

DRAINAGE REPORT

for

Black Farms

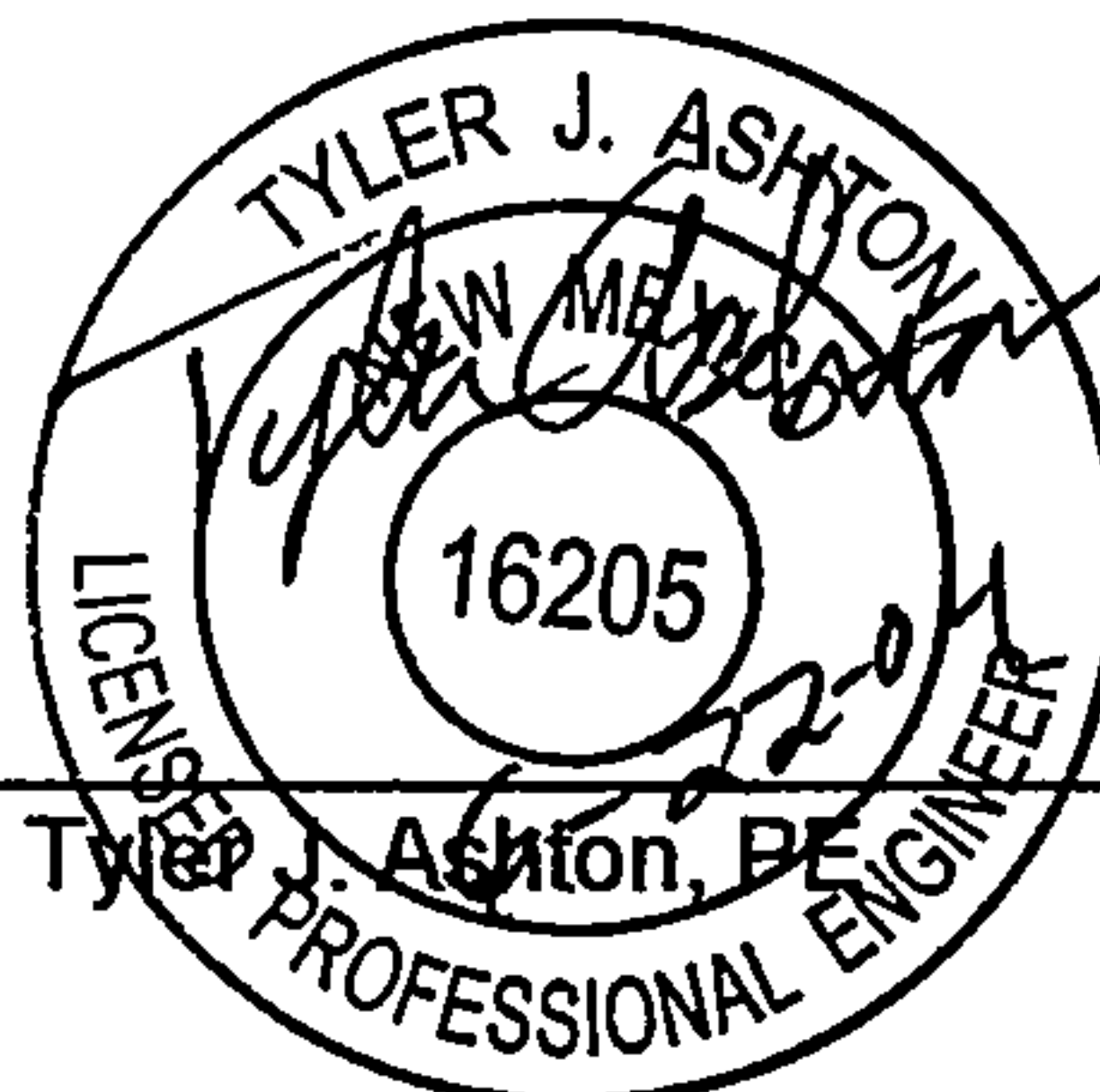
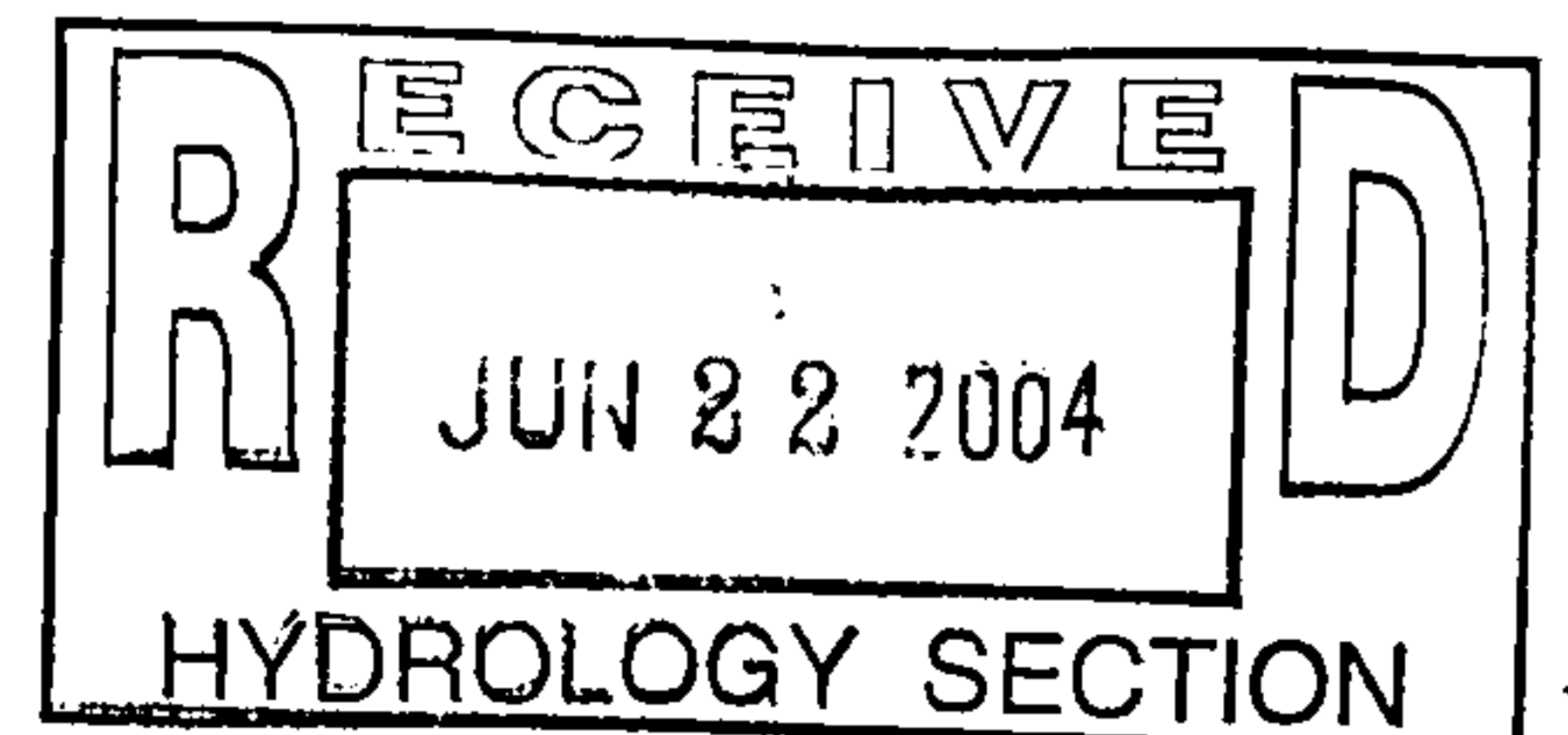
Prepared by

