City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

November 21, 2000

Kevin Patton, PE
Bohannan – Huston
7500 Jefferson NE
Albuquerque, NM 87109

Re: Amended Grading Plan Approval, engineer's stamped dated 11/3/00.
Mountain Highlands at High Desert, Unit 1

Dear Mr. Patton,

Based upon the information provided in your submittal dated 11/3/00, the amended grading plan for the streets in the referenced plan is approved.

If I can be of further assistance, please contact me at 924-3980

Sincerely,

Loren D. Meinz, P.E.
City Hydrology

C: Whitney Reierson
file

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

September 12, 2000

Kevin Patton, P.E.
Bohannan-Huston, Inc.
7500 Jefferson NE
Albuquerque, New Mexico 87109

RE: Drainage Report and Grading and Drainage Plan for Mountain Highlands Unit 1 at High Desert, (E23/D10) Submitted for Preliminary and Final Plat Approval, and Grading and Paving Permit Approval, Engineer's Stamp Dated 8/17/00.

Dear Mr. Patton:

Based on the information provided, the above referenced Grading Plan dated August 17, 2000 for Unit 1 of Mountain Highlands at High Desert is approved for Rough Grading permit release and for Preliminary Plat action by the DRB.

As you are aware, the SIA must be in place prior to Final Plat sign-off, and a topsoil disturbance permit must be obtained before any grading may occur.

If you have any questions, or if I may be of further assistance to you, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: DRB Project #1000512
Jack Eichorn, High Desert Investment Corp.
"File"

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

DRAINAGE REPORT
FOR
MOUNTAIN HIGHLANDS UNIT 1
(TRACT 15D-1B-1B, HIGH DESERT)

AUGUST 18, 2000

PREPARED BY:

BOHANNAN HUSTON, INC.
COURTYARD I
7500 JEFFERSON STREET N.E.
ALBUQUERQUE, NM 87109

PREPARED FOR:

HIGH DESERT INVESTMENT CORPORATION
13000 ACADEMY ROAD NE
ALBUQUERQUE, NM 87111

RECEIVED
AUG 18 2000
HYDROLOGY SECTION

PREPARED BY:

Michael Ramirez, E.I. — Date 8/17/00

UNDER THE SUPERVISION OF:

Kevin Patton, P.E. — Date 8-17-00

KEVIN G. PATTON
NEW MEXICO
13685
REGISTERED PROFESSIONAL ENGINEER

P:\01112\CDP\REPORTS\01112DRNRPRT2.DOC

I. INTRODUCTION

This report pertains to the development of Tract 15D-1B-1B, High Desert, which will be referred to as the Mountain Highlands Unit 1. Tract 15D-1B-1B is 30.5 acres located south of Simms Park Pino Ridge Place and east of the West Highlands Subdivision. Desert Highlands Unit 2 Subdivision is located to the south, and the future development of Mountain Highlands Unit 2 will be constructed to the east of Mountain Highlands Unit 1.

The High Desert Development is bounded by a Sector Development Plan within the City of Albuquerque and Bernalillo County. Tract 15D-1B-1B is zoned SU-2 HD/R-1. Mountain Highlands Unit 1 will consist of 29 lots and is located outside of the Design Overlay Zone. Lot sizes will be 0.5 acres or more, at least 100 foot wide with building envelopes no greater than 12,000 square feet.

Tracts 15D-1B-1B will be developed in a manner similar to past "Highlands" Subdivisions. The development will consist of building envelopes sited on the existing terrain. As with past Highlands developments, this site will be encompassed by a private cross-lot drainage easement located outside of the building envelopes, public roadways and the existing AMAFCA easements. This private cross-lot easement allows storm water to take its natural course across the existing topography. Each lot owner is required to provide a separate grading and drainage plan, prepared by a New Mexico Licensed Professional Engineer. Each plan is review by the High Desert New Construction Committee for compliance with this drainage report.

The roadways, which will serve the internal lots, are designed (as closely as possible) to follow the natural topography in order to permit the storm water to maintain its natural course. Similar to previous "Highlands" developments, the roadways within the Mountain Highlands Unit 1 will construct estate-type curb and gutters that will allow the storm water to pass over the roadways without trapping or redirecting the storm water. As the internal roadways intersect with Blue Grama Road, standard curb and gutter will be constructed in order to redirect the storm water into inlets. The inlets will convey flows into the existing South Pino Tributary Storm Drain.

Each lot owner will be required to provide a separate, individual grading and drainage plan for each lot, stamped and certified by a New Mexico Professional Engineer. The individual lot grading and drainage plan submitted by each lot owner will be reviewed by the High Desert Residential Owners Association New Construction Committee. Upon completion of development within the Highlands, High Desert Investment Corporation has agreed to provide an "as-built" plan for the estate-type lots.

II. PURPOSE OF REPORT

The purpose of this report is to provide site-specific drainage analysis for existing and ultimate conditions for the residential development, referred to as The Mountain Highlands Unit 1 at High Desert (Tract 15D-1B-1B). This plan is prepared and submitted to support rough grading, infrastructure design, and preliminary and final plat approvals.

III. METHODOLOGIES AND REFERENCES

Site conditions are analyzed for a 100-year, 6-hour storm event in accordance with the City of Albuquerque Drainage Ordinance and the Development Process Manual (DPM), Volume 2, Design Criteria, Section 22.2, Hydrology for the City of Albuquerque, January 1993.

The Mountain Highlands Unit 1 development, as described in the "Site Location and Characteristics" section below, is approximately 30.5 acres. Therefore, Part A of the DPM, Section 22.2, which provides a simplified procedure for projects with sub-basins smaller than 40 acres, was used.

This drainage report is consistent with a number of approved drainage reports that exist in and around this development. The following City of Albuquerque and the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) approved studies prepared for the High Desert Development may be referenced throughout this report:

- ***High Desert Drainage Management Master Plan***, dated December 1993

- ***High Desert - Phase II Prudent Line Analysis***, dated August 1995

- ***Drainage Report for High Desert Tract 15D-1B-1A and 4C-1, The West Highlands and the Extension of Blue Grama Road***, dated July 2000

- ***Drainage Report for Unit 2 of Desert Highlands at High Desert –Tract 15D-1B-2***, dated June 1999

The above referenced reports are associated with the development of the Mountain Highlands Unit 1 in some manner. Additional information of the above mentioned reports are found summarized in the following paragraphs.

The *High Desert Drainage Management Master Plan*, dated December 1993, was prepared to support future drainage plans submitted for the development of individual land parcels within High Desert. This report also provided design guidance for the design of primary drainage infrastructure to be constructed by High Desert in advance of or simultaneously with individual parcel development. In addition, it provides fully developed flow rates for basins that influence the Mountain Highlands Unit 1 Subdivision in the High Desert development.

The *High Desert - Phase II Prudent Line Analysis*, dated August 1995, was prepared to establish the prudent lines, (AMAFCA easements within the natural arroyos) for the proposed High Desert development. The report establishes prudent lines from fully developed flow rates of the basins influencing the Mountain Highlands Unit 1 Subdivision in the High Desert development. There are existing AMAFCA easements within the natural arroyos that separate Tract 15D-1B-1A from the future Mountain Highlands Unit 1 Subdivisions (Tract 15D-1B-1B).

The concept of the "prudent line" was established by AMAFCA. The prudent line represents the minimum setback necessary to provide protection for development from an active arroyo. The prudent line concept encompasses not only the flood plain necessary to pass the

100-year storm, but also represents the potential for natural arroyos to move laterally and degrade over time. The long-term effects are based on potential erosion associated with "representative" storm events occurring for a 30-year period.

The Grading and Drainage Plan enclosed contains the prudent lines calculated in the above mentioned report. The prudent lines within Tract 15D-1B-1B were granted as drainage easements to AMAFCA on July 1, 1996, under Document No. 96073621, Book 96-18, Pages 3732-3779. The building envelopes in Tract 15D-1B are not located within the prudent lines.

The *Drainage Report for High Desert Tract 15D-1B-1A and 4C-1, The West Highlands and the Extension of Blue Grama Road*, dated July 2000, was prepared to support the development of the West Highlands Subdivision and extension of Blue Grama Road from Cortaderia Street to Imperata Street. This drainage report has not been approved as of yet. A residual flow of 5 cfs will be allowed to discharge from the Mountain Highlands Unit 1 into the proposed Blue Grama Roadway.

The *Drainage Report for Unit 2 of Desert Highlands at High Desert –Tract 15D-1B-2 Report for High Desert - Tract 15D-1A*, dated June 1999, was prepared to support rough grading, infrastructure design, preliminary and final plat approvals for the residential development of Unit 2 of the Highlands and the pond on Tract 15D-1A-1. This infrastructure now exists and was accepted by the City of Albuquerque under COA Project #621981. A portion of this existing subdivision drains into Imperata Street, and the existing arroyo.

IV. SUMMARY OF THE RELATED PLATTING AND EASEMENTS

Please refer to the proposed Bulk Land Plat for Tract 15D-1B-1 and Preliminary Plat for the Mountain Highlands Unit 1 enclosed in the Exhibit section of this report.

The Bulk Land Plat will subdivide Tract 15D-1B-1 into three tracts. Tract 15D-1B-1A (West Highlands), Tract 15D-1B-1B (Mountain Highlands Unit 1) and Tract 15D-1B-1C (Future

Mountain Highlands Unit 2). This Bulk Land Plat and the Preliminary Plat for West Highlands were submitted to the Development Review Board under a separate application on August 16, 2000.

There is an existing AMAFCA and HDIC easement along the boundary of Tracts 15D-1B-1A (West Highlands) and 15D-1B-1B (Mountain Highlands Unit 1). The existing easement was granted with the overall bulk land plat recorded in 1993, created over an existing FEMA Floodplain.

AMAFCA has already been provided with the necessary arroyo and tributary easements for this project. The maintenance agreement associated with the existing AMAFCA easements mentioned above, defining the different responsibilities required by AMAFCA and the residential Owners Association, has already been recorded. The final plat will clearly identify all maintenance responsibilities for all arroyo and tributary easements.

V. SITE LOCATION AND CHARACTERISTICS

For location of the site, please refer to the vicinity map on the grading and drainage plan enclosed with this report.

Vegetation consists primarily of prairie grasses and a few juniper trees. Slopes in the project site range from 2% to 15%, with the majority of the project sloping at 2% to 8%. The Soil Conservation Service has classified the soils on this site as Embudo-Tijeras complex, Embudo gravely fine sandy loam and Tijeras gravely fine sandy loam, all of which correspond to a common hydrological soil group classification B.

VI. EXISTING HYDROLOGIC AND SITE DRAINAGE CONDITIONS

The existing drainage basins and patterns are shown graphically on the Existing Drainage Conditions Map located in the Plates section of this report. For additional information and comparison, please refer to the *High Desert Drainage Management Master Plan*, dated December 1993.

The existing site consists of six drainage basins, labeled Basins EX- A, EX- B, EX- C, EX- D, EX- E, and EX- F, reflective of *High Desert Drainage Management Master Plan*, dated December 1993. Basin EX- A (1.57 acres, Q_{100}=3.45 cfs) is located to the northwest of corner of Tract 15D-1B-1B. This basin drains to the north toward Simms Park Road, which contains existing inlets which intercept flow and direct under the roadway to an existing swale along the north side of the roadway.

Basin EX- B (14.63 acres, Q_{100}=32.19 cfs) located south of Basin EX- A drains to the west toward Blue Grama Road. The flow will be carried by an existing arroyo which runs through Basin EX- B and into Blue Grama Road. The arroyo contains an existing AMAFCA easement that was mentioned previously within this report. The discharge will then flow into the existing detention pond, and a 36" culvert underneath Blue Grama will carry the flow from the South Pino storm drain (see the *Drainage Report for High Desert Tract 15D-1B-1A and 4C-1, The West Highlands and the Extension of Blue Grama Road*).

Basin EX- C (11.24 acres, Q_{100}=24.73 cfs) is south of Basin EX- B. Flows from this basin are carried west to a temporary desiltation pond on the east side of Blue Grama Road. The flow then empties into the South Pino storm drain located beneath Blue Grama Road.

