

AMENDMENT TO THE

PIKE RIVER WATERSHED PLAN

TOWN OF MT. PLEASANT

AS ADOPTED BY THE

SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

JUNE 1987

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SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

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SUBJECT: Certification of Amendment to the Adopted Pike River Watershed Plan (Upper Pike River Channel Improvements)

TO: The Legislative Bodies of Concerned Local Units of Government Within the Southeastern Wisconsin Region, namely: the County of Racine, the Town of Mt. Pleasant, and the Mt. Pleasant Storm Water Drainage District

This is to certify that at the annual meeting of the Southeastern Wisconsin Regional Planning Commission, held at the Washington County Courthouse, West Bend, Wisconsin on the 15th day of June 1987, the Commission did by unanimous vote by all Commissioners present, being 17 ayes and 0 nays, and by appropriate Resolution, a copy of which is made a part hereof and incorporated by reference to the same force and effect as if it had been specifically set forth herein in detail, adopt an amendment to the Pike River watershed plan, which was originally adopted by the Commission on the 16th day of June 1983 as part of the master plan for the physical development of the Region. The said amendment to the Pike River watershed plan pertains to the proposed Upper Pike River channel improvements, and consists of the documents attached hereto and made a part hereof. Such action taken by the Commission is hereby recorded on, and is a part of, said plan, and the plan as amended is hereby transmitted to the constituent local units of government for consideration, adoption, and implementation.

IN TESTIMONY WHEREOF, I have hereunto set my hand and seal and cause the Seal of the Southeastern Wisconsin Regional Planning Commission to be hereto affixed. Dated at the City of Waukesha, Wisconsin, this 16th day of June 1987.



Anthony F. Balestrieri, Chairman
Southeastern Wisconsin Regional
Planning Commission

ATTEST:



Kurt W. Bauer, Deputy Secretary

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RESOLUTION 87-11

RESOLUTION OF THE SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION AMENDING THE COMPREHENSIVE PLAN FOR THE PIKE RIVER WATERSHED, THE PLAN BEING A PART OF THE MASTER PLAN FOR THE PHYSICAL DEVELOPMENT OF THE REGION COMPRISED OF THE COUNTIES OF KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WALWORTH, WASHINGTON, AND WAUKESHA IN THE STATE OF WISCONSIN (UPPER PIKE RIVER CHANNEL IMPROVEMENTS)

WHEREAS, pursuant to Section 66.945(10) of the Wisconsin Statutes, the Southeastern Wisconsin Regional Planning Commission, at a meeting held on the 16th day of June 1983, duly adopted a comprehensive plan for the Pike River watershed as set forth in SEWRPC Planning Report No. 35, A Comprehensive Plan for the Pike River Watershed; and

WHEREAS, the comprehensive Pike River watershed plan contains recommendations relating to land use development and regulation, environmental corridor land acquisition and preservation, park and outdoor recreation land acquisition and development, floodland regulation, water control facility construction, streamflow recordation, and pollution abatement facility construction, together constituting a desirable and workable water control and water-related community facility plan for the Pike River watershed; and

WHEREAS, on November 20, 1986, the Mt. Pleasant Storm Water Drainage District No. 1 requested the Commission to amend the Pike River watershed plan to incorporate additional flood control measures to fully resolve flooding and drainage problems in the Willow Road area of the Town of Mt. Pleasant, that area lying south of STH 20 in the northeast one-quarter of Section 22 and the southeast one-quarter of Section 15, Township 3 North, Range 22 East; and

WHEREAS, the proposed amendment to the Pike River watershed plan has been reviewed in a memorandum entitled, "Response to Request by Mt. Pleasant Storm Water Drainage District No. 2 to Amend the Pike River Watershed Plan," dated May 8, 1987, attached hereto and made a part hereof, which memorandum concludes that the plan amendment sought by the Mt. Pleasant Storm Water Drainage District No. 1 is sound and in the public interest; and

WHEREAS, the aforereferenced memorandum was reviewed and recommended for approval by the Commission's Pike River Watershed Committee at a meeting held on the 15th day of May 1987; and

WHEREAS, Section 66.945(9) of the Wisconsin Statutes authorizes and empowers the Regional Planning Commission, as the work of making the whole master plan progresses, to amend, extend, or add to the master plan or carry any part or subject thereof into greater detail.

NOW, THEREFORE, BE IT HEREBY RESOLVED:

FIRST: That the comprehensive plan for the Pike River watershed, being a part of the master plan for the physical development of the Region and comprised of SEWRPC Planning Report No. 35, which plan was adopted by the Commission as a part of the master plan on the 16th day of June 1983, be and the same hereby is amended as follows:

1. The previously recommended Upper Pike River channel improvement project as set forth in SEWRPC Planning Report No. 35 is hereby revised and amended to include the revised channel improvements as described in Alternative 1 of the attached memorandum.
2. The flood stage and streambed profiles for the Pike River, as set forth in SEWRPC Planning Report No. 35, are hereby revised in the manner set forth in the attached memorandum to reflect the channel deepening recommended in this plan amendment.

3. The planned 100-year recurrence interval floodplain for the Upper Pike River watershed is hereby revised in the manner set forth in the attached memorandum to reflect the additional channel deepening.

SECOND: That a true, correct, and exact copy of this resolution and its attachments shall be forthwith distributed to each of the local legislative bodies of the local governmental units within the Region entitled thereto and to such other bodies, agencies, or individuals as the law may require, or as the Commission, its Executive Committee, or its Executive Director at their discretion shall determine and direct.

The foregoing resolution, upon motion duly made and seconded, was regularly adopted at the meeting of the Southeastern Wisconsin Regional Planning Commission held on the 15th day of June 1987, the vote being: Ayes 17; Nays 0.



Anthony F. Balestrieri, Chairman

ATTEST:



Kurt W. Bauer
Deputy Secretary

SEWRPC Staff Memorandum

RESPONSE TO REQUEST BY MT. PLEASANT STORM WATER DRAINAGE DISTRICT NO. 1 TO AMEND THE PIKE RIVER WATERSHED PLAN

INTRODUCTION

By letter dated November 20, 1986, the Southeastern Wisconsin Regional Planning Commission was formally requested by the Mt. Pleasant Storm Water Drainage District No. 1 to amend the Pike River watershed plan. The purpose of the amendment would be to incorporate such additional flood control measures as may be necessary to more fully resolve drainage and flooding problems in an existing developed area located just north of the S. C. Johnson & Son, Inc., Waxdale plant, and lying on the east side of Willow Road south of STH 20 in the northeast one-quarter of Section 22 and the southeast one-quarter of Section 15, Township 3 North, Range 22 East. The Storm Water Drainage District indicated that its consulting engineer, in conducting detailed stormwater drainage planning attendant to the Waxdale area, had noted that the flood control measures included in the presently adopted Pike River watershed plan, while serving to abate the flooding problems in the subject area, would not, if implemented, fully resolve such flooding problems, and would leave a residual drainage problem along the Steele Branch, a Pike River tributary. Accordingly, the District's consulting engineer suggested that the Pike River watershed plan recommendations in this respect be reopened, and that alternatives to fully resolving the flooding and related drainage problems be considered. In particular, the District's consulting engineer advanced a proposal that would call for a lowering of the Upper Pike River channel beyond that proposed in the adopted Pike River watershed plan. This would permit drainage improvements to be made in the area in question in such a manner as to totally resolve existing problems.

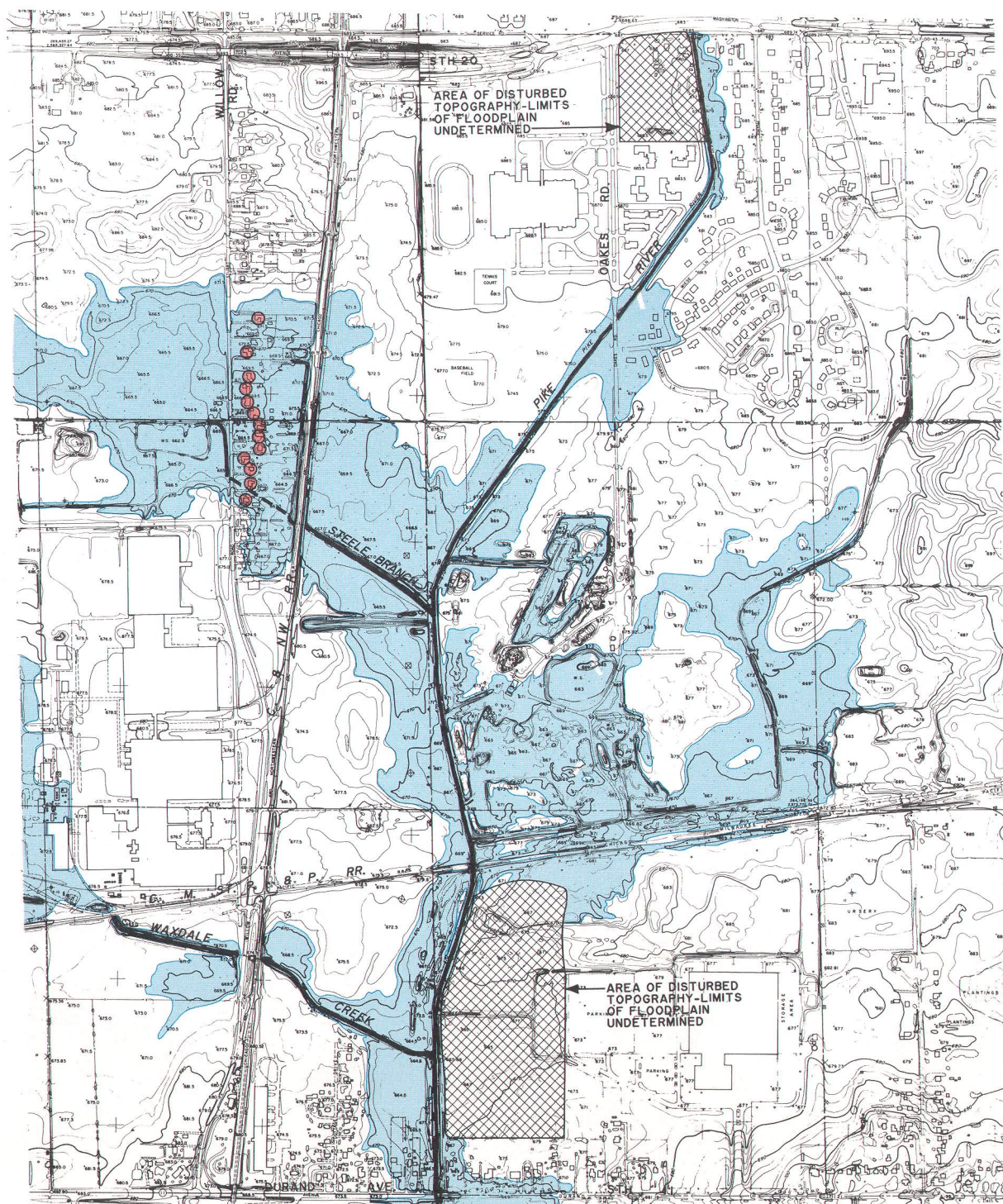
In response to the District's request, the Commission staff completed analyses of alternative ways in which to address the residual flooding and drainage problems noted by the Drainage District. This staff memorandum is intended to document those analyses and to thereby serve as a basis for an amendment to the Pike River watershed plan.

