678	Unknown prehistoric aboriginal campsite	Ineligible	0.4 miles NE of Study Area G	No
41VV1679	Unknown prehistoric aboriginal campsite	Ineligible	300 feet NE of Study Area G	No
41VV1692	Unknown (no data available)	Unknown (no data available)	0.6 miles NW of Study Area C	No
41VV1693	Unknown (no data available)	Unknown (no data available)	0.4 miles W of Study Area C	No
41VV1713	Unknown (no data available)	Unknown (no data available)	0.7 miles SW of Study Area D	No
41VV1820	20th-century ranch and industrial water tank storage facility	Unknown	0.7 miles SE of Study Area A	No
41VV1821	Unknown (no data available)	Unknown (no data available)	0.6 miles NE of Study Area G	No
41VV1822	Late Archaic to Late Prehistoric aboriginal campsite	Unknown	0.4 miles E of Study Area G	No
41VV1829	Unknown (no data available)	Unknown (no data available)	0.5 miles SW of Study Area G	No
41VV1832	Unknown (no data available)	Unknown (no data available)	0.2 miles NW of Study Area C	No
Old San Felipe Cemetery (VV-C006)	Late 19th- to early 20th-century cemetery	Listed Texas Historic Cemetery	0.4 miles SW of Study Area G	No
Map ID 2	The Carter Family in Del Rio	OTHM	0.25 miles W of Study Area E	No
Map ID 4	San Felipe Springs	RTHL/OTHM		No

Table 8. Previously Recorded Cultural Resources within 1.0 Mile of Study Areas

Site (or Map) ID	Site Type	NRHP Eligibility Status	Distance/Direction from Study areas	Potential Impact?
Map ID 5	Canal System of Del Rio	OTHM/NRHP Eligible	Portions of the system are within Study Area F; OTHM is outside study areas	Yes
Map ID 12	Old Perry Building	RTHL/OTHM	0.25 miles SW of Study Area F	No
Map ID 13	Roy Bean C.S.A	OTHM	0.5 miles SW of Study Area F	No
Map ID 14	Seminole Negro Scouts	OTHM	0.5 miles SW of Study Area F	No
Map ID 15	San Felipe High School	OTHM	0.02 miles E of Study Area F	No
Map ID 16	Cementerio Loma De La Cruz	OTHM	1 mile SW of Study Area G	No
Map ID 17	Glenn-Dowe House	RTHL/OTHM	0.25 miles SW of Study Area E	No
Map ID 18	Camp Hudson, C.S.A.	OTHM	0.25 miles NW of Study Area F	No
Map ID 19	Val Verde County Courthouse Square	OTHM	0.25 miles NW of Study Area F	No
Map ID 20	Old Del Rio High School	OTHM	0.5 miles NW of Study Area F	No
Map ID 21	The City of Del Rio	OTHM	0.5 miles NW of Study Area F	No
Map ID 22	Max and Anna Stool	OTHM	0.5 miles W of Study Area F	No
Map ID 23	Elks Lodge Hall	RTHL/OTHM	0.25 miles NW of Study Area F	No
Map ID 24	Cassinelli Gin Hose	RTHL/OTHM	0.02 miles SW of Study Area F	No
Map ID 25	Mason Foster House	OTHM	0.5 miles SW of Study Area F	No
Map ID 26	Val Verde Winery	OTHM	0.75 miles SW of Study Area F	No
Map ID 27	Dr. John R. Brinkley	OTHM	1 mile SW of Study Area F	No

Table 8. Previously Recorded Cultural Resources within 1.0 Mile of Study Areas

Site (or Map) ID	Site Type	NRHP Eligibility Status	Distance/Direction from Study areas	Potential Impact?
Map ID 28	Brinkley Mansion	OTHM	1 mile SW of Study Area F	No
Map ID 29	Val Verde Courthouse and Jail	NRHP Listed	0.02 miles W of Study Area F	No
Map ID 30	Cassinelli Gin House	NRHP Listed	0.25 miles W of Study Area F	No

Source: NRHP, National Register of Historic Place, accessed July 2012

Analysis and Recommendations for Cultural Resources

Prior to the initiation of water management improvements within Del Rio, the specific impact areas will need to be surveyed for the presence of archeological and architectural resources. These resources should be evaluated for eligibility for inclusion in the NRHP and the effects of the proposed project on these resources should be determined.

In South Texas, prehistoric archeological sites are commonly found in upland areas and on alluvial terraces near stream/river channels or drainages and historic-age sites may occur in virtually any physiographic environment. The study areas span a variety of upland landforms, streams, and creeks that have a high potential to contain archeological resources, and a moderately high density of prehistoric and historic-age archeological resources have been recorded within and in the vicinity of the study areas during previous archeological investigations. The likelihood of encountering intact archeological resources that would meet the criteria of significance for inclusion in the NRHP would be somewhat reduced in areas that have experienced extensive urban development. Numerous historic architectural resources and cemeteries have been recorded in Del Rio and the study areas possess a high probability of containing additional undocumented historic-age architectural resources.

According to Section 106, 36 CFR §800, of the National Historic Preservation Act (NHPA) of 1966, if any federal agency permits, federal loans, or loan guarantees are required for the development of the study areas, including permits issued by the USACE, additional efforts to identify and/or assess potential impacts to cultural resources may be required by permitting agencies. Specific to the use of Nationwide Permits issued by the USACE, Special Condition 18(c) of the 2007 Nationwide Permits General Conditions requires non-federal permittees to notify the USACE under the Pre-Construction Notification (PCN) procedures if a proposed project subject to Section 404 jurisdiction may have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the NRHP, including previously unidentified properties. In order to make this determination, the USACE may require a cultural resources survey in the immediate vicinity of any Section 404 regulated activity if at least a moderate potential exists for the occurrence of prehistoric or historic-age properties.

VII. CONCLUSION

Section 404 of the Clean Water Act (CWA), the Antiquities Code of Texas, and the Endangered Species Act apply to projects funded by the City of Del Rio. No jurisdictional wetlands were identified during the

July 2012 field event. OHWMs were recorded for waters of the U.S. identified within the study areas. There is a high potential for archeological resources in the study areas due to the presence of water sources and previously documented sites throughout Del Rio. There is a moderate potential for the presence of historic architectural resources within the study areas; specifically, features associated with the Canal System of Del Rio and San Felipe Springs. It is assumed that no federally-listed species will be adversely affected by the proposed project. Habitat was identified for two of the federally-listed species in Val Verde County: the Devil's River Minnow and Texas hornshell. However, no work will be completed within San Felipe Creek, which is the only waterbody in the study areas that provides habitat for these two species.

Various flood control solutions are being recommended to the City for a Capital Improvements Program. When the engineers and environmental/cultural staff were discussing the flood control alternatives, numerous Nationwide Permits (NWP) were reviewed for relevance to the proposed options. Since a detailed design is not currently available, it is difficult to state exactly what permit would be required. It is likely that the proposed options would fall under one or more of the following Nationwide Permits (NWP):

- NWP 3 – Maintenance
- NWP 13 – Bank Stabilization
- NWP 14 – Linear Transportation Projects
- NWP 18 – Minor Discharges
- NWP 27 – Aquatic Habitat Restoration, Establishment, and Enhancement Activities
- NWP 41 – Reshaping Existing Drainage Ditches
- NWP 43 – Stormwater Management Facilities
- NWP 46 – Discharges in Ditches

It is also likely that the proposed flood control work can be completed under a NWP rather than an Individual Permit (IP), assuming that no work will be completed in the area of Devil's River minnow critical habitat in San Felipe Creek. If federal funds are utilized for the proposed project, a National Environmental Policy Act (NEPA) document will likely be required. The level of document will be determined on the type of work performed and the funding agency. When the City has selected an option and a detailed design has been developed, the environmental permitting requirements should be reassessed. While additional biological field work might be required, an archeological survey would be required.

REFERENCES

Bureau of Economic Geography. 1977. *Geologic Atlas of Texas: Del Rio Sheet*. Robert Thomas Hill Memorial Edition. (GA0014).

"Devils River Minnow Critical Habitat - San Felipe Creek Unit." Federal Register 73:156 (12 August 2008) p. 47024.

French, S.G. 1850. *"Report."* U.S. Senate Ex. Doc #64, 31st Congress, First Session, Washington, D.C.: Government Printing Office, pp 43-44. www.EdwardsAquifer.net page (Accessed August 7, 2012).

Gunnar Brune. "San Felipe Springs." *Handbook of Texas Online.* http://www.tshaonline.org/handbook/online/articles/rps05 (Accessed August 7, 2012).

Natural Resource Conservation Service (NRCS) Soil Data Mart website. 2012. http://soildatamart.nrcs.usda.gov/. (Accessed July 2011).

Prewitt and Associates. 2002. "*Water in the Desert- Prehistory and History of San Felipe Springs*." City of Del Rio.

San Felipe Creek Commissioners. June 2007. *San Felipe Creek Vision Plan*.

Texas Historical Commission. *Texas Archeological Sites Atlas*. http://nueces.thc.state.tx.us/ (Accessed August 8, 2011).

Texas Water Development Board. *Edwards-Trinity (Plateau) Aquifer.* http://www.twdb.state.tx.us/publications/reports/GroundWaterReports/GWReports/R345%20Aquifers%20of%20Texas/Majors/EdTrinPlat.pdf. Published November 1995. (Accessed July 2011).

Texas Water Development Board (TWDB). 1995. *Major Aquifers of Texas*. http://www.twdb.state.tx.us/mapping/maps/pdf/aqu_maj_24x24.pdf (Accessed July 2011).

Texas Parks and Wildlife Department (TPWD). *Wildlife Fact Sheets.* http://www.tpwd.state.tx.us/huntwild/wild/species/#plants (Accessed July 2011).

United States Environmental Protection Agency (USEPA).

- *Descriptions of the Level IV Ecoregions of Texas.* 2010. ftp://ftp.epa.gov/wed/ecoregions/tx/tx_back.pdf (Accessed July 2011).
- *Final National Priorities List (NPL) Sites – by State.* http://www.epa.gov/superfund/sites/query/queryhtm/nplfin.htm#Texas (Accessed July 2011).

United States Fish and Wildlife Service (USFWS).

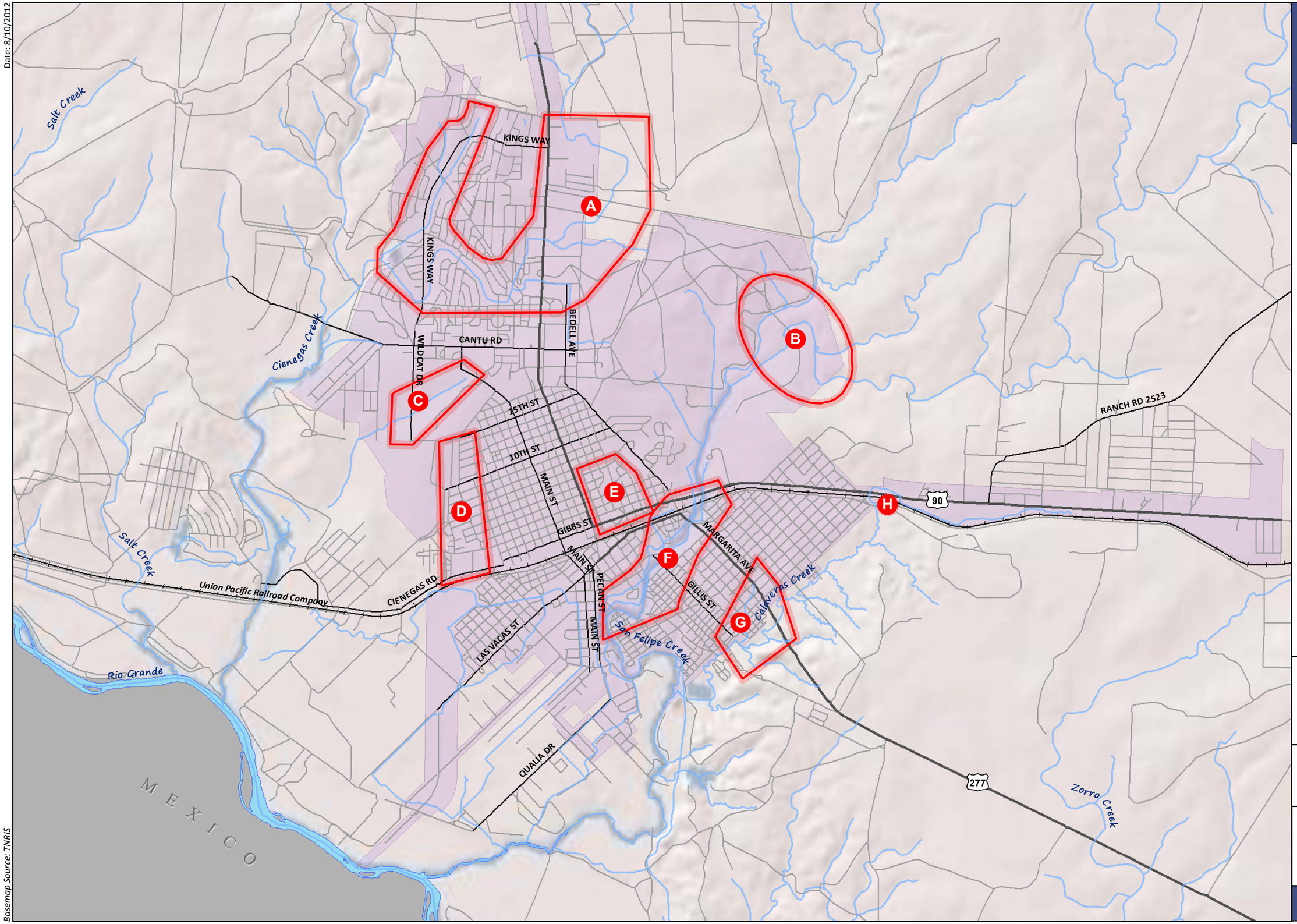
- 2011. Critical *Habitat for Threatened and Endangered Species.* http://criticalhabitat.fws.gov/ (Accessed July 2011).

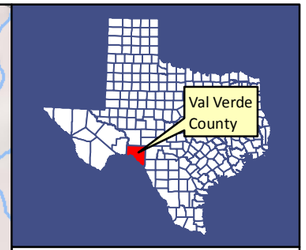
- 2012. *Wetlands Mapper*. http://www.fws.gov/wetlands/Data/Mapper.html (Accessed June 2012).

United States Geologic Survey (USGS). 2012. National Hydrography Dataset. http://nhd.usgs.gov/ (Accessed June 2012).

