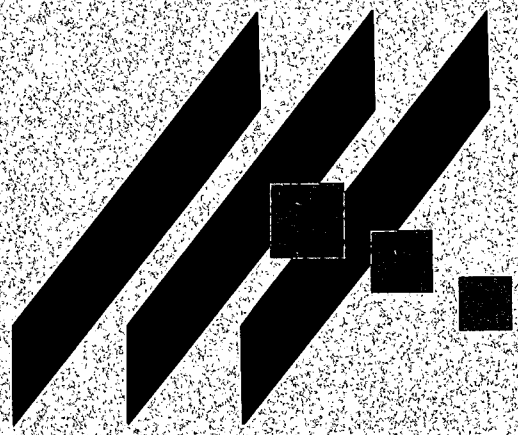
MKEC ENGINEERING CONSULTANTS, INC



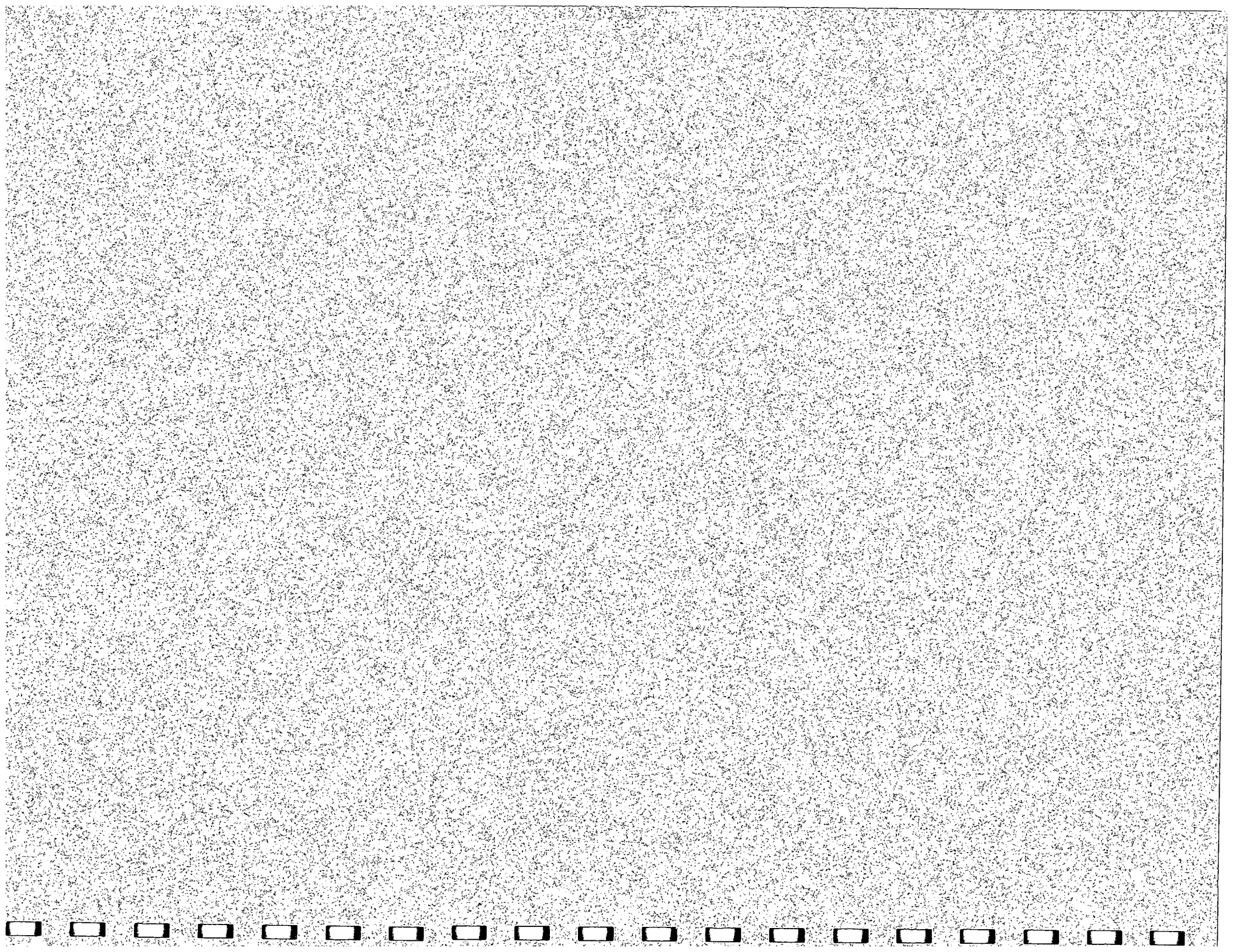
DRAINAGE REPORT

FOR

VOICESTREAM ADDITION

APRIL 2002

411 N. WEBB ROAD • WICHITA, KS 67206 • 316-684-9600 • FAX 316-684-5100



Drainage Report for the Voicestream Addition

Location

The site lies in the East Half of Section 1, Township 27 South, Range 1 East. The site is located at the intersection of Woodlawn Avenue and Mainsgate Road. The total site area is approximately 9.9 acres. The area of the site that will develop is 3.9 acres.

Soils

According to the NRCS (SCS) Sedgwick County Soil Survey, shown in Appendix A, the drainage watershed is Rosehill Silty Clay with 1 to 3 percent slopes (Rd), Farnum Loam with 1 to 3 percent slopes (Fb), and Elandco Silt Loam, frequently flooded (Ec) in the drainage channel west of the site. The Hydrological Soil Group (HSG) to select runoff coefficients is "C".

Pre-Developed Condition

Current Development
The site is developed as an office building with parking lots east and west of the building. The north portion of the site is 3.9 acres of undeveloped land. The site is shown in Appendix B.

Current Landform and Slope
The slopes in the area range from 1.0% to 2.5%. The site in relation to the watershed boundary is shown in Appendix C. Elevations vary from 185 on the east to 168 in the channel. A natural channel known as Crooked Creek crosses the West portion of the site.

Current Runoff Characteristics
An existing storm water system controls runoff from the developed portion of the site. An inlet in the Northwest corner of the developed area drains runoff from the west parking lot into a natural channel west of the site. The undeveloped portion of the site sheet flows towards the drainage channel. About 190 acres has drained into the channel when it passes the site. No portion of the site is included in a regulatory floodplain, shown in Appendix D (FBFM Panel 15, Wichita, Kansas, May 15, 1986.) The nearest 100-year flood boundary is ¾-mile Northwest of the site.

Post-Developed Condition

Proposed Development

A new parking lot is proposed for this site in the undeveloped area to the North, as shown in appendix E. The parking lot will contain approximately 250 parking spaces. The existing building and parking lot will remain the same.

Proposed Landform and Slope

The proposed site will have slopes ranging from 0.8% to 1.2%. The new parking lot will drain to the northwest through a curb inlet that will empty into the channel.

Proposed Runoff Characteristics

The inlet at the Northwest corner of the existing parking lot will be replaced with a curb inlet to accommodate a driveway between existing and proposed parking lots. All other aspects of the existing storm water system will remain the same. A new curb inlet and storm water pipe will carry runoff from the proposed parking lot to the channel in a 2-year event. For larger storms, the runoff will overtop the curb and sheet flow into the channel. The rational method was used to determine runoff for the site. The spreadsheet in Appendix F displays the area, runoff coefficient (c), time of concentration (t_c), and the flowrate (Q) for the site, for the 2, 5, 10, and 100-year events. Table 1 shows the runoff of the new parking lot before and after construction. Table 2 shows the increase in runoff in Crooked Creek after construction of the parking lot. The watershed for Crooked Creek is large enough that the new parking lot has very little effect.

Table 1. Parking lot runoff.

	2-Year (cfs)	5-Year (cfs)	10-Year (cfs)	100-Year (cfs)
Pre-developed	1.54	2.14	3.38	7.98
Post-developed	6.95	8.75	10.72	16.10

Table 2. Crooked Creek runoff.

	2-Year (cfs)	5-Year (cfs)	10-Year (cfs)	100-Year (cfs)
Pre-developed	199.80	260.45	358.64	659.47
Post-developed	205.21	267.06	365.98	667.59

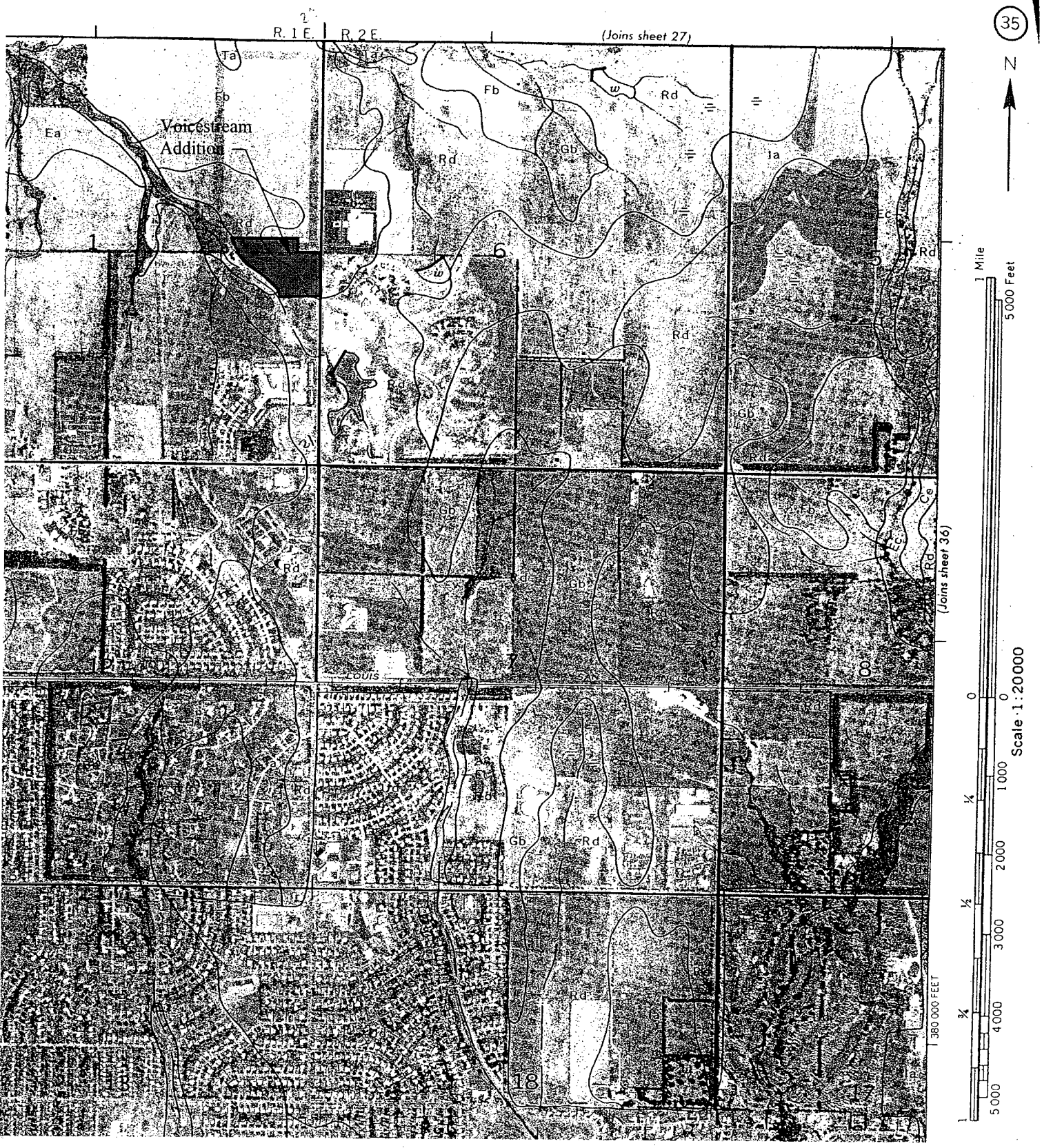
Summary

This site currently has a building and parking lot. A new parking lot is proposed for the site. The new parking lot will increase runoff from the site by about 5 cfs in the 2-year event and 8 cfs for the 100-year event. When Crooked Creek passes this site to the west, 190 acres has drained into it. The increase in runoff due to this parking lot, shown in Table 2, is negligible due to the size of the watershed.

Appendix A

(SCS) Sedgwick County Soil Survey

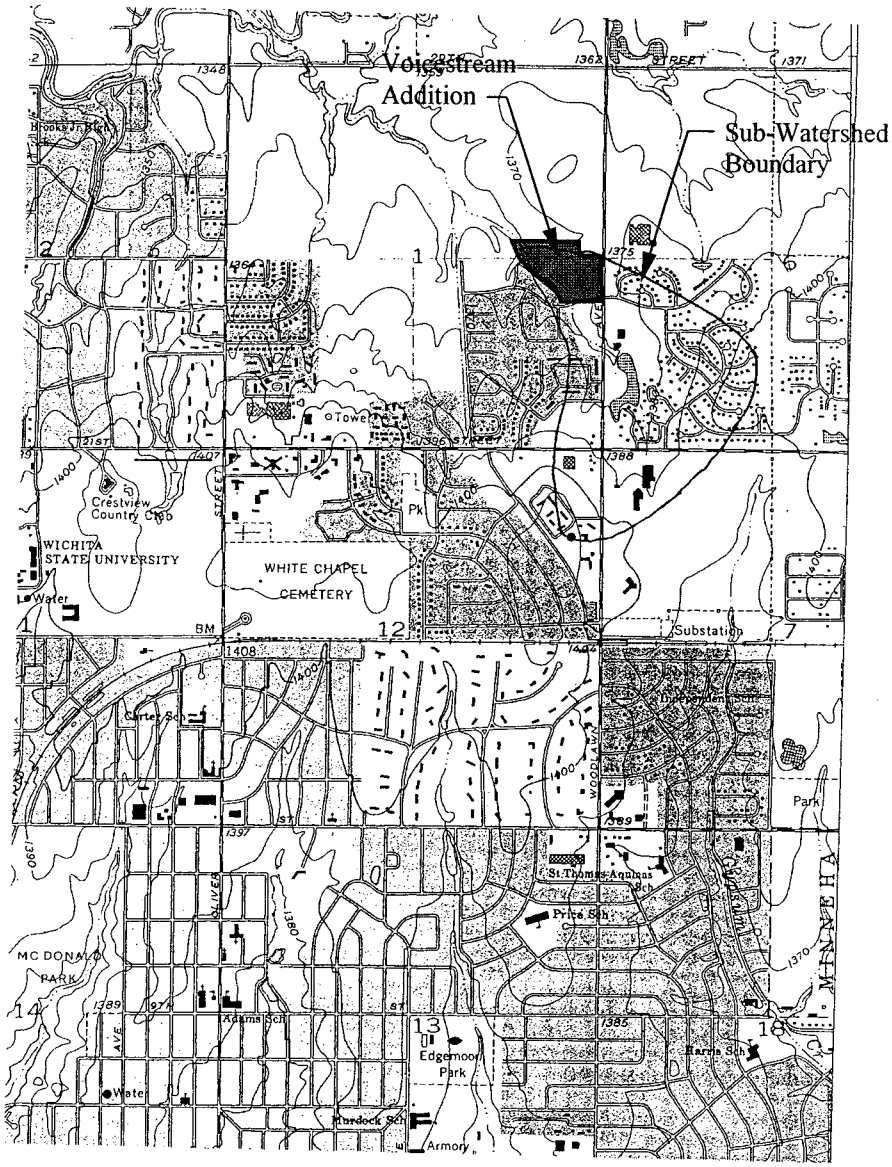
SHEET NUMBER 35



Appendix B

Appendix C

WICHITA EAST QUADRANGLE, Kansas
United States
Department of the Interior
Geological Survey



SCALE 1:24 000

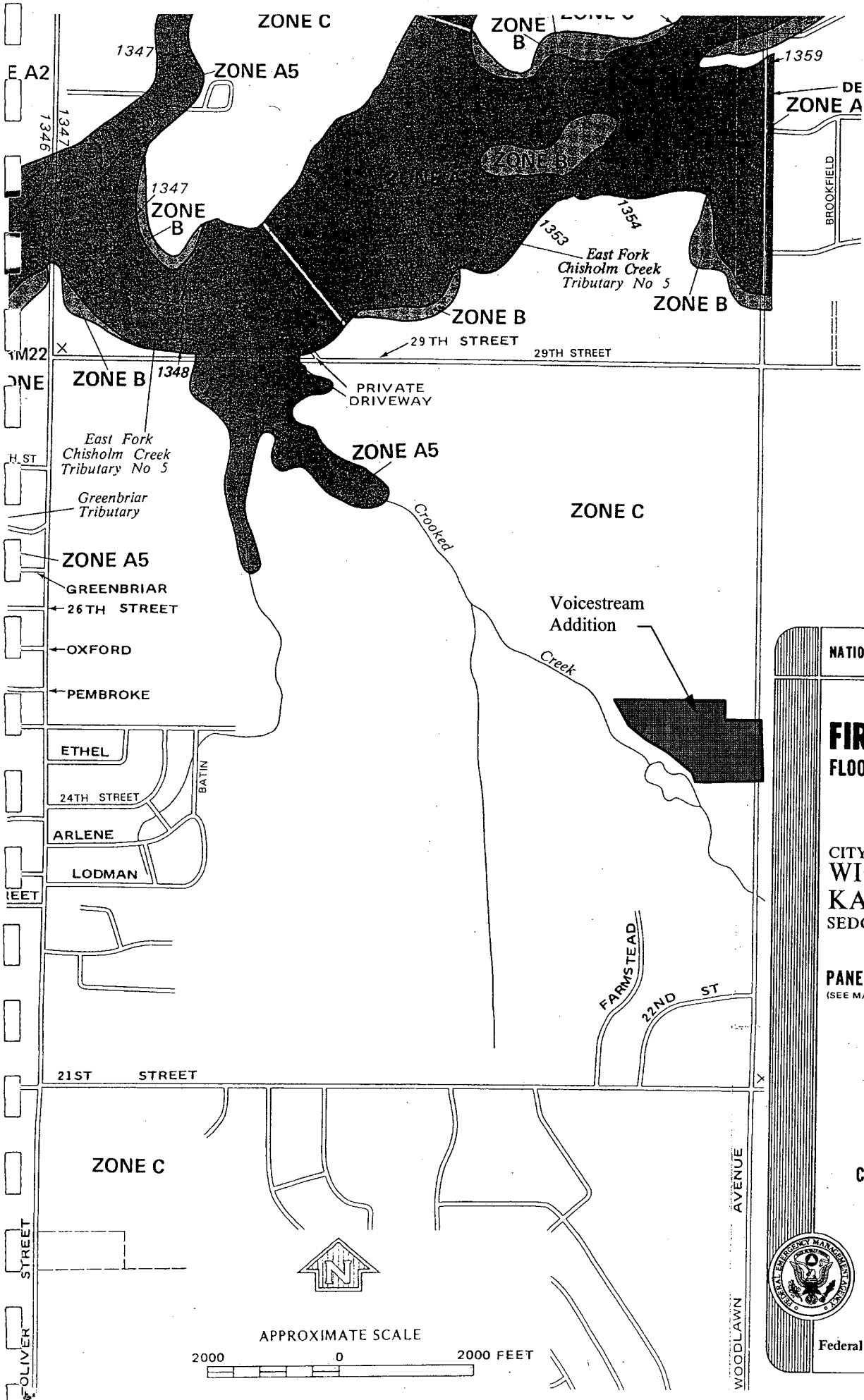
1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

Appendix D



NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CITY OF
WICHITA,
KANSAS
SEDGWICK COUNTY

PANEL 15 OF 40
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
200328 0015 B

EFFECTIVE DATE:
MAY 15, 1986

Federal Emergency Management Agency

Appendix E

Appendix F

4/19/02

DRAINAGE ANALYSIS SUMMARY
VOICESTREAM ADDITION
Rosehill Silty Clay, Farnum Loam, & Elandco Silt Loam - Soil Group C

Area ID	Area ac	Accum. Area ac	C2	C5	C10	C100	Elev Max	Elev Min	Flow Length	Tc2 Calc	Avg V2	Tc5 Calc	Avg V5	Tc10 Calc	Avg V10	Tc100 Calc	vg V100	Tc2 min	Tc5 min	Tc10 min	Tc100 min	I2 in/hr	I5 in/hr	I10 in/hr	I100 in/hr	Q2 cfs	Q5 cfs	Q10 cfs	Q100 cfs
Parking Lot																													
Pre-Developed	2.6		0.26	0.29	0.37	0.53	184.5	175.0	780	39.54	0.33	38.13	0.34	34.36	0.38	26.83	0.48	40	38	34	27	2.28	2.84	3.51	5.79	1.54	2.14	3.38	7.98
Post - Developed	2.6		0.74	0.76	0.79	0.84	184.0	175.0	780	17.25	0.75	16.30	0.80	14.86	0.87	12.46	1.04	17	16	15	15	3.81	4.43	5.22	7.37	6.95	8.75	10.72	16.10
Crooked Creek Watershed																													
Pre-Developed	190.0		0.44	0.46	0.52	0.61	222.0	175.0	1800	36.60	0.82	35.49	0.85	32.17	0.93	27.18	1.10	37	35	32	27	2.39	2.98	3.63	5.69	199.80	260.45	358.64	659.47
Post - Developed	190.0																									205.21	267.06	365.99	667.59