Basin EX- D (2.33 acres, Q_{100}=5.13 cfs) is east of Blue Grama Road. Flows from this basin are carried west into Blue Grama Road. The flow is then intercepted by inlets and discharges into the South Pino storm drain.

Basin EX- E (17.11 acres, Q_{100}=37.64 cfs) encompasses most of Tract 15D-1B-1B and is located to the south of Basin EX- C and north of the Desert Highlands Unit 2. Basin EX- E drains to the west into the permanent pond on Tract 15D-1A-1 which drains into the South Pino Tributary Storm Drain. Basin EX- F is located to the south of Basin EX- E and north of the Desert Highlands Unit 2. This basin also drains to the west into the permanent pond in Tract 15D-1A-1.

VII. FEMA FLOODPLAINS

Currently, there are no FEMA floodplains that lie on Tract 15D-1B-1. Bohannan Huston, Inc. prepared a Letter of Map Revision (LOMR) to revise floodplains in High Desert. The LOMR is enclosed in Exhibit 6. The only floodplain in the vicinity of Tract 15D-1B-1 lies to the south in the permanent pond on Tract 15D-1A-1.

VIII. DEVELOPED HYDROLOGICAL AND HYDRAULIC CONDITIONS

A summary table has been provided in Appendix A of this report, which provides the calculated treatment types and the peak discharge for the 100-year, 6-hour storm event. The average building envelope in Tract 15D-1B-1B is 0.275 acres or 12,000 sf, and the average lot size in Tract 15D-1B-1B is 0.97 acres or 42,044 sf (see Appendix B). This report has estimated that the treatment types within the average building envelope would consist of 75% Type D (impervious) and 25% Type B, while the area outside of the building envelope and within the lot would remain Type A.

Tract 15D-1B-1B encompasses the Mountain Highlands Unit 1. This Tract will consist of 29 lots. The drainage associated with the development the Mountain Highlands Unit 1 can be simplified into three main categories: those basins that drain to Simms Park Road; those basins that drain to the Blue Grama; and those basins that drain west across Tract 15D-1B-1B into the existing South Pino Tributary storm drain.

Basin 1 drains to the existing Simms Park Road. Basins 6 and 7 drain to Blue Grama Road. Basin 2 flows in the existing arroyo under Russian Sage Court through a culvert and into a

second culvert under Blue Grama Road that carries the flow into the South Pino Storm Drain. Basins 3, 4 and 5 drain to inlets within the subdivision, which in turn discharge into the South Pino Tributary storm drain. Basins 8 and 9 drain to the west into the South Pino Tributary storm drain.

Basin 1 (1.57 acres, Q_{100}=4.02 cfs) consists of the backyards on lots 2-6 which lie in the northwest corner of Tract 15D-1B-1B. This basin drains into Simms Park Pino Ridge Place and is intercepted by inlets within Simms Park Road. Currently there are three existing inlets on the south side of Simms Park Road that accept flows from existing basins south of Simms Park Road. Due to the fact that the Mountain Highlands Unit 1 Subdivision will not be mass graded, the proposed basins discharging into Simms Park Road will not significantly add to the flows currently draining into these inlets.

Basin 2 (15.35 acres, Q_{100}=45.36 cfs) consists of portions of lots 1-18 and most of Russian Sage Court and includes the existing AMAFCA easement. Basin 2 drains to the southwest in the arroyo and flows into a 36" culvert under Russian Sage Court. It then flows into a second culvert under Blue Grama Pino Ridge Place discharges into the South Pino Storm Drain. Basin 3 (6.37 acres, Q_{100}=19.75 cfs) encompasses portions of lots 11-14, 23-29 and the eastern half of Pino Ridge Place, portions of Pino Pond Court, Cherry Sage Court and Pino Ridge Place. Standard curb on both sides of Pino Pond Court will route the flow to the south to an inlet at the bottom of Pino Pond Court. The inlet discharges into South Pino storm drain. This inlet is not designed to accept two times the 100-year flow. In the event that the inlet becomes clogged, the overflow will overtop the curb and drain to the northwest, eventually making its way to Pino Ridge Place without flowing into any building envelopes. Basin 4 (1.33 acres, Q_{100}=3.86 cfs) includes portions of lots 20 and 21 and drains to the south into Pino Ridge Place. The entrance of Pino Ridge Place will be built with standard curb and gutter and inlets in order to intercept these flows. Basin 4 will drain into Pino Ridge Place and the inlets in the Pino Ridge Place roadway will intercept this flow. Basin 5 (2.39 acres, Q_{100}=9.10 cfs) consists of the western half of Pino Ridge Place and portions of lots 15-18, 20 and 21. The flow from Basin 5 flows down Pino Ridge Place and is intercepted by three inlets at the bottom of Pino Ridge Place. Two inlets on the north side of Pino Ridge Place intercept 12.8 cfs from Basins 4 and 5. A third inlet on the south side of Pino Ridge Place will be

used to intercept nuisance flows. The first inlet on the north side will intercept 9 cfs with a by-pass of 3.96 cfs. The second inlet captures 3.8 cfs with a by-pass of 0.16 cfs.

Basin 6 (0.84 acres, Q_{100}=2.47 cfs) consists mostly of lot 1 adjacent to Blue Grama on the west side. The basin drains to the west into Blue Grama Road where inlets in the Blue Grama roadway intercept the flow down. Basin 7 (2.33 acres, Q_{100}=6.76 cfs) encompasses portions of lots 19, 20, 22 and Tract 15D-1A-1. This basin also drains into Blue Grama where inlets downstream will intercept the flow.

Basin 8 (17.81 acres, Q_{100}=55.22 cfs) consists of portions of lots 22-29 and an area to the east of the proposed Mountain Highlands Unit 1 into the future Mountain Highlands Unit 2 and a portion of the Desert Highlands Unit 2. Basin 9 (23.7 acres, Q_{100}=78 cfs) consists of the future Mountain Highlands Unit 2 and the northern portions of the Desert Highlands Unit 2. During the fully developed 100-year flow, 1730 cfs is calculated to flow in the arroyo from both basins. The permanent pond on Tract 15D-1A-1 will take this flow from the arroyo and discharge it into the South Pino Tributary storm drain.

IX. CONCLUSION

The primary goal of this drainage plan for the Mountain Highlands Unit 1 is to provide sound and innovative drainage management schemes that permit preservation of the natural terrain with the least possible impact. The utilization of drainage schemes outlined in this report accomplishes this goal in a safe and adequate manner. We recommend that this plan be approved as requested.

EXISTING CONDITIONS FOR
THE MOUNTAIN HIGHLANDS TRACTS 15D-1B-1B
Aug-00

BASIN ID	DISCHARGES TO	AREA (ACRES)		Q(100-YR) DEVELOPED (CFS)
EX-A	Simms Park Road	1.57		3.45
EX-B	Existing Arroyo	14.63		32.19
EX-C	Existing Arroyo	11.24		24.73
EX-D	Blue Grama Rd	2.33		5.13
EX-E	South Pino Pond	17.11		37.64
EX-F	South Pino Pond	23.70		52.14
	TOTAL	70.58		155.28

NOTES:

1. Obtained from Section 22.2, Hydrology of the Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque, January, 1993
   * Table A-4
   ** Table A-9

PROPOSED CONDITIONS FOR
THE MOUNTAIN HIGHLANDS TRACTS 15D-1B-1B
Aug-00

BASIN ID	DISCHARGES TO	AREA (ACRES)		Q(100-YR) DEVELOPED (CFS)
1	Simms Park Road	1.57		4.02
2	South Pino Storm Drain	15.36		45.36
3	Proposed Inlet	6.37		19.75
4	Proposed Inlet	1.33		3.86
5	Proposed Inlet	2.39		9.10
6	Blue Grama	0.84		2.47
7	Blue Grama	2.33		6.76
8	South Pino Pond	17.81		55.22
9	South Pino Pond	23.70		78.00
	TOTALS	71.70		224.54

NOTES:

1. Obtained from Section 22.2, Hydrology of the Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque, January, 1993
   * Table A-4
   ** Table A-9

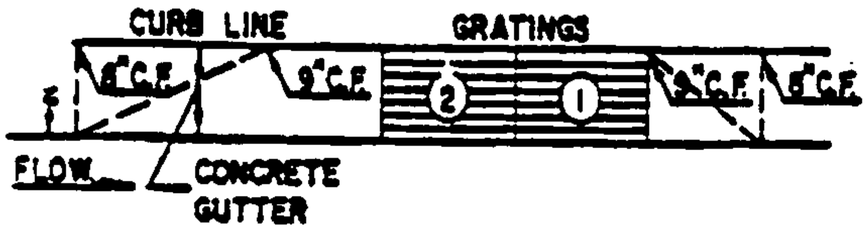
DEVELOPED CONDITIONS FOR EACH LOT

LOT #	AREA (ACRES)	% LAND TREATMENT* A	B	C	D	PEAK DISCHARGE - (CFS/ACRE)* A	B	C	D	Q(100-YR) DEVELOPED (CFS)
1	1.683	83.64	4.42	0.00	11.95	2.20	2.92	3.73	5.25	4.37
2	0.860	67.98	8.65	0.00	23.37	2.20	2.92	3.73	5.25	2.56
3	0.806	65.84	9.22	0.00	24.94	2.20	2.92	3.73	5.25	2.44
4	1.033	73.33	7.20	0.00	19.47	2.20	2.92	3.73	5.25	2.94
5	0.851	67.62	8.74	0.00	23.64	2.20	2.92	3.73	5.25	2.54
6	2.135	87.10	3.48	0.00	9.42	2.20	2.92	3.73	5.25	5.36
7	0.831	66.87	8.95	0.00	24.19	2.20	2.92	3.73	5.25	2.50
8	0.894	69.17	8.32	0.00	22.50	2.20	2.92	3.73	5.25	2.63
9	0.825	66.60	9.02	0.00	24.38	2.20	2.92	3.73	5.25	2.48
10	0.825	66.61	9.01	0.00	24.37	2.20	2.92	3.73	5.25	2.48
11	0.931	70.41	7.99	0.00	21.60	2.20	2.92	3.73	5.25	2.72
12	0.778	64.57	9.56	0.00	25.86	2.20	2.92	3.73	5.25	2.38
13	0.843	67.33	8.82	0.00	23.85	2.20	2.92	3.73	5.25	2.52
14	0.747	63.13	9.96	0.00	26.92	2.20	2.92	3.73	5.25	2.31
15	0.951	71.05	7.82	0.00	21.14	2.20	2.92	3.73	5.25	2.76
16	0.915	69.89	8.13	0.00	21.98	2.20	2.92	3.73	5.25	2.68
17	0.854	67.72	8.71	0.00	23.56	2.20	2.92	3.73	5.25	2.54
18	1.027	73.16	7.25	0.00	19.59	2.20	2.92	3.73	5.25	2.93
19	0.890	69.06	8.35	0.00	22.59	2.20	2.92	3.73	5.25	2.63
20	0.784	64.85	9.49	0.00	25.66	2.20	2.92	3.73	5.25	2.39
21	0.803	65.71	9.26	0.00	25.03	2.20	2.92	3.73	5.25	2.43
22	0.857	67.84	8.68	0.00	23.48	2.20	2.92	3.73	5.25	2.55
23	1.111	75.20	6.69	0.00	18.10	2.20	2.92	3.73	5.25	3.11
24	0.772	64.34	9.63	0.00	26.04	2.20	2.92	3.73	5.25	2.37
25	1.174	76.53	6.34	0.00	17.14	2.20	2.92	3.73	5.25	3.25
26	0.950	71.02	7.83	0.00	21.16	2.20	2.92	3.73	5.25	2.76
27	1.055	73.89	7.05	0.00	19.06	2.20	2.92	3.73	5.25	2.99
28	0.993	72.26	7.49	0.00	20.25	2.20	2.92	3.73	5.25	2.85
29	0.812	66.06	9.16	0.00	24.78	2.20	2.92	3.73	5.25	2.45
TOTAL	27.991									80.92