APPENDIX A – FIGURES

Date: 8/10/2012





N
S

0 2,000 4,000
Feet

Study Area
Del Rio City Limits

Project Location and Study Areas

FIGURE 1

Basemap Source: TNRIS

Date: 8/16/2012

Study Area

National Hydrography Dataset Flowline

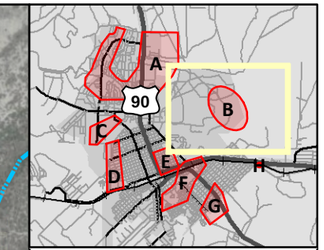
Basemap Source: City of Del Rio & Bing Maps

Aerial Photograph with NHD

STUDY AREA A

FIGURE 2A

Date: 8/16/2012



N

S

0 500 1,000

Feet

Study Area

National Hydrography Dataset Flowline

Aerial Photograph with NHD

STUDY AREA B

FIGURE 2B

Basemap Source: City of Del Rio & Bing Maps

Date: 8/16/2012

Basemap Source: City of Del Rio & Bing Maps

CITY OF Del Rio TEXAS

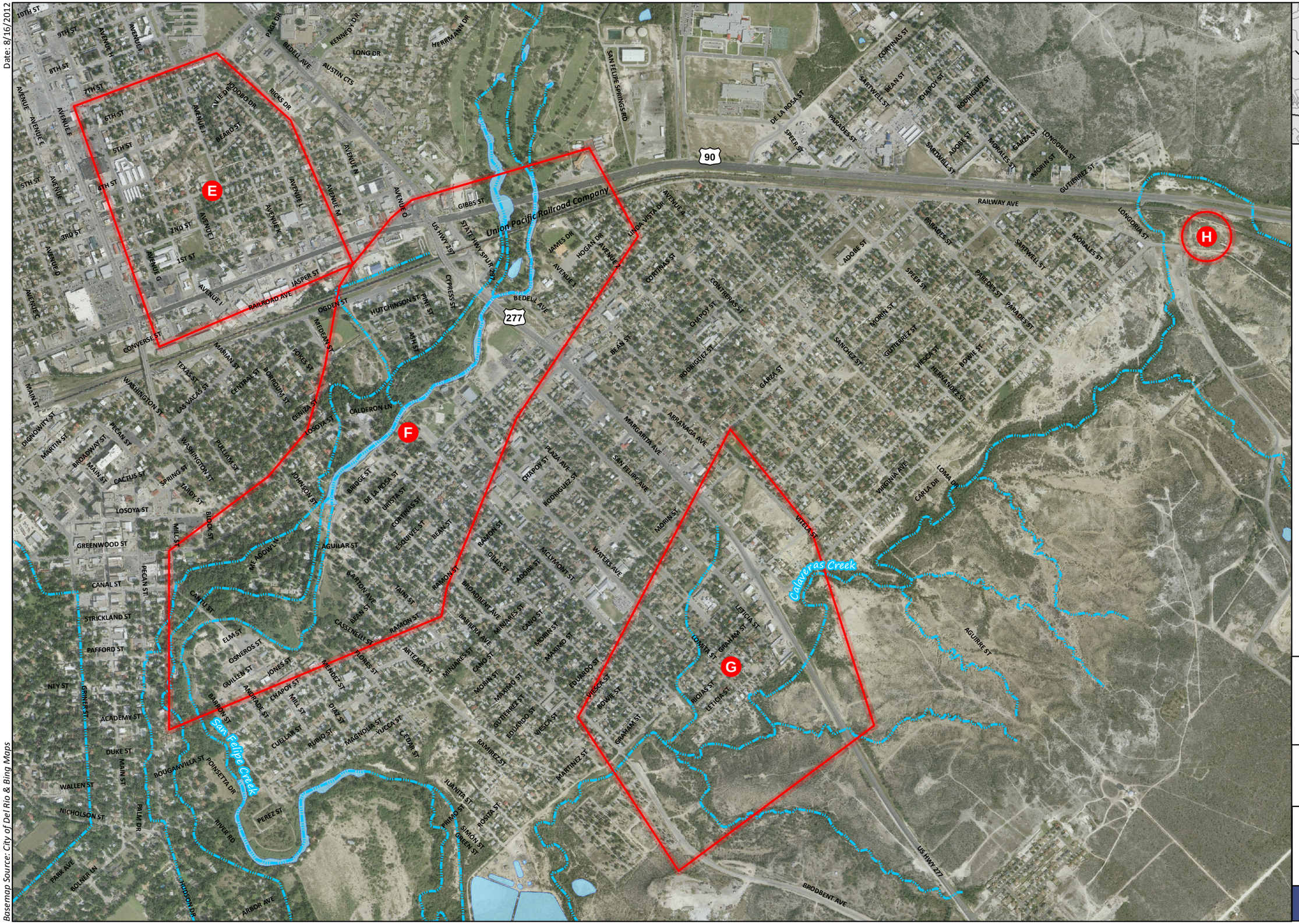
CP&Y

Aerial Photograph with NHD

STUDY AREA C-D

FIGURE 2C

Date: 8/16/2012



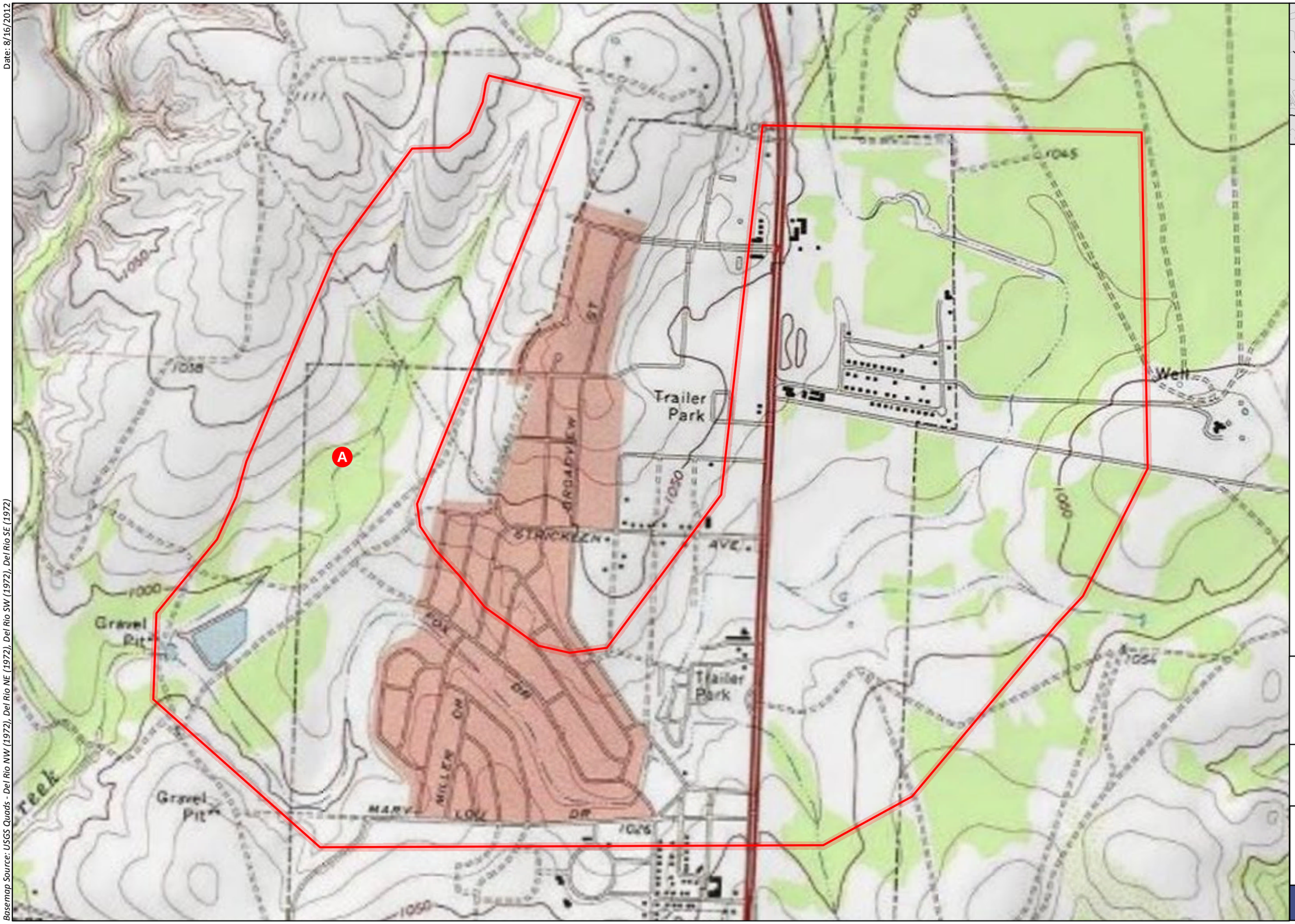
Basemap Source: City of Del Rio & Bing Maps

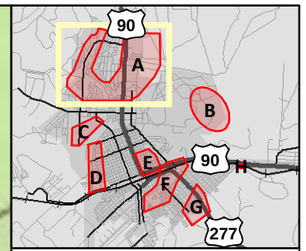
Aerial Photograph with NHD

STUDY AREA E-H

FIGURE 2D

Date: 8/16/2012





N

S

0 500 1,000

Feet

Study Area

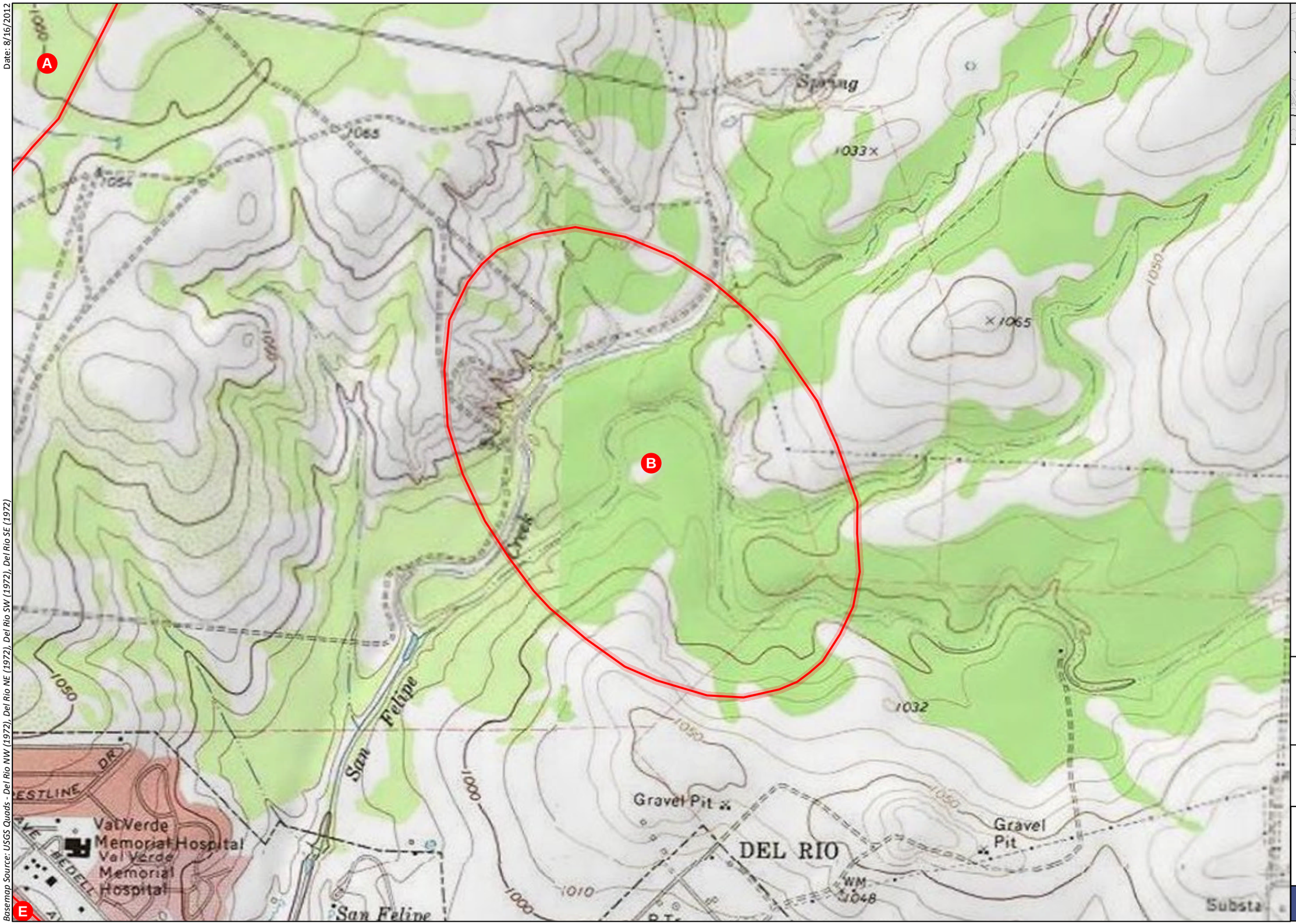
USGS Topographic Map

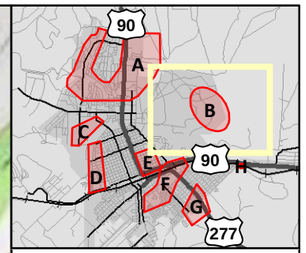
STUDY AREA A

FIGURE 3A

Basemap Source: USGS Quads - Del Rio NW (1972), Del Rio NE (1972), Del Rio SW (1972), Del Rio SE (1972)