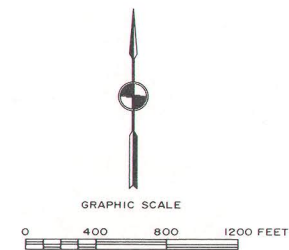
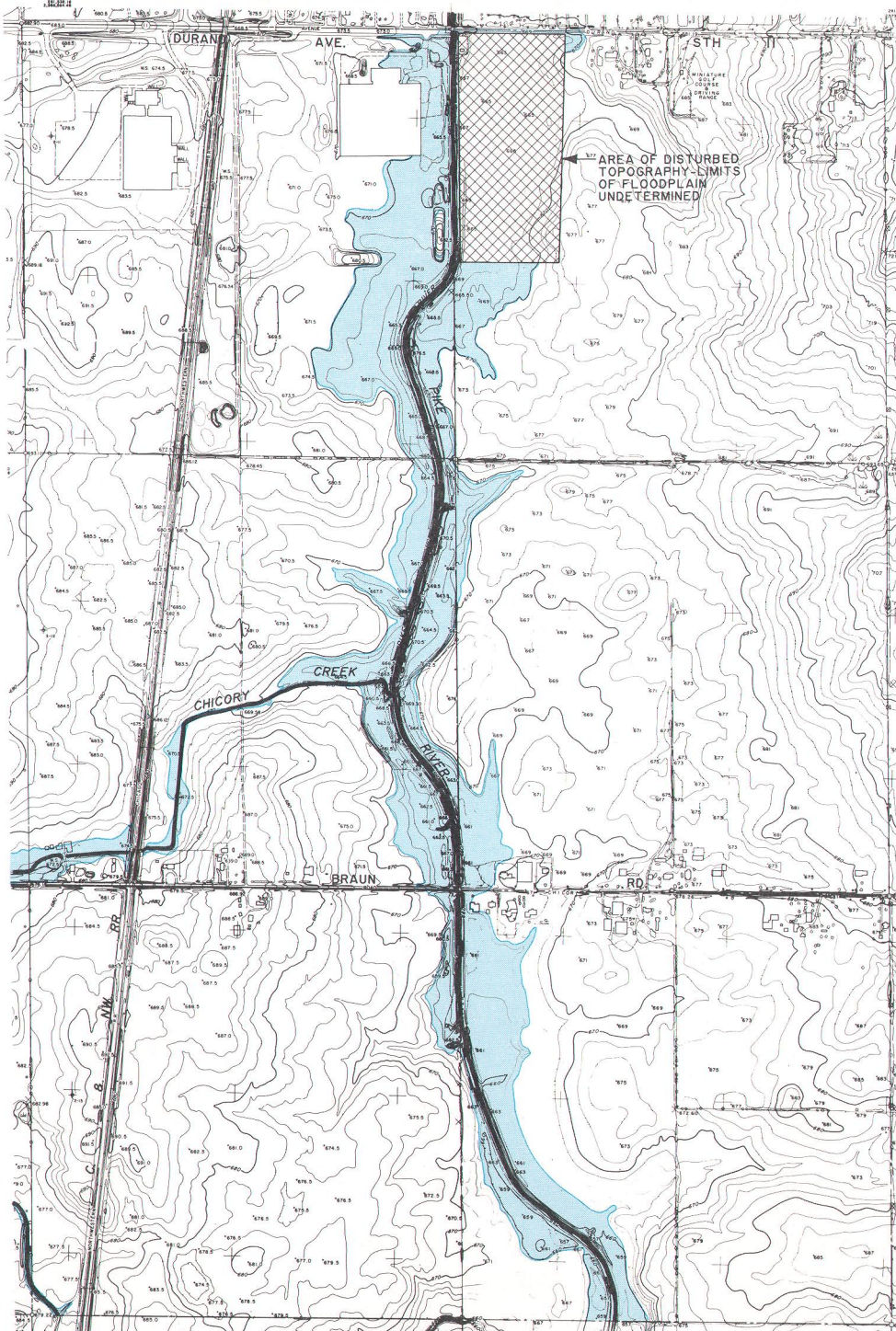
FLOOD CONTROL RECOMMENDATIONS FOR THE UPPER PIKE RIVER INCLUDED IN THE CURRENT WATERSHED PLAN

As originally adopted and set forth in SEWRPC Planning Report No. 35, A Comprehensive Plan for the Pike River Watershed, the plan recommends that the Upper Pike River channel from Oakes Road to the confluence with Pike Creek, which lies east of the Chicago & North Western Railway (C&NW) in this vicinity, be deepened and enlarged. The channel would be deepened an average of 2.5 feet, and widened to a bottom width ranging from 10 to 20 feet. Under the plan, the improved channel would be turf-lined and have side slopes of one on three feet. A total of seven bridges in the Upper Pike River system would be modified, replaced, or removed. If these recommended channel improvements were to be undertaken, the regulatory 100-year recurrence interval flood stage just north of the S. C. Johnson & Son, Inc., plant would be lowered by 2.6 feet—from 671.8 feet National Geodetic Vertical Datum (NGVD) to 669.2 feet NGVD.

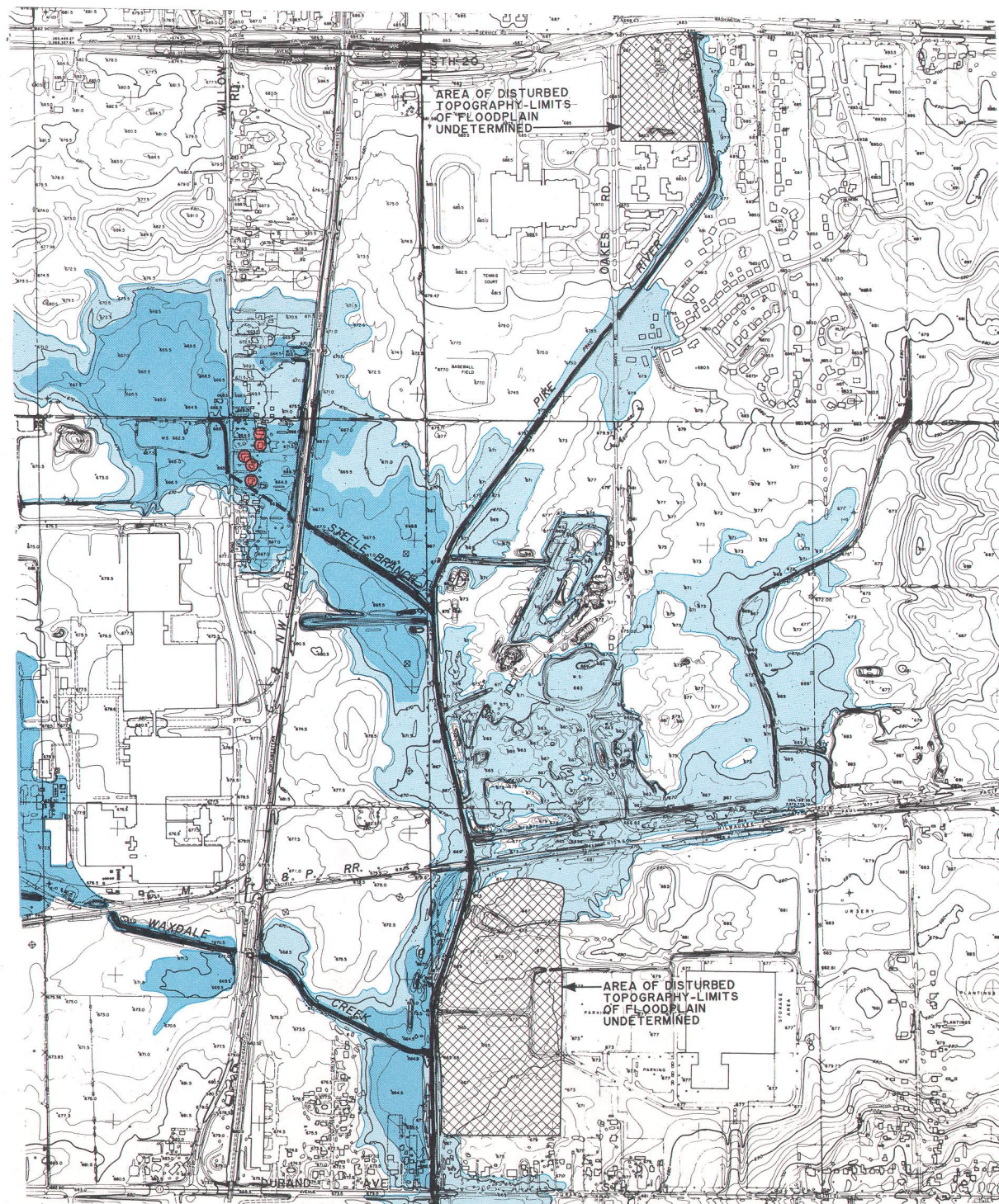
As shown on the map attached hereto as Exhibit A, there are 13 single-family structures along the east side of Willow Road which are located within the present 100-year recurrence interval floodplain of the Pike River. These homes are located between Willow Road and the C&NW Railway just north of the Waxdale plant. The Steele Branch traverses the area, draining about 1,120 acres of land to the Upper Pike River at its confluence.