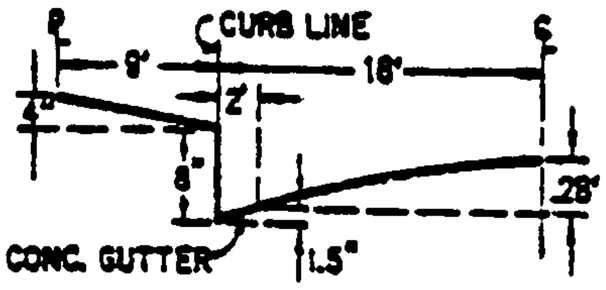
NOTES:
*Obtained from Section 22.2, Hydrology of the Development Process Manual, Vol. 2, Design Criteria for the City of Albuquerque, January, 1993
The lots Land Percentage Type was determined by assuming each building envelope to 73% impervious (Type D) and 27% natural (Type B)

Dino Ridge Place

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



GRATING & GUTTER PLAN



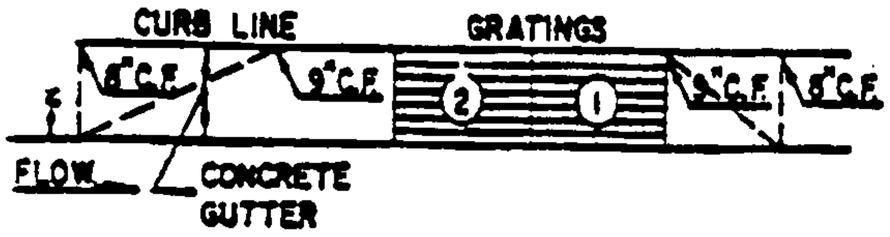
TYPICAL HALF STREET SECTION
(ABOVE BASIN)

PLATE 22.3 D-6

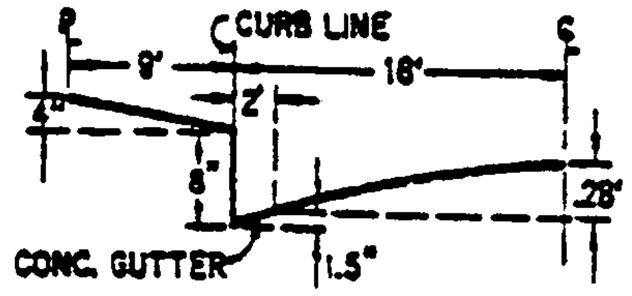
C1

Pino Ridge Place

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

3.3 cfs

PLATE 22.3 D-6

C2

1

PRCS+TD 2+20.56

"AA" inlet

"CC" inlet

Q_{inlet} = 9 cfs

Q_{inlet} = 3.8 cfs

$Q_{residual}$ = 0.16 cfs

Q_{low} = 12.8 cfs

Q_{inlet} = Numerical Flows

"E" inlet

PCS+TD 1+10.69

PCS+TD 1+00.00

1+00

PCS+TD 0+00.00

C3

ANALYSIS OF AN INLET IN A SUMP CONDITION - Pino Pond Court

INLET TYPE: Double Grate Type "A" with curb opening wings on both sides on inlet.

WEIR: Q=C*L*H^1.5

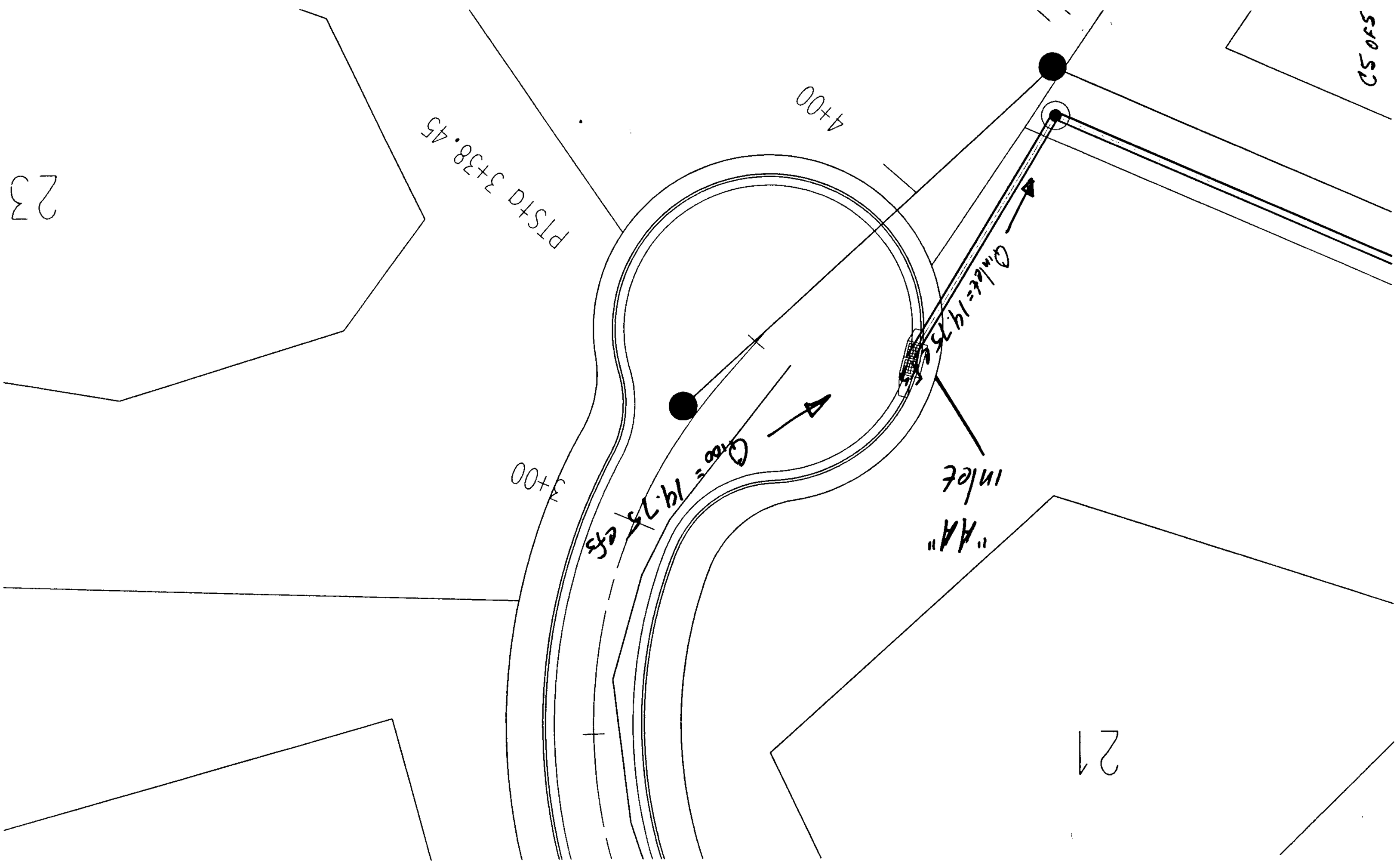
Wing opening	Grate opeining
C= 3.0	C=3.0
L= 4.0 ft	L(double grate)=[2(2.67')+2(1.8')]=8.94 ft
Q=3.0(4.0')H**1.5= 12.0H**1.5	Q=3.0(8.94)H^1.5=26.82*H^1.5

ORIFICE: Q=C*A*(2*G*H)**0.5

Grate opening	Wing opening
C=0.6	C=0.6
A(double grate)=8.19 sf	A=2.0 sf
Q=4.194*(64.4*H)^0.5	Q=1.2*(64.4*H)^0.5

	WS ELEVATION	HEIGHT ABOVE INLET	Q (CFS) WEIR "A" OPENING	Q (CFS) WEIR DOUBLE GRATE	Q (CFS) ORIFICE DOUBLE GRATE	TOTAL Q (CFS)	COMMENTS:
~FL @ INLET	0.00	0.00	0.00	0.00	0.00	0.00	Flow at double "A" inlet w/ two wing openings
	0.05	0.05	0.13	0.30	8.82	0.57	Weir controls on grate analysis
	0.10	0.10	0.38	0.85	12.47	1.61	
	0.15	0.15	0.70	1.56	15.27	2.95	
	0.20	0.20	1.07	2.40	17.64	4.55	
	0.25	0.25	1.50	3.35	19.72	6.35	
	0.30	0.30	1.97	4.41	21.60	8.35	
TOP OF CURB	0.35	0.35	2.48	5.55	23.33	10.52	
	0.40	0.40	3.04	6.78	24.94	12.86	
	0.45	0.45	3.62	8.10	26.45	15.34	
	0.50	0.50	4.24	9.48	27.88	17.97	
	0.55	0.55	4.89	10.94	29.25	20.73	Q(100 yr) = 19.75 cfs is provided at this depth
	0.60	0.60	5.58	12.46	30.55	23.62	
	0.65	0.65	6.29	14.05	31.79	26.63	
	0.70	0.70	7.03	15.71	32.99	29.76	
	0.75	0.75	7.79	17.42	34.15	33.01	
	0.80	0.80	8.59	19.19	35.27	36.36	
	0.85	0.85	9.40	21.02	36.36	39.83	2 x Q(100 yr) = 39.5 cfs is provided at this depth
ROW LIMIT	0.90	0.90	10.25	22.90	37.41	43.39	

NOTE: The total runoff intercepted by the inlet at the low point in the road is:
Qr(100) = 2*[(runoff of the wing opening) + (the lesser of the weir or orifice amount taken by the double grate)].
THE 100 YR STORM EVENT = 19.75 CFS at the sump condition


CS 0+55
4+00
PI 5+0 3+38.45
3+00
Q_{100} = 19.75 cfs
Q_{inlet} = 19.75 cfs
inlet
"AA"
23
21

Russian Sage Culvert

==========

Drainage Structure Analyzer

Culvert Hydraulic Analysis

Date: Thursday, August 17, 2000 05:04:12 PM

==========

Input Data

Shape	Circular	
Material	RC C76-A	
Roughness	0.013000	
Entrance Edge	Square edge w/ headwall	
Number of Barrels	1	
Length	0.00	ft
Slope	0.00%	
Tailwater	0.00	ft
Size (W x T):	36.00 x 3.0000	
Flow Rate	37.00	cfs

Output Results

Flow Rate	37.00	cfs
Control	Outlet	
Capacity	0.00	cfs
Velocity	5.23	ft/s
Tailwater	0.00	ft
Headwater	3.00	ft
Critical Depth	1.97	ft
Normal Depth	3.00	ft
Size (W x T):	36.00 x 3.0000	

01

2

61+10

00+12

37 cfs

36" RCP

37 cfs

02 of 2

Pino Ridge Place

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

□ MANNING'S N= .017 SLOPE= .056

□POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	2.33	5	11.00	1.63	9	63.17	0.67
2	8.38	2.17	6	36.00	0.88	10	63.63	0.67
3	8.83	2.17	7	61.00	0.13	11	70.00	0.50
4	9.00	1.50	8	63.00	0.00	12	0.00	0.00

□ WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.01	0.01	0.00	0.0	0.17	0.59	0.16	0.01	0.02
0.02	0.02	0.00	0.0	0.34	0.93	0.33	0.01	0.03
0.03	0.03	0.01	0.0	0.51	1.22	0.49	0.02	0.05
0.04	0.04	0.01	0.0	0.68	1.48	0.65	0.03	0.07
0.05	0.05	0.02	0.0	0.85	1.71	0.81	0.05	0.10
0.06	0.06	0.03	0.1	1.02	1.93	0.98	0.06	0.12
0.07	0.07	0.04	0.1	1.19	2.14	1.14	0.07	0.14
0.08	0.08	0.05	0.1	1.37	2.34	1.30	0.09	0.17
0.09	0.09	0.07	0.2	1.54	2.53	1.46	0.10	0.19
0.10	0.10	0.08	0.2	1.71	2.72	1.63	0.11	0.21
0.11	0.11	0.10	0.3	1.88	2.90	1.79	0.13	0.24
0.12	0.12	0.12	0.4	2.05	3.07	1.95	0.15	0.27
0.13	0.13	0.14	0.4	2.30	3.16	2.20	0.15	0.28
0.14	0.14	0.16	0.5	2.65	3.20	2.54	0.16	0.30
0.15	0.15	0.19	0.6	2.99	3.27	2.87	0.17	0.32
0.16	0.16	0.22	0.7	3.34	3.36	3.21	0.18	0.34
0.17	0.17	0.25	0.9	3.68	3.47	3.54	0.19	0.36
0.18	0.18	0.29	1.0	4.02	3.58	3.88	0.20	0.38
0.19	0.19	0.33	1.2	4.37	3.70	4.21	0.21	0.40
0.20	0.20	0.37	1.4	4.71	3.82	4.55	0.23	0.43
0.21	0.21	0.42	1.7	5.06	3.94	4.89	0.24	0.45
0.22	0.22	0.47	1.9	5.40	4.07	5.22	0.26	0.48
0.23	0.23	0.53	2.2	5.74	4.20	5.56	0.27	0.50
0.24	0.24	0.58	2.5	6.09	4.33	5.89	0.29	0.53
0.25	0.25	0.64	2.9	6.43	4.46	6.23	0.31	0.56
0.26	0.26	0.71	3.2	6.77	4.59	6.57	0.33	0.59
0.27	0.27	0.77	3.7	7.12	4.72	6.90	0.35	0.62
0.28	0.28	0.85	4.1	7.46	4.84	7.24	0.36	0.64
0.29	0.29	0.92	4.6	7.81	4.97	7.57	0.38	0.67
0.30	0.30	1.00	5.1	8.15	5.10	7.91	0.40	0.70
0.31	0.31	1.08	5.6	8.49	5.22	8.25	0.42	0.73
0.32	0.32	1.16	6.2	8.84	5.35	8.58	0.44	0.76
0.33	0.33	1.25	6.8	9.18	5.47	8.92	0.47	0.80
0.34	0.34	1.34	7.5	9.52	5.60	9.25	0.49	0.83
0.35	0.35	1.43	8.2	9.87	5.72	9.59	0.51	0.86
0.36	0.36	1.53	8.9	10.21	5.84	9.92	0.53	0.89
0.37	0.37	1.63	9.7	10.56	5.96	10.26	0.55	0.92
0.38	0.38	1.74	10.6	10.90	6.08	10.60	0.57	0.95
0.39	0.39	1.84	11.4	11.24	6.20	10.93	0.60	0.99
0.40	0.40	1.96	12.4	11.59	6.32	11.27	0.62	1.02
0.41	0.41	2.07	13.3	11.93	6.43	11.60	0.64	1.05
0.42	0.42	2.19	14.3	12.27	6.55	11.94	0.67	1.09
0.43	0.43	2.31	15.4	12.62	6.67	12.28	0.69	1.12

12.96 cfs

□ WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.45	0.45	2.56	17.7	13.31	6.90	12.95	0.74	1.19
0.46	0.46	2.69	18.9	13.65	7.01	13.28	0.76	1.22
0.47	0.47	2.83	20.1	13.99	7.12	13.62	0.79	1.26
0.48	0.48	2.96	21.4	14.34	7.23	13.96	0.81	1.29
0.49	0.49	3.11	22.8	14.68	7.34	14.29	0.84	1.33
0.50	0.50	3.25	24.2	15.03	7.45	14.63	0.86	1.36
0.51	0.51	3.40	25.3	15.74	7.45	15.34	0.86	1.37

E1

Pino Ridge Place

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

MANNING'S N= .017 SLOPE= .028

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	2.33	5	11.00	1.63	9	63.17	0.67
2	8.38	2.17	6	36.00	0.88	10	63.63	0.67
3	8.83	2.17	7	61.00	0.13	11	70.00	0.50
4	9.00	1.50	8	63.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.01	0.01	0.00	0.0	0.17	0.41	0.16	0.00	0.01
0.02	0.02	0.00	0.0	0.34	0.66	0.33	0.01	0.03
0.03	0.03	0.01	0.0	0.51	0.86	0.49	0.01	0.04
0.04	0.04	0.01	0.0	0.68	1.04	0.65	0.02	0.06
0.05	0.05	0.02	0.0	0.85	1.21	0.81	0.02	0.07
0.06	0.06	0.03	0.0	1.02	1.37	0.98	0.03	0.09
0.07	0.07	0.04	0.1	1.19	1.52	1.14	0.04	0.11
0.08	0.08	0.05	0.1	1.37	1.66	1.30	0.04	0.12
0.09	0.09	0.07	0.1	1.54	1.79	1.46	0.05	0.14
0.10	0.10	0.08	0.2	1.71	1.92	1.63	0.06	0.16
0.11	0.11	0.10	0.2	1.88	2.05	1.79	0.07	0.18
0.12	0.12	0.12	0.3	2.05	2.17	1.95	0.07	0.19
0.13	0.13	0.14	0.3	2.30	2.23	2.20	0.08	0.21
0.14	0.14	0.16	0.4	2.65	2.26	2.54	0.08	0.22
0.15	0.15	0.19	0.4	2.99	2.31	2.87	0.08	0.23
0.16	0.16	0.22	0.5	3.34	2.38	3.21	0.09	0.25
0.17	0.17	0.25	0.6	3.68	2.45	3.54	0.09	0.26
0.18	0.18	0.29	0.7	4.02	2.53	3.88	0.10	0.28
0.19	0.19	0.33	0.9	4.37	2.61	4.21	0.11	0.30
0.20	0.20	0.37	1.0	4.71	2.70	4.55	0.11	0.31
0.21	0.21	0.42	1.2	5.06	2.79	4.89	0.12	0.33
0.22	0.22	0.47	1.4	5.40	2.88	5.22	0.13	0.35
0.23	0.23	0.53	1.6	5.74	2.97	5.56	0.14	0.37
0.24	0.24	0.58	1.8	6.09	3.06	5.89	0.15	0.39
0.25	0.25	0.64	2.0	6.43	3.15	6.23	0.15	0.40
0.26	0.26	0.71	2.3	6.77	3.24	6.57	0.16	0.42
0.27	0.27	0.77	2.6	7.12	3.33	6.90	0.17	0.44
0.28	0.28	0.85	2.9	7.46	3.42	7.24	0.18	0.46
0.29	0.29	0.92	3.2	7.81	3.51	7.57	0.19	0.48
0.30	0.30	1.00	3.6	8.15	3.60	7.91	0.20	0.50
0.31	0.31	1.08	4.0	8.49	3.69	8.25	0.21	0.52
0.32	0.32	1.16	4.4	8.84	3.78	8.58	0.22	0.54
0.33	0.33	1.25	4.8	9.18	3.87	8.92	0.23	0.56
0.34	0.34	1.34	5.3	9.52	3.96	9.25	0.24	0.58
0.35	0.35	1.43	5.8	9.87	4.04	9.59	0.25	0.60
0.36	0.36	1.53	6.3	10.21	4.13	9.92	0.26	0.62
0.37	0.37	1.63	6.9	10.56	4.21	10.26	0.28	0.65
0.38	0.38	1.74	7.5	10.90	4.30	10.60	0.29	0.67
0.39	0.39	1.84	8.1	11.24	4.38	10.93	0.30	0.69
0.40	0.40	1.96	8.7	11.59	4.47	11.27	0.31	0.71
0.41	0.41	2.07	9.4	11.93	4.55	11.60	0.32	0.73
0.42	0.42	2.19	10.1	12.27	4.63	11.94	0.33	0.75
0.43	0.43	2.31	10.9	12.62	4.71	12.28	0.35	0.78

3.9 cfs

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.45	0.45	2.56	12.5	13.31	4.88	12.95	0.37	0.82
0.46	0.46	2.69	13.3	13.65	4.96	13.28	0.38	0.84
0.47	0.47	2.83	14.2	13.99	5.04	13.62	0.39	0.86
0.48	0.48	2.96	15.2	14.34	5.11	13.96	0.41	0.89
0.49	0.49	3.11	16.1	14.68	5.19	14.29	0.42	0.91
0.50	0.50	3.25	17.1	15.03	5.27	14.63	0.43	0.93
0.51	0.51	3.40	17.9	15.74	5.27	15.34	0.43	0.94

E2 of 2

Pino Pond Court

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

□ MANNING'S N= .017 SLOPE= .0238

□POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.95	5	11.00	0.67	9	31.17	0.67
2	8.38	0.78	6	20.00	0.39	10	31.63	0.67
3	8.83	0.77	7	29.00	0.13	11	40.00	0.50
4	9.00	0.76	8	31.00	0.00	12	0.00	0.00

□ WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.01	0.01	0.00	0.0	0.17	0.38	0.16	0.00	0.01
0.02	0.02	0.00	0.0	0.34	0.61	0.33	0.01	0.03
0.03	0.03	0.01	0.0	0.51	0.79	0.49	0.01	0.04
0.04	0.04	0.01	0.0	0.68	0.96	0.65	0.01	0.05
0.05	0.05	0.02	0.0	0.85	1.12	0.81	0.02	0.07
0.06	0.06	0.03	0.0	1.02	1.26	0.98	0.02	0.08
0.07	0.07	0.04	0.1	1.19	1.40	1.14	0.03	0.10
0.08	0.08	0.05	0.1	1.37	1.53	1.30	0.04	0.12
0.09	0.09	0.07	0.1	1.54	1.65	1.46	0.04	0.13
0.10	0.10	0.08	0.1	1.71	1.77	1.63	0.05	0.15
0.11	0.11	0.10	0.2	1.88	1.89	1.79	0.06	0.17
0.12	0.12	0.12	0.2	2.05	2.00	1.95	0.06	0.18
0.13	0.13	0.14	0.3	2.31	2.06	2.20	0.07	0.20
0.14	0.14	0.16	0.3	2.66	2.08	2.54	0.07	0.21
0.15	0.15	0.19	0.4	3.01	2.13	2.89	0.07	0.22
0.16	0.16	0.22	0.5	3.36	2.19	3.23	0.07	0.23
0.17	0.17	0.25	0.6	3.71	2.25	3.57	0.08	0.25
0.18	0.18	0.29	0.7	4.06	2.32	3.91	0.08	0.26
0.19	0.19	0.33	0.8	4.41	2.40	4.26	0.09	0.28
0.20	0.20	0.38	0.9	4.76	2.48	4.60	0.10	0.30
0.21	0.21	0.42	1.1	5.11	2.56	4.94	0.10	0.31
0.22	0.22	0.47	1.3	5.46	2.65	5.28	0.11	0.33
0.23	0.23	0.53	1.4	5.81	2.73	5.62	0.12	0.35
0.24	0.24	0.59	1.7	6.16	2.81	5.97	0.12	0.36
0.25	0.25	0.65	1.9	6.51	2.90	6.31	0.13	0.38
0.26	0.26	0.71	2.1	6.86	2.98	6.65	0.14	0.40
0.27	0.27	0.78	2.4	7.21	3.07	6.99	0.15	0.42
0.28	0.28	0.85	2.7	7.56	3.15	7.34	0.15	0.43
0.29	0.29	0.93	3.0	7.91	3.23	7.68	0.16	0.45
0.30	0.30	1.01	3.3	8.26	3.31	8.02	0.17	0.47
0.31	0.31	1.09	3.7	8.61	3.40	8.36	0.18	0.49
0.32	0.32	1.17	4.1	8.96	3.48	8.70	0.19	0.51
0.33	0.33	1.26	4.5	9.31	3.56	9.05	0.20	0.53
0.34	0.34	1.35	4.9	9.66	3.64	9.39	0.21	0.55
0.35	0.35	1.45	5.4	10.01	3.72	9.73	0.21	0.56
0.36	0.36	1.55	5.9	10.36	3.80	10.07	0.22	0.58
0.37	0.37	1.65	6.4	10.71	3.88	10.41	0.23	0.60
0.38	0.38	1.76	7.0	11.06	3.96	10.76	0.24	0.62
0.39	0.39	1.87	7.5	11.41	4.03	11.10	0.25	0.64
0.40	0.40	1.98	8.1	11.75	4.11	11.43	0.26	0.66
0.41	0.41	2.10	8.8	12.09	4.19	11.76	0.27	0.68
0.42	0.42	2.21	9.5	12.42	4.27	12.09	0.28	0.70
0.43	0.43	2.34	10.2	12.76	4.35	12.42	0.29	0.72

□ WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.45	0.45	2.59	11.7	13.44	4.50	13.08	0.31	0.76
0.46	0.46	2.72	12.5	13.77	4.58	13.41	0.33	0.79
0.47	0.47	2.86	13.3	14.11	4.65	13.74	0.34	0.81
0.48	0.48	3.00	14.2	14.45	4.73	14.07	0.35	0.83
0.49	0.49	3.14	15.1	14.79	4.80	14.40	0.36	0.85
0.50	0.50	3.29	16.0	15.13	4.87	14.73	0.37	0.87
0.51	0.51	3.44	16.7	15.96	4.85	15.55	0.36	0.87

F-1

Pino Pond Court

22ft.out

0.52	0.52	3.60	17.4	16.79	4.83	16.37	0.36	0.88
0.53	0.53	3.77	18.2	17.62	4.82	17.19	0.36	0.89
0.54	0.54	3.94	19.0	18.45	4.82	18.02	0.36	0.90
0.55	0.55	4.13	19.9	19.28	4.83	18.84	0.36	0.91
0.56	0.56	4.32	20.9	20.11	4.84	19.66	0.36	0.92
0.57	0.57	4.52	21.9	20.94	4.85	20.48	0.37	0.94
0.58	0.58	4.73	23.0	21.77	4.87	21.30	0.37	0.95
0.59	0.59	4.95	24.2	22.60	4.90	22.13	0.37	0.96
0.60	0.60	5.17	25.5	23.43	4.93	22.95	0.38	0.98
0.61	0.61	5.40	26.8	24.26	4.96	23.77	0.38	0.99
0.62	0.62	5.65	28.2	25.09	4.99	24.59	0.39	1.01
0.63	0.63	5.90	29.6	25.92	5.03	25.41	0.39	1.02
0.64	0.64	6.15	31.2	26.75	5.06	26.24	0.40	1.04
0.65	0.65	6.42	32.8	27.58	5.10	27.06	0.40	1.05
0.66	0.66	6.70	34.5	28.41	5.15	27.88	0.41	1.07
0.67	0.67	6.98	36.3	29.18	5.20	28.64	0.42	1.09
0.68	0.68	7.27	38.6	29.38	5.31	29.31	0.44	1.12
0.69	0.69	7.56	41.0	29.59	5.43	29.51	0.46	1.15
0.70	0.70	7.86	43.2	30.25	5.49	29.71	0.47	1.17
0.71	0.71	8.16	45.7	30.45	5.60	29.92	0.49	1.20
0.72	0.72	8.46	48.3	30.66	5.72	30.12	0.51	1.23
0.73	0.73	8.76	51.0	30.86	5.82	30.33	0.53	1.26
0.74	0.74	9.07	53.8	31.07	5.93	30.53	0.55	1.29
0.75	0.75	9.37	56.6	31.27	6.04	30.73	0.57	1.32
0.76	0.76	9.68	59.5	31.48	6.14	30.94	0.59	1.35
0.77	0.77	9.99	62.3	31.74	6.24	31.20	0.60	1.37
0.78	0.78	10.30	65.2	32.09	6.32	31.55	0.62	1.40
0.79	0.79	10.62	67.9	32.56	6.39	32.02	0.63	1.42
0.80	0.80	10.95	70.6	33.06	6.45	32.52	0.65	1.45
0.81	0.81	11.27	73.5	33.56	6.52	33.03	0.66	1.47
0.82	0.82	11.61	76.3	34.06	6.58	33.53	0.67	1.49
0.83	0.83	11.94	79.3	34.57	6.64	34.03	0.68	1.51
0.84	0.84	12.29	82.3	35.07	6.70	34.53	0.70	1.54
0.85	0.85	12.63	85.4	35.57	6.76	35.03	0.71	1.56
0.86	0.86	12.99	88.6	36.07	6.82	35.53	0.72	1.58
0.87	0.87	13.34	91.9	36.57	6.89	36.04	0.74	1.61
0.88	0.88	13.71	95.2	37.08	6.95	36.54	0.75	1.63
0.89	0.89	14.08	98.6	37.58	7.01	37.04	0.76	1.65
0.90	0.90	14.45	102.1	38.08	7.07	37.54	0.78	1.68
0.91	0.91	14.83	105.7	38.58	7.13	38.04	0.79	1.70
0.92	0.92	15.21	109.3	39.08	7.19	38.54	0.80	1.72
0.93	0.93	15.60	113.0	39.59	7.25	39.05	0.82	1.75
0.94	0.94	15.99	116.8	40.09	7.31	39.55	0.83	1.77
0.95	0.95	16.35	120.3	40.54	7.36	40.00	0.84	1.79

19.75 cfs

F2

Pine Pond Court

22ft.out

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

MANNING'S N= .017 SLOPE= .084

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.95	5	11.00	0.67	9	31.17	0.67
2	8.38	0.78	6	20.00	0.39	10	31.63	0.67
3	8.83	0.77	7	29.00	0.13	11	40.00	0.50
4	9.00	0.76	8	31.00	0.00	12	0.00	0.00

WSEL	DEPTH INC	FLOW AREA	FLOW RATE	WETTED PER	FLOW VEL	TOPWID	VEL HEAD	ENERGY HEAD
(FT)	(FT)	SQ.FT.	(CFS)	(FT)	(FPS)	(FT)	(FT)	(FT)
0.01	0.01	0.00	0.0	0.17	0.72	0.16	0.01	0.02
0.02	0.02	0.00	0.0	0.34	1.14	0.33	0.02	0.04
0.03	0.03	0.01	0.0	0.51	1.49	0.49	0.03	0.06
0.04	0.04	0.01	0.0	0.68	1.81	0.65	0.05	0.09
0.05	0.05	0.02	0.0	0.85	2.10	0.81	0.07	0.12
0.06	0.06	0.03	0.1	1.02	2.37	0.98	0.09	0.15
0.07	0.07	0.04	0.1	1.19	2.62	1.14	0.11	0.18
0.08	0.08	0.05	0.1	1.37	2.87	1.30	0.13	0.21
0.09	0.09	0.07	0.2	1.54	3.10	1.46	0.15	0.24
0.10	0.10	0.08	0.3	1.71	3.33	1.63	0.17	0.27
0.11	0.11	0.10	0.3	1.88	3.55	1.79	0.20	0.31
0.12	0.12	0.12	0.4	2.05	3.76	1.95	0.22	0.34
0.13	0.13	0.14	0.5	2.31	3.87	2.20	0.23	0.36
0.14	0.14	0.16	0.6	2.66	3.91	2.54	0.24	0.38
0.15	0.15	0.19	0.8	3.01	4.00	2.89	0.25	0.40
0.16	0.16	0.22	0.9	3.36	4.11	3.23	0.26	0.42
0.17	0.17	0.25	1.1	3.71	4.23	3.57	0.28	0.45
0.18	0.18	0.29	1.3	4.06	4.37	3.91	0.30	0.48
0.19	0.19	0.33	1.5	4.41	4.51	4.26	0.32	0.51
0.20	0.20	0.38	1.8	4.76	4.66	4.60	0.34	0.54
0.21	0.21	0.42	2.0	5.11	4.81	4.94	0.36	0.57
0.22	0.22	0.47	2.4	5.46	4.97	5.28	0.38	0.60
0.23	0.23	0.53	2.7	5.81	5.13	5.62	0.41	0.64
0.24	0.24	0.59	3.1	6.16	5.29	5.97	0.43	0.67
0.25	0.25	0.65	3.5	6.51	5.44	6.31	0.46	0.71
0.26	0.26	0.71	4.0	6.86	5.60	6.65	0.49	0.75
0.27	0.27	0.78	4.5	7.21	5.76	6.99	0.51	0.78
0.28	0.28	0.85	5.0	7.56	5.92	7.34	0.54	0.82
0.29	0.29	0.93	5.6	7.91	6.07	7.68	0.57	0.86
0.30	0.30	1.01	6.3	8.26	6.23	8.02	0.60	0.90
0.31	0.31	1.09	6.9	8.61	6.38	8.36	0.63	0.94
0.32	0.32	1.17	7.7	8.96	6.53	8.70	0.66	0.98
0.33	0.33	1.26	8.4	9.31	6.69	9.05	0.69	1.02
0.34	0.34	1.35	9.3	9.66	6.84	9.39	0.73	1.07
0.35	0.35	1.45	10.1	10.01	6.99	9.73	0.76	1.11
0.36	0.36	1.55	11.1	10.36	7.14	10.07	0.79	1.15
0.37	0.37	1.65	12.0	10.71	7.29	10.41	0.82	1.19
0.38	0.38	1.76	13.1	11.06	7.43	10.76	0.86	1.24
0.39	0.39	1.87	14.1	11.41	7.58	11.10	0.89	1.28
0.40	0.40	1.98	15.3	11.75	7.73	11.43	0.93	1.33
0.41	0.41	2.10	16.5	12.09	7.88	11.76	0.96	1.37
0.42	0.42	2.21	17.8	12.42	8.02	12.09	1.00	1.42
0.43	0.43	2.34	19.1	12.76	8.17	12.42	1.04	1.47

19.75 cfs

WSEL	DEPTH INC	FLOW AREA	FLOW RATE	WETTED PER	FLOW VEL	TOPWID	VEL HEAD	ENERGY HEAD
(FT)	(FT)	SQ.FT.	(CFS)	(FT)	(FPS)	(FT)	(FT)	(FT)
0.45	0.45	2.59	21.9	13.44	8.46	13.08	1.11	1.56
0.46	0.46	2.72	23.4	13.77	8.60	13.41	1.15	1.61
0.47	0.47	2.86	25.0	14.11	8.74	13.74	1.19	1.66
0.48	0.48	3.00	26.6	14.45	8.88	14.07	1.22	1.70
0.49	0.49	3.14	28.3	14.79	9.02	14.40	1.26	1.75
0.50	0.50	3.29	30.1	15.13	9.16	14.73	1.30	1.80
0.51	0.51	3.44	31.3	15.96	9.11	15.55	1.29	1.80

F3

Pino Pond Court

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

MANNING'S N= .017 SLOPE= .0121

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.95	5	11.00	0.67	9	31.17	0.67
2	8.38	0.78	6	20.00	0.39	10	31.63	0.67
3	8.83	0.77	7	29.00	0.13	11	40.00	0.50
4	9.00	0.76	8	31.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.01	0.01	0.00	0.0	0.17	0.27	0.16	0.00	0.01
0.02	0.02	0.00	0.0	0.34	0.43	0.33	0.00	0.02
0.03	0.03	0.01	0.0	0.51	0.57	0.49	0.00	0.03
0.04	0.04	0.01	0.0	0.68	0.69	0.65	0.01	0.05
0.05	0.05	0.02	0.0	0.85	0.80	0.81	0.01	0.06
0.06	0.06	0.03	0.0	1.02	0.90	0.98	0.01	0.07
0.07	0.07	0.04	0.0	1.19	1.00	1.14	0.02	0.09
0.08	0.08	0.05	0.1	1.37	1.09	1.30	0.02	0.10
0.09	0.09	0.07	0.1	1.54	1.18	1.46	0.02	0.11
0.10	0.10	0.08	0.1	1.71	1.26	1.63	0.02	0.12
0.11	0.11	0.10	0.1	1.88	1.35	1.79	0.03	0.14
0.12	0.12	0.12	0.2	2.05	1.43	1.95	0.03	0.15
0.13	0.13	0.14	0.2	2.31	1.47	2.20	0.03	0.16
0.14	0.14	0.16	0.2	2.66	1.48	2.54	0.03	0.17
0.15	0.15	0.19	0.3	3.01	1.52	2.89	0.04	0.19
0.16	0.16	0.22	0.3	3.36	1.56	3.23	0.04	0.20
0.17	0.17	0.25	0.4	3.71	1.61	3.57	0.04	0.21
0.18	0.18	0.29	0.5	4.06	1.66	3.91	0.04	0.22
0.19	0.19	0.33	0.6	4.41	1.71	4.26	0.05	0.24
0.20	0.20	0.38	0.7	4.76	1.77	4.60	0.05	0.25
0.21	0.21	0.42	0.8	5.11	1.83	4.94	0.05	0.26
0.22	0.22	0.47	0.9	5.46	1.89	5.28	0.06	0.28
0.23	0.23	0.53	1.0	5.81	1.95	5.62	0.06	0.29
0.24	0.24	0.59	1.2	6.16	2.01	5.97	0.06	0.30
0.25	0.25	0.65	1.3	6.51	2.07	6.31	0.07	0.32
0.26	0.26	0.71	1.5	6.86	2.13	6.65	0.07	0.33
0.27	0.27	0.78	1.7	7.21	2.19	6.99	0.07	0.34
0.28	0.28	0.85	1.9	7.56	2.25	7.34	0.08	0.36
0.29	0.29	0.93	2.1	7.91	2.30	7.68	0.08	0.37
0.30	0.30	1.01	2.4	8.26	2.36	8.02	0.09	0.39
0.31	0.31	1.09	2.6	8.61	2.42	8.36	0.09	0.40
0.32	0.32	1.17	2.9	8.96	2.48	8.70	0.10	0.42
0.33	0.33	1.26	3.2	9.31	2.54	9.05	0.10	0.43
0.34	0.34	1.35	3.5	9.66	2.60	9.39	0.10	0.44
0.35	0.35	1.45	3.8	10.01	2.65	9.73	0.11	0.46
0.36	0.36	1.55	4.2	10.36	2.71	10.07	0.11	0.47
0.37	0.37	1.65	4.6	10.71	2.77	10.41	0.12	0.49
0.38	0.38	1.76	5.0	11.06	2.82	10.76	0.12	0.50
0.39	0.39	1.87	5.4	11.41	2.88	11.10	0.13	0.52
0.40	0.40	1.98	5.8	11.75	2.93	11.43	0.13	0.53
0.41	0.41	2.10	6.3	12.09	2.99	11.76	0.14	0.55
0.42	0.42	2.21	6.7	12.42	3.05	12.09	0.14	0.56
0.43	0.43	2.34	7.2	12.76	3.10	12.42	0.15	0.58