Date: 8/16/2012





N

S

0 500 1,000

Feet

Study Area

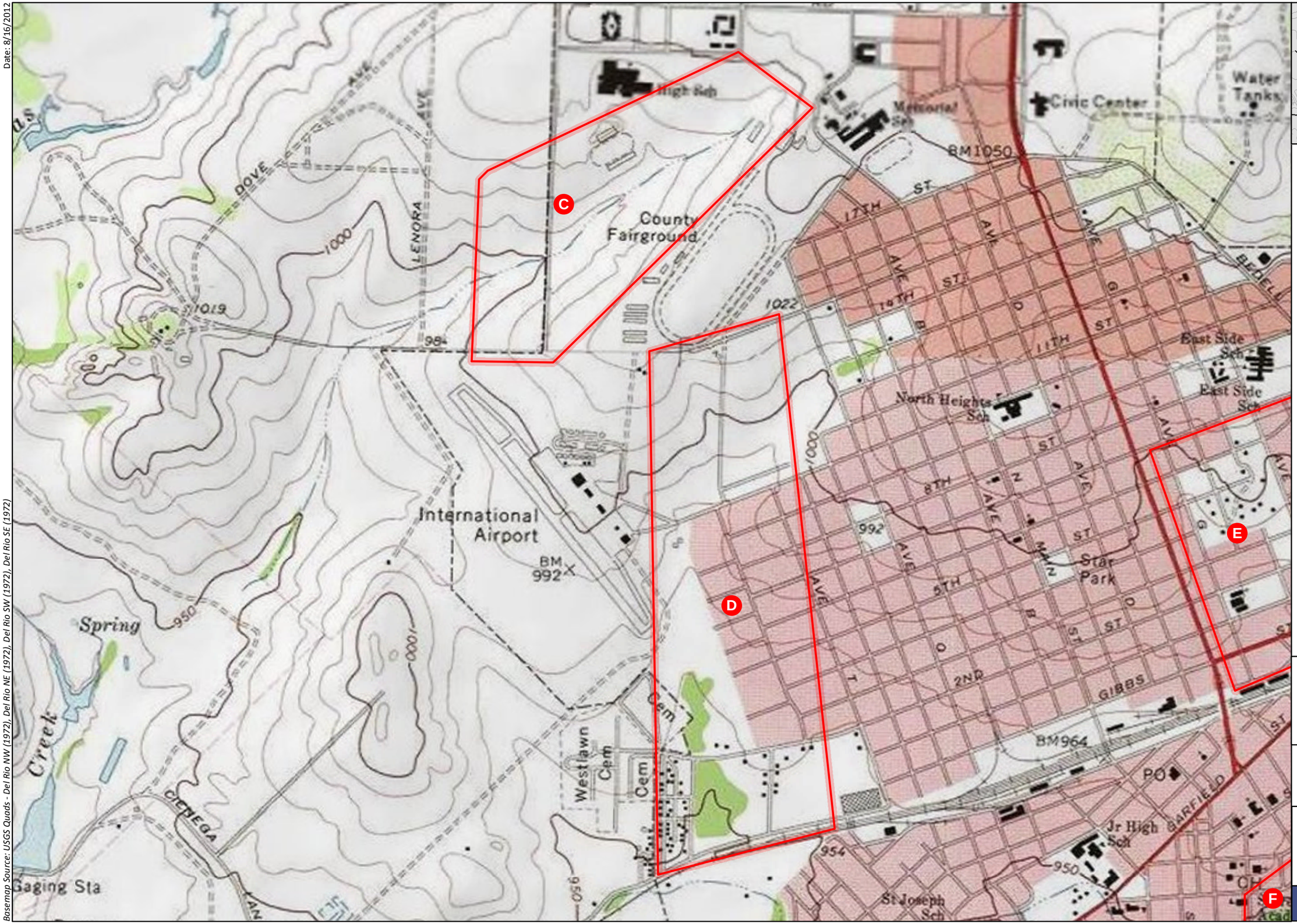
USGS Topographic Map

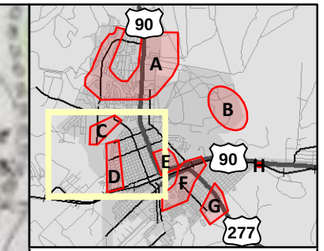
STUDY AREA B

FIGURE 3B

Basemap Source: USGS Quads - Del Rio NW (1972), Del Rio NE (1972), Del Rio SW (1972), Del Rio SE (1972)

Date: 8/16/2012





N

S

0 500 1,000

Feet

Study Area

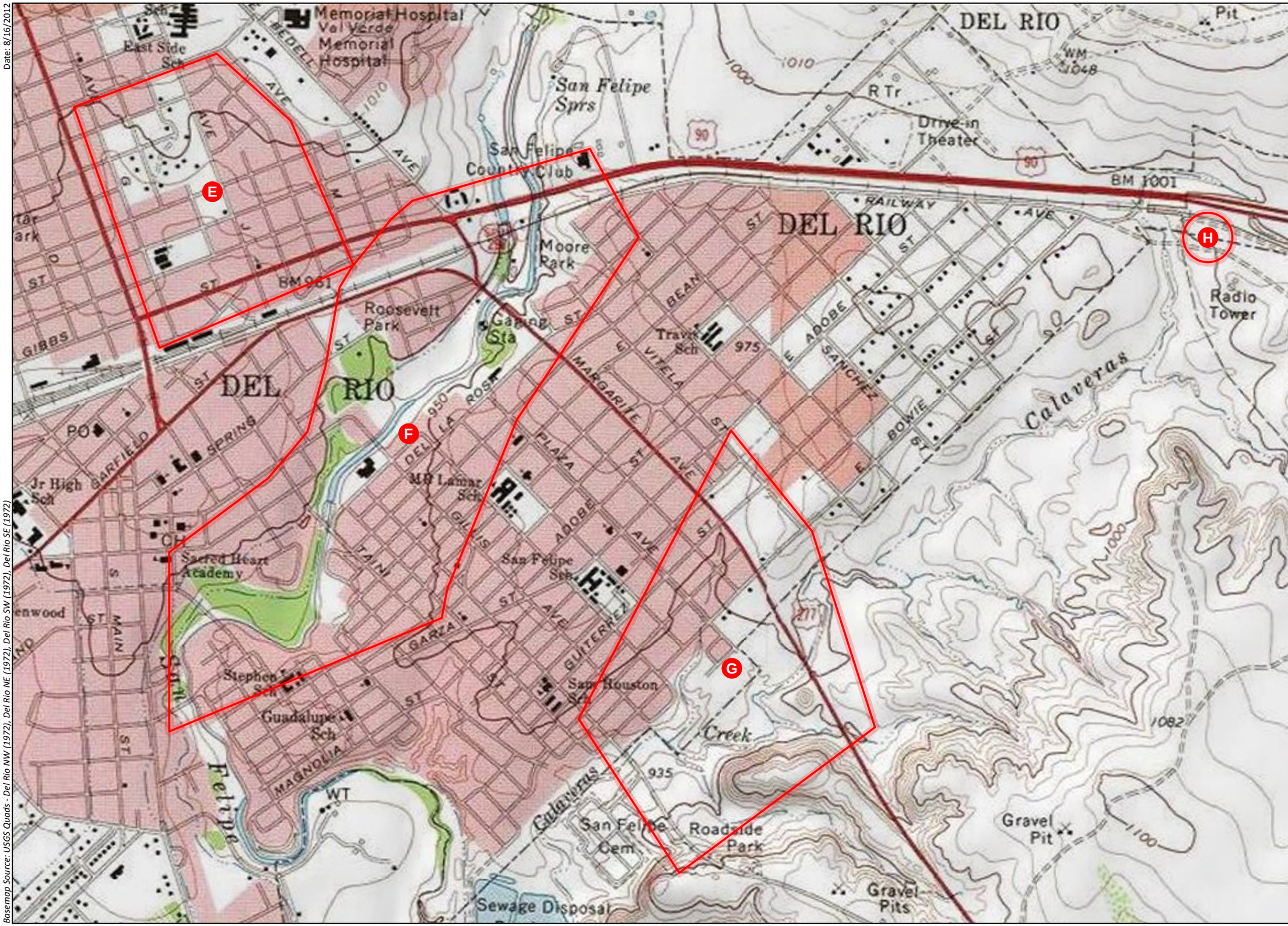
USGS Topographic Map

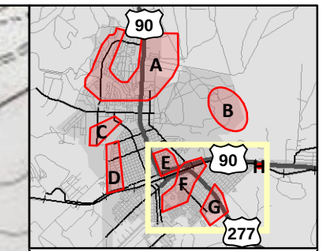
STUDY AREA C-D

FIGURE 3C

Basemap Source: USGS Quads - Del Rio NW (1972), Del Rio NE (1972), Del Rio SW (1972), Del Rio SE (1972)

Date: 8/16/2012





N

S

0 500 1,000

Feet

Study Area

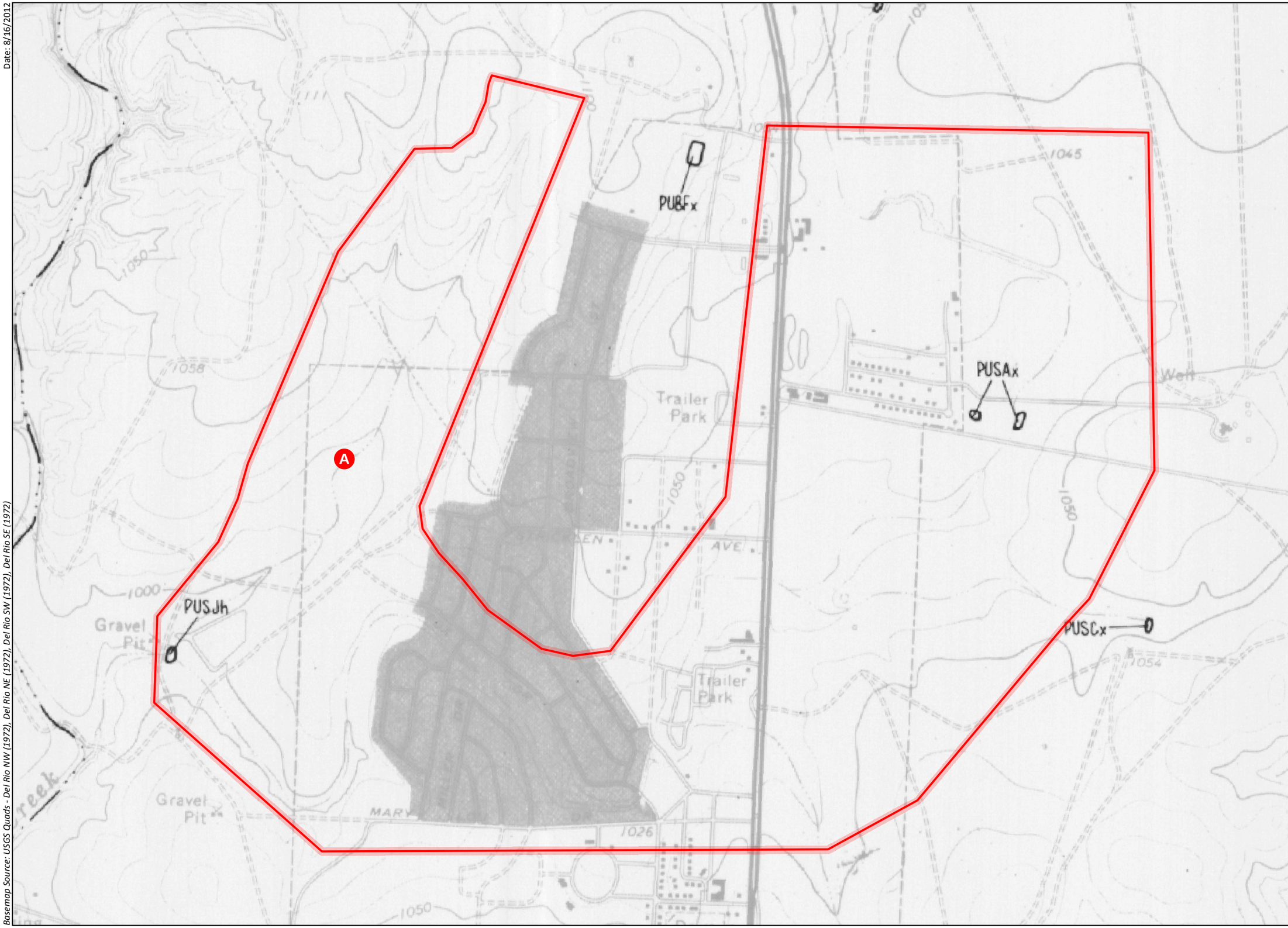
USGS Topographic Map

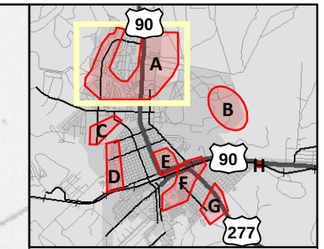
STUDY AREA E-H

FIGURE 3D

Basemap Source: USGS Quads - Del Rio NW (1972), Del Rio NE (1972), Del Rio SW (1972), Del Rio SE (1972)

Date: 8/16/2012





N

S

0 500 1,000

Feet

Study Area

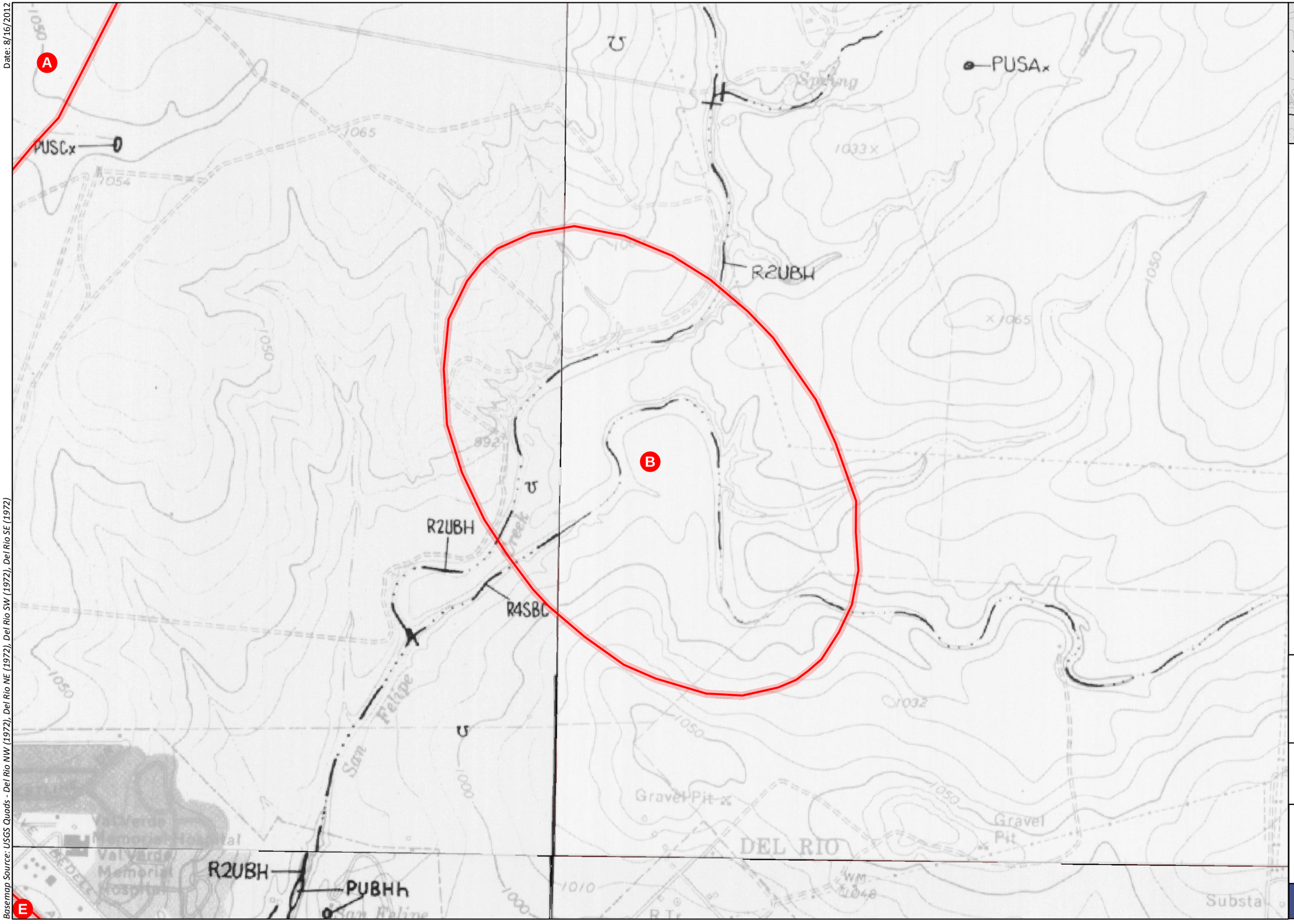
National Wetlands Inventory Map

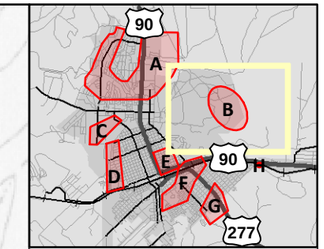
STUDY AREA A

FIGURE 4A

Basemap Source: USGS Quads - Del Rio NW (1972), Del Rio NE (1972), Del Rio SW (1972), Del Rio SE (1972)