Tierra West, LLC
8509 Jefferson NE
Albuquerque, New Mexico 87113

Prepared for

Mr. Mike Sivage
Black Farms, LLC
6700 B Jefferson NE, Suite 1
Albuquerque, NM 87109

June 2004



Location

The site is located east of Coors Road and is bounded on the south by Paseo Del Norte, on the north by the Calabacillas Arroyo, and on the east by Riverfronte Drive. The site is shown on the attached Zone Atlas Map C-13 and contains approximately 67 acres. We propose to grade the site and build a 56 lot subdivision. The purpose of this report is to provide the drainage analysis and management plan for the new addition to the subdivision.

Existing Drainage Conditions

The site is undeveloped and at one time was used as farmland. Currently any water that falls on the site remains on site with little to no runoff.

FIRM Map

The site is located on FIRM Map section 35001C0116 F, 35001C0108 F, and 35001C0109 F as shown on the attached excerpt. The maps show that the site does not lie within a flood zone.

On-Site Drainage Management Plan

The site was divided into 58 developed basins, see attached basin map. The new subdivision will follow a normal flat valley grading scheme where all storm drainage will be retained on-site. Each lot, basins 1-56, will drain into individual ponds that are located on each lot. The treatment for these basins is as follows: 0% A, 55% B, 0% C and 45% D per the flat grading scheme. The runoff from the new roads that will be created by this subdivision will be retained in lot ponds that border the road. Basins 57 and 58 consist of the proposed Irving Lane and Westside Drive. The storm water from Irving Lane will flow down

down Irving and into ponds that are located on either side of the roadway. The storm water that falls within the intersection of Coors and Westside will flow down an existing asphalt swale on the south side of the road and into a new type D storm drain inlet. The water will then be piped into an existing manhole on the north side of the road and into the Calabacillas Arroyo.

All ponds were sized to hold the 100-year, 10-day volume storm. With storms larger than the 100-year, 10-day, the runoff will flow towards the river to the east and to the Calabacillas Arroyo to the north. See following tables for runoff and pond calculations.

Calculations

The Weighted E method from the "City of Albuquerque Development Process Manual Volume II – Chapter 22, 2003 Revision" was used to calculate the runoff and volume for the site.

