

SPARTANBURG COUNTY POTENTIAL FLOOD DAMAGE ASSESSMENT

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working under contract with the S.C. Water Resources Commission.**

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NOTE: Flood Insurance Rate Maps and Floodway Boundary Maps showing location of structures are separately bundled. *(See Soil Conservation Service)*

SUMMARY OF RESULTS

During March, 1985, Potential Flood Damage Areas were inspected by windshield survey and structures found to be possibly at risk were evaluated for potential damages. The appendix contains the survey sheets by tributary/reach and indicates the characteristics of the structures and the potential damages. These sheets refer to the (attached) Floodway Maps for location of the structures. Table 1 presents a summary of the results.

As can be seen from the summary, potential flood damage is limited primarily to small areas of residential structures.

Table 1. Spartanburg County Flood Damage Assessment Summary

RIVER	TRIBUTARY/REACH	MAP#	#OF STRUCTURES	\$ DAMAGE	DAMAGE FACTOR
Lawson's Fork	E. Main to Fernwood Dr.	4	13	79,300	1.03
Lawson's Fork	Eastwood Drive	7	3	76,850	.23
Fairforest Creek	Tributary F-2	6	9	39,300	.35
N. Tyger River	Ransom Creek	151	9	29,500	.27
Fairforest Creek	Williams Branch	5 & 6		3	28.900 .9
Lawson's Fork	North Fork	79	5	28,100	.14
Lawson's Fork	Halfway Branch	91	1	7,250	.7
Lawson's Fork	US 221 to Archer Rd.	87	2	5,800	.12
Fairforest Creek	Farley Branch	2	2'	5,050	.10
Lawson's Fork	South Fork	94	1	3,900	.4
Fairforest Creek	Gooch Street	3	4	2,000	.8

$$\text{Damage Factor} = (\# \text{ of structures} \times \text{damages}) / 10,000$$

WORKPLAN

SPARTANBURG COUNTY POTENTIAL FLOOD DAMAGE ASSESSMENT

Purpose:

To identify and assess potential damage to structures located within or adjacent to the 100-year Flood Boundaries throughout Spartanburg County, South Carolina.

Preliminary Preparations:

1. Discuss methodology and end-producer with USDA Soil Conservation Service and South Carolina Water Resources Commission.
2. Collect and cross-reference study maps.
3. Develop forms and methodology for study.
4. Make preliminary reconnaissance of study area.

Workplan:

1. Survey all Flood Hazard areas in Spartanburg County visually accessible by vehicle.
 - a. Identify structures within the 100-year Flood Boundary as shown on FIRM or Floodway maps.
 - b. Evaluate structure characteristics, (adopted from SCS Technical Guide #21).
 - c. Estimate 100-year Flood level in relation to 1st floor level of the structure using hand level.

- d. Assess potential damage to structures using tables adapted from SCS Technical Guide #21.

2. Survey Time Phasing.

- a. Study area will be surveyed one FIRM or Floodway map panel at a time
- b. As panel (areas) are completed, data will be written up and turned into SCWRC in draft form
- c. Status reports will be turned into SCWRC once every two weeks, including work completed and work expected to be completed in the succeeding two weeks.
- d. Quality control sampling will be conducted by SCWRC personnel as and when considered necessary
- e. A Final Report of the study including maps, data sheets, tables and summary will be completed before March 22, 1985--tables will list and summarize potential damage assessments by hydrologic basins and stream segments and will consist of reference numbers to location of structures on FIRM or Floodway maps, characteristics of the structure depth of 100-year flood levels in relation to 1st flood levels of the structures and estimated potential damage to structures

FLOOD DAMAGE ASSESSMENT PARAMETERS

RESIDENTIAL AND COMMERCIAL PROPERTY

Methodology:

A methodology was developed based on Floodway Damage Estimates Residential and Commercial Property, EWP Technical Guide No. 21 Supplement 1, (Fort Worth: South Regional Technical Service Center, USDA, SCS, December 1970).