Date: 8/16/2012





N

S

0 500 1,000

Feet

Study Area

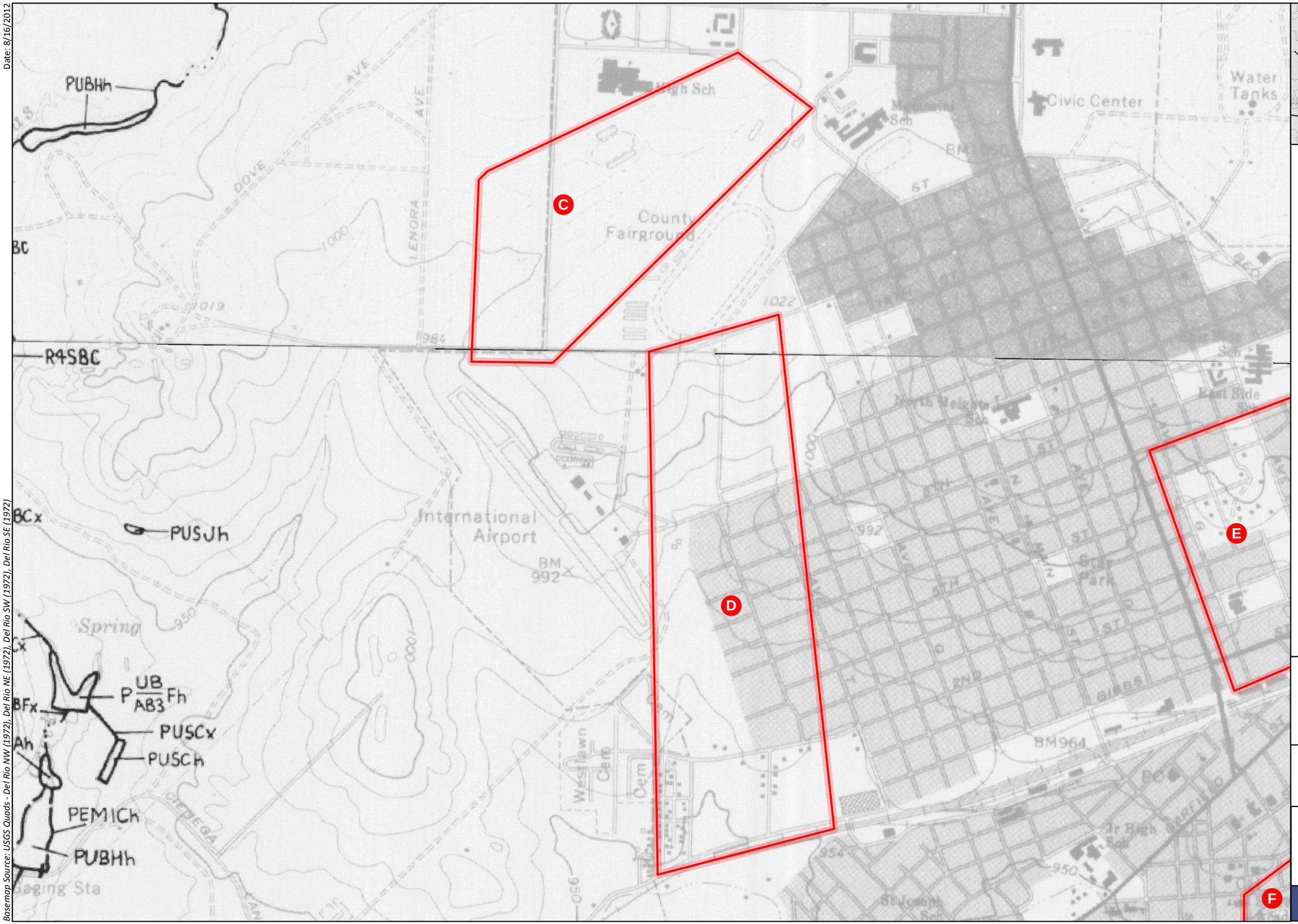
National Wetlands Inventory Map

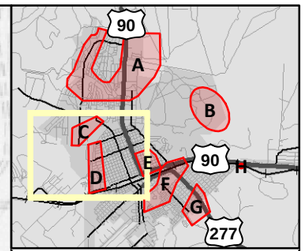
STUDY AREA B

FIGURE 4B

Basemap Source: USGS Quads - Del Rio NW (1972), Del Rio NE (1972), Del Rio SW (1972), Del Rio SE (1972)

Date: 8/16/2012





N

S

0 500 1,000

Feet

Study Area

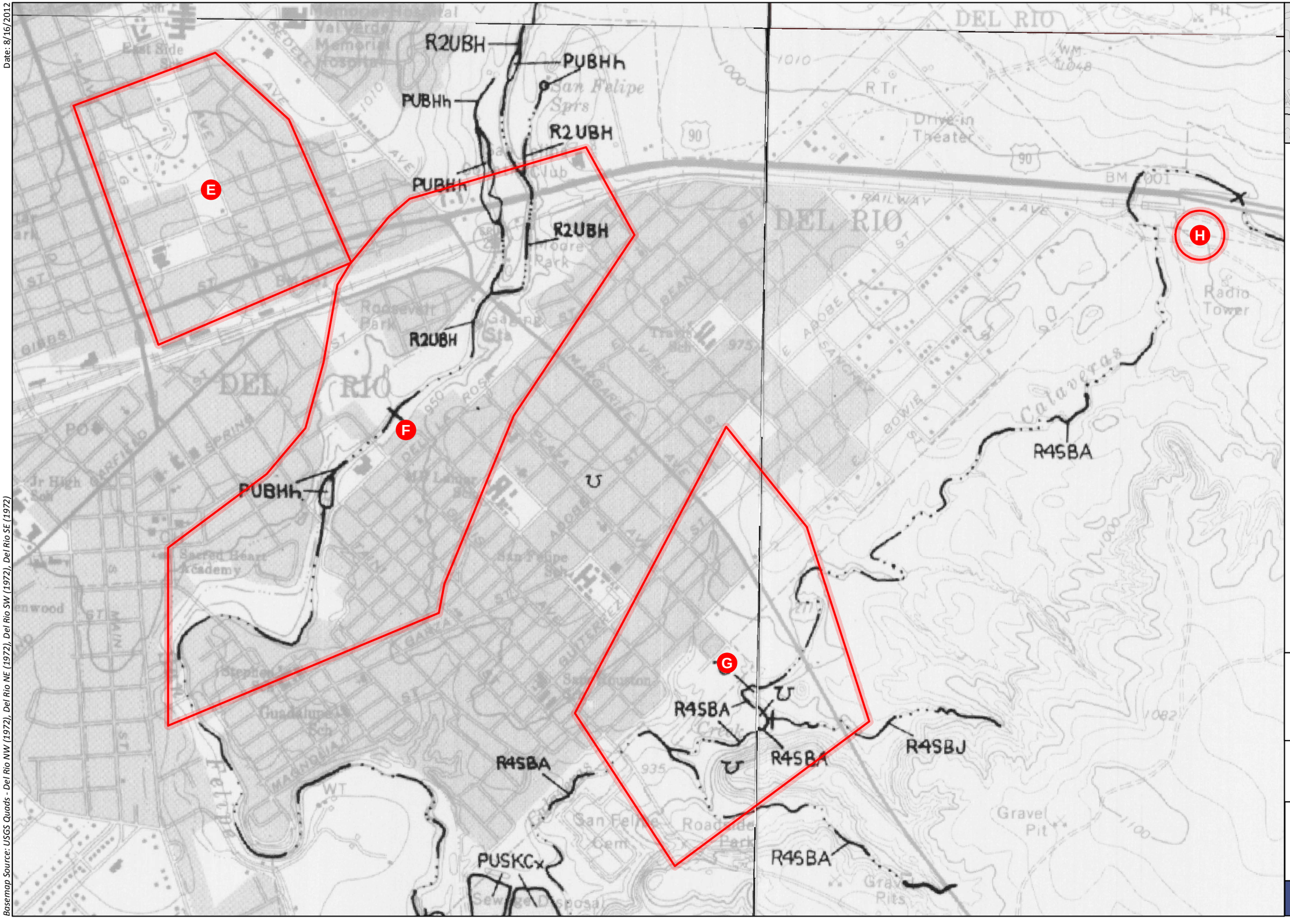
National Wetlands Inventory Map

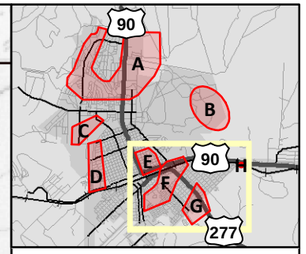
STUDY AREA C-D

FIGURE 4C

Basemap Source: USGS Quads - Del Rio NW (1972), Del Rio NE (1972), Del Rio SW (1972), Del Rio SE (1972)

Date: 8/16/2012





N

S

0 500 1,000

Feet

Study Area

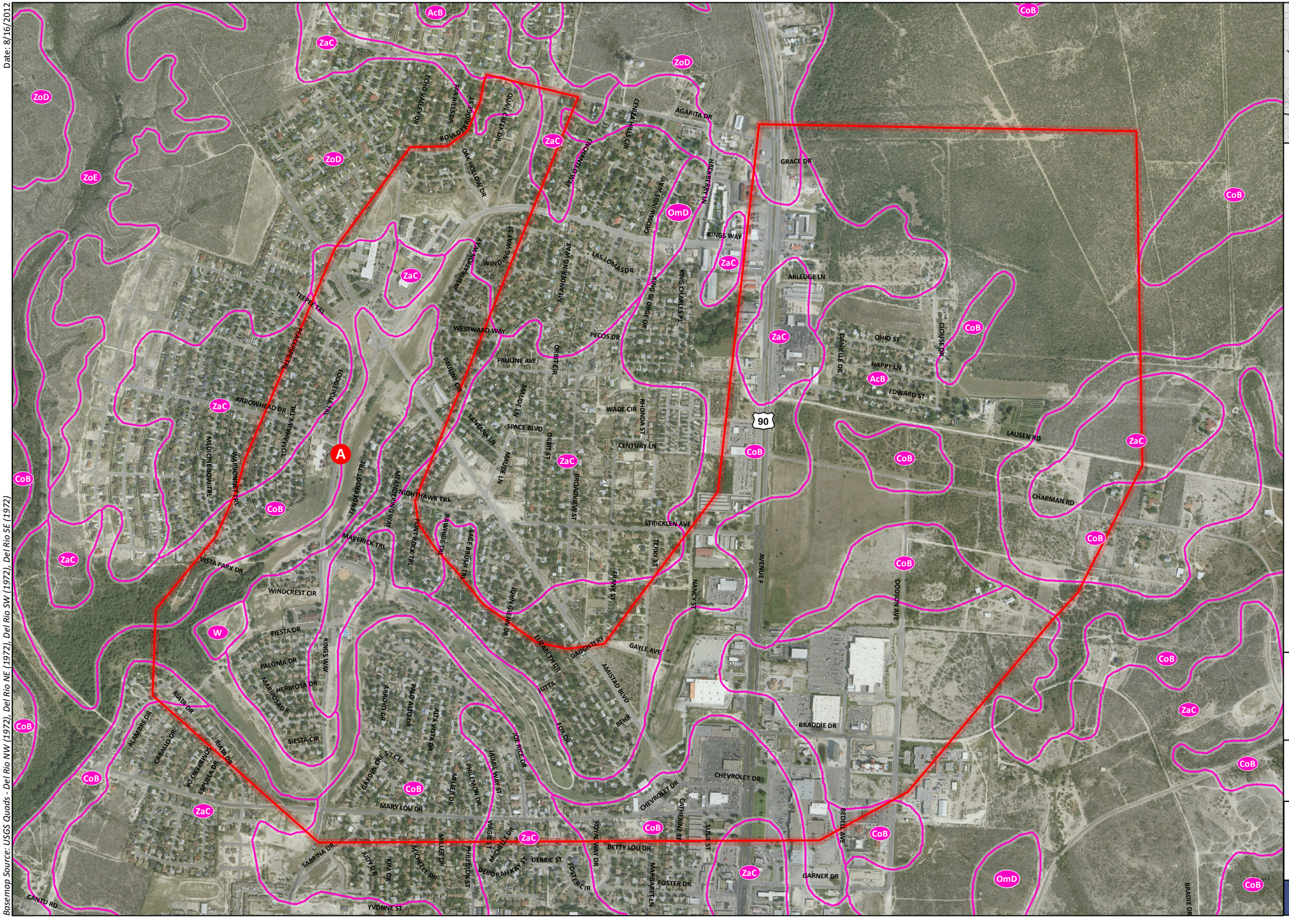
National Wetlands Inventory Map

STUDY AREA E-H

FIGURE 4D

Basemap Source: USGS Quads - Del Rio NW (1972), Del Rio NE (1972), Del Rio SW (1972), Del Rio SE (1972)

Date: 8/16/2012



Basemap Source: USGS Quads - Del Rio NW (1972), Del Rio NE (1972), Del Rio SW (1972), Del Rio SE (1972)