If the channel and bridge improvements recommended in SEWRPC Planning Report No. 35 were to be implemented, the number of single-family homes lying within the 100-year recurrence interval floodplain would be reduced to five, with an attendant decrease in the areal extent of land in the floodplain (see map attached as Exhibit B). Based upon field inspections, it would appear that two of the five homes included in the residual floodplain would experience basement flooding only, while the remaining three homes could experience first-floor flooding during a major flood event. It is this residual flooding problem that the Drainage District asked to be addressed in an amendment to the Pike River watershed plan.



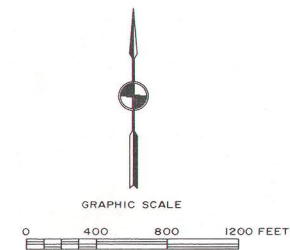
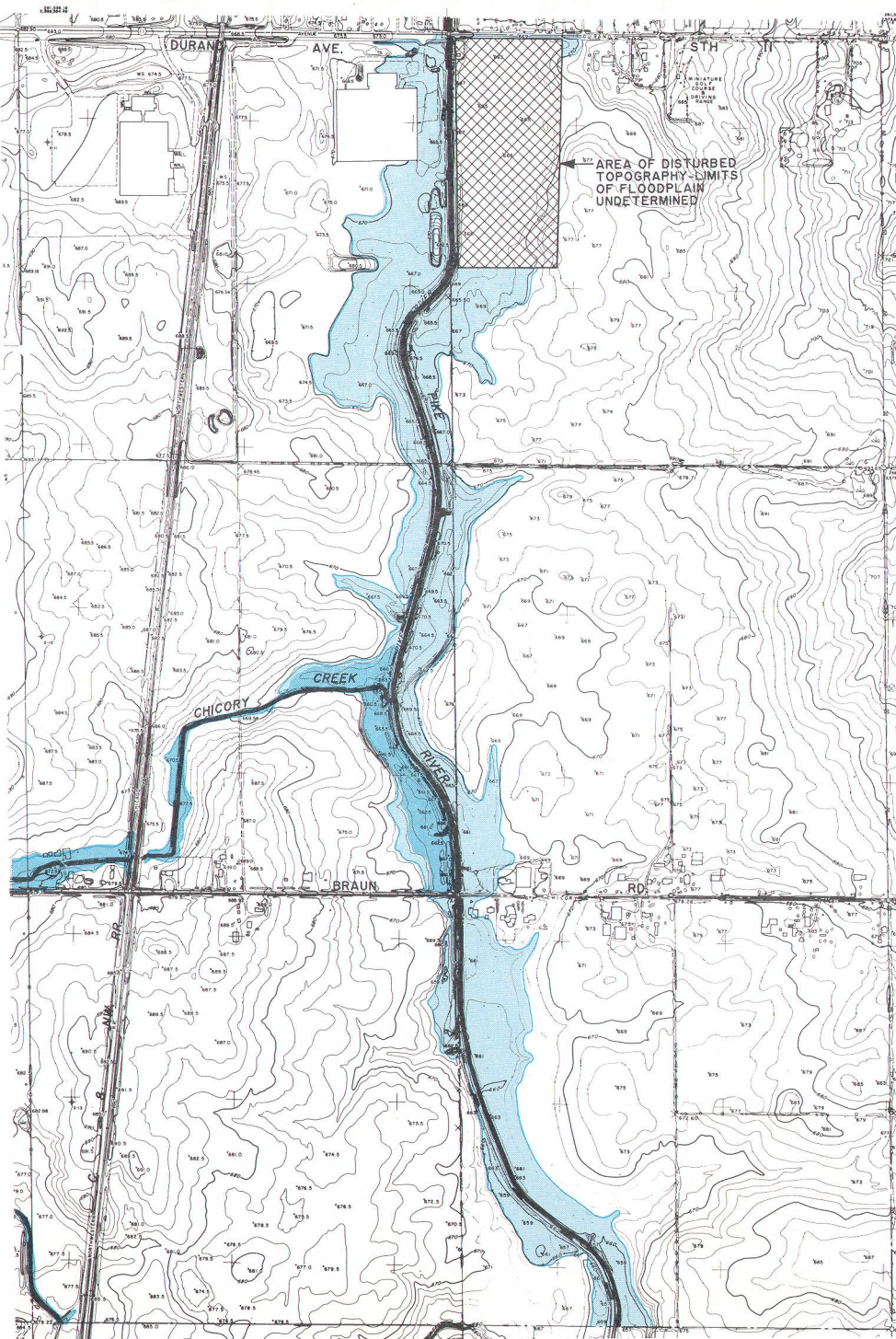


Source: SEWRPC.



LEGEND

- 100-YEAR RECURRENCE INTERVAL FLOODLAND UNDER PLANNED LAND USE AND EXISTING CHANNEL CONDITIONS
- 100-YEAR RECURRENCE INTERVAL FLOODLAND UNDER PLANNED LAND USE AND PLANNED CHANNEL CONDITIONS
- SINGLE FAMILY STRUCTURE LOCATED WITHIN 100-YEAR FLOODLANDS
- EXISTING CHANNEL



Source: SEWRPC.

ALTERNATIVE SUPPLEMENTAL FLOOD CONTROL MEASURES CONSIDERED

Three alternatives were considered to eliminate flooding along Willow Road west of the C&NW Railway line and north of the S. C. Johnson & Son, Inc., plant. A description and an economic analysis of each alternative are presented below.

Alternative 1—Additional Channel Deepening

As suggested by the consulting engineer for the Drainage District, the proposed channel bottom of the Upper Pike River downstream of Oakes Road could be further deepened in order to eliminate any residual structural flooding west of the C&NW Railway line. Under this alternative, the proposed channel bottom would have to be deepened an average of 5.5 feet, or about 3.0 feet deeper than proposed under the Pike River watershed plan. As shown on the map attached hereto as Exhibit C, this additional deepening would extend downstream of Oakes Road a distance of about two miles to about Braun Road. This deepening could be accomplished without any change in the recommended bottom width of the Pike River channel.

The estimated capital cost of the Upper Pike River channel deepening project, as that project is described in the adopted Pike River watershed plan, is \$1,386,000. The average annual cost of that project would be \$95,500; the average annual benefits about \$47,100; and the benefit-cost ratio about 0.5. The estimated incremental capital cost attendant to the more extensive channel deepening described above is estimated at \$200,000. The average annual cost of the incremental improvement would be \$12,600. The incremental deepening would have an estimated average annual benefit of \$4,800. Thus, the incremental deepening would have a benefit-cost ratio of 0.4. If the original deepening project and the above-described incremental deepening project are combined, the average annual cost of the combined project would be \$108,100, and the average annual benefits would be about \$51,900. This would result in a benefit-cost ratio of the combined project of 0.5.

If this alternative is selected, and if the approximately 80 acre-feet of floodwater storage envisioned to be provided west of Willow Road in the adopted Pike River watershed plan is provided, either through maintenance of the natural floodplain storage along the Steele Branch upstream of Willow Road or through the construction of an engineered detention basin at that location, the additional channel deepening described above should have no significant impact on downstream flood flows and stages.

Alternative 2—Structure Floodproofing and Elevation

Under the second alternative, assuming the Pike River channel recommendations included in the adopted plan were to be carried out, the five homes remaining in the regulatory floodplain, as shown on the map attached hereto as Exhibit D, would be elevated and/or floodproofed as necessary to eliminate structure flooding damages due to backwater from the Pike River channel. The estimated capital cost of this alternative is \$73,000. The average annual cost is estimated at \$4,600. The average annual benefits from such an alternative are estimated at \$4,800, resulting in a benefit-cost ratio of just over 1.0. If this alternative was to be implemented, the overland structure flooding problems experienced by the homes along the east side of Willow Road would be resolved, although yard flooding would remain. In addition, the land north of the Waxdale plant remaining in the residual floodplain could be filled and used for urban development, provided, however, that, as under the first alternative, at least 80 acre-feet of stormwater storage capacity is provided west of Willow Road.

Alternative 3—Diking and Channel Enclosure

Under the third alternative, a dike would be constructed along the west side of Willow Road and an attendant conduit and backwater gate installed east of Willow Road to prevent flooding of the residential area lying between the C&NW Railway line and Willow Road by backwater from the Upper Pike River and from runoff from the Steele Branch drainage basin. As shown on the map attached hereto as Exhibit E, the dike would extend about 1,100 feet along the west side of Willow Road and, in order to meet the provisions of Chapter NR 116 of the Wisconsin Administrative Code, would have to have a crest elevation 3.0 feet