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.45	0.45	2.59	8.3	13.44	3.21	13.08	0.16	0.61
0.46	0.46	2.72	8.9	13.77	3.26	13.41	0.17	0.63
0.47	0.47	2.86	9.5	14.11	3.32	13.74	0.17	0.64
0.48	0.48	3.00	10.1	14.45	3.37	14.07	0.18	0.66
0.49	0.49	3.14	10.8	14.79	3.42	14.40	0.18	0.67
0.50	0.50	3.29	11.4	15.13	3.48	14.73	0.19	0.69
0.51	0.51	3.44	11.9	15.96	3.46	15.55	0.19	0.70

F4

Pine Pond Court

0.52	0.52	3.60	12.4	16.79	3.44	16.37	0.18	0.70
0.53	0.53	3.77	12.9	17.62	3.44	17.19	0.18	0.71
0.54	0.54	3.94	13.5	18.45	3.44	18.02	0.18	0.72
0.55	0.55	4.13	14.2	19.28	3.44	18.84	0.18	0.73
0.56	0.56	4.32	14.9	20.11	3.45	19.66	0.18	0.74
0.57	0.57	4.52	15.6	20.94	3.46	20.48	0.19	0.76
0.58	0.58	4.73	16.4	21.77	3.47	21.30	0.19	0.77
0.59	0.59	4.95	17.3	22.60	3.49	22.13	0.19	0.78
0.60	0.60	5.17	18.2	23.43	3.51	22.95	0.19	0.79
0.61	0.61	5.40	19.1	24.26	3.53	23.77	0.19	0.80
0.62	0.62	5.65	20.1	25.09	3.56	24.59	0.20	0.82
0.63	0.63	5.90	21.1	25.92	3.58	25.41	0.20	0.83
0.64	0.64	6.15	22.2	26.75	3.61	26.24	0.20	0.84
0.65	0.65	6.42	23.4	27.58	3.64	27.06	0.21	0.86
0.66	0.66	6.70	24.6	28.41	3.67	27.88	0.21	0.87
0.67	0.67	6.98	25.9	29.18	3.70	28.64	0.21	0.88
0.68	0.68	7.27	27.5	29.38	3.79	29.31	0.22	0.90
0.69	0.69	7.56	29.2	29.59	3.87	29.51	0.23	0.92
0.70	0.70	7.86	30.8	30.25	3.92	29.71	0.24	0.94
0.71	0.71	8.16	32.6	30.45	4.00	29.92	0.25	0.96
0.72	0.72	8.46	34.5	30.66	4.08	30.12	0.26	0.98
0.73	0.73	8.76	36.4	30.86	4.15	30.33	0.27	1.00
0.74	0.74	9.07	38.4	31.07	4.23	30.53	0.28	1.02
0.75	0.75	9.37	40.4	31.27	4.31	30.73	0.29	1.04
0.76	0.76	9.68	42.4	31.48	4.38	30.94	0.30	1.06
0.77	0.77	9.99	44.5	31.74	4.45	31.20	0.31	1.08
0.78	0.78	10.30	46.5	32.09	4.51	31.55	0.32	1.10
0.79	0.79	10.62	48.4	32.56	4.56	32.02	0.32	1.11
0.80	0.80	10.95	50.4	33.06	4.60	32.52	0.33	1.13
0.81	0.81	11.27	52.4	33.56	4.65	33.03	0.34	1.15
0.82	0.82	11.61	54.4	34.06	4.69	33.53	0.34	1.16
0.83	0.83	11.94	56.5	34.57	4.73	34.03	0.35	1.18
0.84	0.84	12.29	58.7	35.07	4.78	34.53	0.35	1.19
0.85	0.85	12.63	60.9	35.57	4.82	35.03	0.36	1.21
0.86	0.86	12.99	63.2	36.07	4.87	35.53	0.37	1.23
0.87	0.87	13.34	65.5	36.57	4.91	36.04	0.37	1.24
0.88	0.88	13.71	67.9	37.08	4.95	36.54	0.38	1.26
0.89	0.89	14.08	70.3	37.58	5.00	37.04	0.39	1.28
0.90	0.90	14.45	72.8	38.08	5.04	37.54	0.39	1.29
0.91	0.91	14.83	75.4	38.58	5.08	38.04	0.40	1.31
0.92	0.92	15.21	78.0	39.08	5.13	38.54	0.41	1.33
0.93	0.93	15.60	80.6	39.59	5.17	39.05	0.41	1.34
0.94	0.94	15.99	83.3	40.09	5.21	39.55	0.42	1.36
0.95	0.95	16.35	85.8	40.54	5.25	40.00	0.43	1.38

19.75 cfs

F 5 of 5

(GP)

RECEIVED BHI JUL 18 2000

Federal Emergency Management Agency

Washington, D.C. 20472

Kevin,
Circled in
FEMA floodplain
deal will like
yes to
enter into
date box.

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 99-06-1119P

The Honorable Jim Baca
Mayor, City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Community: City of Albuquerque, NM
Community No.: 350002
Panels Affected: 35001C0144 D, 0161 D, and 0163 D

Effective Date of This Revision: JUL 13 2000

102-I-A-C

Dear Mayor Baca:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report for Bernalillo County, New Mexico and Incorporated Areas (the effective FIRM and FIS report for your community), in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated March 29, 1999, Ms. Susan M. Calongne, P.E., City/County Floodplain Administrator, City of Albuquerque/Bernalillo County, requested that FEMA revise the FIRM and FIS report to show the effects of the following structures:

- The Bear Arroyo Tributary Diversion Structure along Bear Arroyo Tributary approximately 5,600 feet east of Tramway Boulevard;

- The South Pino Tributary Desiltation Pond approximately 2,500 feet downstream (along Bear Arroyo Tributary) of the Bear Arroyo Tributary Diversion Structure;

- The North Bear Arroyo Tributary Desiltation Pond approximately 800 feet south of the South Pino Tributary Desiltation Pond;

- The South Bear Arroyo Tributary Desiltation Pond approximately 500 feet south of the North Bear Arroyo Tributary Desiltation Pond;

- The South Pino Tributary storm drain system from Tramway Boulevard to the South Pino Tributary Desiltation Pond;

- The High Desert Subdivision Phase 1-B-1 storm drain system from Tramway Boulevard to the North and South Bear Arroyo Tributary Desiltation Ponds; and

- The Peppertree Pond just south of Academy Road and approximately 700 feet west of Tramway Boulevard.

- The Bear Canyon storm drain system from Eubank Boulevard to Lowell Street.

This request also incorporated flooding effects at the intersection of Academy Boulevard and Carruthers Road.

All data required to complete our review of this request were submitted with letters from Ms. Brenda Martin, P.E., Water Resources Group, Bohannan-Huston, Inc., and Ms. Calongne.

We have completed our review of the submitted data and the flood data shown on the effective FIRM and FIS report. We have revised the FIRM and FIS report to modify the elevations and floodplain boundary delineations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) along South Pino Tributary from Tramway Boulevard to the South Pino Tributary Desiltation Pond and along Bear Arroyo Tributary from Eubank Boulevard to the Bear Arroyo Tributary Diversion Structure. As a result of the modifications, base flood elevations (BFEs) and a Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, were established for Bear Arroyo Tributary from the South Pino Tributary Desiltation Pond to just upstream of the Bear Arroyo Tributary Diversion Structure. The SFHAs for Bear Arroyo Tributary from Eubank Boulevard to the Bear Arroyo Tributary Diversion Structure and for South Pino Tributary from Tramway Boulevard to the South Pino Tributary Desiltation Pond were removed from the FIRM. SFHAs and BFEs were established for the North and South Bear Arroyo Tributary Desiltation Ponds and the Peppertree Pond. An SFHA and flood depth were established at the intersection of Academy Road and Carruthers Boulevard. The modifications are shown on the enclosed annotated copies of FIRM Panel(s) 35001C0144D, 35001C0161 D, and 35001C0163D; Profile Panel(s) 80P; and affected portions of the Summary of Discharges Table. This Letter of Map Revision (LOMR) hereby revises the above-referenced panel(s) of the effective FIRM and the affected portions of the FIS report, both dated September 20, 1996.

The modifications are effective as of the date shown above. The map panel(s) as listed above and as modified by this letter will be used for all flood insurance policies and renewals issued for your community.

The following table is a partial listing of existing and modified BFEs:

Location	Existing BFE (feet)**	Modified BFE (feet)*
Bear Arroyo Tributary:		
At Lowell Boulevard	1	None
Approximately 800 feet downstream of Bear Arroyo Tributary Diversion Structure	None	6,227
South Pino Tributary:		
Approximately 1,000 feet upstream of Tramway Boulevard	1	None

*Referenced to the National Geodetic Vertical Datum, rounded to the nearest whole foot
**Depth of flow

Public notification of the proposed modified BFEs will be given in the *Albuquerque Journal* on or about August 10 and August 17, 2000. A copy of this notification is enclosed. In addition, a notice of changes will be published in the *Federal Register*. Within 90 days of the second publication in the *Albuquerque Journal*, a citizen may request that FEMA reconsider the determination made by this LOMR. Any request for reconsideration must be based on scientific or technical data. All interested parties are on notice that, until

the 90-day period elapses, the determination to modify the BFEs presented in this LOMR may itself be modified.

Because this LOMR will not be printed and distributed to primary users, such as local insurance agents and mortgage lenders, your community will serve as a repository for these new data. We encourage you to disseminate the information reflected by this LOMR throughout the community, so that interested persons, such as property owners, local insurance agents, and mortgage lenders, may benefit from the information. We also encourage you to prepare a related article for publication in your community's local newspaper. This article should describe the assistance that officials of your community will give to interested persons by providing these data and interpreting the NFIP maps.

We will not physically revise and republish the FIRM and FIS report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel(s) and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This LOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

The basis of this LOMR is, in whole or in part, a culvert project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the culverts rests with your community.

This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and is in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed minimum NFIP criteria. These criteria are the minimum and do not supersede any State or local requirements of a more stringent nature. This includes adoption of the effective FIRM to which the regulations apply and the modifications described in this LOMR. Our records show that your community has met this requirement.

A Consultation Coordination Officer (CCO) has been designated to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Mr. Frank Pagano
Director, Mitigation Division
Federal Emergency Management Agency, Region VI
Federal Regional Center, Room 206
800 North Loop 288
Denton, Texas 76201-3698
(940) 898-5127

FEMA makes flood insurance available in participating communities; in addition, we encourage communities to develop their own loss reduction and prevention programs. Through the *Project Impact: Building Disaster Resistant Communities* initiative, launched by FEMA Director James Lee Witt in 1997, we seek to focus the energy of businesses, citizens, and communities in the United States on the importance of reducing their susceptibility to the impact of all natural disasters, including floods, hurricanes, severe storms, earthquakes, and wildfires. Natural hazard mitigation is most effective when it is planned for and implemented at the local level, by the entities who are most knowledgeable of local conditions and whose economic stability and safety are at stake. For your information, we are enclosing a copy of a pamphlet describing this nationwide initiative. For additional information on *Project Impact*, please visit our Web site at **www.fema.gov/impact**.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the CCO for your community at the telephone number cited above. If you have any questions regarding this LOMR, please contact the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Katie Hayden

Katie Hayden, Program Specialist
Hazards Study Branch
Mitigation Directorate

For: Matthew B. Miller, P.E., Chief
Hazards Study Branch
Mitigation Directorate

Enclosures

cc: Ms. Susan M. Calongne, P.E.
City/County Floodplain Administrator
City of Albuquerque/Bernalillo County

Mr. Howard C. Stone, P.E.
Vice President
Water Resources Group
Bohannan-Huston, Inc.

Ms. Brenda Martin, P.E.
Water Resources Group
Bohannan-Huston, Inc.

CHANGES ARE MADE IN DETERMINATIONS OF BASE FLOOD ELEVATIONS FOR THE CITY OF ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO, UNDER THE NATIONAL FLOOD INSURANCE PROGRAM

On September 20, 1996, the Federal Emergency Management Agency identified Special Flood Hazard Areas (SFHAs) in the City of Albuquerque, Bernalillo County, New Mexico, through issuance of a Flood Insurance Rate Map (FIRM). The Mitigation Directorate has determined that modification of the elevations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) for certain locations in this community is appropriate. The modified base flood elevations (BFEs) revise the FIRM for the community.

The changes are being made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and are in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65.

A hydraulic analysis was performed to incorporate the effects of the Bear Arroyo Tributary Diversion Structure along Bear Arroyo Tributary approximately 5,600 feet east of Tramway Boulevard; the South Pino Tributary Desiltation Pond approximately 2,500 feet downstream of the Bear Arroyo Tributary Diversion Structure; the North Bear Arroyo Tributary Desiltation Pond approximately 800 feet south of the South Pino Tributary Desiltation Pond; the South Bear Arroyo Tributary Desiltation Pond approximately 500 feet south of the North Bear Arroyo Tributary Desiltation Pond; the Peppertree Pond just south of Academy Pond and approximately 700 feet west of Tramway Boulevard; the South Pino Tributary, High Desert Subdivision Phase 1-B-1, and Bear Canyon storm drain systems; and flooding effects at the intersection of Academy Boulevard and Carruthers Road. This has resulted in establishment of BFEs and an SFHA for Bear Arroyo Tributary from the South Pino Tributary Desiltation Pond to just upstream of the Bear Arroyo Tributary Diversion Structure, removal of the SFHAs for Bear Arroyo Tributary from Eubank Boulevard to the Bear Arroyo Tributary Diversion Structure and for South Pino Tributary from Tramway Boulevard to the South Pino Tributary Desiltation Pond, establishment of SFHAs and BFEs for the North and South Bear Arroyo Tributary Desiltation Ponds, and establishment of an SFHA and flood depth at the intersection of Academy Boulevard and Carruthers Road. The table below indicates existing and modified BFEs for selected locations along the affected lengths of the flooding source(s) cited above.

Location	Existing BFE (feet)**	Modified BFE (feet)*
Bear Arroyo Tributary:		
At Lowell Boulevard	1	None
Approximately 800 feet downstream of Bear Arroyo Tributary Diversion Structure	None	6,227
South Pino Tributary:		
Approximately 1,000 feet upstream of Tramway Boulevard	1	None

*National Geodetic Vertical Datum, rounded to nearest whole foot
**Depth of flow

Under the above-mentioned Acts of 1968 and 1973, the Mitigation Directorate must develop criteria for floodplain management. To participate in the National Flood Insurance Program (NFIP), the community must use the modified BFEs to administer the floodplain management measures of the NFIP. These

modified BFEs will also be used to calculate the appropriate flood insurance premium rates for new buildings and their contents and for the second layer of insurance on existing buildings and contents.

Upon the second publication of notice of these changes in this newspaper, any person has 90 days in which he or she can request, through the Chief Executive Officer of the community, that the Mitigation Directorate reconsider the determination. Any request for reconsideration must be based on knowledge of changed conditions or new scientific or technical data. All interested parties are on notice that until the 90-day period elapses, the Mitigation Directorate's determination to modify the BFEs may itself be changed.

Any person having knowledge or wishing to comment on these changes should immediately notify:

The Honorable Jim Baca
Mayor, City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

RANCHITOS AVENUE
PINO AVENUE
ZONE AO
(DEPTH 1)
SAN FRANCISCO ROAD
CORONADO AVENUE
ZONE AE
(EL 6016)
ZONE AO
(DEPTH 2)
DEL REY AVENUE
SANTA MONICA AVENUE
TENNYSON STREET
TRAM TERRACE COURT
TRAMWAY BOULEVARD
CALLE DE RAPHAEL
100 - YEAR FLOOD CONTAINED IN CULVERT
SAN RAFAEL AVENUE
ZONE AO
(DEPTH 1)
ZONE AE
(EL 6058)
QUAIL RUN DRIVE
TRAMWAY TERRACE PLACE
QUAIL RUN LOOP
QUAILWOOD DR
QUAIL RUN COURT
QUAIL RUN DRIVE
TERRACE LOOP South
LANE AVENUE
DEER DRIVE
BOBCAT BOULEVARD
Concrete Channel
Arroyo De
ZONE AO
(DEPTH 3)
ZONE AO
(DEPTH 1)
ZONE AO
(DEPTH 2)
Baca Domingo
ZONE AO
(DEPTH 2)
DRIVE
ZONE X
MARIGOLD DRIVE
LOOP
LAUREL PLACE
LAUREL
BOBCAT PLACE
MORNING GLORY ROAD
BOULEVARD
BLUEBELL DRIVE
HONEYSUCKLE DRIVE
BOBCAT
AVENUE
RAFAEL
SAN RAFAEL PLACE
BLUEBELL PLACE
SAN RAFAEL COURT
GOLDEN ROD DRIVE
ROAD
ZONE AO
(DEPTH 2)
Rino
MARIGOLD DRIVE
ROCKROSE
ARROYO
ZONE AO
(DEPTH 3)
EAGLE RIDGE ROAD
EAGLE RIDGE TERRACE
EAGLE RIDGE DR
EAGLE RIDGE LANE
EAGLE RIDGE PLACE
EAGLE RIDGE COURT
BERNALILLO COUNTY
CITY OF ALBUQUERQUE
RM32
ZONE AO
(DEPTH 1)
ZONE AO
(DEPTH 3)
ZONE AO
(DEPTH 3)
ZONE AO
(DEPTH 1)
REVISED AREA
AREA REVISED BY LOMR DATED MAY 2, 1997
ZONE AE
(EL 6016)
ZONE AE
(EL 5970)
ZONE X
100 - YEAR FLOOD CONTAINED IN STORM DRAIN
ZONE AE
(EL 6150)
ZONE AE
(EL 6158)
ZONE X
CITY OF ALBUQUERQUE
350002
JOINS PANEL 0163

NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 11 NORTH AND RANGE 4 EAST.

APPROXIMATE SCALE IN FEET
500 0 5

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO AND INCORPORATED AREAS

PANEL 161 OF 825
(SEE MAP INDEX FOR PANELS NOT PRINTED)

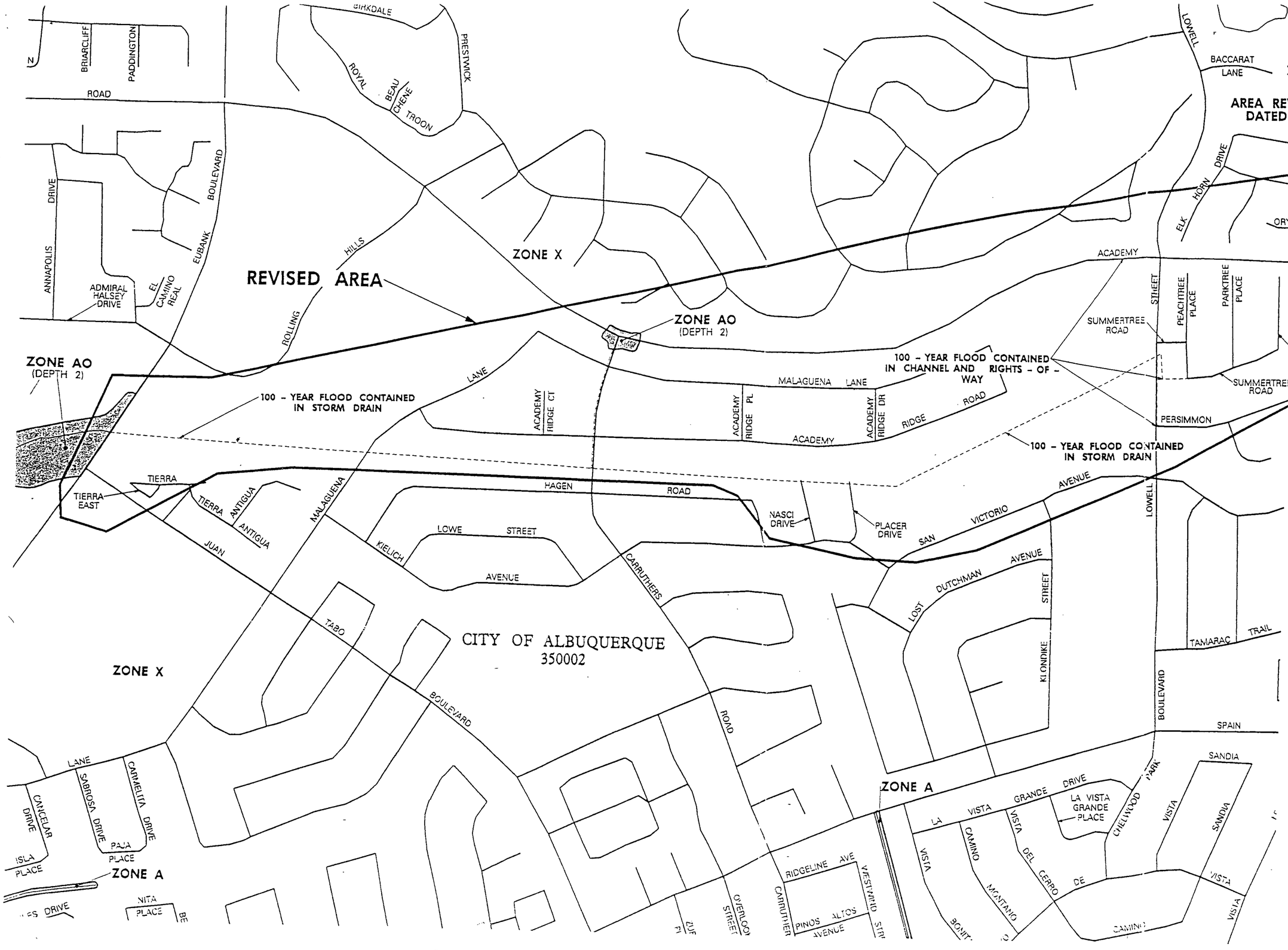
CONTAINS COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0161	D
BERNALILLO COUNTY	350067	0161	D

REVISED TO REFLECT LOMR DATED JUL 13 2000

MAP NUMBER
35001C0161 D

EFFECTIVE DATE:
SEPTEMBER 20, 1996

Federal Emergency Management Agency



NATIONAL FLOOD INSURANCE PROGRA

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY,
NEW MEXICO AND
INCORPORATED AREA

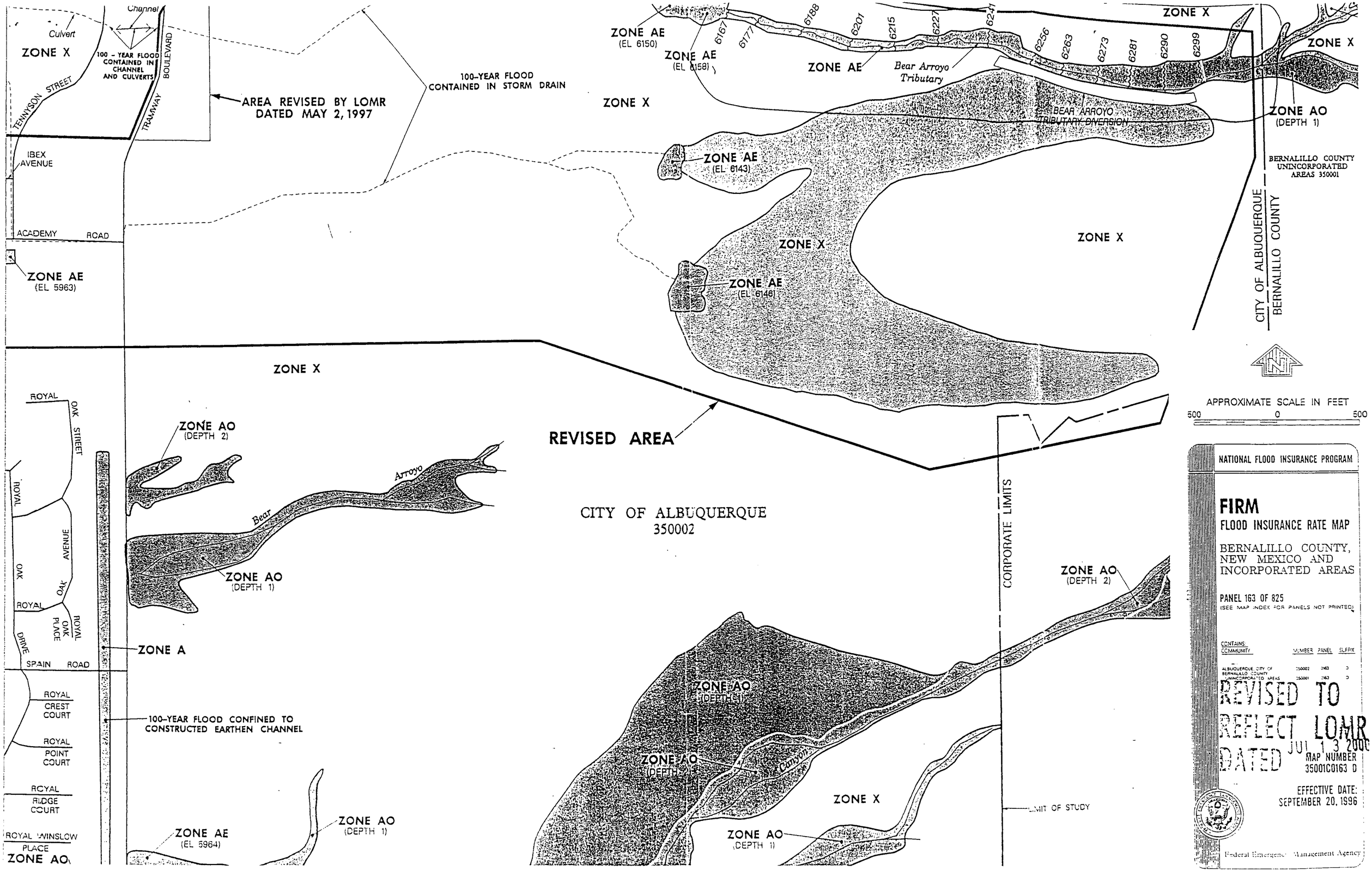
PANEL 144 OF 825
(SEE MAP INDEX FOR PANELS NOT PRINTED

COMMUNITY	NUMBER	PANEL	SUFF
ALBUQUERQUE, CITY OF	350002	0144	D

REVISED TO
REFLECT LOM
DATED JUL 1 3 20
MAP NUMBE
35001C0144 D

EFFECTIVE DATE:
SEPTEMBER 20, 1996

Federal Emergency Management Agenc



NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO AND INCORPORATED AREAS

PANEL 163 OF 825

(SEE MAP INDEX FOR PANELS NOT PRINTED)

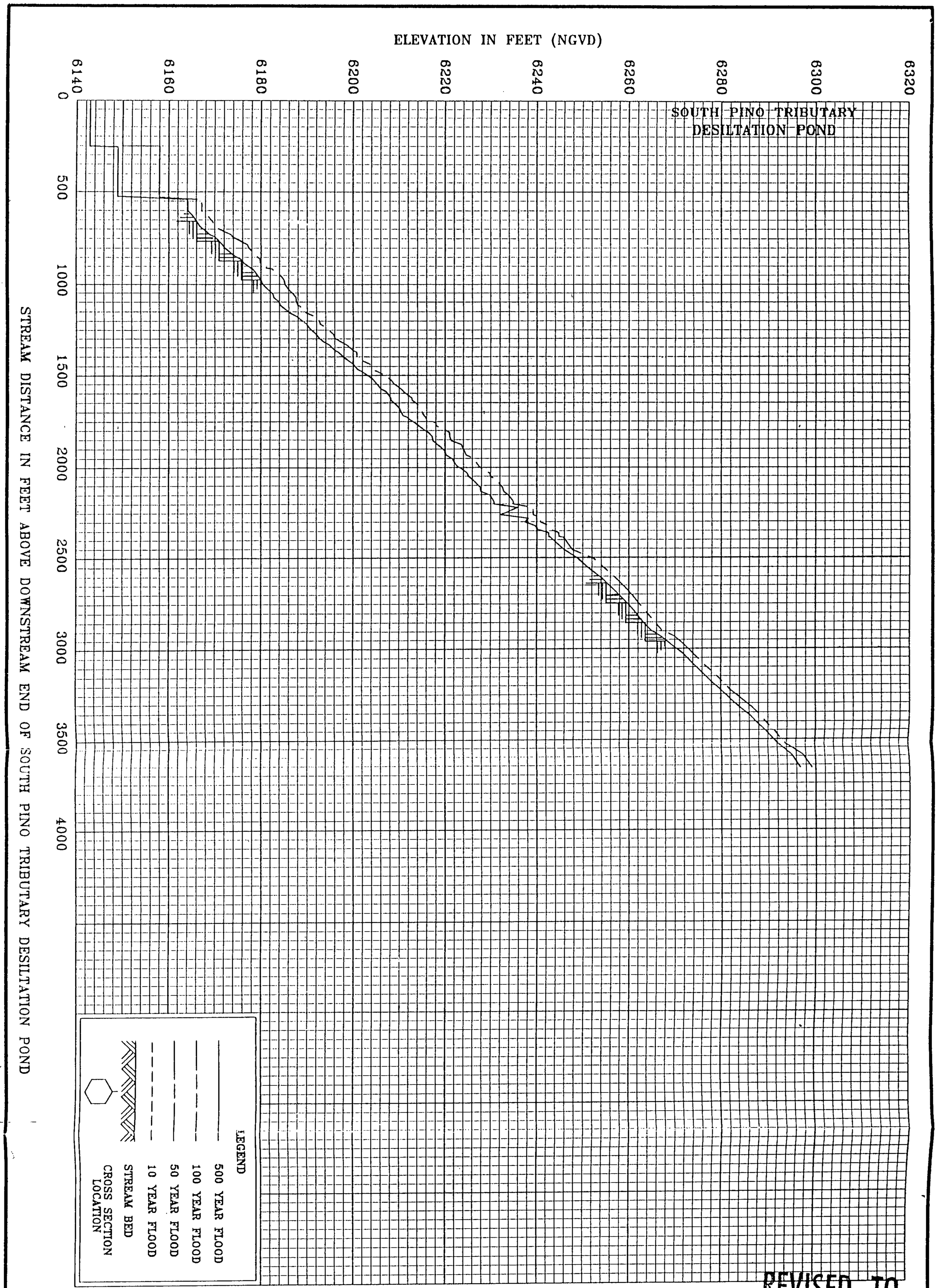
CONTAINS COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0163	D
BERNALILLO COUNTY UNINCORPORATED AREAS	350001	0163	D

REVISED TO REFLECT LOMR DATED JUL 13 2000

MAP NUMBER
35001C0163 D

EFFECTIVE DATE:
SEPTEMBER 20, 1996

Federal Emergency Management Agency



REVISED TO REFLECT LOMR DATED JUL 13 2000

80P

FEDERAL EMERGENCY MANAGEMENT AGENCY

BERNALILLO COUNTY, NM

AND INCORPORATED AREAS

FLOOD PROFILES

BEAR ARROYO TRIBUTARY

Table 3. Summary of Discharges for Shallow Flooding Areas

Flooding Source and Location	Drainage Area (square miles)	100-Year Peak Discharges (cfs)
Amole Arroyo[1]		
Above Dam	4.9	1,456
At Dam Outfall	4.9	80
Just East of Diversion Dike	0.96	477
At confluence with Sacate Blanco Arroyo	1.54	609[3]
Bear Canyon Arroyo[2]		
At outflow of Juan Tabo Dam	9.7	1,930
At Eubank & confluence with Bear Arroyo	10.48	1,948
Bear Arroyo[2]		
At Juan Tabo Boulevard	0.26	159
At confluence with Bear Canyon Arroyo	0.40	149
At Wyoming Boulevard	12.09	1,957
At inflow to Arroyo Del Oso Dam	15.00	2,159
Bear Arroyo Tributary		
Upstream of Bear Arroyo Tributary Diversion Structure	0.73	1,330
At Juan Tabo Boulevard[2]	1.87	1,400
At Wyoming Boulevard[2]	2.41	1,520
Black Arroyo		
Black Arroyo Dentention Dam Inflow	9.86	5,357
Black Arroyo Detention Dam Outflow	9.86	2,468
Boca Negra Arroyo[1]		
Just West of Atrisco Drive	2.12	894
At confluence with South Branch	4.38	1,653

REVISED DATA

[1]Flows from Matotan, 1975
[2]Flows from Northeast Heights Drainage Management Plan - Leonard Rice - April 1975
[3]By Regression Analysis

REVISED TO REFLECT LOMR DATED JUL 13 2000

Federal Emergency
Management Agency

Office of Emergency Information and Media Affairs, Washington, D.C. 20472

(202) 646-4600

FACT SHEET

PROJECT IMPACT
Building a Disaster Resistant Community

BACKGROUND

PROJECT IMPACT is an initiative developed by FEMA Director James Lee Witt to challenge the country to undertake actions that protect families, businesses and communities by reducing the effects of natural disasters. This initiative includes a national awareness campaign, the selection of pilot communities that demonstrate the benefits of hazard mitigation through a partnership approach, and an outreach effort to businesses and communities using a new guidebook that offers a formula for a community or business to follow to become disaster resistant.

RATIONALE

The increasing number and severity of natural disasters the past decade demands that action be taken to reduce the threat that hurricanes, severe storms, earthquakes, floods and wildfires impose upon the economic stability, economic future and safety of the citizens of the U.S. As the federal agency responsible for emergency management, FEMA is committed to reducing disaster losses by focusing the energy of businesses, citizens, and communities in the U.S. on the importance of reducing their susceptibility to the impact of natural disasters.

There are three primary tenets of the PROJECT IMPACT initiative:

- *Mitigation is a local issue.* It is best addressed by a local partnership that involves government, businesses and private citizens.

- *Private sector participation is essential.* Disasters threaten the economic and commercial growth of our cities, towns, villages and counties. Without the participation of the private sector, comprehensive solutions will not be developed.

- *Mitigation is a long-term effort that requires long-term investment.* Disaster losses will not be eliminated overnight.

PILOT COMMUNITIES

Director Witt and FEMA have worked closely with seven communities throughout the U.S. to develop a PROJECT IMPACT plan that localities, businesses and citizens can follow to build disaster resistant communities where they live and work. Director Witt will participate in events in each of these communities to congratulate them on their foresight, commitment, and contribution to a disaster resistant nation.

PROJECT IMPACT GUIDEBOOK

The guidebook presents that steps a community can take to become disaster resistant. It also provides examples of the actions and resources available to accomplish this goal.