CITY OF Del Rio TEXAS

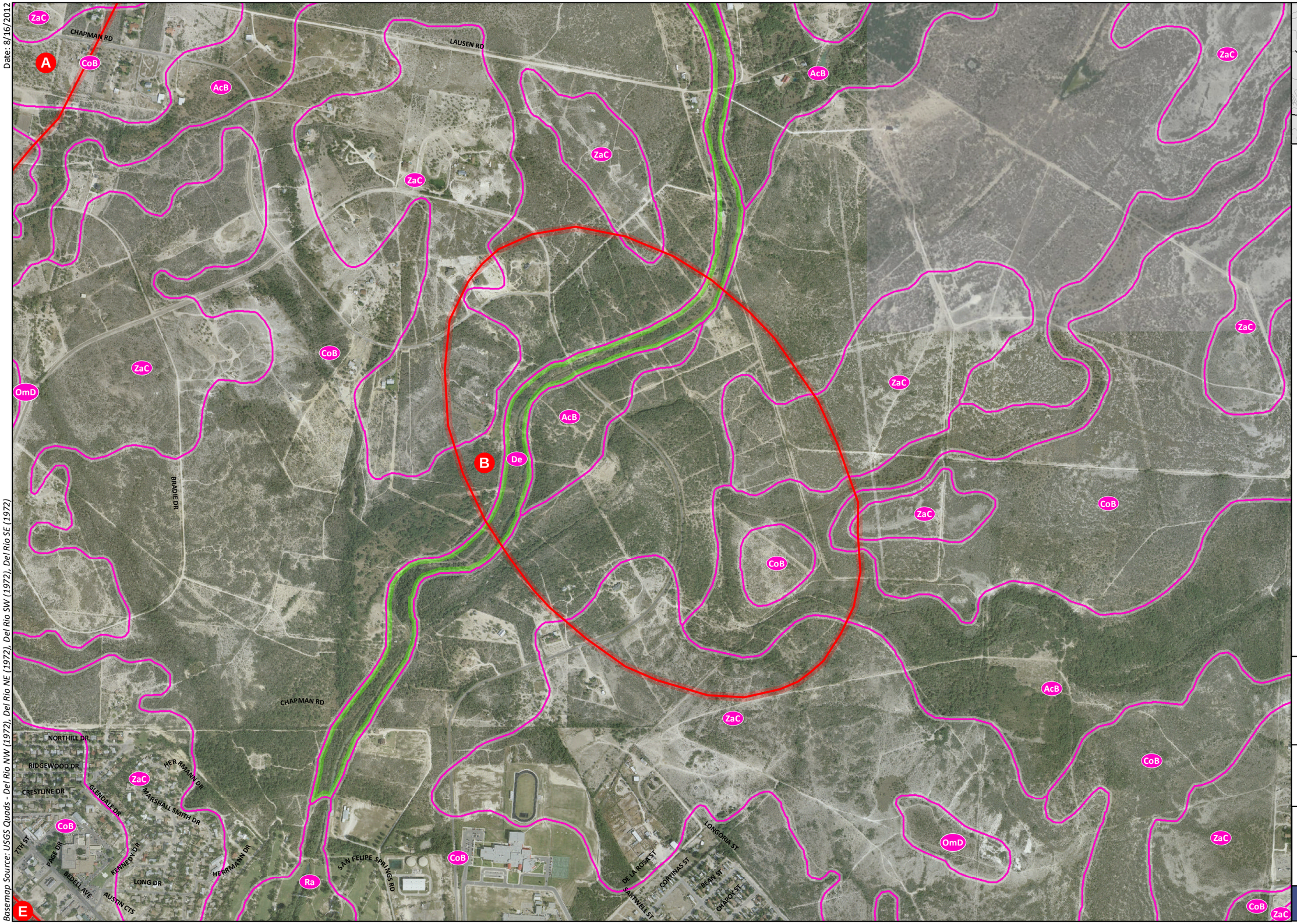
CP&Y

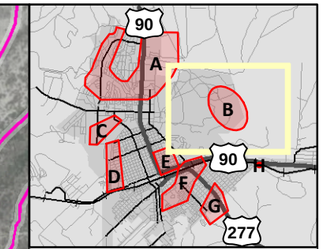
NRCS Soil Map

STUDY AREA A

FIGURE 5A

Date: 8/16/2012





N

S

0 500 1,000

Feet

Study Area

Natural Resources Conservation Service Soil Boundary

Hydric Soil

CITY OF Del Rio TEXAS

CP&Y

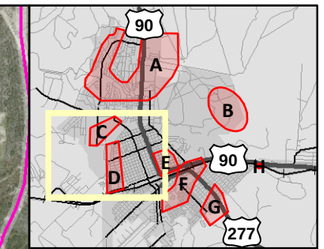
NRCS Soil Map

STUDY AREA B

FIGURE 5B

Basemap Source: USGS Quads - Del Rio NW (1972), Del Rio NE (1972), Del Rio SW (1972), Del Rio SE (1972)

Date: 8/16/2012



N

S

0 500 1,000

Feet

Study Area

Natural Resources Conservation Service Soil Boundary

Hydric Soil

CITY OF Del Rio TEXAS

CP&Y

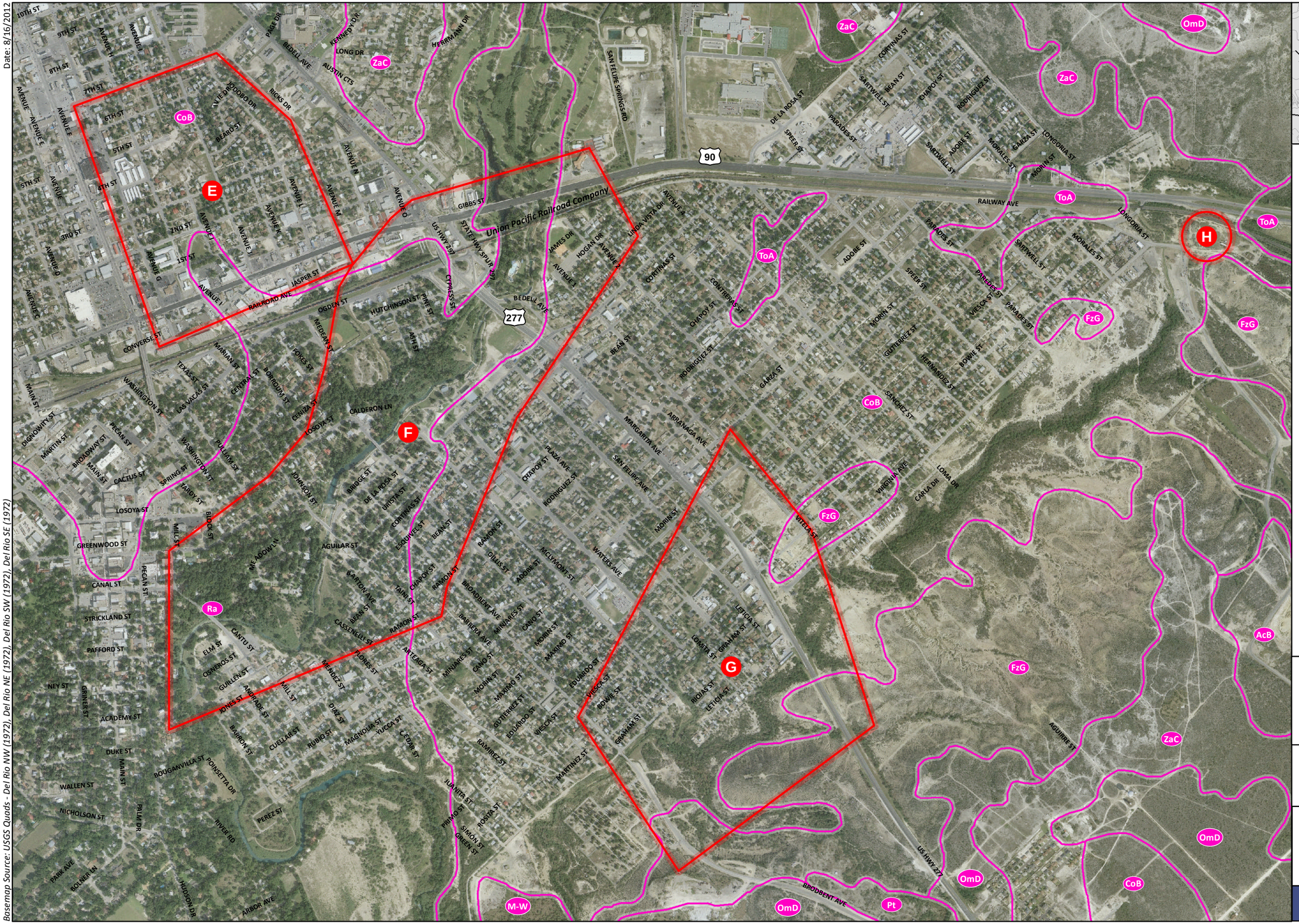
NRCS Soil Map

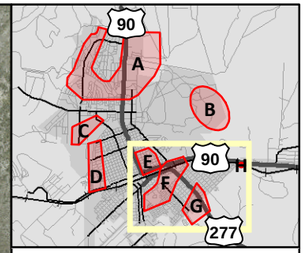
STUDY AREA C-D

FIGURE 5C

Basemap Source: USGS Quads - Del Rio NW (1972), Del Rio NE (1972), Del Rio SW (1972), Del Rio SE (1972)