Description Parameters were modified to reflect current increased values and more recent construction factors.

A field inventory worksheet, "Field Inventory of Property in Flood Area" (Fig. 1) is used to establish estimates of damages from updated damage data (Table 2).

The property classification parameters for the "Field Inventory" are as follows:

1. Type of Property:

Residential property

RFS - Frame, Stucco

RBV - Brick Veneer

RM - Masonary

MH - Mobile Home

Figure 1. Survey Sheet Format

_____ County Flood Area Property Inventory

Basin # _____ River _____ Tributary/Reach _____

FIRM/Floodway panel # _____ Date Surveyed _____

Structure # (Refer to map)	100 yr. Flood Elevation in reference to 1st Floor (in feet)	TYPE	CLASS	Stories	Basement?	Size	Furnishing Class	Yard Damage or Bus. Type	Estimated Damage
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Commercial property

Classified by size and business type

Com, Size, Type

2. Class - structures are classified by value

Residential

Class "C" - less than \$50,000

Class "B" - \$50,000 to \$99,000

Class "A" - more than \$100,000

Mobile Homes

Class "MH" - Double wide 24 x 50 - \$24,400

Extra long - 14 x 70 - \$21,560

Long - 12 x 60 - \$12,200

Small - 55 - \$8,000

3. Stories

Residences are classified as to the number of stories. The classifications included are one story, 1-1/2 stories, 2 stories, and split level houses. Each family unit of a semi-detached or duplex residence should be treated as a detached residence and appraised accordingly.

For other properties, include only that portion of the building used for commercial operations; a 2 story building with a store on the first floor and a residence on the second floor will be 1 story for the purpose of commercial appraisals.

For other properties than residential, this column may also be used to indicate wood flooring or concrete.

4. Basement

All buildings except mobile homes (Class MH) are classified as with or without basements.

5. Size

The size of a building is based on its plan area. However, due to the infinite number of building sizes, it is felt that sufficient accuracy can be achieved by using three basic sizes - small, average and large - for each type of residential building. Non residential buildings are sized by square dimensions, i.e. "20 x 30".

6. Yard Damage or Business Type

Additional damage to the building is calculated in terms of additional items that may be incurred in the building if flooded. Types of additional damage that may be included are listed below:

Yard damage	- \$ 300
Temporary evacuation cost	- \$ 500
Building Cleanup	- \$ 500
Damage to cars	- \$1000
Probability of car damage	- \$ 25
Other damage	- \$ 200

Total additional damage: $300+500+500+1000(0.25)+200 = \$1,750$

Source: Detailed Project Report, Brushy Creek, (May 1982, USA CORP)

The process of assessing yard damage was simplified for the purposes of this study by identifying three (3) levels of severity:

Minor damage:	\$ 500 or less
Moderate damage:	\$ 501 to \$1,000
Major damage:	\$1,001 to \$1,750

Minor damage implies damage to some landscaping and miscellaneous cleanup and replacement costs

Moderate damage implies more extensive damage to landscaping, fences, yard furniture and equipment

Major damage extensive yard and vehicle damage or damage to outbuildings

7. Furnishings

Furnishings are divided into three classifications: High, Average, and Low. The exterior appearance of a building is assumed to indicate the relative value of the furnishings within. Buildings which are old and in poor condition have a generally slovenly appearance and may be expected to contain furnishings of comparatively low value; whereas immaculately maintained properties probably contain furnishings of comparatively high value.

The following should be kept in mind when filling in the Appraisal Sheet. If necessary, break the properties into two or more separate establishments, such as, a motel with a large restaurant. Use as many additional lines as is necessary for remarks or explanations. Such additional data will facilitate office analysis.

The generalized damages shown in Table 2 are for average size residential buildings and contents with average furnishings based on the class of the residence, the number of stories, and if the residence has a basement.

Table 3 provides adjustment factors to be used to adjust the damages in Table 2 depending on the size of the buildings and the classification of the furnishings. The factor is the percentage above or below that listed in Table 2 for structures with other than average Class (B), size or furnishings.