Summary

There is no offsite drainage flowing onto this site and all onsite water will be detained within the ponds on site. All on the onsite ponds have more than enough capacity to hold the 100-year, 10-day storm. The development of this site is consistent with the DPM, Chapter 22, Hydrology section. It is recommended this drainage plan be approved.

Pond Volume Calculations

Lot	Top Elevation (ft)	Bottom Elevation (ft)	Top Area (sf)	Bottom Area (sf)	Volume Req'd (ac-ft)	Volume Provided (ac-ft)	WSEL (ft)	Min Pad Elev (ft)
1	4990.02	4988.02	4130	2056	0.14	0.142	4990.03	4991.03
2	4990.02	4988.02	4028	2266	0.14	0.144	4989.94	4990.94
3	4990.02	4988.02	5555	3183	0.20	0.201	4990.01	4991.01
4	4990.02	4988.02	6221	4537	0.23	0.247	4989.87	4990.87
5	4990.02	4988.02	6900	5200	0.25	0.278	4989.79	4990.79
6	4990.02	4988.02	5284	2745	0.18	0.184	4989.97	4990.97
7	4990.02	4988.02	6600	4149	0.24	0.247	4989.94	4990.94
8	4988	4986	6138	3594	0.22	0.223	4987.94	4988.94
9	4988	4986	5691	3368	0.19	0.208	4987.87	4988.87
10	4988	4986	5896	3551	0.20	0.217	4987.82	4988.82
11	4988	4986	5824	3454	0.20	0.213	4987.83	4988.83
12	4988	4986	5533	3218	0.19	0.201	4987.92	4988.92
13	4987.43	4985.43	6636	4324	0.24	0.252	4987.30	4988.30
14	4987.43	4985.43	5508	3087	0.18	0.197	4987.27	4988.27
15	4987.3	4985.3	4604	2546	0.15	0.164	4987.13	4988.13
16	4988.03	4986.03	4422	2437	0.15	0.157	4987.96	4988.96
17	4988.34	4986.34	4414	2432	0.15	0.157	4988.19	4989.19
18	4988.66	4986.66	4700	2603	0.15	0.168	4988.45	4989.45
19	4988.96	4986.96	4787	2747	0.15	0.173	4988.64	4989.64
20	4989.21	4987.21	5839	3971	0.22	0.225	4989.12	4990.12
21	4988.84	4986.84	4831	2732	0.17	0.174	4988.78	4989.78
22	4988.5	4986.5	4358	2297	0.14	0.153	4988.32	4989.32
23	4988.18	4986.18	4196	2025	0.14	0.143	4988.10	4989.10
24	4987.83	4985.83	4228	2042	0.14	0.144	4987.74	4988.74
25	4987.43	4985.43	4538	2592	0.16	0.164	4987.33	4988.33
26	4987.43	4985.43	4812	2844	0.17	0.176	4987.34	4988.34
27	4987.43	4985.43	4636	2565	0.15	0.165	4987.20	4988.20
28	4987.43	4985.43	5559	2405	0.18	0.183	4987.35	4988.35
29	4987.43	4984.43	6373	2315	0.21	0.299	4986.56	4987.56
30	4987.43	4984.43	10036	3107	0.44	0.453	4987.33	4988.33
31	4987.43	4984.43	7070	2578	0.31	0.332	4987.22	4988.22
32	4987.43	4984.43	6023	1552	0.21	0.261	4986.80	4987.80
33	4987.43	4985.43	5845	3289	0.20	0.210	4987.30	4988.30
34	4987.43	4985.43	5237	3076	0.18	0.191	4987.29	4988.29
35	4987.43	4984.43	5607	2832	0.29	0.291	4987.42	4988.42
2 (36)	5003.1	5000.1	6051	2385	0.28	0.290	5002.95	5003.95
3 (37)	5002.53	5000.02	5441	2020	0.20	0.215	5002.31	5003.31
4 (38)	5000.17	4997.67	5187	2368	0.20	0.217	4999.96	5000.96
5 (39)	4997.71	4994.96	5076	2144	0.21	0.228	4997.44	4998.44
6 (40)	4996.5	4993.94	5109	2329	0.21	0.219	4996.35	4997.35
7 (41)	4996	4993	4575	1914	0.19	0.223	4995.50	4996.50
8 (42)	4996	4993	4708	1612	0.19	0.218	4995.67	4996.67
9 (43)	4996	4993	4589	2075	0.20	0.229	4995.58	4996.58
10 (44)	4996	4993	5117	2392	0.25	0.259	4995.86	4996.86
11 (45)	4998.1	4995.6	5417	2655	0.20	0.232	4997.71	4998.71
12 (46)	4999.19	4996.69	5214	2512	0.21	0.222	4999.11	5000.11
13 (47)	5000.43	4997.93	5135	2880	0.20	0.230	5000.13	5001.13
14 (48)	5001.49	4998.99	4224	2131	0.17	0.182	5001.37	5002.37
15 (49)	5002.58	5000.08	3918	1930	0.16	0.168	5002.51	5003.51
16 (50)	5003.81	5001.31	4184	2125	0.17	0.181	5003.59	5004.59
17 (51)	5005.01	5002.51	4094	2037	0.16	0.176	5004.82	5005.82
18 (52)	5006.78	5004.28	5281	2323	0.20	0.218	5006.59	5007.59
19 (53)	5006.98	5003.98	6060	2989	0.31	0.312	5006.99	5007.99
20 (54)	4999.74	4997.24	5701	3465	0.26	0.263	4999.75	5000.75
21 (55)	4997.16	4995.16	5299	3435	0.18	0.201	4997.00	4998.00
1 (56)	4997.16	4995.16	5299	3435	0.19	0.201	4997.09	4998.09
Pond Sof I	4989.00	4986.93	5209	3791	0.11	0.214	4987.99	--
Pond Nof I	4989.00	4986.93	3681	1133	0.11	0.114	4988.92	--