Date: 8/16/2012





N

S

0 500 1,000

Feet

Study Area

Natural Resources Conservation Service Soil Boundary

Hydric Soil

CITY OF Del Rio TEXAS

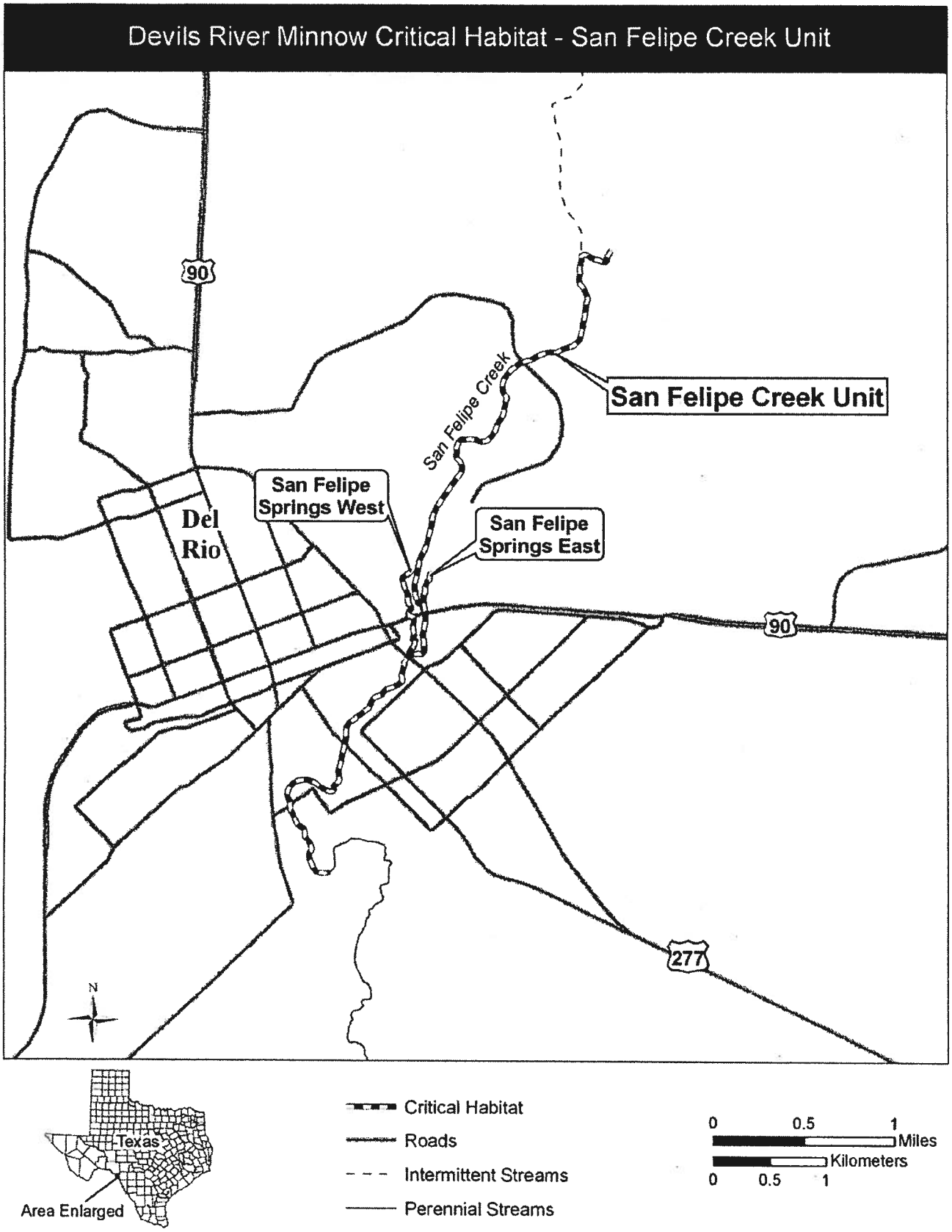
CP&Y

NRCS Soil Map

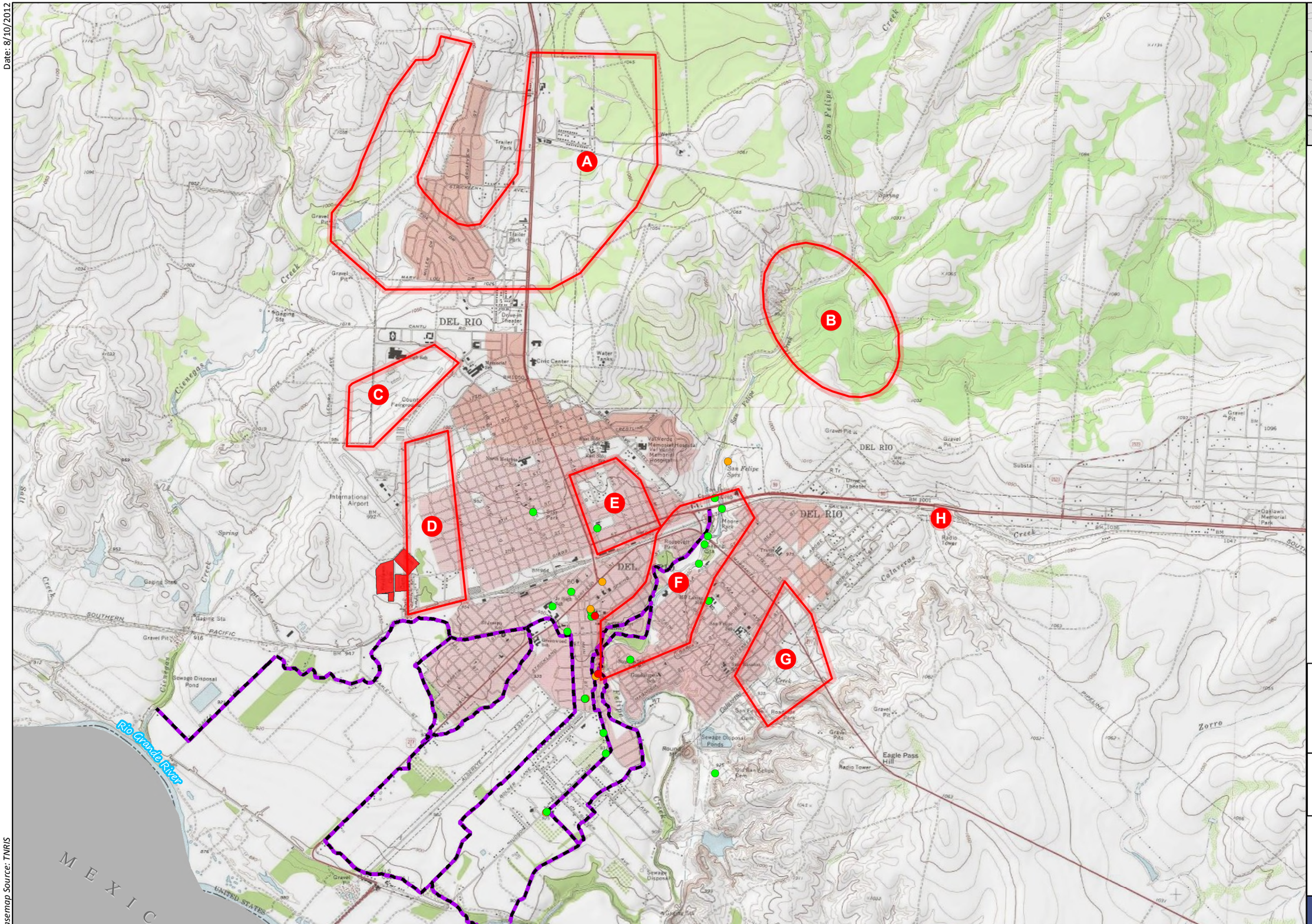
STUDY AREA E-H

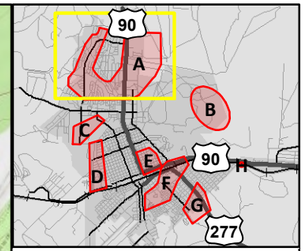
FIGURE 5D

Basemap Source: USGS Quads - Del Rio NW (1972), Del Rio NE (1972), Del Rio SW (1972), Del Rio SE (1972)


Devils River Minnow Critical Habitat - San Felipe Creek Unit
90
San Felipe Creek
San Felipe Creek Unit
San Felipe Springs West
San Felipe Springs East
Del Rio
90
277
N
Texas
Area Enlarged
Critical Habitat
Roads
Intermittent Streams
Perennial Streams
0 0.5 1 Miles
0 0.5 1 Kilometers

Date: 8/10/2012





N

S

0 2,000 4,000

Feet

Designation

- NRHP Listed
- OTHM
- RTHL/OTHM
- NRHP Eligible Canal System of Del Rio
- NRHP Listed

CITY OF Del Rio TEXAS

CP&Y

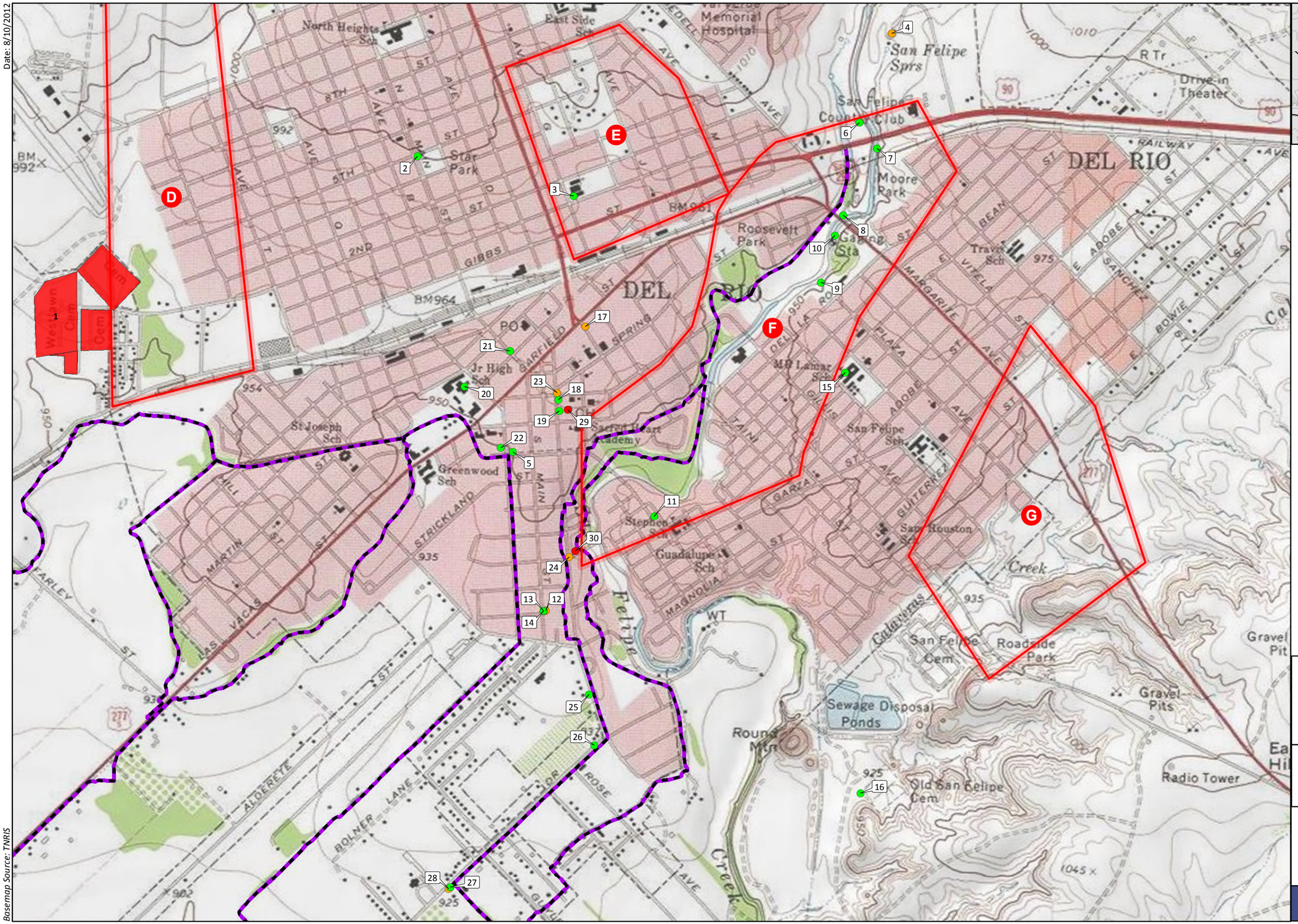
Historic Resources

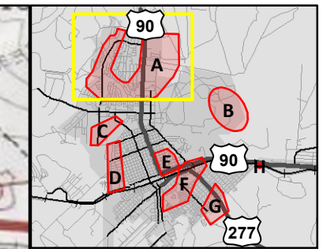
Overview

FIGURE 7A

Basemap Source: TNRIS

Date: 8/10/2012





N

S

0 850 1,700

Feet

Designation

- NRHP Listed
- OTHM
- RTHL/OTHM
- NRHP Eligible Canal System of Del Rio
- NRHP Listed

Historic Resources

Downtown

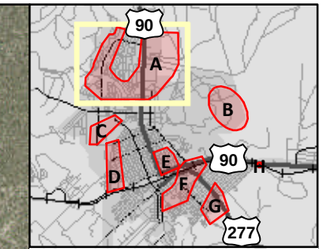
FIGURE 7B

Basemap Source: TNRIS

Figure 7C

Map Resource Number	Name	Designation
1	Del Rio Cemeteries Historic District	NRHP Listed
2	The Carter Family in Del Rio	OTHM
3	First Baptist Church of Del Rio	OTHM
4	San Felipe Springs	RTHL/OTHM
5	Canal System of Del Rio	OTHM/NRHP Eligible
6	Val Verde County	OTHM
7	U.S. Army Camel Corps	OTHM
8	Camp Michie	OTHM
9	Site of Camp Del Rio	OTHM
10	Cal Rogers and the Vin Fiz	OTHM
11	Brown Plaza	OTHM
12	Old Perry Building	RTHL/OTHM
13	Roy Bean C.S.A.	OTHM
14	Seminole-Negro Scouts	OTHM
15	San Felipe High School	OTHM
16	Cementerio Loma De La Cruz	OTHM
17	Glenn-Dowe House	RTHL/OTHM
18	Camp Hudson, C.S.A.	OTHM
19	Val Verde County Courthouse Square	OTHM
20	Old Del Rio High School	OTHM
21	The City of Del Rio	OTHM
22	Max and Anna Stool	OTHM
23	Elks Lodge Hall	RTHL/OTHM
24	Cassinelli Gin House	RTHL/OTHM
25	Mason Foster House	OTHM
26	Val Verde Winery	OTHM
27	Dr. John R. Brinkley	OTHM
28	Brinkley Mansion	RTHL/OTHM
29	Val Verde Courthouse and Jail	NRHP Listed
30	Cassinelli Gin House	NRHP Listed

Date: 8/16/2012



N
S

0 500 1,000
Feet

Study Area

CITY OF Del Rio TEXAS

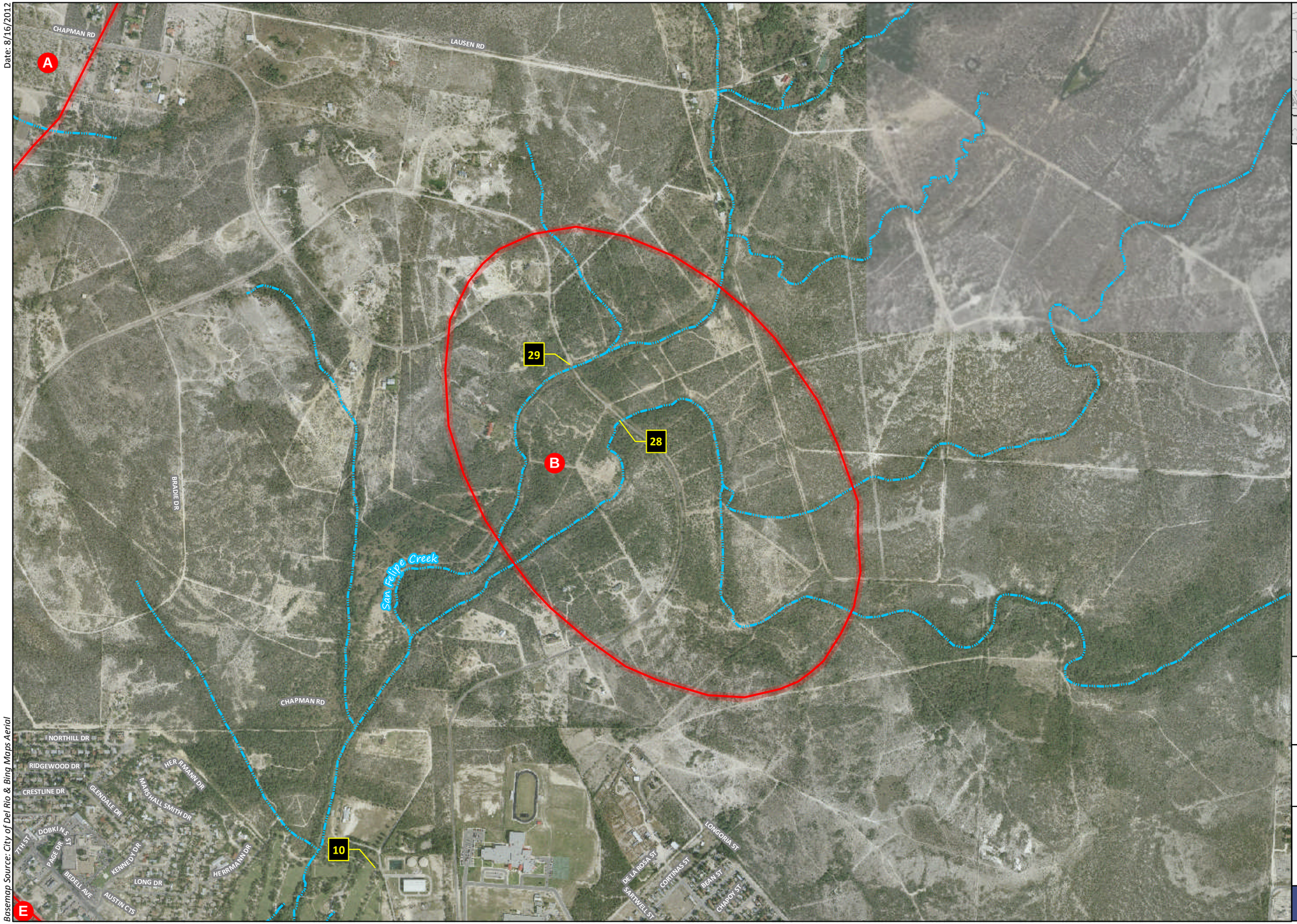
CP&Y

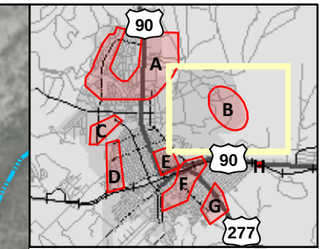
NRCS Soil Map
STUDY AREA A

FIGURE 8A

Basemap Source: City of Del Rio & Bing Maps Aerial

Date: 8/16/2012





N

S

0 500 1,000

Feet

Study Area

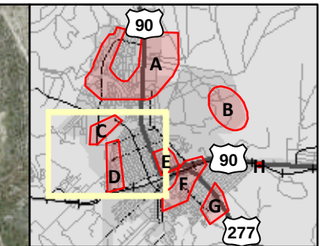
Basemap Source: City of Del Rio & Bing Maps Aerial