Table 2. Flood Damage Estimates.

100 Years Flood Level in Reference to 1st Floor Level of Structure

Class	Stories	Base- ment	Size	Furnish- ings	1st																		
					-8	-7	-6	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10
A	1	Yes	Av	A	3.6	8.1	12.4	15.0	16.4	17.3	17.9	18.6	27.4	39.4	52.2	62.2	67.5	69.9	71.4	72.7	73.1	81.4	84.6
A	1	No	Av	A	-	-	-	-	-	.2	.5	.7	8.1	18.7	33.6	45.7	51.7	54.2	55.6	56.9	57.4	65.7	69.3
A	1 1/2	Yes	Av	A	2.9	6.7	10.2	11.9	12.6	13.5	14.1	14.8	21.0	30.0	38.8	46.0	49.6	51.7	53.2	54.4	54.9	61.8	66.7
A	1 1/2	No	Av	A	-	-	-	-	-	.2	.5	.7	5.5	13.1	23.9	33.2	37.6	39.8	41.3	42.4	42.9	49.9	54.7
A	2	Yes	Av	A	3.3	7.8	12.1	14.7	16.1	16.9	17.6	18.3	24.6	32.4	37.6	42.1	45.0	47.4	48.5	49.6	49.8	58.0	62.3
A	2	No	A	A	-	-	-	-	-	.2	.5	.7	5.6	12.1	19.3	25.9	29.5	32.0	33.1	34.2	34.4	42.5	46.9
B	1	Yes	A	A	-	1.5	2.6	3.6	4.8	5.6	6.2	6.8	11.6	19.8	27.7	34.6	37.8	39.3	40.5	41.5	41.9	47.5	49.5
B	1	No	A	A	-	-	-	-	-	.1	.2	.3	5.2	11.9	20.5	28.1	31.7	33.2	34.4	35.4	35.8	41.3	43.7
B	1 1/2	Yes	A	A	-	1.1	1.9	2.9	3.4	3.8	4.1	4.7	8.2	14.5	20.6	26.2	28.5	29.9	31.0	32.0	32.2	37.6	39.9
B	1 1/2	No	A	A	-	-	-	-	-	.1	.2	.3	3.8	8.7	15.4	21.7	24.5	25.9	26.9	27.9	28.2	33.6	35.8
B	2	Yes	A	A	-	1.5	2.8	4.1	5.1	5.9	6.3	6.6	9.9	15.4	19.4	22.8	24.7	26.0	27.0	27.7	27.8	33.2	36.1
B	2	No	A	A	-	-	-	-	-	.1	.2	.3	3.7	7.8	12.4	16.4	18.9	20.1	21.2	21.9	22.0	27.4	30.2
C	1	Yes	A	A	-	-	.7	1.2	1.6	2.4	2.8	3.0	4.9	7.0	9.7	11.7	13.8	14.4	14.8	15.2	15.3	17.6	18.4
C	1	No	A	A	-	-	-	-	-	.1	.2	.2	2.9	4.6	7.5	9.8	12.3	12.9	13.3	13.7	13.8	16.1	17.0
C	1 1/2	Yes	A	A	-	-	.7	1.2	1.6	2.4	2.8	3.0	4.9	7.0	8.9	10.6	12.0	12.5	13.0	13.5	13.6	16.6	18.3
C	1 1/2	No	A	A	-	-	-	-	-	.1	.2	.2	2.9	4.2	6.7	8.6	10.5	11.0	11.5	12.0	12.1	15.1	16.8
C	2	Yes	A	A	-	-	.7	1.2	1.6	2.4	2.8	3.0	4.9	7.0	7.7	8.9	9.9	10.5	10.8	11.3	11.3	14.3	15.5
C	2	No	A	A	-	-	-	-	-	.1	.2	.2	2.9	3.7	5.5	6.9	8.4	8.9	9.3	9.7	9.8	12.8	15.5

¹In thousands of dollars

NOTE: Estimates based upon EWP Technical Guide No. 21 Supplement 1 Table #1A updated by Engineering News Report Factor of 4.6.