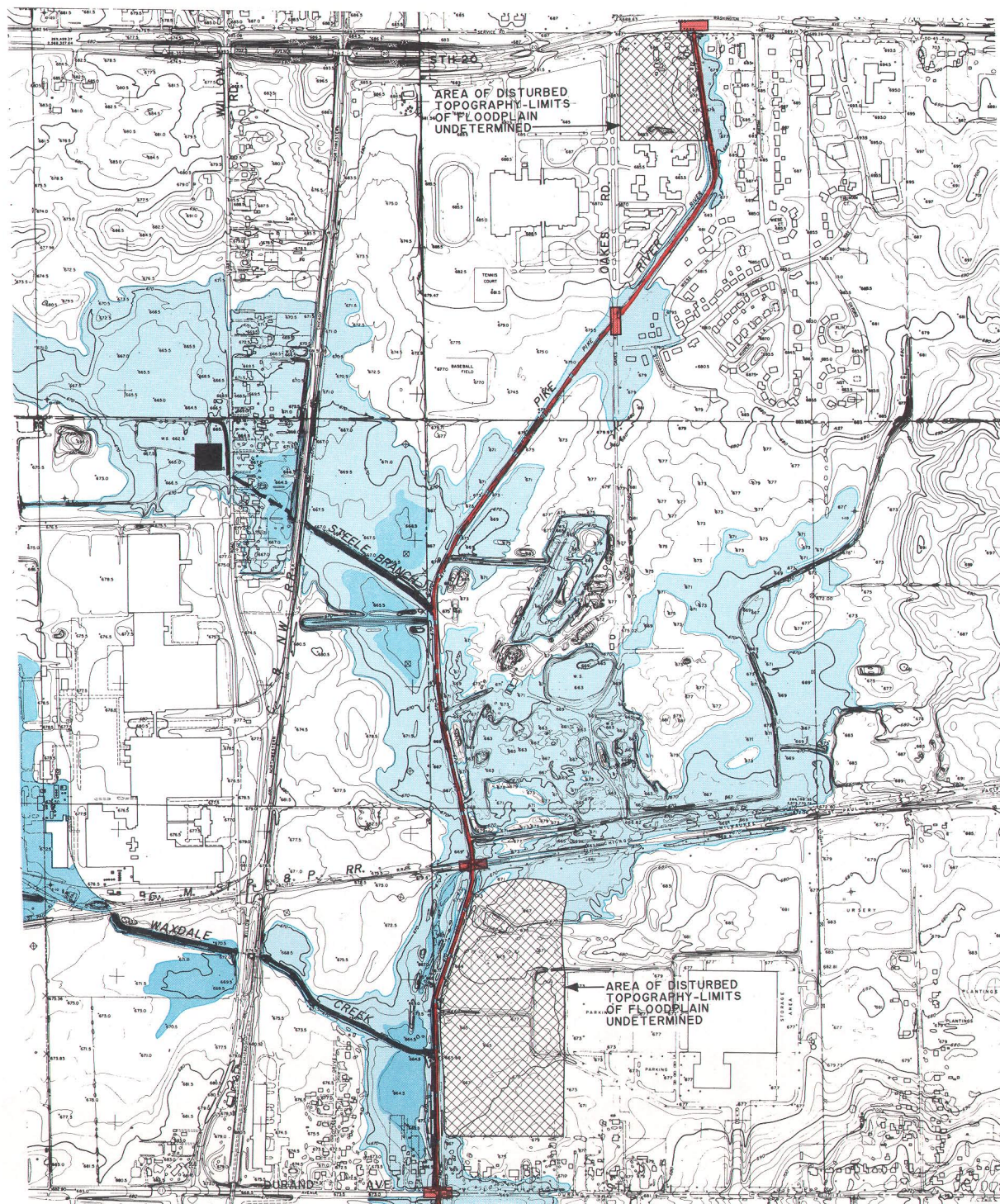
above the regulatory flood elevation. Assuming that the Pike River channel improvements recommended in the adopted plan were to be implemented, the dike elevation would have to be set at 672.2 feet NGVD. The dike would range in height from about 1.0 foot to about 4.0 feet above the existing crown of Willow Road. The capital cost of the dike, the conduit, and the backwater control gate necessary to prevent Pike River floodwaters from backing up west of the C&NW Railway is estimated at \$120,000. The estimated average annual cost of this alternative would be \$7,600; the estimated average annual benefits \$4,800; and the benefit-cost ratio 0.6.

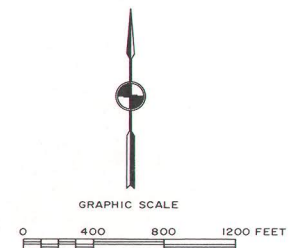
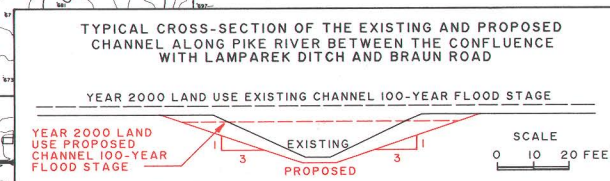
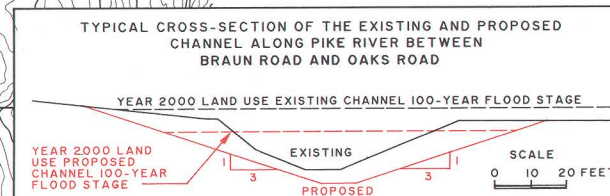
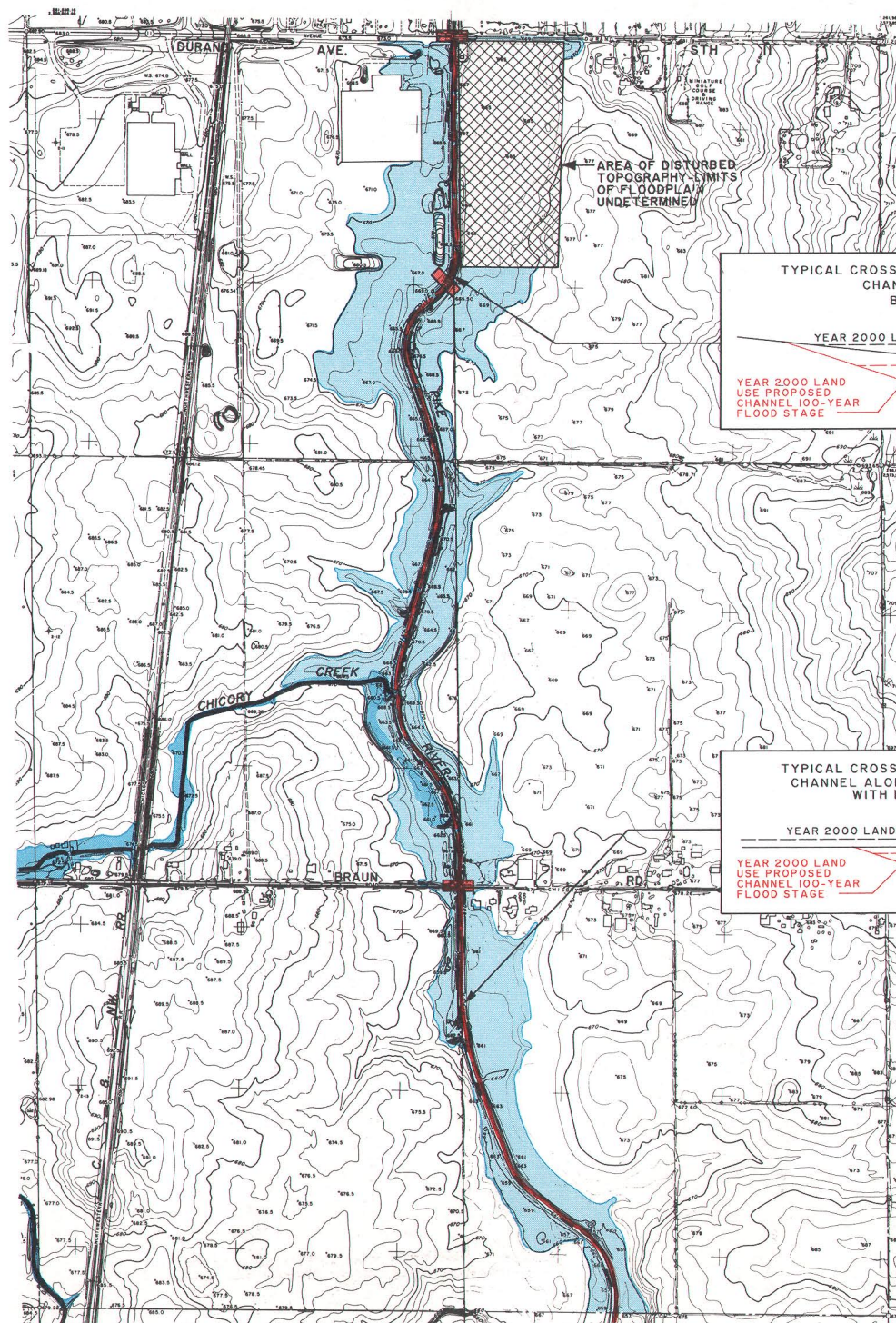
CONCLUDING REMARKS AND RECOMMENDATIONS

All three of the foregoing alternatives would fully resolve structure flooding along Willow Road. While the floodproofing and elevation alternative is the least costly and would have the highest benefit-cost ratio, it is also the alternative judged least likely to be implemented, since implementation would rely upon private sector initiative. In addition, under this alternative, yard flooding would remain in the Willow Road area, making the homes in that area less attractive on the urban real estate market.