NRCS Soil Map

STUDY AREA B

FIGURE 8B

Date: 8/16/2012



N

S

0 500 1,000

Feet

Study Area

CITY OF Del Rio TEXAS

CP&Y

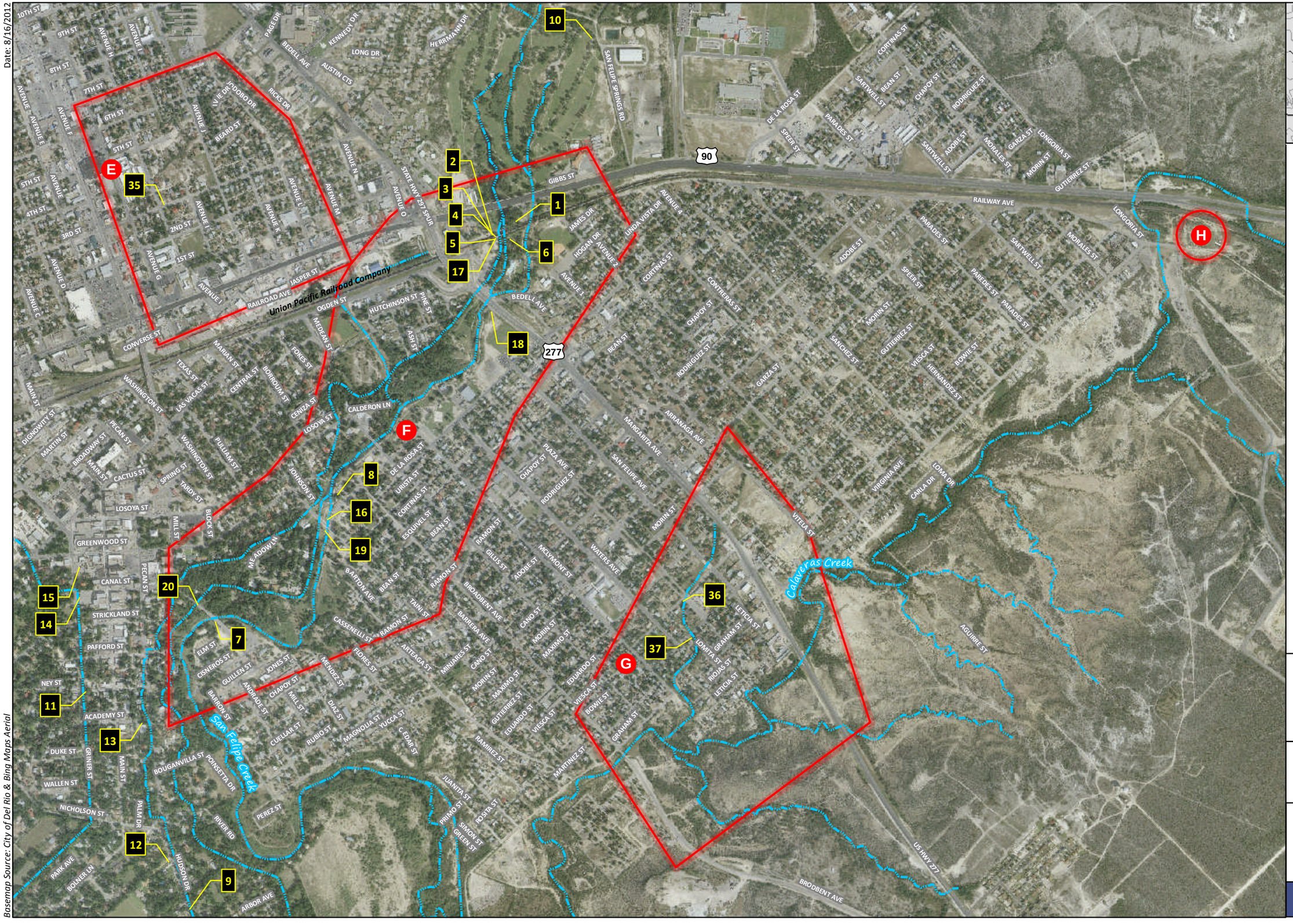
NRCS Soil Map

STUDY AREA C-D

FIGURE 8C

Basemap Source: City of Del Rio & Bing Maps Aerial

Date: 8/16/2012



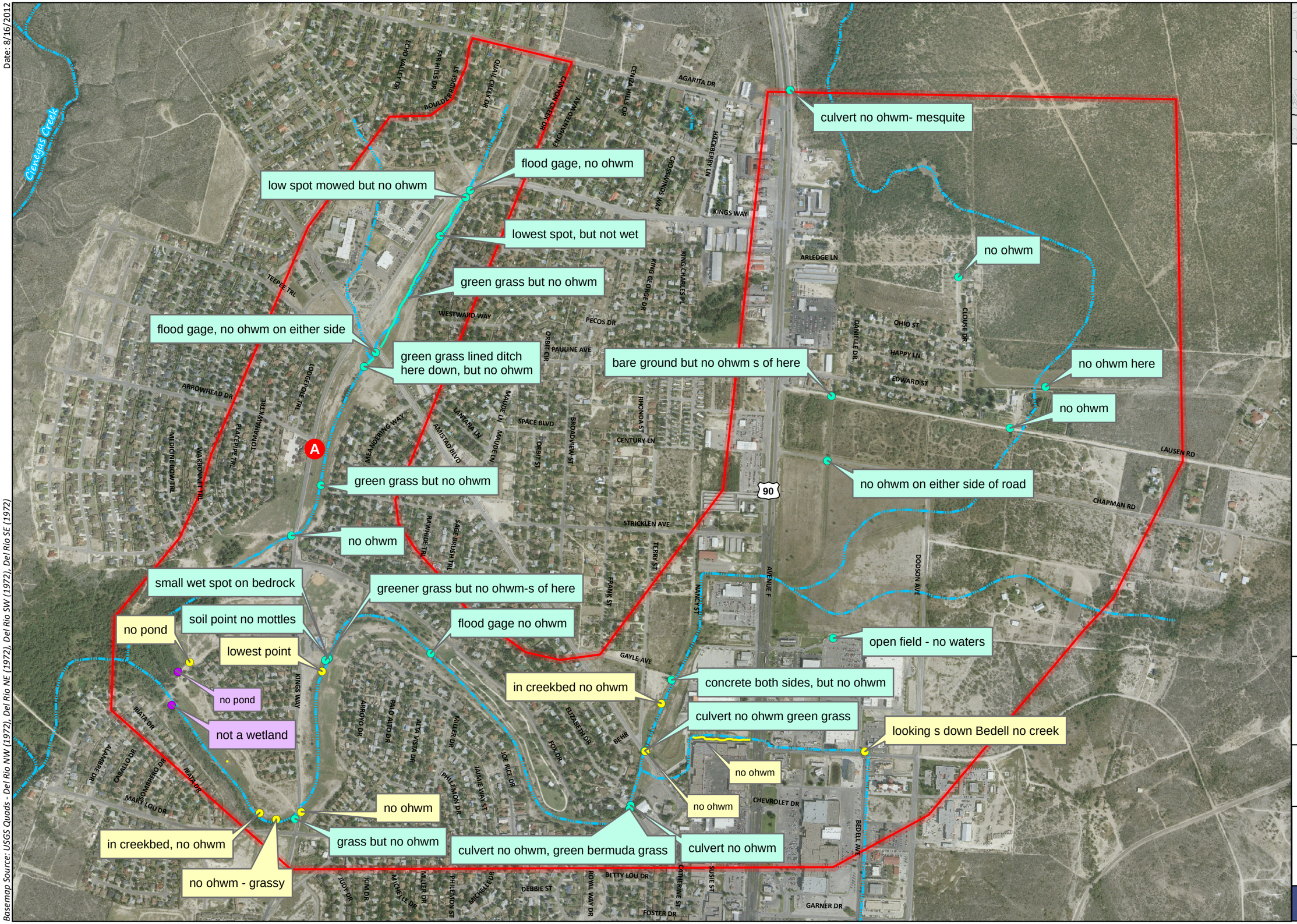
Basemap Source: City of Del Rio & Bing Maps Aerial

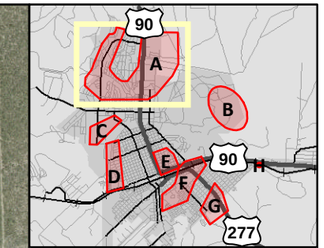
NRCS Soil Map

STUDY AREA E-H

FIGURE 8D

Date: 8/16/2012





N

S

0 410 820

Feet

Study Area

National Hydrography Dataset Flowline

GPS Data

- February 2008
- January 2011
- July 2011
- July 2012
- February 2008
- January 2011
- July 2012
- July 2011

CITY OF Del Rio TEXAS

CP&Y

GPS Data Map

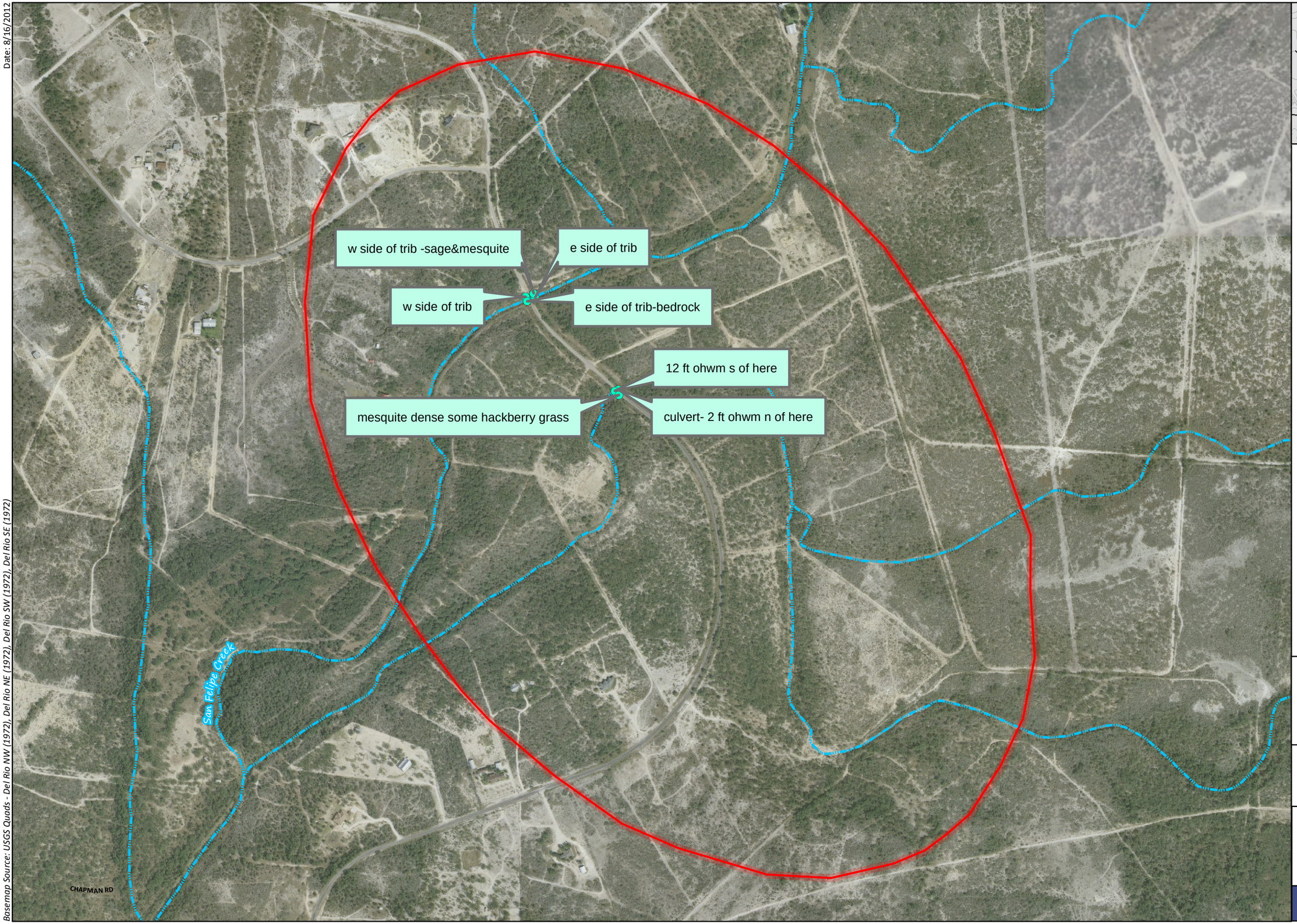
STUDY AREA A

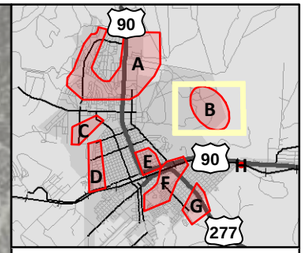
FIGURE 9A

Basemap Source: USGS Quads - Del Rio NW (1972), Del Rio NE (1972), Del Rio SW (1972), Del Rio SE (1972)

Date: 8/16/2012

Basemap Source: USGS Quads - Del Rio NW (1972), Del Rio NE (1972), Del Rio SW (1972), Del Rio SE (1972)





N

S

0 250 500

Feet

Study Area

National Hydrography Dataset Flowline

GPS Data

- February 2008
- January 2011
- July 2011
- July 2012
- February 2008
- January 2011
- July 2012
- July 2011

CITY OF Del Rio TEXAS

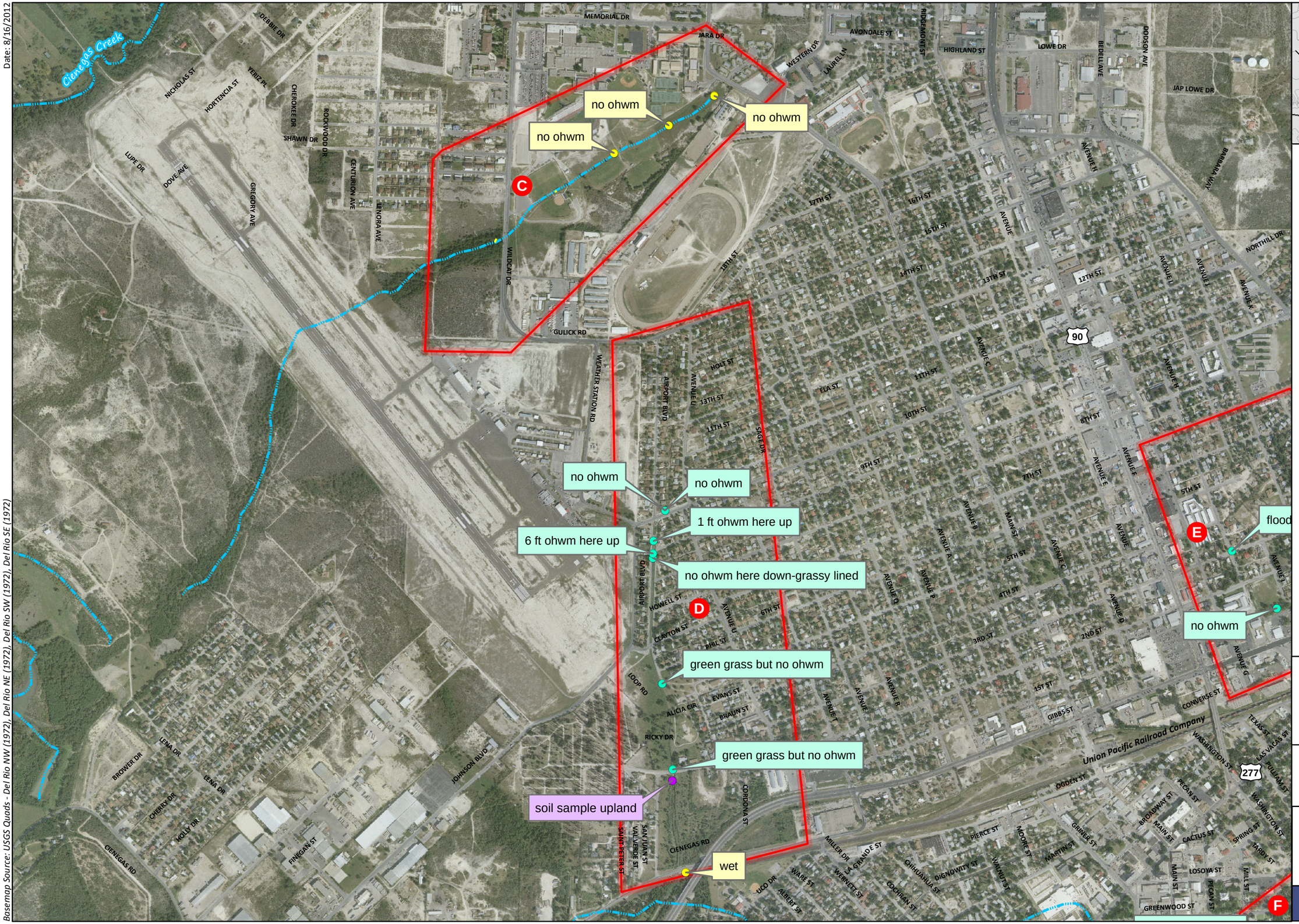
CP&Y

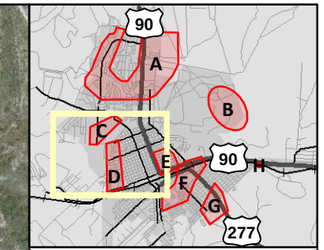
GPS Data Map

STUDY AREA B

FIGURE 9B

Date: 8/16/2012





N

S

0 415 830

Feet

Study Area

National Hydrography Dataset Flowline

GPS Data

- February 2008
- January 2011
- July 2011
- July 2012
- February 2008
- January 2011
- July 2012
- July 2011

CITY OF Del Rio TEXAS

CP&Y

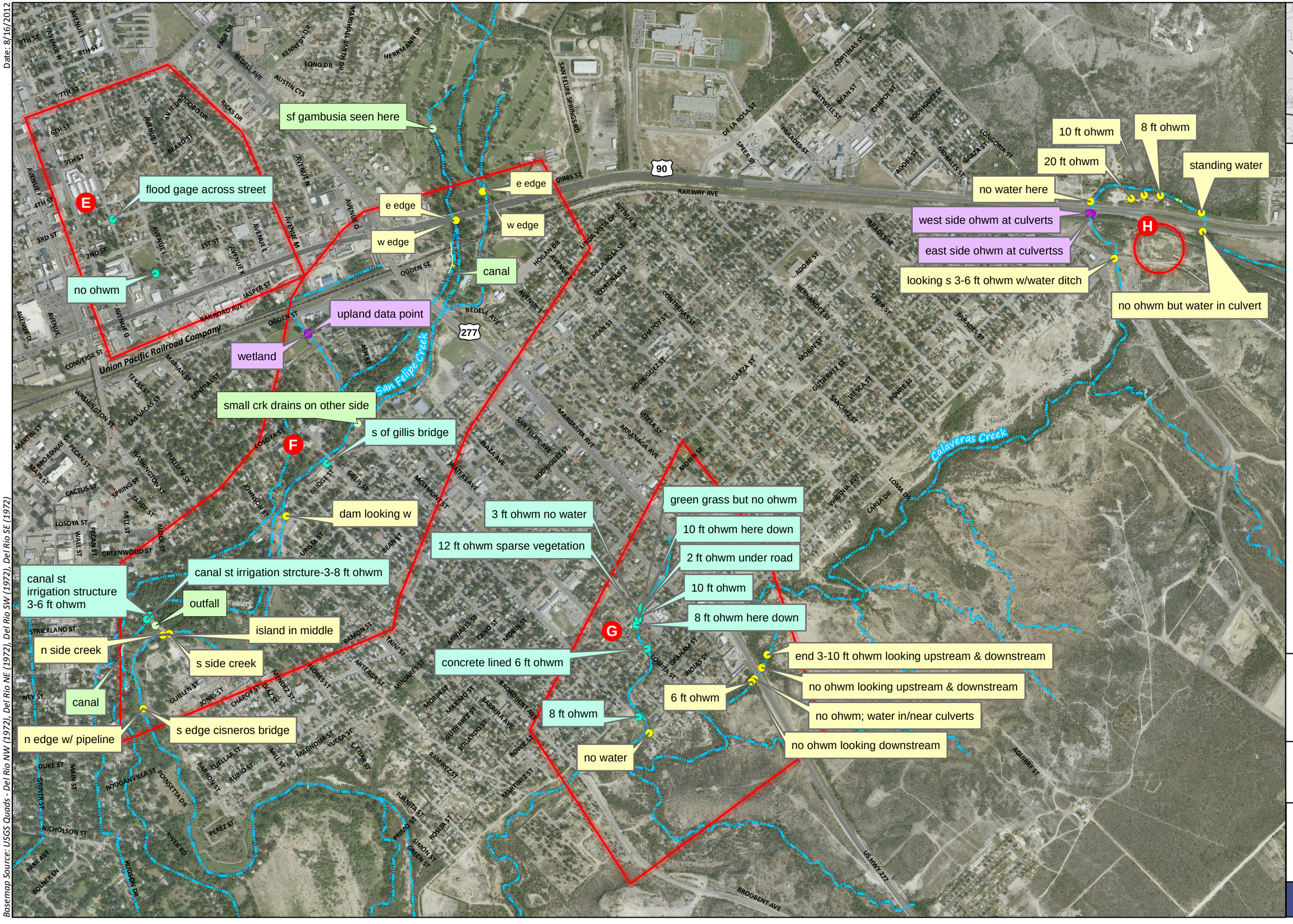
GPS Data Map

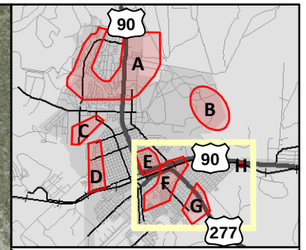
STUDY AREA C-D

FIGURE 9C

Basemap Source: USGS Quads - Del Rio NW (1972), Del Rio NE (1972), Del Rio SW (1972), Del Rio SE (1972)

Date: 8/16/2012





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Feet

Study Area

National Hydrography Dataset Flowline

GPS Data

- February 2008
- January 2011
- July 2011
- July 2012

- February 2008
- January 2011
- July 2012
- July 2011

CITY OF Del Rio TEXAS

CP&Y

GPS Data Map

STUDY AREA E-H

FIGURE 9D

Basemap Source: USGS Quads - Del Rio NW (1972), Del Rio NE (1972), Del Rio SW (1972), Del Rio SE (1972)

APPENDIX B – PHOTO LOG

Photo 1
In Study Area F- Metal Truss Bridge over San Felipe Creek.

Photo 2
In Study Area F- Blue Hole Reservoir and Railroad Bridge.

Photo 3
In Study Area F-Gates to Madre Ditch.

Photo 4
In Study Area F- Railroad bridge at the Old San Felipe Ditch and Madre Ditch.

Photo 5
In Study Area F- Blue Hole Reservoir and Pedestrian Bridge.

Photo 6
In Study Area F- Madre Ditch downstream of San Felipe Springs.

Photo 7
Near Study Area F- Looking southeast from Canal Street toward Brown Plaza.

Photo 8
In Study Area F- Old San Felipe Ditch near Gillis Street.

Photo 9
View of the Val Verde Winery located south of Study Area F.

Photo 10
Official Texas Historical Marker for the Canal System of Del Rio.

Photo 11
Near Study Area F- Check gate at St. Mary's Ditch.

Photo 12
View of the Historic Mason Foster House (near Study Area F).

Photo 13
In Study Area F- View of a stone and concrete lined ditch.

Photo 14
View of a concrete lined ditch near Study Area F.

Photo 15
View of Star Park where the Official Texas Historical Marker for the Carter Family of Del Rio is located.

Photo 16
In Study Area F- View of Tardy Dam. This area is also Devils River Minnow critical habitat.

Photo 17
In Study Area F- View of the Gibbs Street Bridge.

Photo 18
In Study Area F- Gillis Street Bridge.

Photo 19
In Study Area F- Johnston Street Bridge.

Photo 20
In Study Area F- Canal Street Bridge.

Photo 21
In Study Area A - On Lausen Road looking south at culverts under road.
Note green grass, but no OHWM.

Photo 22
In Study Area A – West of Home Depot, looking north.
Note tire tracks, but no OHWM.

Photo 23
In Study Area A – East of swimming pool.
Note green grass where swimming pool filter back wash water is released each Monday.
No discernible OHWM was observed.

Photo 24
In Study Area A – Wet area east of swimming pool.
This was determined not to be a jurisdictional wetland.

Photo 25
In Study Area A – West of Kings Way, looking north at tributary crossing.
No OHWM was observed.

Photo 26
In Study Area A – Looking south at tributary where no discernible OHWM was observed.
Intersection of Kings Way and Amistad Blvd is on the right hand side of figure.
No T&E habitat was observed in Study Area A.

Photo 27
In Study Area A – Looking south at tributary where no OHWM was observed.
Kings Way is on the right side of the picture, along with a walking path.

Photo 28
In Study Area B – Looking south at San Felipe Creek Tributary 1 from Jap Lowe Dr.
Note the OHWM.

Photo 29
In Study Area B – Looking north at San Felipe Creek from Jap Lowe Dr.
Note the obvious OHWM.

Photo 30
Study Area C - West of Wildcat Drive, note the OHWM.

Photo 31
Study Area C - East of Wildcat Drive where no OHWM was observed.

Photo 32
In Study Area D – Looking south at culverts under intersection of 10th St. and Airport Blvd. and median where water eventually flows.

Photo 33
In Study Area D – Looking north at culverts at intersection 10th St. and Airport Blvd.

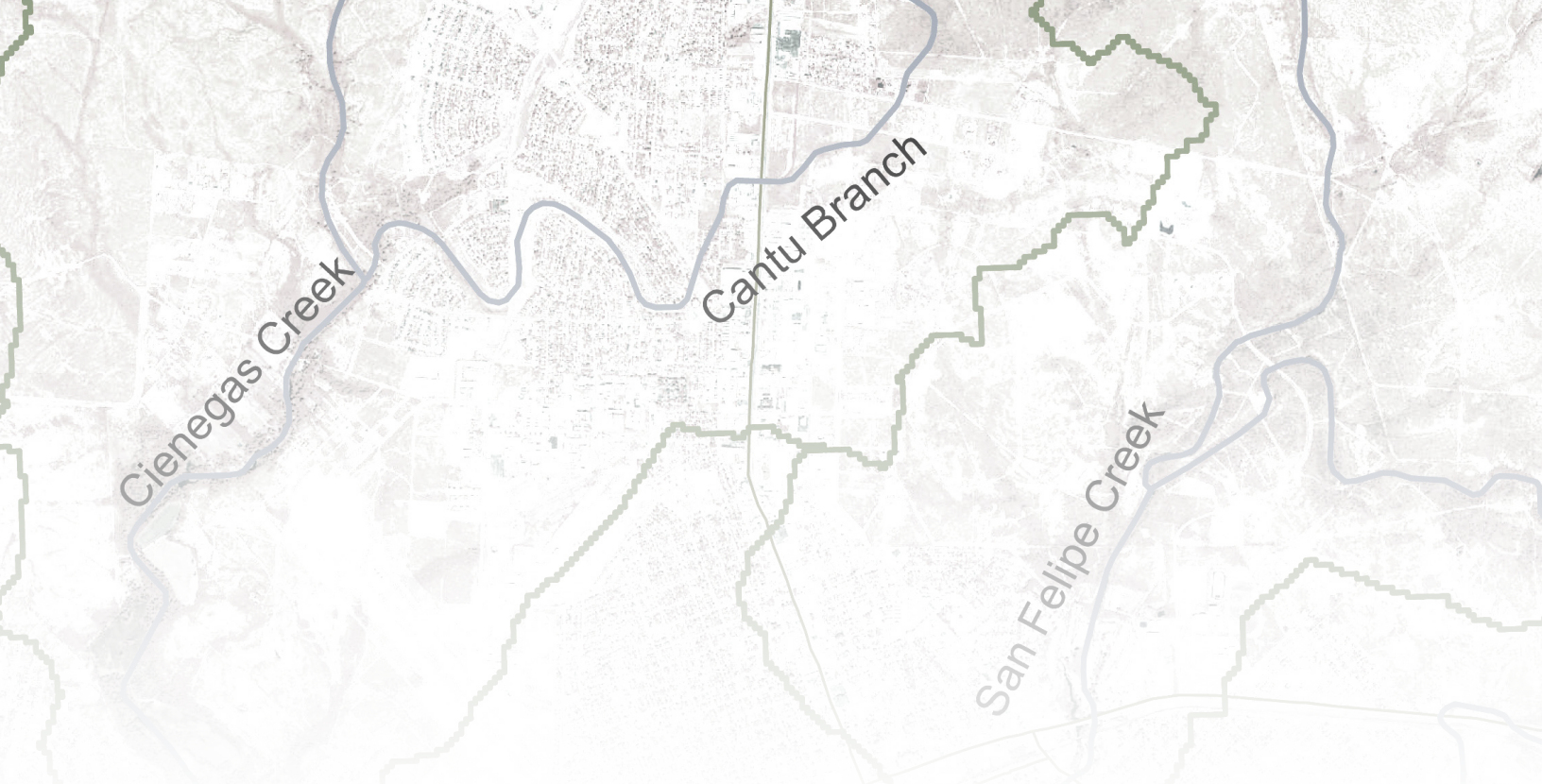
Photo 34
In Study Area D – Looking north at median where there is a discontinuous OHWM.

Photo 35
In Study Area E – at Ave H and 3rd showing the flood gauge where water goes over road. No OHWM was observed. Most of the study areas are within residential areas. Therefore, T&E habitat was not observed.

Photo 36
In Study Area G - Looking downstream south of Viesca St. and Plaza Ave. Note the OHWM.

Photo 37
In Study Area G – Looking downstream south of Bowie St.

Photo 38
In Study Area F- View of the Pedestrian Bridge over Blue Hole.



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