Table 2. Continued

100 Year Flood Level In Reference to 1st Flood Level

Class	Size	Form	-1	0	+1	+2	+3	+4	+5	+6	+7	+8	+9
MH	DW	A	.3	1.9	3.7	5.6	7.1	8.0	8.6	9.3	9.9	10.8	12.3
MH	XL	A	.3	1.6	3.2	4.8	6.3	6.9	7.5	8.0	8.5	9.3	10.7
MH	L	A	.3	.9	1.8	2.7	3.5	3.9	4.2	4.5	4.8	5.2	6.0
MH	M	A	.1	.5	1.2	1.9	2.4	2.9	3.25	3.6	3.9	4.3	4.3
MH	S	A											

MH values compared with ratio of damage to cost as standard house (+1 = .15 of average value) indexed by EWP Technical Guide No. 21 Supplement 1 Table #1A.

Table 3. Adjustment Factors¹

Class	Size	Furnishings	Factor (%)
A	L	H	130
A	L	A	111
A	L	L	95
A	A	H	117
A	A	A	100
A	A	L	84
A	S	H	106
A	S	A	90
A	S	L	74
B	L	H	134
B	L	A	120
B	L	L	106
B	A	H	114
B	A	A	100
B	A	L	86
B	S	H	91
B	S	A	78
B	S	L	67
C	L	H	154
C	L	A	121
C	L	L	88
C	A	H	135
C	A	A	100
C	A	L	70
C	S	H	110
C	S	A	79
C	S	L	57
MH	L	H	218
MH	L	A	120
MH	L	L	59
MH	A	H	169
MH	A	A	100
MH	A	L	43
MH	S	H	100
MH	S	A	80
MH	S	L	26

¹To adjust Table 2 damages for other than average size residences and furnishings.

HOW TO USE FIELD SURVEY SHEETS

Figure 2 is a sample of a Field Survey Sheet. It shows which hydrologic basin the tributary/reach lies in and indicates which firm/floodway map to refer to.

- Structure # refers to the number of the structure as located on the Firm/Floodway Map or a detail map.
- The number in parenthesis indicates the number of structures identified at that location if more than one.
- 100 year Flood level indicates the estimated level in feet of a 100 year flood in reference to the first flood of the structure - either above or below.
- -3 indicates that though there would be no structural damage to the structure, some level of yard damage would be expected, in this case "moderate".
- Type refers to the type of construction, in this case a residential Brick Veneer (RBV).
- Class - refers to the quality of construction.
- Stores - refers to the number of stores to the structure.

Figure 2. Sample Survey Sheet

County Flood Area Property Inventory

Basin # _____ River _____ Tributary/Reach _____

FIRM/Floodway panel # _____ Date Surveyed _____

Structure # (Refer to map)	100 yr. Flood Elevation in reference to 1st Floor (in feet)	TYPE	CLASS	Stories	Basement?	Size	Furnishing Class	Yard Damage or Bus. Type	Estimated Damage	
1 (3)	10	RBV	B	1½	No	A	A	Moderate	18,600	
2	<-3	NO STRUCTURAL DAMAGE							Moderate	1,000

SAMPLE

- Basement - indicates whether the structure has a basement or not.

- Size - refers to the square footage floor space of a structure, A being "Average" 1200 to 1500 square foot.

- Furnishing class refers to quality of furnishings which is usually considered to be A for "Average".

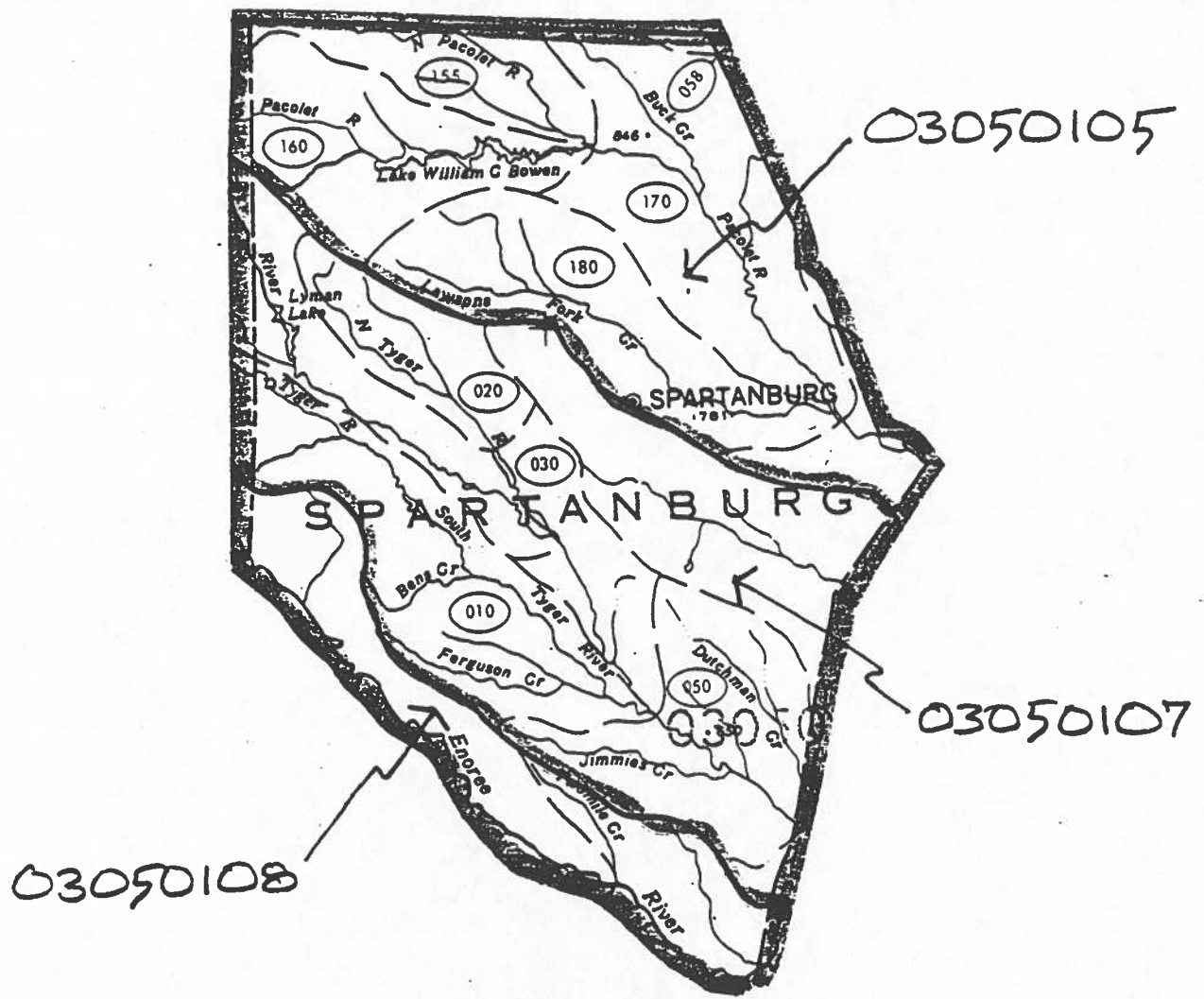
- Yard damage - estimate amount of damage to yard and outside equipment. Business type indicate the structures commercial use.

- Estimate damage is the estimated damage which might occur to the structure.

Appendix
Field Survey Sheets

BASIN LOCATION MAP

SPARTANBURG, S.C.



Basin # 105-180 River Lawson's Fork Creek Tributary/Reach E. Main to Fernwood Dr.FIRM/Floodway panel # City of Spartanburg #4Date Surveyed 2-11-85

Structure # (Refer to map)	100 yr. Flood Elevation in reference to 1st Floor (in feet)	TYPE	CLASS	Stories	Basement?	Size	Furnishing Class	Yard Damage or Bus. Type	Estimated Damage
1	+0	RBV	B	1	no	A	A	moderate	6,200
2	+0	RFS	B	1	no	A	A	moderate	6,200
3	-2	RBV	B	1	no	A	A	moderate	1,200
4	+0	RFS	B	1	no	A	a	moderate	6,200
5	+0	RBV	B	1	no	A	a	moderate	6,200
6(3)	-3	no structural damage						moderate	3,000
7	-6	RBV	A	1	yes	L	H	moderate	13,400
8(2)	-6	RBV	A	2	yes	L	H	major	34,900
9(2)	-3	No Structural damage						moderate	2,000
								TOTAL	79,300

Basin # 105-180 River Lawson's Fork Creek Tributary/Reach Eastwood Dr.

FIRM/Floodway panel # City of Spartanburg #7 Date Surveyed 2-13-85

Structure # (Refer to map)	100 yr. Flood Elevation in reference to 1st Floor (in feet)	TYPE	CLASS	Stories	Basement?	Size	Furnishing Class	Yard Damage or Bus. Type	Estimated Damage
1	+0	RFS	B	1	no	A	A	minor	5,700
2	+6	RFS	B	1	no	A	A	major	36,150
3	+5	RFS	B	1	no	A	A	major	35,000
									76,850

Adapted from USDA, SCS Floodwater Damage Estimates, EWP Technical Guide #21, December 1970, p.5

Basin # 107-060

River Fairforest Creek

Tributary/Reach Trib. F-2

FIRM/Floodway panel # City of Spartanburg #6

Date Surveyed 2-13-85

Structure # (Refer to map)	100 yr. Flood Elevation in reference to 1st Floor (in feet)	TYPE	CLASS	Stories	Basement?	Size	Furnishing Class	Yard Damage or Bus. Type	Estimated Damage
1	+0	RBV	B	1	no	S	A	minor	4,500
2(3)	<-3	No structural damage						minor	1,500
3	-6	RBV	B	1	no	A	A	moderate	3,600
4(2)	+1	RBV	B	1	no	A	A	moderate	25,800
5	+0	RFS	C	1	no	A	A	minor	3,400
6	<-3	No structural damage						minor	500
									39,300

Adapted from USDA, SCS Floodwater Damage Estimates, EWP Technical Guide #21, December 1970, p.5

Basin # 107-020

River North Tyger River

Tributary/Reach Ransom Creek

FIRM/Floodway panel # Spartanburg Co. #151

Date Surveyed

Structure # (Refer to #)	100 yr. Flood Elevation in reference to 1st Floor (in feet)	TYPE	CLASS	Stories	Basement?	Size	Furnishing Class	Yard Damage or Bus. Type	Estimated Damage
1	+1	RBV	B	1½	no	A	A	moderate	4,800
2	+1	RBV	B	1½	no	A	A	moderate	4,800
3(2)	+0	RBV	B	1	no	A	A	minor	17,100
4	-1	RBV	B	1½	no	A	A	minor	800
5 (4)	-3	No structural damage						minor	2,000
									29,500

Adapted from USDA, SCS Floodwater Damage Estimates, EWP Technical Guide #21, December 1970, p.5

Basin # 107-060River Fairforest CreekTributary/Reach Williams BrFIRM/Floodway panel # City of Spartanburg #5 & #6Date Surveyed 2-11-85

Structure # (Refer to map)	100 yr. Flood Elevation in reference to 1st Floor (in feet)	TYPE	CLASS	Stories	Basement?	Size	Furnishing Class	Yard Damage or Bus. Type	Estimated Damage
panel 5									
1	+0	RFS	B	1	yes	A	A	moderate	12,600
2	+1	RFS	B	1	no	A	A	moderate	12,900
panel 6									
1	+0	RFS	C	1	no	A	A	minor	3,400
									28,900

Adapted from USDA, SCS Floodwater Damage Estimates, EWP Technical Guide #21, December 1970, p.5