Weighted E Method

Zone #1

Developed Basins

Basin	Area (sf)	Area (acres)	Area (sq miles)	Treatment A		Treatment B		Treatment C		Treatment D		100-Year			100-Year 10 day	
				%	(acres)	%	(acres)	%	(acres)	%	(acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Volume (ac-ft)	
1	37827.00	0.868	0.00136	0%	0	55%	0.478	0%	0	45%	0.391	1.255	0.091	2.68	0.14	
2	36629.00	0.841	0.00131	0%	0	55%	0.462	0%	0	45%	0.378	1.255	0.088	2.59	0.14	
3	52817.00	1.213	0.00189	0%	0	55%	0.667	0%	0	45%	0.546	1.255	0.127	3.74	0.20	
4	60454.00	1.388	0.00217	0%	0	55%	0.763	0%	0	45%	0.625	1.255	0.145	4.28	0.23	
5	64927.00	1.491	0.00233	0%	0	55%	0.820	0%	0	45%	0.671	1.255	0.156	4.60	0.25	
6	47478.00	1.090	0.00170	0%	0	55%	0.599	0%	0	45%	0.490	1.255	0.114	3.36	0.18	
7	62611.00	1.437	0.00225	0%	0	55%	0.791	0%	0	45%	0.647	1.255	0.150	4.43	0.24	
8	57268.00	1.315	0.00205	0%	0	55%	0.723	0%	0	45%	0.592	1.255	0.137	4.05	0.22	
9	51499.00	1.182	0.00185	0%	0	55%	0.650	0%	0	45%	0.532	1.255	0.124	3.64	0.19	
10	52162.00	1.197	0.00187	0%	0	55%	0.659	0%	0	45%	0.539	1.255	0.125	3.69	0.20	
11	51640.00	1.185	0.00185	0%	0	55%	0.652	0%	0	45%	0.533	1.255	0.124	3.65	0.20	
12	51131.00	1.174	0.00183	0%	0	55%	0.646	0%	0	45%	0.528	1.255	0.123	3.62	0.19	
13	62407.00	1.433	0.00224	0%	0	55%	0.788	0%	0	45%	0.645	1.255	0.150	4.42	0.24	
14	47945.00	1.101	0.00172	0%	0	55%	0.605	0%	0	45%	0.495	1.255	0.115	3.39	0.18	
15	39817.00	0.914	0.00143	0%	0	55%	0.503	0%	0	45%	0.411	1.255	0.096	2.82	0.15	
16	40229.00	0.924	0.00144	0%	0	55%	0.508	0%	0	45%	0.416	1.255	0.097	2.85	0.15	
17	38504.00	0.884	0.00138	0%	0	55%	0.486	0%	0	45%	0.398	1.255	0.092	2.73	0.15	
18	39672.00	0.911	0.00142	0%	0	55%	0.501	0%	0	45%	0.410	1.255	0.095	2.81	0.15	
19	38478.00	0.883	0.00138	0%	0	55%	0.486	0%	0	45%	0.398	1.255	0.092	2.72	0.15	
20	56911.00	1.306	0.00204	0%	0	55%	0.719	0%	0	45%	0.588	1.255	0.137	4.03	0.22	
21	44596.00	1.024	0.00160	0%	0	55%	0.563	0%	0	45%	0.461	1.255	0.107	3.16	0.17	
22	36887.00	0.847	0.00132	0%	0	55%	0.466	0%	0	45%	0.381	1.255	0.089	2.61	0.14	
23	36300.00	0.833	0.00130	0%	0	55%	0.458	0%	0	45%	0.375	1.255	0.087	2.57	0.14	
24	36373.00	0.835	0.00130	0%	0	55%	0.459	0%	0	45%	0.376	1.255	0.087	2.57	0.14	
25	41234.00	0.947	0.00148	0%	0	55%	0.521	0%	0	45%	0.426	1.255	0.099	2.92	0.16	
26	44340.00	1.018	0.00159	0%	0	55%	0.560	0%	0	45%	0.458	1.255	0.106	3.14	0.17	
27	38785.00	0.890	0.00139	0%	0	55%	0.490	0%	0	45%	0.401	1.255	0.093	2.75	0.15	