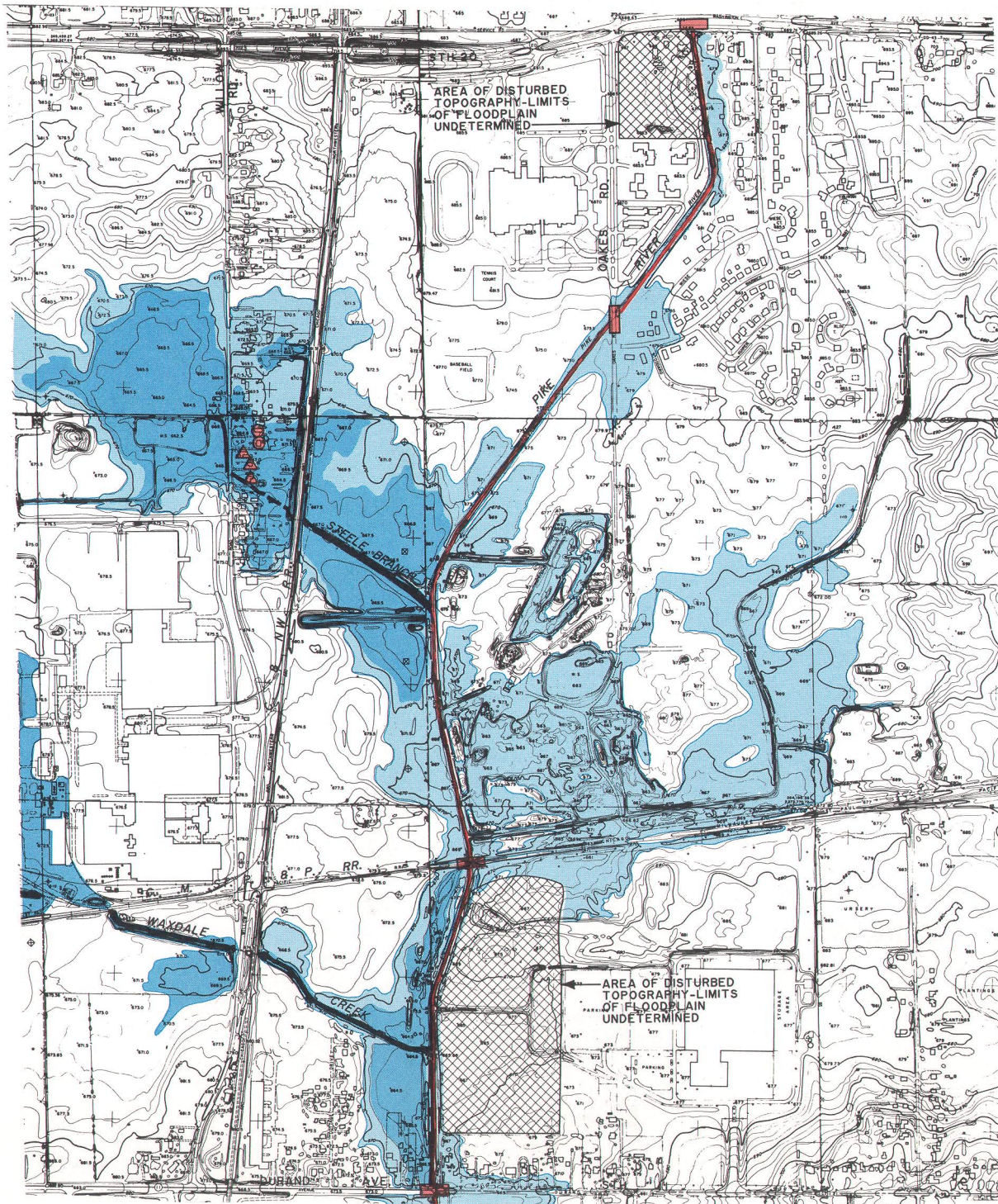
Given the foregoing, given the recommendation in the adopted Pike River watershed plan to enlarge and deepen the Pike River channel, and given further the desire of the Mt. Pleasant Storm Water Drainage District No. 1 to fully resolve structure and yard flooding problems in the Willow Road area, the Commission staff recommends that the Pike River watershed plan be formally amended to incorporate the additional channel deepening described in Alternative 1 above. These deepening improvements would not substantially change the character of the current recommendations of the Pike River watershed plan and the attendant environmental impacts, and would not significantly change the benefit-cost ratio attendant to the recommendations already in that plan. Accordingly, it is recommended that the Pike River watershed plan be formally amended in the following respects:

1. The previously recommended Upper Pike River channel improvement project, as set forth in SEWRPC Planning Report No. 35, is hereby revised and amended to include the revised channel improvement as described in Alternative 1 of this memorandum. Furthermore, the economic analyses attendant to those improvements as set forth in Table 104, page 508, of SEWRPC Planning Report No. 35, are hereby revised to include the additional benefits and costs associated with the additional channel deepening. A revised copy of Table 104 is attached hereto as Exhibit K.
2. The flood stage and streambed profiles for the Pike River, as set forth in Figures G-3 and G-4, pages 643 and 645, of SEWRPC Planning Report No. 35, are hereby revised to reflect the further channel deepening recommended in this plan amendment. Copies of revised Figures G-3 and G-4 are attached hereto as Exhibits H and J.
3. The planned 100-year recurrence interval floodplain attendant to the recommended plan for the Upper Pike River subwatershed as originally shown on Map 84, pages 510 and 511, and Map G-4, page 644, of SEWRPC Planning Report No. 35, is hereby revised appropriately to reflect the channel deepening. Copies of revised Maps 84, G-3, and G-4 are hereby attached hereto as Exhibits F, G, and I.



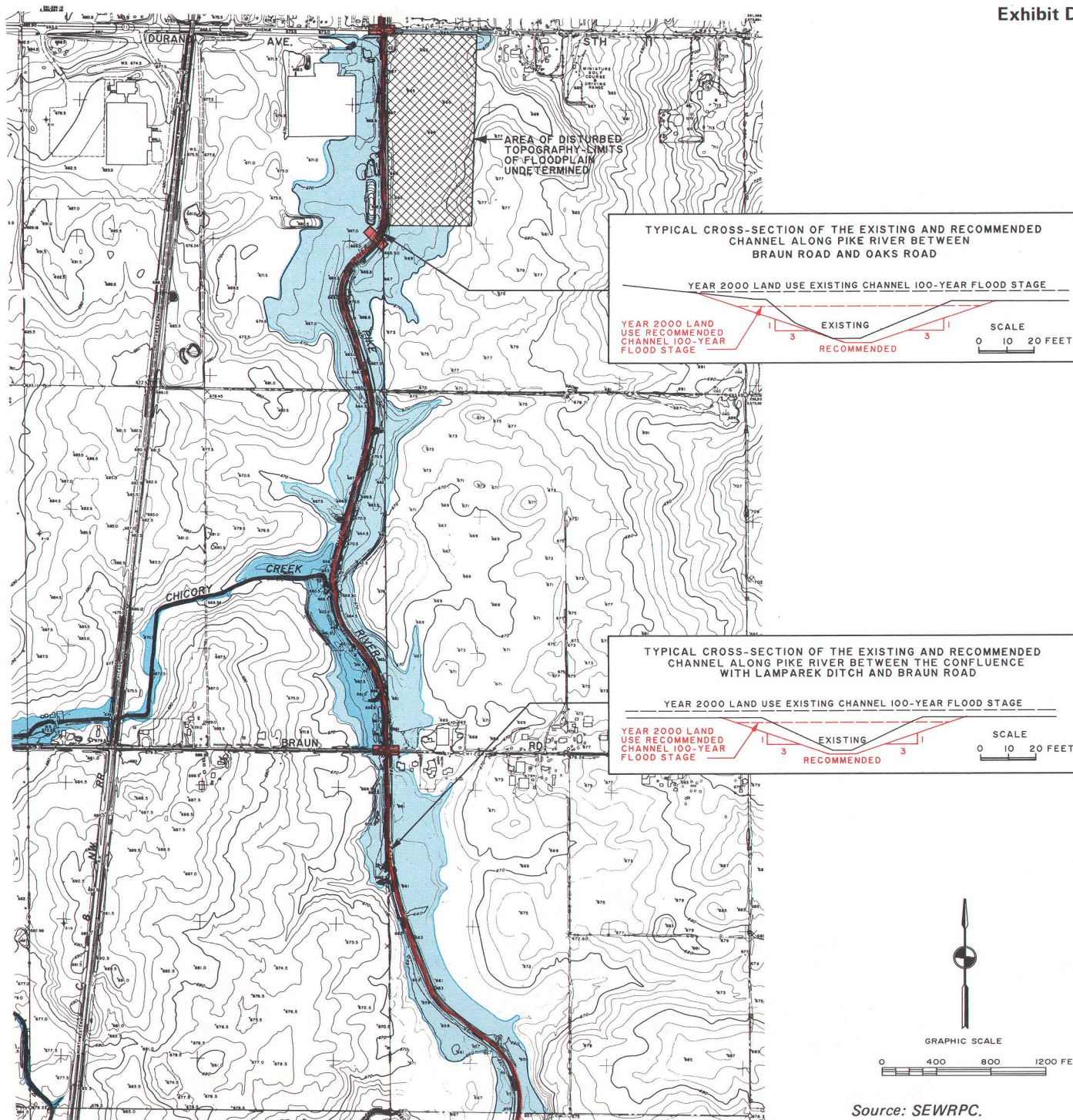


Source: SEWRPC.