Basin # 105-180

River Lawson Fork Creek

Tributary/Reach North Fork

Hwy. 9

FIRM/Floodway panel # Spartanburg Co. #79

Date Surveyed 2-14-85

Structure # (Refer to map)	100 yr. Flood Elevation in reference to 1st Floor (in feet)	TYPE	CLASS	Stories	Basement?	Size	Furnishing Class	Yard Damage or Bus. Type	Estimated Damage	
1	+2	RFS	B	2	no	L	A	major	16,600	
2	+1	COM	n/a				Construction Equip.		5,000	
3	-6	RFS	B	1	yes	S	A	moderate	3,000	
4(2)	<-3	No structural damage							major	3,500
									28,100	

Adapted from: USDA, SCS Floodwater Damage Estimates, EWP Technical Guide #21, December 1970, p.5

Basin # 105-180 River Lawson's Fork Creek Tributary/Reach Halfway Branch

FIRM/Floodway panel # Spartanburg Co. # 91 Date Surveyed 2-13-85

Structure # (Refer to map)	100 yr. Flood Elevation in reference to 1st Floor (in feet)	TYPE	CLASS	Stories	Basement?	Size	Furnishing Class	Yard Damage or Bus. Type	Estimated Damage
1	+0	RBV	B	1	no	L	A	moderate	7,250
									7,250

Adapted from USDA, SCS Floodwater Damage Estimates, EWP Technical Guide #21, December 1970, p.5

Basin # 105-180 River Lawson's Fork Creek Tributary/Reach US 221 to Archer Rd.

FIRM/Floodway panel # Spartanburg Co. #87

Date Surveyed 2-12-85

Structure # (Refer to map)	100 yr. Flood Elevation in reference to 1st Floor (in feet)	TYPE	CLASS	Stories	Basement?	Size	Furnishing Class	Yard Damage or Bus. Type	Estimated Damage
1	-6	COM	n/a	1	yes	Restaurant	Storage		5,000
2	-1	MH	n/a			DW	A	minor	800
									5,800

Adapted from USDA, SCS Floodwater Damage Estimates, EWP Technical Guide #21, December 1970, p.5

Basin # 107-060

River Fairforest Creek

Tributary/Reach Farley Branch

FIRM/Floodway panel # City of Spartanburg #2

Date Surveyed 2-15-85

Structure # (Refer to map)	100 yr. Flood Elevation in reference to 1st Floor (in feet)	TYPE	CLASS	Stories	Basement?	Size	Furnishing Class	Yard Damage or Bus. Type	Estimated Damage
1	<-3	No Structural damage						minor	500
2	+0	RBV	B	1	no	S	A	minor	4,550
									5,050

Adapted from USDA, SCS Floodwater Damage Estimates, EWP Technical Guide #21, December 1970, p.5

Basin # 105-180

River Lawson's Fork Creek

Tributary/Reach South Fork

FIRM/Floodway panel # Spartanburg Co. #94

Date Surveyed 2-12-85

Structure # (Refer to map)	100 yr. Flood Elevation in reference to 1st Floor (in feet)	TYPE	CLASS	Stories	Basement?	Size	Furnishing Class	Yard Damage or Bus. Type	Estimated Damage
1	+0	RFS	C	1	no	S	A	moderate	3,900
									3,900

Adapted from: USDA, SCS Floodwater Damage Estimates, EWP Technical Guide #21, December 1970, p.5

Basin # 107-060 River Fairforest Creek Tributary/Reach Gooch St.

FIRM/Floodway panel # City of Spartanburg #3 Date Surveyed 2-14-85

Structure # (Refer to map)	100 yr. Flood Elevation in reference to 1st Floor (in feet)	TYPE	CLASS	Stories	Basement?	Size	Furnishing Class	Yard Damage or Bus. Type	Estimated Damage
1(4)	<-3	No structural		damage				minor	2,000
									2,000

Adapted from USDA, SCS Floodwater Damage Estimates, EWP Technical Guide #21, December 1970, p.5