28	46505.00	1.068	0.00167	0%	0	55%	0.587	0%	0	45%	0.480	1.255	0.112	3.29	0.18	
29	56090.00	1.288	0.00201	0%	0	55%	0.708	0%	0	45%	0.579	1.255	0.135	3.97	0.21	
30	115622.00	2.654	0.00415	0%	0	55%	1.460	0%	0	45%	1.194	1.255	0.278	8.18	0.44	
31	81826.00	1.878	0.00294	0%	0	55%	1.033	0%	0	45%	0.845	1.255	0.196	5.79	0.31	
32	54427.00	1.249	0.00195	0%	0	55%	0.687	0%	0	45%	0.562	1.255	0.131	3.85	0.21	
33	51953.00	1.193	0.00186	0%	0	55%	0.656	0%	0	45%	0.537	1.255	0.125	3.68	0.20	
34	47041.00	1.080	0.00169	0%	0	55%	0.594	0%	0	45%	0.486	1.255	0.113	3.33	0.18	
35	76768.00	1.762	0.00275	0%	0	55%	0.969	0%	0	45%	0.793	1.255	0.184	5.43	0.29	
36	72977.00	1.675	0.00262	0%	0	55%	0.921	0%	0	45%	0.754	1.255	0.175	5.17	0.28	
37	52002.00	1.194	0.00187	0%	0	55%	0.657	0%	0	45%	0.537	1.255	0.125	3.68	0.20	
38	52587.00	1.207	0.00189	0%	0	55%	0.664	0%	0	45%	0.543	1.255	0.126	3.72	0.20	
39	54381.00	1.248	0.00195	0%	0	55%	0.687	0%	0	45%	0.562	1.255	0.131	3.85	0.21	
40	54560.00	1.253	0.00196	0%	0	55%	0.689	0%	0	45%	0.564	1.255	0.131	3.86	0.21	
41	49218.00	1.130	0.00177	0%	0	55%	0.621	0%	0	45%	0.508	1.255	0.118	3.48	0.19	
42	51224.00	1.176	0.00184	0%	0	55%	0.647	0%	0	45%	0.529	1.255	0.123	3.63	0.19	
43	52293.00	1.200	0.00188	0%	0	55%	0.660	0%	0	45%	0.540	1.255	0.126	3.70	0.20	
44	65286.00	1.499	0.00234	0%	0	55%	0.824	0%	0	45%	0.674	1.255	0.157	4.62	0.25	
45	51764.00	1.188	0.00186	0%	0	55%	0.654	0%	0	45%	0.535	1.255	0.124	3.66	0.20	
46	56889.00	1.306	0.00204	0%	0	55%	0.718	0%	0	45%	0.588	1.255	0.137	4.03	0.21	
47	53685.00	1.232	0.00193	0%	0	55%	0.678	0%	0	45%	0.555	1.255	0.129	3.80	0.20	
48	45860.00	1.053	0.00165	0%	0	55%	0.579	0%	0	45%	0.474	1.255	0.110	3.25	0.17	
49	43092.00	0.989	0.00155	0%	0	55%	0.544	0%	0	45%	0.445	1.255	0.103	3.05	0.16	
50	43709.00	1.003	0.00157	0%	0	55%	0.552	0%	0	45%	0.452	1.255	0.105	3.09	0.17	
51	43059.00	0.988	0.00154	0%	0	55%	0.544	0%	0	45%	0.445	1.255	0.103	3.05	0.16	
52	53407.00	1.226	0.00192	0%	0	55%	0.674	0%	0	45%	0.552	1.255	0.128	3.78	0.20	
53	82809.00	1.901	0.00297	0%	0	55%	1.046	0%	0	45%	0.855	1.255	0.199	5.86	0.31	
54	69764.00	1.602	0.00250	0%	0	55%	0.881	0%	0	45%	0.721	1.255	0.167	4.94	0.26	
55	48848.00	1.121	0.00175	0%	0	55%	0.617	0%	0	45%	0.505	1.255	0.117	3.46	0.18	
56	51241.00	1.176	0.00184	0%	0	55%	0.647	0%	0	45%	0.529	1.255	0.123	3.63	0.19	
57	56026.00	1.286	0.00201	0%	0	50%	0.643	0%	0	50%	0.643	1.320	0.141	4.12	0.23	
Westside	48696.00	1.118	0.00175	0%	0	0%	0.000	0%	0	100%	1.118	1.970	0.184	4.89	0.33	

Equations:

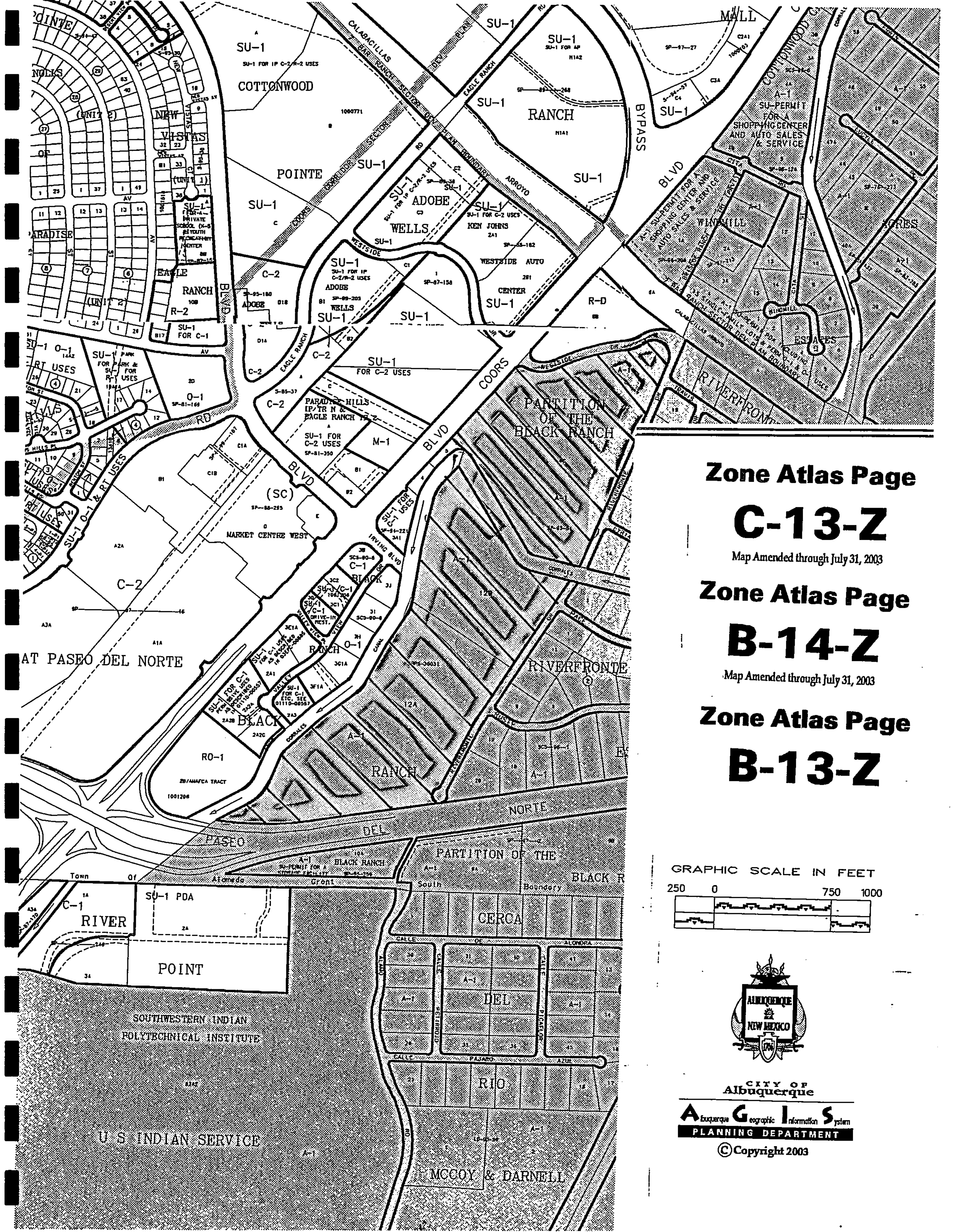
Weighted E = $E_a \cdot A_a + E_b \cdot A_b + E_c \cdot A_c + E_d \cdot A_d$ / (Total Area)

Volume = Weighted D * Total Area

Flow = $Q_a \cdot A_a + Q_b \cdot A_b + Q_c \cdot A_c + Q_d \cdot A_d$

MAP POCKET A

Grading and Drainage Plan



Zone Atlas Page

C-13-Z

Map Amended through July 31, 2003

Zone Atlas Page

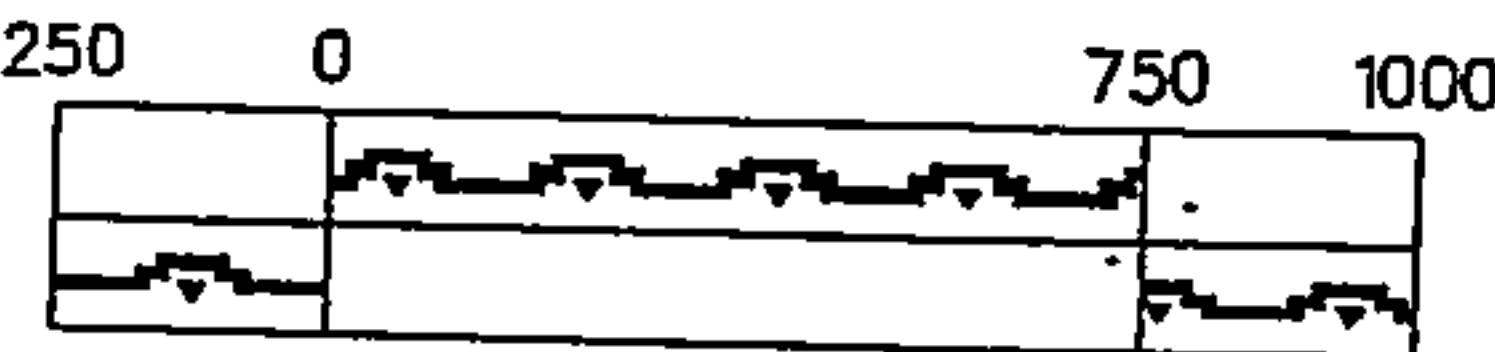
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Map Amended through July 31, 2003