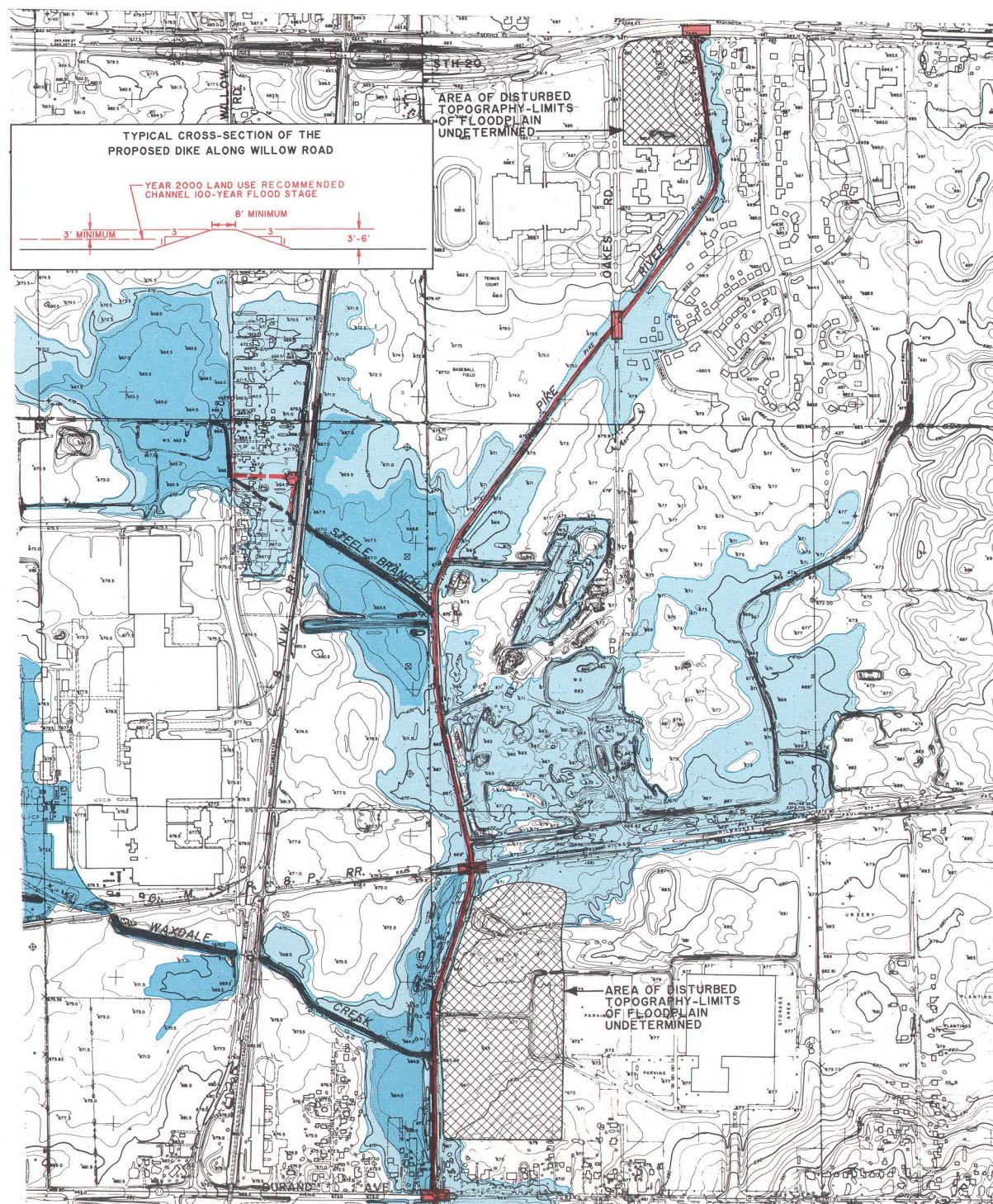


LEGEND

- 100-YEAR RECURRENCE INTERVAL FLOODLAND UNDER PLANNED LAND USE AND EXISTING CHANNEL CONDITIONS THAT WOULD BE ELIMINATED UNDER PLANNED CHANNEL CONDITIONS
- 100-YEAR RECURRENCE INTERVAL FLOODLAND UNDER PLANNED LAND USE AND PLANNED CHANNEL CONDITIONS
- EXISTING CHANNEL
- PROPOSED CHANNEL ENLARGEMENT
- PROPOSED BRIDGE OR CULVERT MODIFICATION OR REPLACEMENT
- PROPOSED BRIDGE REMOVAL
- HOMES PROPOSED TO BE FLOODPROOFED
- HOMES PROPOSED TO BE ELEVATED

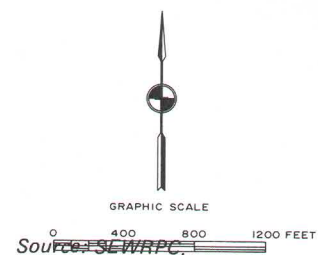
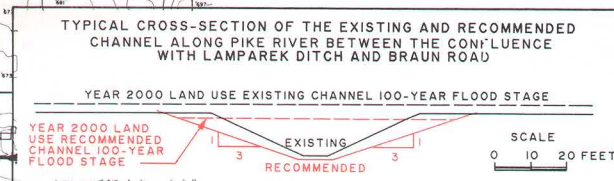
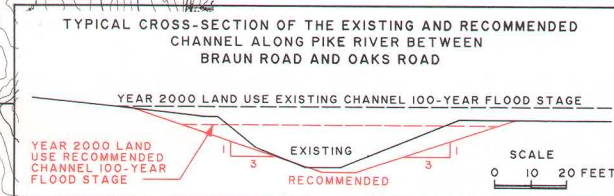
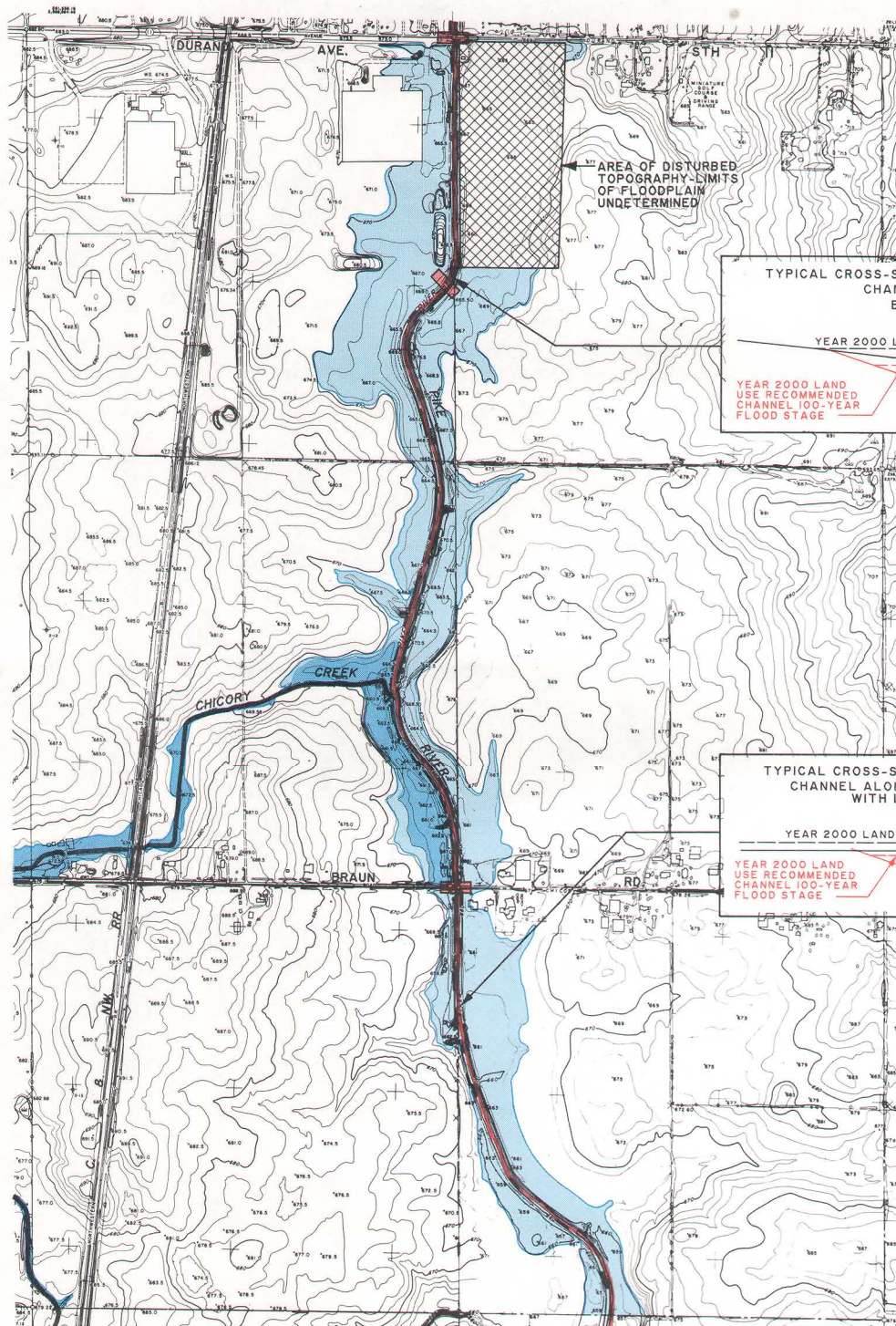


Source: SEWRPC.



LEGEND

- 100-YEAR RECURRENCE INTERVAL FLOODLAND UNDER PLANNED LAND USE AND EXISTING CHANNEL CONDITIONS THAT WOULD BE ELIMINATED UNDER PLANNED CHANNEL CONDITIONS
- 100-YEAR RECURRENCE INTERVAL FLOODLAND UNDER PLANNED LAND USE AND PLANNED CHANNEL CONDITIONS
- EXISTING CHANNEL
- PROPOSED CHANNEL ENLARGEMENT
- PROPOSED BRIDGE OR CULVERT MODIFICATION OR REPLACEMENT
- PROPOSED BRIDGE REMOVAL
- PROPOSED DIKE
- PROPOSED BURIED CONDUIT
- PROPOSED CONDUIT INLET WITH BACKWATER GATE



TYPICAL CROSS-SECTION OF THE EXISTING AND RECOMMENDED CHANNEL ALONG PIKE RIVER BETWEEN OAKES ROAD AND C.T.H. C

YEAR 2000 LAND USE EXISTING CHANNEL 100-YEAR FLOOD STAGE

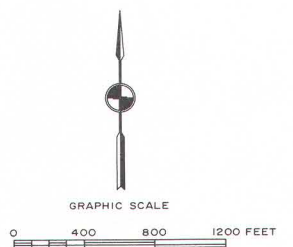
SCALE
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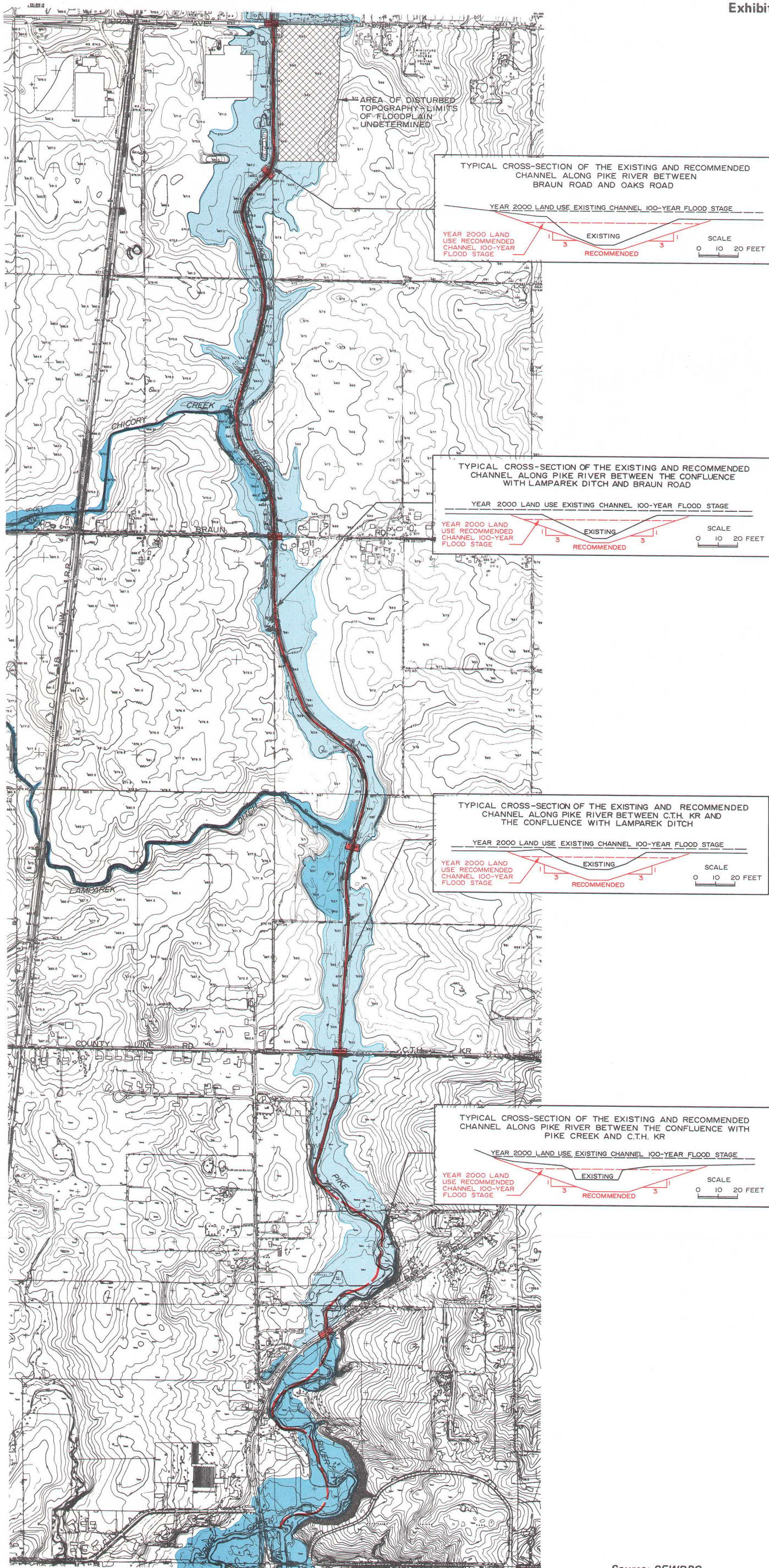
EXISTING
RECOMMENDED
YEAR 2000 LAND USE RECOMMENDED CHANNEL 100-YEAR FLOOD STAGE

AREA OF DISTURBED TOPOGRAPHY - LIMITS OF FLOODPLAIN UNDETERMINED

AREA OF DISTURBED TOPOGRAPHY - LIMITS OF FLOODPLAIN UNDETERMINED

NOTE: THIS EXHIBIT REPLACES MAP 84 ON PAGE 510 IN SEWRPC PLANNING REPORT NO. 35.





Source: SEWRPC.

Exhibit G

AERIAL PHOTOGRAPH SHOWING AREAS SUBJECT TO FLOODING ALONG THE PIKE RIVER (RIVER MILE 9.00 TO 13.50)



LEGEND

- APPROXIMATE EXISTING CHANNEL CENTERLINE AND RIVER MILE STATIONING
- 100-YEAR RECURRENCE INTERVAL FLOODLANDS-- PLANNED LAND USE AND PLANNED CHANNEL CONDITIONS
- 100-YEAR RECURRENCE INTERVAL FLOODLANDS UNDER PLANNED LAND USE AND EXISTING CHANNEL CONDITIONS THAT WOULD BE ELIMINATED UNDER PLANNED CHANNEL CONDITIONS

NOTE: DUE TO MAP SCALE LIMITATIONS, THE DIFFERENCE BETWEEN THE 100-YEAR RECURRENCE INTERVAL FLOODLANDS UNDER PLANNED LAND USE AND EXISTING CHANNEL CONDITIONS, AND THE 100-YEAR RECURRENCE INTERVAL FLOODLANDS UNDER PLANNED LAND USE AND PLANNED CHANNEL CONDITIONS, MAY NOT APPEAR ON THIS MAP. WHERE NO DIFFERENCE APPEARS REFERENCE SHOULD BE MADE TO THE FLOOD STAGE PROFILE SHOWN BELOW.

NOTE: THIS EXHIBIT REPLACES MAP G-3 ON PAGE 642 IN SEWRPC PLANNING REPORT NO. 35.

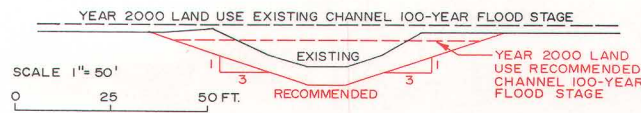
Source: SEWRPC.

TYPICAL CROSS-SECTIONS OF RECOMMENDED CHANNEL ALONG PIKE RIVER

FROM RM 9.61 TO RM 11.15



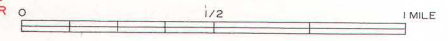
FROM RM 11.15 TO RM 13.50



SCALE 1"= 50'
0 25 50 FT.

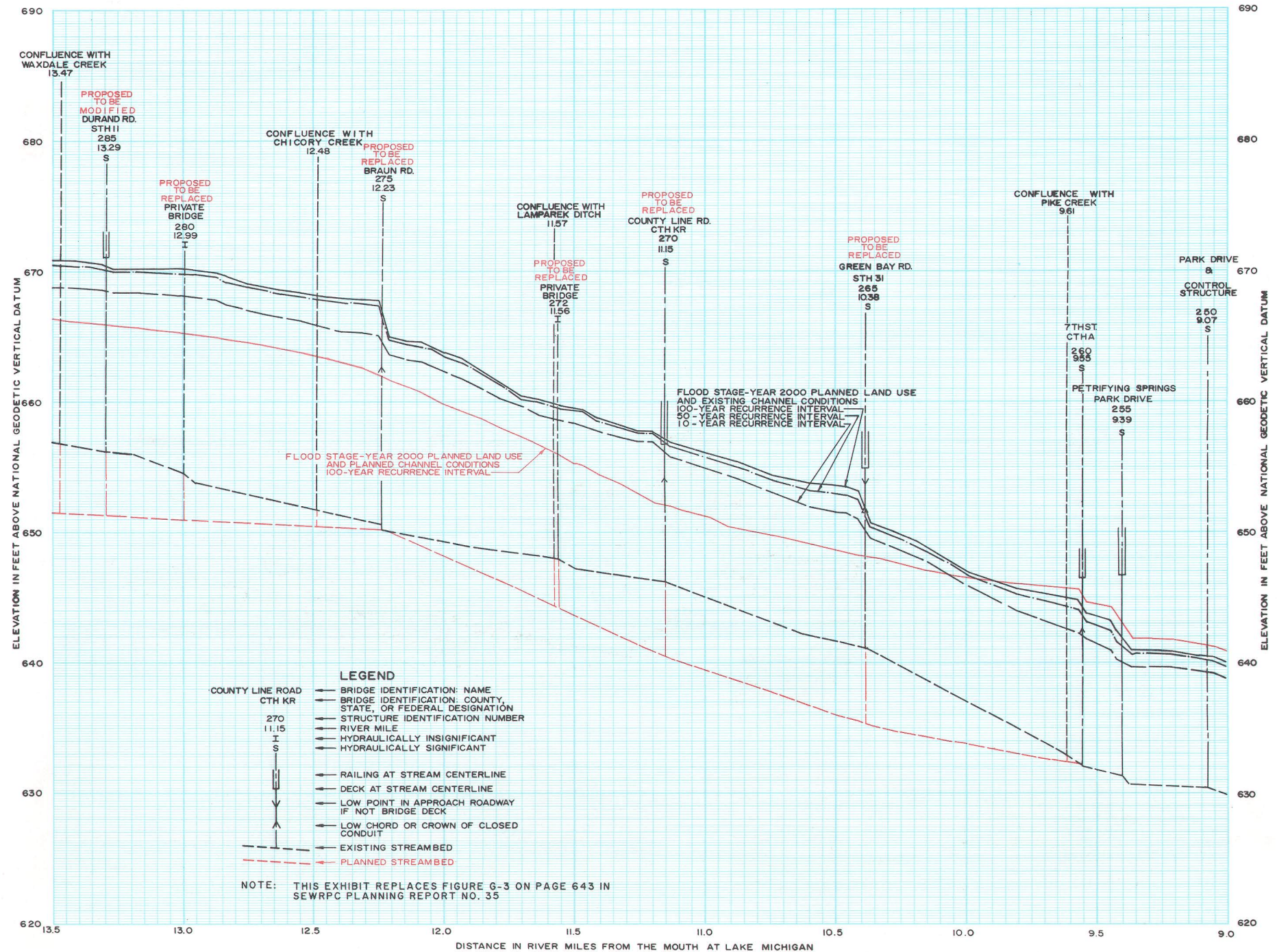


GRAPHIC SCALE

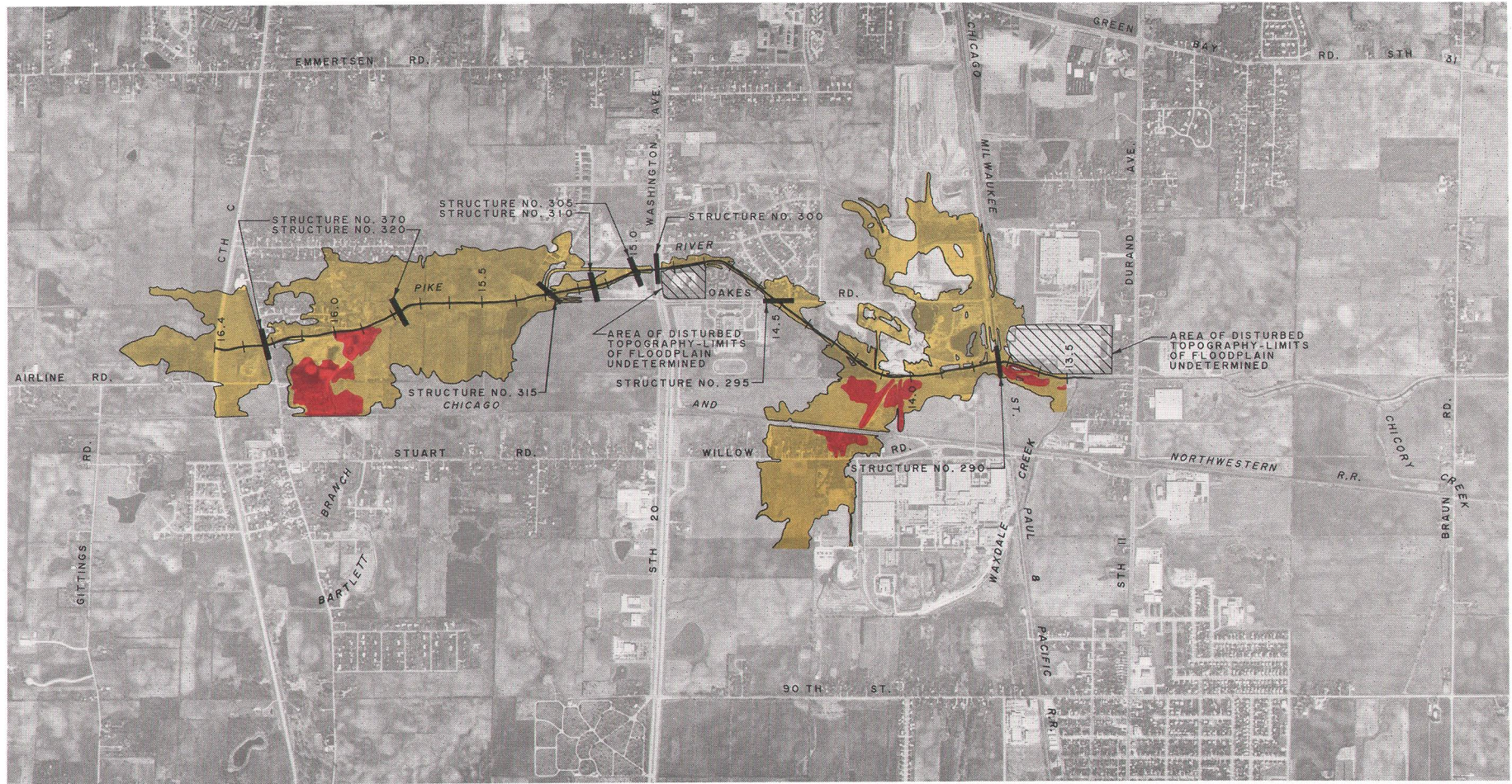


DATE OF PHOTOGRAPHY: APRIL 1986

FLOOD STAGE AND STREAMBED PROFILE FOR THE PIKE RIVER (RIVER MILE 9.00 TO 13.50)



AERIAL PHOTOGRAPH SHOWING AREAS SUBJECT TO FLOODING ALONG THE PIKE RIVER (RIVER MILE 13.50 TO 16.40)

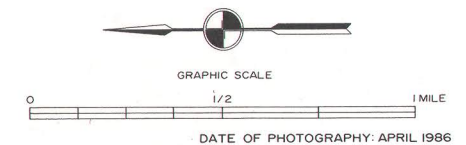
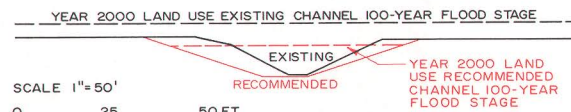


LEGEND

- 10
+
—
APPROXIMATE EXISTING CHANNEL CENTERLINE
AND RIVER MILE STATIONING
- 100-YEAR RECURRENCE INTERVAL FLOODLANDS--
PLANNED LAND USE AND PLANNED CHANNEL CONDITIONS
- 100-YEAR RECURRENCE INTERVAL FLOODLANDS UNDER
PLANNED LAND USE AND EXISTING CHANNEL CONDITIONS
THAT WOULD BE ELIMINATED UNDER PLANNED CHANNEL CONDITIONS

NOTE: DUE TO MAP SCALE LIMITATIONS, THE DIFFERENCE BETWEEN THE 100-YEAR RECURRENCE INTERVAL FLOODLANDS UNDER PLANNED LAND USE AND EXISTING CHANNEL CONDITIONS, AND THE 100-YEAR RECURRENCE INTERVAL FLOODLANDS UNDER PLANNED LAND USE AND PLANNED CHANNEL CONDITIONS, MAY NOT APPEAR ON THIS MAP. WHERE NO DIFFERENCE APPEARS REFERENCE SHOULD BE MADE TO THE FLOOD STAGE PROFILE SHOWN BELOW.

NOTE: THIS EXHIBIT REPLACES MAP G-4 ON PAGE 644 IN SEWRPC PLANNING REPORT NO. 35.

TYPICAL CROSS-SECTION OF RECOMMENDED CHANNEL
ALONG PIKE RIVER
FROM RM 13.50 TO RM 16.40

FLOOD STAGE AND STREAMBED PROFILE FOR THE PIKE RIVER (RIVER MILE 13.50 TO 16.40)

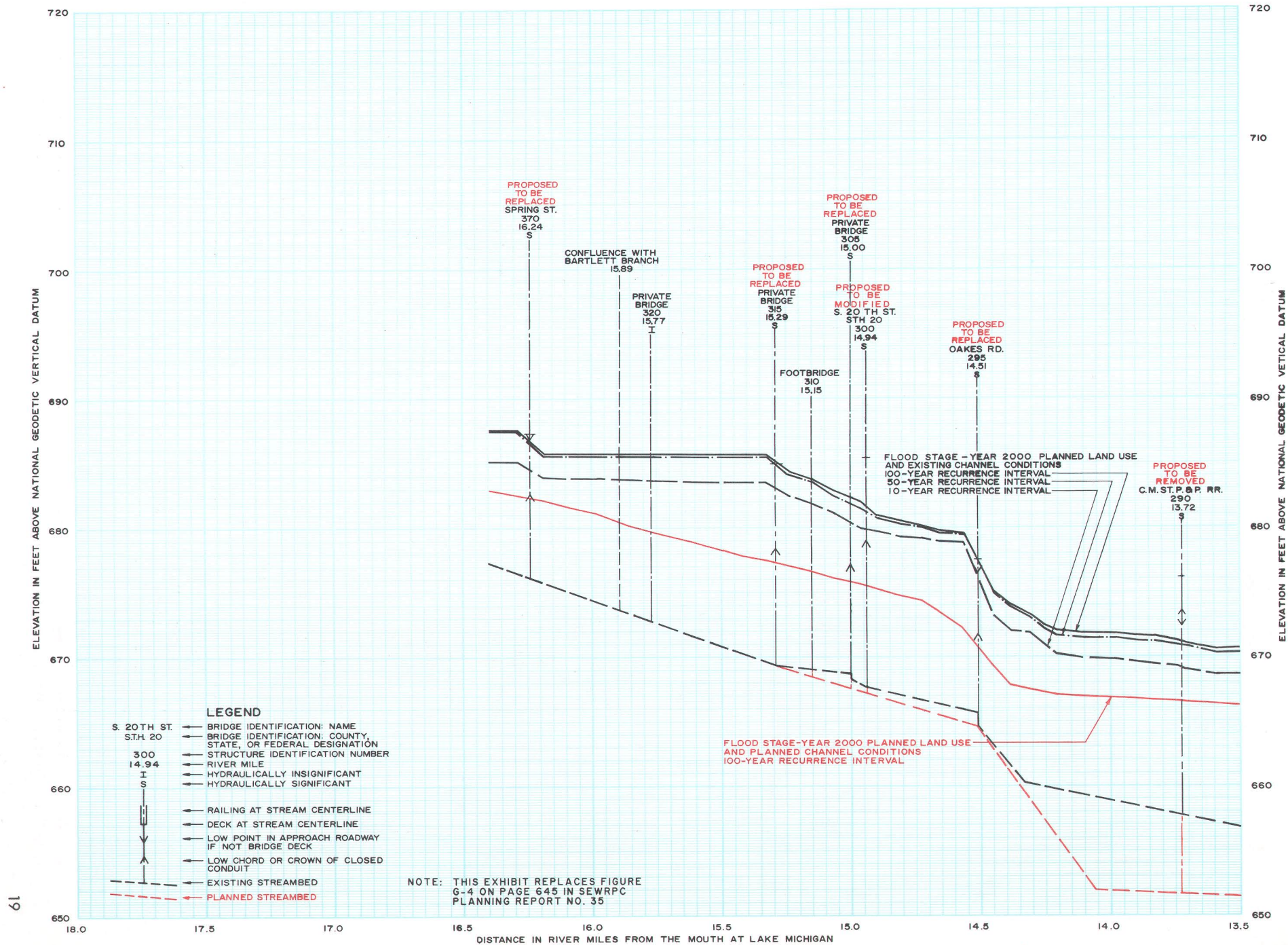


Exhibit K

**SUMMARY OF CAPITAL AND OPERATION AND MAINTENANCE COSTS OF
THE RECOMMENDED FLOODLAND MANAGEMENT PLAN FOR THE UPPER
PIKE RIVER SUBWATERSHED: PIKE RIVER AND BARTLETT BRANCH**

Stream	Plan Element	Estimated Cost	
		Capital	Annual Operation and Maintenance
Pike River	Channel improvement		
	Channel widening and deepening— CTH C to Oakes Road	\$ 162,000	\$ 2,200
	Channel widening and deepening— Oakes Road to CTH KR	610,000	3,700
	Channel widening and deepening— CTH KR to confluence with Pike Creek	129,000	1,700
	Subtotal	\$ 901,000	\$ 7,600
	Bridge modification or replacement— required for flood control and charged to watershed plan		
	Farm bridge downstream of confluence with Lamparek Ditch	\$ 2,000	\$ --
	Farm bridge downstream of STH 11	2,000	--
	STH 11	70,000	--
	Soo Line Railroad upstream of STH 11	4,000	--
	Oakes Road	100,000	--
	STH 20	186,000	--
	Two private bridges upstream of STH 20	174,000	--
	Spring Street	147,000	--
	Subtotal	\$ 685,000	\$ --
	Bridge replacement—required for transportation and flood control and charged to transportation plan		
	STH 31	\$ 297,000	\$ --
	CTH KR	297,000	--
	Braun Road	297,000	--
	Subtotal	\$ 891,000	\$ --
	Summary		
	Charged to transportation plan.	\$ 891,000	\$ --
	Charged to watershed plan	1,586,000	7,600
	Total	\$ 2,477,000	\$ 7,600
	Benefit-cost analysis		
	Average annual benefits		
	Structural damages.	\$ 37,900	
	Crop damages	14,000	
	Total	\$ 51,900	
	Average annual costs		
	At 6 percent rate of return	\$ 108,100	
	At 10 percent rate of return	166,000	
	Benefit-cost ratio		
	At 6 percent rate of return	0.48	
	At 10 percent rate of return	0.31	

NOTE: Costs identified as chargeable to the transportation plan are not included in the benefit-cost analysis.