Zone Atlas Page

B-13-Z

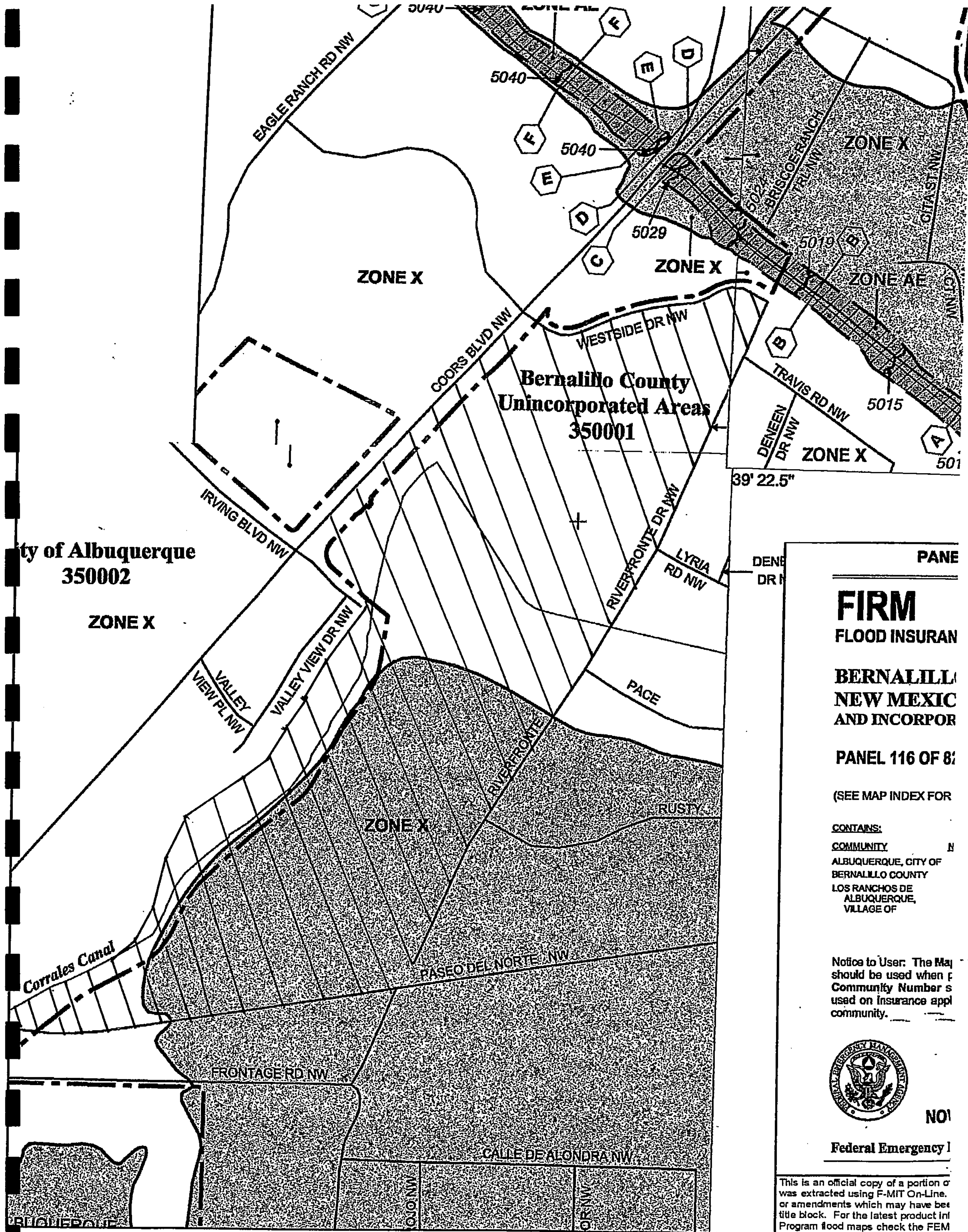
GRAPHIC SCALE IN FEET



CITY OF
Albuquerque

Albuquerque Geographic Information System
PLANNING DEPARTMENT

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PANE

FIRM
FLOOD INSURAN

BERNALILLA
NEW MEXIC
AND INCORPOR

PANEL 116 OF 8

(SEE MAP INDEX FOR

CONTAINS:
COMMUNITY N
ALBUQUERQUE, CITY OF
BERNALILLO COUNTY
LOS RANCHOS DE
ALBUQUERQUE,
VILLAGE OF

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should be used when p
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community.

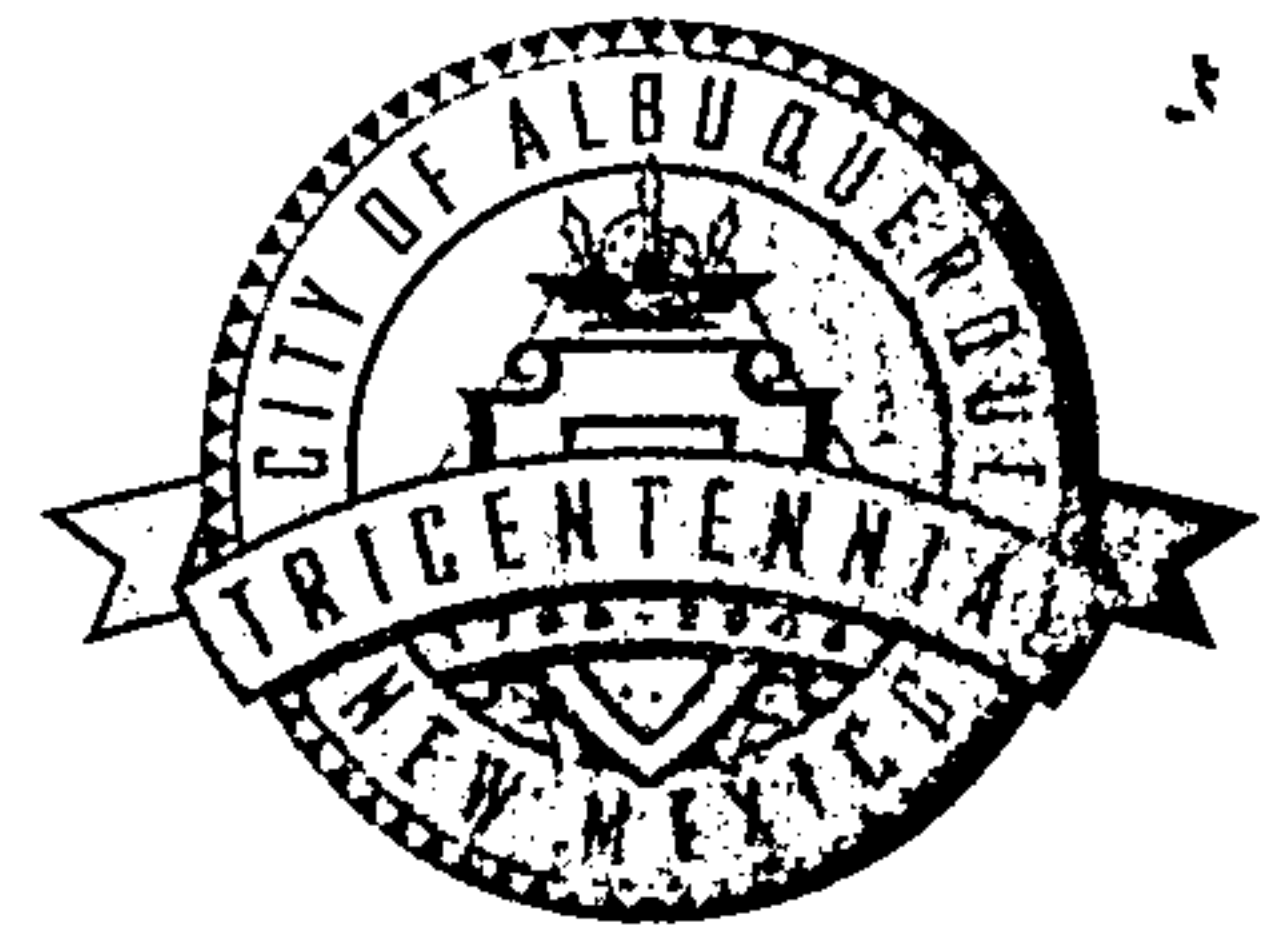


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Federal Emergency

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Program flood maps check the FEM

CITY OF ALBUQUERQUE



February 7, 2007

Ronald R. Bohannon, P.E.
Tierra West, LLC.
5571 Midway Park Place NE
Albuquerque, NM 87109

Re: Black Farm Estates, Engineer's Certification dated 12-8-06
Request for Release of Financial Guarantee, (C13/D27)

Dear Mr. Bohannon,

Based upon the information provided in your Drainage Certification received on January 10, 2007, the above referenced plan is approved for release of financial guarantee for project #7329.81.

Sincerely,

Jeremy Hoover, P.E.
Senior Engineer
Hydrology Section
Development and Building Services

cc: file (C13/D27)
Marilyn Maldonado

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov