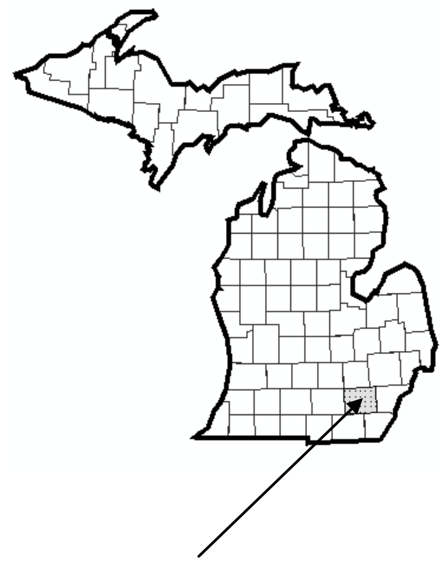
FLOOD INSURANCE STUDY

WASHTENAW COUNTY, MICHIGAN
(ALL JURISDICTIONS)



VOLUME 1 OF 2

Community Name	Community Number	Community Name	Community Number
Ann Arbor, Charter Township of	260535	Milan, City of	260151
Ann Arbor, City of	260213	Northfield, Township of	260635
Augusta, Township of	260627	Pittsfield, Charter Township of	260623
Barton Hills, Village of	261154	Salem, Township of	260636
Bridgewater, Township of*	261786	Saline, City of	260215
Chelsea, City of	260599	Saline, Township of	261792
Dexter, Township of	260536	Scio, Township of	260537
Dexter , Village of	260600	Sharon, Township of*	260538
Freedom, Township of*	261787	Superior, Township of	260540
Lima, Township of	261788	Sylvan, Township of	261793
Lodi, Township of	261789	Webster, Township of	261785
Lyndon, Township of	261790	York, Charter Township of	260541
Manchester, Township of	261791	Ypsilanti, Charter Township of	260542
Manchester, Village of	260316	Ypsilanti, City of	260216

* No Special Flood Hazard Areas Identified

Effective
April 3, 2012

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
26161CV001A

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this FIS report at any time. In addition, FEMA may revise part of this FIS report by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult with community officials and c heck the Community Map Repository to obtain the most current FIS report components.

Selected Flood Insurance Rate Map panels for this community contain information that was previously shown separately on the corresponding Flood Boundary and Floodway Map panels (e.g., floodways, cross sections). In addition, former flood hazard zone designations have been changed as follows:

Old Zone(s)	New Zone
A1 through A30	AE
B	X (shaded)
C	X

Initial Countywide FIS Effective Date: April 3, 2012

Revised FIS Report Dates:

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Flood Insurance Rate Map Index
Flood Insurance Rate Map

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West Branch Malletts Creek	Panel 66P
West Branch Paint Creek	Panels 67P – 70P
West Park Miller Drain	Panel 71P
West Park Miller Drain South Branch	Panel 72P
Wood Outlet Drain	Panels 73P – 78P

PUBLISHED SEPARATELY:

Flood Insurance Rate Map Index
Flood Insurance Rate Map

FLOOD INSURANCE STUDY

WASHTENAW COUNTY, MICHIGAN (ALL JURISDICTIONS)

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and supersedes the FIS reports, Flood Insurance Rate Maps (FIRMs), Flood Boundary and Floodway Maps in the geographic area of Washtenaw County, Michigan, including Charter Townships of Ann Arbor, Pittsfield, York and Ypsilanti: Cities of Ann Arbor, Chelsea, Milan, Saline and Ypsilanti, Townships of, Augusta, Dexter, Lima, Lodi, Lyndon, Manchester, Northfield, Salem, Saline, Scio, Superior, Sylvan and Webster, and Villages of Barton Hills, Dexter and Manchester (hereinafter referred to collectively as Washtenaw County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates. This information will also be used by Washtenaw County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the NFIP are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

The City of Milan is a dual-county community located in Washtenaw and Monroe Counties. The entire community is mapped with Washtenaw County and included in the Washtenaw County FIS report.

The Townships of Bridgewater, Freedom and Sharon are communities with No Special Flood Hazard Areas Identified.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

The Digital Flood Insurance Rate Maps (DFIRMs) and FIS Report for this countywide study have been produced in digital format. Flood hazard information was converted to meet the Federal Emergency Management Agency (FEMA) DFIRM database specifications and Geographic Information System (GIS) format requirements. The flood hazard information was created and is provided in a digital format so that it can be incorporated into a local GIS and be accessed more easily by the community.

1.2 Authority and Acknowledgments

The sources of authority for this FIS are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

Redelineation of previously effective flood hazard information for this FIS report and accompanying FIRMs as well as conversion of the incorporated areas of Washtenaw County into countywide format was performed by Fuller, Mossbarger, Scott and May Engineers, Inc. (FMSM) now Stantec Consulting Services Inc. (Stantec), for FEMA under Contract No. HSFE05-05-D-0026, Task Order No. HSFE05-05-J-0001. This work was completed in July, 2007.

Information pertaining to the authority and acknowledgements for each of the previously effective FIS reports and new floodplain studies for communities within Washtenaw County was compiled for this FIS report and is shown below.

Charter Twp. of Ann Arbor	The previously effective FIS for the Charter Township of Ann Arbor is dated September, 1979. The hydrologic and hydraulic analyses for the study were performed by USACE Detroit District for Federal Insurance Administration (FIA) under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 15, Amendment No 2. In this FIS, Huron River, Little Portage Lake, Losee Lake, Silver Lake, North Lake, Halfmoon Lake, Portage Lake and Blind Lake were studied by detailed methods. This study was completed in June 1978 (Reference 3).
City of Ann Arbor	The previously effective FIS for the City of Ann Arbor is dated January 2, 1992. The original hydrologic and hydraulic analyses for Malletts Creek, Northwest Branch Malletts Creek and West Branch Malletts Creek were performed by United States Army Corps of Engineers (USACE) Detroit District for FEMA under Inter-Agency Agreement No. EMW-87-E-2509, Project Order No. 9. This study was completed in December 1988 (Reference 1). Hydrologic and hydraulic analyses for Huron River, Eberwhite Drain Overland Flow, Murray-Washington Drain Overland Flow, West Park-Miller Drain Overland Flow, West Park-Miller Drain North Branch Overland Flow, and West Park-Miller Drain South Branch Overland Flow were obtained from the 1985 FIS for the City of Ann Arbor (References 1 and 2).
Township of Dexter	The previously effective FIS for the Township of Dexter is dated February 19, 1987. The hydrologic and hydraulic analyses for the study were performed by STS Consultants, Ltd. for FEMA under Contract No. EMW-83-C-1169. Huron River was studied by detailed methods in this FIS. This study was completed in September 1985 (Reference 4).

Village of Manchester

The previously effective FIS for the Village of Manchester is dated December 15, 1981. The hydrologic and hydraulic analyses for the study were performed by William and Works, Inc for FEMA, under Contract No. H-3970. River Raisin was studied by detailed methods in this FIS. The study was completed in December 1980 (Reference 5).

Township of Northfield

The previously effective FIS for the Township of Northfield is dated November 16, 1990. The hydrologic and hydraulic analyses for the study were performed by USACE Detroit District for FEMA, under Inter-Agency Agreement No. EMW-87-E-2509, Project Order No. 10. Horseshoe Lake was studied by detailed methods. This study was completed in March 1988 (Reference 6).

Charter Twp. of Pittsfield

The previously effective FIS for the Charter Township of Pittsfield is dated May 15, 1991. The hydrologic and hydraulic analyses for the Pittsburgh Ann Arbor Drain were performed by USACE Detroit District for FEMA under Inter-Agency Agreement No. EMW-87-E-2509, Project Order No. 10. This study was completed in July 1988. The hydrologic and hydraulic analyses for Swift Run Drain were performed by McNamee, Porter, and Seeley/Smith Hinchman and Grylls in September 1980. The hydrologic and hydraulic analyses for Wood Outlet Drain were taken from the FIS for the City of Saline, Michigan (Reference 7).

City of Saline

The previously effective FIS for the City of Saline is dated July 18, 1983. The hydrologic and hydraulic analyses for the study were performed by William and Works, Inc. for FEMA under Contract No. H-3970. The following streams were studied in detail: Saline River and Wood Outlet Drain. This study was completed in February 1981 (Reference 8).

Township of Scio

The previously effective FIS for the Township of Scio is dated August 3, 1989. The hydrologic and hydraulic analyses for the study were performed by USACE Detroit District for FEMA under Inter-Agency Agreement No. EMW-85-E-1822, Project Order No. 1. The following streams were studied in detail: Honey Creek and its three tributaries. This study was completed in 1987 (Reference 9).

City of Ypsilanti: The previously effective FIS for the City of Ypsilanti is dated September 1982. The hydrologic and hydraulic analyses for the study were performed by USACE Detroit District for FIA under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 15, Amendment No. 2. The following streams were studied in detail: Huron River and Paint Creek. This study was completed in September 1978 (Reference 10).

Charter Twp. of Ypsilanti: The previously effective FIS for the Charter Township of Ypsilanti is dated December 15, 1980. The hydrologic and hydraulic analyses for the study were performed by USACE Detroit District for FIA under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 15, Amendment No. 2. The following streams were studied by detailed methods: Huron River, Paint Creek and West Branch of Paint Creek. This study was completed in November 1979 (Reference 11).

New Detailed Studies: New detailed hydrologic and hydraulic analyses for twelve (12) stream reaches in Washtenaw County were performed for this study by Spicer Group, Inc. for FEMA. This study was completed in September 2006 and supersedes any previously effective studies within the study area. The new detailed study reaches include: Allen Creek, Letts Creek, Mill Creek, Millers Creek, North Fork Mill Creek, Paint Creek, Swift Run Drain, Traver Creek, Tributary to Paint Creek, West Branch of Paint Creek, West Park Miller Drain and West Park-Miller Drain South Branch.

New Approximate Studies: New approximate hydrologic and hydraulic analyses for stream reaches in Washtenaw County were performed for this study by FMSM, now Stantec, for FEMA, under Contract No. HSFE05-05-D-0026, Task Order No. J-0001. This study was completed in March 2006. Streams studied by approximate methods include: Fleming Creek, Honey Creek Tributary 1, Huron River DS Reach, Huron River US Reach, Huron River US Reach Tributary 1,Huron River US Reach Tributary 1.1, Huron River US Reach Tributary 1.2, Letts Creek Tributary 1, Mill Creek, Mill Creek Tributary 1, Mill Creek Tributary 2, Mill Creek Tributary 3, North Fork Mill Creek, North Fork Mill Creek Tributary 1, O'Connor Drain, Saline River.

The digital base map files for Washtenaw County were derived from two sources. One map source is a county wide Digital Line Graph with a scale of 1:24,000 and a contour interval of 5 and 10 feet generated by the U.S. Geological Survey (USGS) in 1981. Another source is a Digital Line Graph with a scale of 1:2,400 and a contour interval of 5 feet. It was generated in 1997 and provided by the Ann Arbor Geographic Information System (AAGIS). The coordinate system used for the production of this DFIRM is State Plane Michigan South FIPS 2113 Feet, North American Datum 1983, Lambert Conformal Conic Projection. Differences in the datum and projection system used in the production of DFIRMs for adjacent counties may result in slight positional differences in map features at the county boundaries. These differences do not affect the accuracy of information shown on this DFIRM.

Redelineation of the previously effective flood hazard information for this FIS report, correction to the North American Vertical Datum of 1988 (NAVD 88), and conversion of the unincorporated and incorporated areas of Washtenaw County into the countywide format was performed by FMSM/Stantec for FEMA under Contract No. HSFE05-05-D-0026, Task Order No. HSFE05-05-J-0001.

1.3 Coordination

The purpose of an initial Consultation Coordination Officer's (CCO's) meeting is to discuss the scope of the FIS. A final CCO meeting is held to review the results of the study. The dates of the initial and final CCO meetings held for the previous FIS reports covering the geographic area of Washtenaw County, Michigan are shown in Table 1. The initial and final CCO meetings were attended by the study contractor, FEMA (or FIA), Michigan Department of Environment Quality (MDEQ) and the affected community.

TABLE 1 CCO MEETING DATES FOR PRE-COUNTYWIDE FIS

COMMUNITY NAME	INITIAL CCO DATE	FINAL CCO DATE
City of Ann Arbor	August 22, 1986	January 24, 1991
Charter Township of Ann Arbor	September 1976	April 3, 1979
Township of Dexter	April 21, 1983	March 11, 1986
Village of Manchester	N/A	July 21, 1981
Township of Northfield	August 21, 1986	December 6, 1989
Charter Township of Pittsfield	August 22, 1986	December 7, 1989
City of Saline	May 1978	January 18, 1982
Township of Scio	May 20, 1985	September 15, 1988
City of Ypsilanti	September 1976	August 16, 1979
Charter Township of Ypsilanti	September 1976	July 29,1980

Source: References 1-11

The initial CCO meeting for this countywide FIS was held on July 27th, 2004 and was attended by FEMA, MDEQ, MRBC, FMSM/Stantec, CBBEL, and representatives from Washtenaw County. The results of the study were reviewed at the final CCO meeting held on April 30, 2008, and attended by representatives of FEMA, FMSM/Stantec and Washtenaw County. Problems raised at that meeting have been addressed.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Washtenaw County, Michigan. All previously effective FIRM panels for Washtenaw County have been revised, updated and republished in countywide format as a part of this FIS. Analyses described herein refer collectively to previous study efforts detailed in References 1-11 in addition to new studies. The FIRM panel index, provided as Exhibit 2, illustrates the revised FIRM panel layout.

Approximate methods of analysis were used to study those areas having low development potential and/or minimal flood hazards as identified at the initial CCO meetings identified in Table 1. The scope and methods of approximate study were proposed to and agreed upon by FEMA and Washtenaw County. For this study, sixteen new stream reaches were studied by using approximate methods. These streams were described in section 1.2. In other areas where approximate studies had been completed for previous FIS reports, approximate flood hazard areas were redelineated.

The areas studied by detailed methods were selected with priority given to all known flood hazard areas, areas of projected development and proposed construction. Flooding sources studied by detailed methods are shown in Table 2.

TABLE 2 LIMITS OF DETAILED STUDY

STREAM REACH	STUDY LENGTH (MILES)	LIMITS OF DETAILED STUDY
Allen Creek	3.28	Mouth at Huron River to Hill Street in City of Ann Arbor
Eberwhite Drain Overland Flow	0.65	Confluence with Allen Creek to Lutz Ave.
Honey Creek	6.7	Mouth at Huron River to the confluence point of Tributary 3 at Liberty Road
Honey Creek Tributary No. 1	0.3	Mouth at Honey Creek to Jackson Road.
Honey Creek Tributary No. 2	2.4	Mouth at Honey Creek to approximately 230 ft downstream of Park Road.
Honey Creek Tributary No. 3	0.9	Mouth at Honey Creek to approximately 2,300 ft upstream of Honey Run Drive.
Huron River	19.6	Washtenaw County boundary at Rawsonville Road to corporate limits of Township of Dexter.
Letts Creek	5.72	Mouth at North Fork Mill Creek to Pierce Road.
Malletts Creek	3.91	Corporate Limits of Charter Township of Ann Arbor at Huron Pike to corporate limits of Charter Township of Pittsfield at Ellsworth Road.

TABLE 2 LIMITS OF DETAILED STUDY (continued)

STREAM REACH	STUDY LENGTH (MILES)	LIMITS OF DETAILED STUDY
Mill Creek	4.0	Mouth at Huron River to corporate limits of Township of Scio at Parker Road.
Miller Creek	2.65	Mouth at Huron River to approximately 1,600 feet upstream of Baxter Road.
Murray-Washington Overland Flow	0.6	Confluence with Allen Creek at the railroad to approximately 1,000 ft upstream of 8th Street.
North Fork Mill Creek	5.0	Approximately 3,500 feet downstream of Fletcher Road to Convay Road.
Northwest Branch Malletts Creek	3.0	Confluence with Malletts Creek to 7th Street
Paint Creek	15.35	Corporate limits of Charter Township of Ypsilanti at Bemis Road to Congress Street.
Paint Creek – New Detailed Study	7.36	Washtenaw County Boundary to corporate limits of Charter Township of Ypsilanti at Bemis Road.
Pittsfield - Ann Arbor Drain	0.72	Ellsworth Road to State Street.
Saline River	3.18	Corporate limits of City of Milan to upstream corporate limits of Charter Township of York at Platt Street.
Swift Run Drain	5.0	Mouth at Huron River to Morgan Road.
Traver Creek	1.3	Mouth at Huron River to Traver Road.
Traver Creek – New Detailed Study	3.52	Traver Road to US 23.
Tributary to Paint Creek	2.9	Approximately 750 feet downstream of Munger Road to Morritt Road
West Branch Malletts Creek	2.8	Confluence with Malletts Creek to approximately 500 ft downstream of Eisenhower Pike.
West Branch Paint Creek	0.4	Corporate limits of Charter Township of Ypsilanti at Bemis Road to Divergence from Paint Creek.
West Branch Paint Creek – New Detailed Study	2.61	Confluence with Paint Creek to corporate limits of Charter Township of Ypsilanti at Bemis Road.
West Park Miller Drain	0.68	Mouth at Allen Creek to approximately 100 ft downstream of Wesley Avenue
West Park Miller Drain – South Branch	0.57	Mouth at WPMD to approximately 70 ft downstream of North Ravena Boulevard.
Wood Outlet Drain	5.2	Confluence with Saline River to approximately 2,000 ft upstream of Technology Drive.

This countywide FIS also incorporated the determination of letters issued by FEMA resulting in map changes (Letters of Map Change, or LOMCs). All LOMCs in Washtenaw County for which information could be found are summarized in the Summary of Map Action (SOMA) included in the Technical Support Data Notebook (TSDN) associated with this FIS update. LOMRs (Letters of Map Revision) that have been incorporated into the maps are shown in Table 3. Copies of the SOMA may be obtained from the Community Map Repository. Copies of the TSDN may be obtained from FEMA.

Table 3 SUMMARY OF LOMRs INCORPORATED

CID	Flooding Source	Case Number	Date Issued	New Panel
260213	Allen Creek Murray-Washington Drain Overland Flow	07-05-0217P	23-Jan-07	26161C0242E, 26161C0244E
260623	Wood Outlet Drain	03-05-2560P	09-April-04	26161C0405E

2.2 Community Description

Washtenaw County, Michigan encompasses approximately 720 square miles and is located in the southeastern part of Michigan approximately 30 miles west of Detroit. It is bounded on the north by Livingston and Oakland Counties; on the east by Wayne County; on the south by Lenawee and Monroe Counties; and on the west by Jackson County. The estimated population of the county based on the U.S. Census Bureau's 2008 estimate is approximately 347,376 persons (Reference 13). The county is served by several highways including Interstate 94, U.S. Route 12 and 23 and State Route 14 and 17. The county is also served by Conrail and Ann Arbor Railroad (Reference 1-11).

The topography of Washtenaw County is generally undulating to flat with several small areas of hills. The Huron River, which flows north to south through the County, is a major waterway flowing through southeastern Michigan to its mouth at Lake Erie. The Saline River, which is located in southern Washtenaw County and flows south, is a major tributary of the River Raisin, one of the major rivers of southeast Michigan (Reference 1-11).

The climate in Washtenaw County is characteristically continental and, as such, is subject to extreme temperature variation and fairly well distributed precipitation. Precipitation is slightly greater during the summer months than during the winter months. The annual precipitation is approximately 30 inches. Snowfall averages approximately 30 inches annually. (Reference 1-11)

The Charter Township of Ann Arbor is located on the eastern half of Washtenaw County. According to the U.S. Census Bureau statistics, the 2008 estimated population of Charter Township of Ann Arbor was reported to be 4,484 (Reference 13). The majority of the precipitation occurs from April to September. The northern half of the township is hilly with small lakes and swamps. At the time of the previously effective FIS, the drainage system was not well developed in this area. The topography has been modified by the floodplains of Huron River, Fleming Creek and Traver Creek (Reference 3).

The City of Ann Arbor is located in central Washtenaw County. According to the U.S. Census Bureau statistics, the 2008 estimated population of City of Ann Arbor was reported to be 114,024 (Reference 13). The city covers approximately 23 square miles and has retained its urban residential character over the years. The mean temperature is 49.5 degrees Fahrenheit (F) with extremes ranging from -21°F to 105°F. Generally, the month of greatest precipitation is May while the month of least precipitation is February. In the southern section of the City of Ann Arbor, the topography is gently rolling to flat (Reference 1).

The Township of Augusta is located in southeastern Washtenaw County. According to the U.S. Census Bureau statistics, the 2008 estimated population of Township of Augusta was reported to be 6,774 (Reference 13).

The Township of Dexter is located in northwestern Washtenaw County. According to the U.S. Census Bureau statistics, the 2008 estimated population of Township of Dexter was 5,939 (Reference 13). At the time of the previously effective FIS the area of this community was mostly wooded, and land use was mainly recreational with a residential concentration around the lakes. Approximately 56 percent of the total precipitation falls within the period of May through October (Reference 4).

The Village of Manchester is located in southwestern Washtenaw County. According to the U.S. Census Bureau statistics, the 2008 estimated population of Village of Manchester was 2,222 (Reference 13). Transportation facilities serving the Village include State Highway 52. At the time of the previously effective FIS development within the floodplain was limited to a minor amount of residential development (Reference 5).

The City of Milan is located on the border of Washtenaw County and Monroe County. According to the U.S. Census Bureau statistics, the 2008 estimated population of the City of Milan was 5,657 (Reference 13).

The Township of Northfield is located in north central Washtenaw County. It is served by U.S. Highway 23 and Ann Arbor Railroad. According to the U.S. Census Bureau statistics, the 2008 estimated population of Township of Northfield was 8,487 (Reference 13). At the time of the previously effective FIS, land use within the township was mainly undeveloped or agricultural with limited industrial, commercial and residential development. The topography within the township is generally undulating to flat with several small areas of hills (Reference 6).

The Charter Township of Pittsfield is located in southern Washtenaw County. It is served by Interstate 94, U.S. Highway 12 and 23, and Ann Arbor Railroad and Conrail. According to the U.S. Census Bureau statistics, the 2008 estimated population of Charter Township of Pittsfield was reported to be 34,196 (Reference 13). The soils within the township range from well drained to somewhat poorly drained with moderately fine textured subsoil and underlying material. The topography is gently rolling to flat. At the time of the previously effective FIS, development was concentrated mainly along the arterial roads and near the City of Ann Arbor. Developments within the floodplain areas were primarily residential and agricultural (Reference 7).

The Township of Salem is located in northeastern Washtenaw County. According to the U.S. Census Bureau statistics, the 2008 estimated population of Township of Salem was 6,614 (Reference 13).

The City of Saline is located in southern Washtenaw County. It is served by Interstate 94, U.S. Highway 12 and 23 , and Ann Arbor Railroad and Conrail. According to the U.S. Census Bureau statistics, the 2008 estimated population of City of Saline was 8,882 (Reference 13). The topography is generally flat to gently rolling in the center of the community. Soils in this area are primarily sandy loam and s ilt loam glacial outwash deposits and have fair to good drainage characteristics. Saline River flows from north to south through the city. At the time of the previously effective FIS, development in the floodplain was limited to primarily single family residences and a few commercial developments. Several recreation areas are located near the Saline Dam impoundment. The land use within the floodplain of Wood Outlet Drain was agricultural or undeveloped at that time (Reference 8).

The Township of Scio, encompassing 34.4 square miles, is located in central Washtenaw County. According to the U.S. Census Bureau statistics, the 2008 estimated population of Township of Scio was 19,473 (Reference 13). Scio is served by Interstate 94 and Conrail Railroad (Reference 9).

The Charter Township of York is located in southeastern Washtenaw County. According to the U.S. Census Bureau statistics, the 2008 estimated population of Charter Township of York was 8,284 (Reference 13).

The City of Ypsilanti is located in the eastern half of Washtenaw County. According to the U.S. Census Bureau statistics, the 2008 estimated population of City of Ypsilanti was 21,464 (Reference 13). The city's topography varies. The western half is a relatively level moraine and the eastern half is modified by the Huron River. These two features provide good drainage within the city boundaries. At the time of the previously effective FIS, floodplain development had been primarily recreational. Commercial development occurred mostly along the arterial roads that traverse the city. Industry development occurred in areas adjacent to the Huron River while residential areas developed throughout the rest of the city (Reference 10).

The Charter Township of Ypsilanti is located in the eastern half of Washtenaw County. According to the U.S. Census Bureau statistics, the 2008 estimated population of Charter Township of Ypsilanti was 52,975 (Reference 13). The township has a similar topography as the City of Ypsilanti. At the time of the previously effective FIS, residential development was concentrated on t he northern half of the township, and commercial developments occurred along the arterial roads. Floodplains of the Huron River, Paint Creek and West Branch Paint Creek were used primarily for recreation and agriculture (Reference 11).

2.3 Principal Flood Problems

In Washtenaw County, severe floods caused by intense thunderstorms during summer months have been r ecorded. However, the more severe flooding in rivers such as Huron River, Traver Creek, Paint Creek, Willow Run and Fleming Creek generally occur in late winter and early spring from a combination of frozen ground, melting snow and heavy rain. The greatest floods of the Huron River in Washtenaw County during the time period of 1920 to 1980 occurred in March 1918, April 1947 and June 1968, as recorded by the USGS stage gage on Huron River at the Charter Township of Ann Arbor. These floods had estimated recurrence intervals of 38, 19 and 15 years respectively based on flood frequency analyses performed at the time of the previous FIS. Urbanization in the Ann Arbor-Ypsilanti area has had a profound effect on the flow in the Huron River. A heavy rain will produce sudden high discharges. Based on the USGS gage records for the Huron River at the Charter Township of Ann Arbor, the June 1968 storm produced a flow increase of 3,800 cubic feet within a period of two to three hours after precipitation. The probability of flooding in the Huron River is further increased by the constrictive bridges in the Charter Township of Ann Arbor and debris accumulated near these structures (Reference 3).

Flooding conditions in the Township of Dexter are generally caused by increased lake levels and river flows, which are the result of major storm events in the respective watersheds. The resulting increase in flood elevations has an impact on residential, commercial and industrial developments in the floodplain adjacent to the lakes and river system (Reference 4).

In the Village of Manchester, only a small amount of serious flooding has occurred according to the local officials. Historical flooding has been primarily limited to the undeveloped areas adjacent to the rivers (Reference 5).

The principal flooding conditions in the Township of Northfield occur on Horseshoe Lake and surrounding low-lying areas. The principal cause is prolonged wet spells. Intensive storms during these wet spells substantially increase the amount of flow from Horseshoe Lake. The lake has an outlet that allows some outflow during typical wet spells but cannot handle big storm events. The greatest flooding on Horseshoe Lake from the early 1940's to 1990's occurred on April 6, 1947 with a maximum elevation of 903.5 ft (NAVD88). This elevation corresponds to about a 2.5-percent-annual-chance event based on the frequency analysis from the 1990 FIS (Reference 6).

In the Charter Township of Pittsfield, the flooding on certain streams has resulted in crop damage, siltation at bridges and culverts and flooding of several residential structures (Reference 7).

In the City of Saline, the most severe recorded flooding through 1983 on Saline River occurred in June 1968. During this flood, the west embankment of Saline River Dam failed. The dam was not rebuilt until 1974. Based on the records from the USGS gage station on the Saline River near the City of Saline, the June 1968 flood had a peak discharge of 3,990 cfs, which was slightly greater than the 1-percent-annual-chance flood estimated in a report created by USGS in 1978 (Reference 8).

In the Township of Scio, based on gage records for the Huron River at Ann Arbor, high runoff occurs mostly in late winter and spring. Due to the summer precipitation pattern, potential for flooding in summer time also exists (Reference 9).

In the City of Ypsilanti, the probability of severe flooding in Paint Creek is increased due to constrictive culverts under Interstate Highway 94. During the March 1918 flood, Peninsular Dam failed and inundated Michigan Ave. During the April 1947 flood, the municipal pump, sewage treatment plant and high service pumping station were surrounded with water and the city's well field was also inundated, The Ford Motor Company reported approximately 1.5 million dollars in damage. During the 1968 flood, commercial and residential areas located within the Huron River floodplain were damaged (Reference 10).

In the Charter Township of Ypsilanti, the probability of severe flooding in the Huron River is increased by the constrictive bridges and the debris accumulated near these structures. A similar effect occurs on Fleming Creek, Paint Creek and Traver Creek with constrictive culverts and poor alignment. During the June 1960 flood, Paint Creek extended itself throughout its floodplain and flowed over Michigan Avenue and Textile Road (Reference 11).

2.4 Flood Protection Measures

In the Charter Township of Ann Arbor, no flood control projects for Huron River are known to exist. The combined flood control capability of the Geddes, Argo and Barton Dams is minor because the pool levels must be maintained for water supply, waste disposal and recreation. Reservoir capacity is not enough for large flood stage reduction (Reference 3).

In the City of Ann Arbor, extensive improvements have been made to Malletts Creek to alleviate flood damages. The work included several new culverts, channel improvement and the construction of two on-line retention ponds, one of which is just beyond the city limits. These improvements significantly reduce the 1-percent-annual-chance flood discharge in the City of Ann Arbor. An off-line retention basin was also constructed for Traver Creek to reduce the flood discharge (Reference 1).

In the Township of Dexter, dams and culverts were constructed on the Huron River as flood control measurements to regulate the discharge of stormwater. This system attenuates the peak flow discharge and hence reduces the flood discharge (Reference 4).

In the Village of Manchester, two dams (the Manchester Mill Dam and the Manchester Ford Dam) serve to control the 0.2-percent-annual-chance flood. No other flood control measures were known to exist at the time of the previously effective FIS (Reference 5).

Within the Township of Northfield, flood protection measurements do not exist. The small lake level control at the Horseshoe Lake outlet is only for maintaining the legal lake level. Non-structural measures were established in the township in the form of ordinance to govern floodplain development. The township has adopted the ordinances to be in compliance with requirements of the State of Michigan and NFIP (Reference 6).

In the Charter Township of Pittsfield, extensive flood improvements were made in 1978 to the Pittsfield-Ann Arbor Drain. The improvements include two on-line retention basins, which significantly reduced the 1-percent-annual-chance flood discharges. The township also implements nonstructural flood protection measures in the form of land use regulations to aid in the protection of future flood damage (Reference 7).

In the City of Saline, earthen dikes with a top elevation of 743.0 feet (NGVD 29) have been constructed around the wastewater treatment plant since the 1968 flood to protect the plant from future flooding. The Saline River dam, located on the Saline River and adjacent to the US Highway 12 crossing, regulates the peak flow but no documented operating procedure is known to exist. Rating curves for the dam indicates that the peak discharge of the spillway is about 6,000 cfs without overtopping the dam. This is greater than the 0.2-percent-annual-chance flood discharge (4,600 cfs) that was predicted in the 1983 FIS report (Reference 8).

No flood control measures are known to exist within the Township of Scio (Reference 9).

In the Charter Township of Ypsilanti, no flood control projects for the Huron River are known to exist. The combined flood control capability of dams in Huron River is minor because the pool levels must be maintained for water supply, waste disposal and recreation. Reservoir capacity is not enough for large flood stage reduction. On the Paint Creek, a retention basin has been built just south of Interstate Highway 94 to reduce the impact of flooding on the downstream properties within the township. Between Interstate Highway 94 and Congress Street, the channel has been cleaned, widened and straightened (Reference 10).

There are no flood protection measures for Huron River and Paint Creek within the City of Ypsilanti. The combined capacity of dams on the Huron River is not available for large stage flood reduction (Reference 11).

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods in Washtenaw County, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for these studies. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 1-percent-annual-chance flood in any 50-year period is approximately 40 percent (4 in 10); for any 90 year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of the original study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by detailed methods within Washtenaw County. A summary of peak discharges for the 10-, 2-, 1-, and 0.2-percent-annual-chance (10-, 50-, 100-, and 500-year return period) floods of each flooding source studied in detail in Washtenaw County is presented in Table 4. A description of the derivation of flood discharges for each stream follows.

For streams with gage records, peak discharges were derived from a statistical analysis of historical records. Two USGS gages are available on the Huron River in Washtenaw County. One of the USGS gages (Gage No. 04173000) has a period of record of 30 years through 1987 and is located approximately 2 miles upstream from the North Territorial Road Bridge at the Township of Dexter. The other gage (Gage No. 04174500) has a period of record of 60 years through 1992 and is located at the City of Ann Arbor. The stream flow records from these two gages were used to develop discharge-frequency data for Huron River. Peak discharges for different return periods were estimated from a log-Pearson Type distribution as outlined by the U.S. Water Resources Council (Reference 14). For the portion of Huron River within the Township of Dexter, peak discharge values were obtained from the statistical analysis using records from the USGS gage at North Territorial Road (Reference 1-4). For Huron River within the City and Charter Township of Ypsilanti, peak flow was estimated from the records of the USGS gage at Ann Arbor (Reference 10 and11). The hydrology of Huron River within the City of Ann Arbor was obtained from Special Flood Hazard Information Report-Huron River – Ann Arbor, Ypsilanti, Michigan and Vicinity prepared by USACE (Reference 15).

Peak discharges for the portion of Paint Creek within the City of Ypsilanti, the portion of Wood Outlet Drain upstream from Conrail Railroad and the portion of Traver Creek downstream from Traver Road were determined using Brater’s unit-hydrograph method (Reference 30). This method includes factors such as drainage area, infiltration capacities, population density and intensity-duration pattern. For the portion of Wood Outlet Drain downstream from Conrail Railroad, the flow was calculated using area correlation techniques. An area correlation factor of 0.886 (per MDEQ) was used (Reference 7 and 8).

Peak discharges for Eberwhite Drain, Murray-Washington Drain and West Park-Miller Drain were obtained from analyses using Brater’s unit-hydrograph method. Then a HEC-1 (Reference 16) computer program was used to route the resulted hydrographs to include the impacts from storm sewer storage, channel routings and/or storage routing.

A Soil Conservation Services (SCS) unit-hydrograph method was selected in HEC-1 computer program to calculate peak discharges for the following listed streams on which no gage data are available: Honey Creek and its tributaries within the Township of Scio; Malletts Creek and a portion of Paint Creek within the Charter Township of Ypsilanti; Pittsfield-Ann Arbor Drain; and West and Northwest Branches Malletts Creek (Reference 1-11). SCS method combines drainage characteristics such as drainage area, slope, soil type and land use to determine the peak flow for specified return periods. SCS curve numbers were used to estimate runoffs. Soil types within the studied watersheds were determined from both general and detail survey maps for Washtenaw County. Rainfall duration values were obtained from TP-40 (Reference 17). The SCS Type I rainfall distribution was used. Peak discharge of the portion of Paint Creek within the Charter Township of Ypsilanti was estimated using SCS. The resulting hydrograph was then adjusted by using USACE's HEC-1 program to take into account the storage volumes and routing effects. The diversion of Paint Creek and West Branch Paint Creek was estimated using an energy grade line-discharge relationship, which assumes that at the diversion point, both energy grade lines are equal.

For Saline River and River Raisin, a TR-20 computer program was used to estimate the peak discharges (Reference 18). Parameters of TR-20 include watershed drainage area, time of concentration, curve number, reach length and structure/cross sections rating curves. Calibrations of the models were performed to confirm good correlation of simulated historic floods to actual observed streamflow gage data (Reference 8 and19).

For the new detailed study reaches with gages, a flow-frequency analysis was performed to estimate peak discharges based on gage records. For Mill Creek, USGS Gage No. 04173500, located 12 feet downstream of Parker Road was utilized in the hydrologic analysis. The procedure of flood flow-frequency analyses was outlined in Guidelines for Determining Flood Flow Frequency, Bulletin 17 E (Reference 18). The hydrologic analysis at ungaged sites on a gaged stream was performed using a drainage area ratio technique, as outlined in Guidelines and Specifications for Flood Hazard Mapping Partners, Appendix C: Guidance for Riverine Flooding Analyses and Mapping by FEMA's Flood Hazard Mapping Program (Reference 19). As outlined in Reference 19, transfer procedures are typically used when the drainage area of the ungaged site is between 50 and 200 percent of the drainage area at the gaged site. The study sites for Mill Creek are in accordance with this criterion.

For the new detailed study reaches without gage data, a Rainfall-Runoff Unit Hydrograph method was used to estimate the discharges. This method was applied for the following new detailed study reaches: Letts Creek, Millers Creek, North Fork Mill Creek, Paint Creek, Traver Creek, Tributary to Paint Creek, West Branch of Paint Creek and Swift Run Drain. Rainfall-Runoff Unit Hydrograph technique was outlined in Computing Flood Discharges For Small Ungaged Watersheds (Reference 17). The procedure is similar to what was developed by the U.S. SCS (Reference 20). Input parameters included total rainfall amounts from Rainfall Frequency Atlas of the Midwest (Reference 21) associated with each flood frequency and individual subbasin characteristics such as runoff curve numbers (based on land use and soil type), time of concentration, and subbasin drainage areas.

In the hydrologic analysis for the portion of Traver Creek from Traver Creek No. 3 Dam (ID #2380) to Traver Road, an unsteady state HEC-RAS model was developed. This model allowed routing of flood hydrographs through the dam so that attenuation and impoundment could be accurately modeled. For locations downstream of the dam, unsteady state inflow hydrographs were determined using the MDEQ SCS Method and HEC-HMS. An inflow hydrograph was determined first for the dam to be used in the unsteady state model. From the unsteady state model, peak discharges were determined for the locations downstream of the dam. The discharges upstream of the dam were not routed (Reference 23).

West Branch Paint Creek diverges from Paint Creek causing a split in flow. The two streams rejoin further downstream at the confluence. A MDEQ SCS spreadsheet and a Regression Method were applied to calculate the inflow at the point of divergence, providing a flow rate for each design storm at that point. A FlowMaster model was constructed using the HEC-1 cross sections data from the 1980 FIS and the incoming discharges from the SCS spreadsheet to aid in the division of the flows to Paint Creek and West Branch Paint Creek. This method assumes that at their diversion, both energy grade lines are equal. These calculated discharges were then added to the discharges calculated from the MDEQ SCS spreadsheet for West Branch Paint Creek and subtracted from the discharges obtained from the MDEQ SCS spreadsheet or the Regression Method for Paint Creek (Reference 23).

For the new approximate study reaches, only the 1-percent-annual-chance peak discharges were calculated. For streams where gage records are available, peak discharges were first computed from historical records using the PEAKQ4.1 program developed by USGS to get the 1-percent-annual-chance peak flow at the gage site (Reference 25). Then a Drainage Area Ratio method was carried out to determine the flow at the study site. A value of 0.89 provided by MDEQ was used for the power coefficient in the Drainage Area Ratio method. For streams on which no gage records are available, two methods were used to obtain peak discharges. If the watershed drainage area at the study site is larger than 20 square miles, a National Flood Frequency (NFF) regression equation program provided by the USGS was used (Reference 26); otherwise, the MDEQ SCS spreadsheet was used to obtain the peak flow.

TABLE 4 – SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ. MILES)	PEAK DISCHARGE (CFS)			
		10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	1-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
Allen Creek					
At mouth	5.5	1,686	2,142	2,395	3,428
Just upstream of confluence with West Park-Miller Drain	3.7	1,672	2,036	2,172	2,469
Just upstream of confluence with Eberwhite Drain Overland Flow	1.8	697	1,058	1,269	1,734
At Hill Street	0.5	743	1,087	1,244	1,601
Eberwhite Drain Overland Flow					
At mouth	0.4	115	-	320	-

TABLE 4 – SUMMARY OF DISCHARGES (continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ. MILES)	PEAK DISCHARGE (CFS) 10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	1-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
Honey Creek					
At mouth	22.6	-	-	1,740	-
Just upstream of confluence with Tributary No. 1	10.5	-	-	990	-
Just upstream of confluence with Tributary No. 2	4.9	-	-	420	-
Just upstream of confluence with Tributary No. 3	1.8	-	-	350	-
Honey Creek Tributary No. 1					
At mouth	6.0	-	-	830	-
Honey Creek Tributary No. 2					
At mouth	4.5	-	-	630	-
Approximately 9,000 feet upstream of mouth	1.4	-	-	360	-
Honey Creek Tributary No. 3					
At mouth	1.30	-	-	150	-
Huron River					
Belleville Road	820	5,870	8,739	10,006	13,475
Interstate Highway 94	809	5,775	8,597	9,844	13,256
Peninsular Dam	802	5,643	8,401	9,616	12,954
Downstream of Fleming Creek	796	5,532	8,235	9,429	12,698
Geddes Dam	765	4,978	7,411	8,485	11,427
At Fuller Street	736	4,850	6,550	7,500	10,100
Barton Dam	730	4,800	6,490	7,430	10,018
Argo Dam	730	4,800	6,490	7,430	10,000
At North Territorial Road	522	2,130	3,015	3,410	4,360
Letts Creek					
Upstream of confluence with N. Fork Mill Creek	19.36	180*	330*	420*	650*
At Main Street	18.89	180*	330*	420*	650*
Approximately 1,400 feet downstream of Cavanaugh Road	16.95	180	330	420	650
At Pierce Road	9.34	140	260	330	550
Malletts Creek					
At mouth	10.85	1,130	1,600	1,870	2,400
At Platt Road	9.33	910	1,300	1,500	1,920
Just upstream of confluence of Northwest Branch Malletts Creek	3.00	260	410	490	640
Just upstream of confluence of West Branch Malletts Creek	0.91	70	120	140	190
At Ann Arbor Railroad	0.63	40	60	80	110

TABLE 4 – SUMMARY OF DISCHARGES (continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ. MILES)	PEAK DISCHARGE (CFS) 10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	1-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
Mill Creek					
Confluence with Huron River	144.64	1,400	1,700	1,900	2,100
Dexter Dam #324	143.86	1,400	1,700	1,900	2,100
Approximately 3,500 feet upstream of Shield Road	134.25	1,300	1,600	1,700	2,000
USGS Gage No. 04173500, (approximately 12 feet downstream of Parker Road)	130.70	1,300	1,600	1,700	2,000
Millers Creek					
Confluence with Huron River	2.45	180*	300*	350*	500*
Downstream of Diversion Channel	2.34	180	300	350	500
Upstream of Diversion Channel	2.00	180	270	280	300
Lakehaven Drive	1.95	180	290	350	500
Intersection of Huron Parkway and Hubbard Street	1.19	150	240	290	400
Confluence with unnamed tributary (approximately 200 feet upstream of Baxter Road)	0.76	150	230	280	380
Approximately 400 feet downstream of Green Road	0.25	80	120	130	170
Millers Creek Diversion					
Downstream of Diversion	2.00	0	30	70	200
Murray-Washington Overland Flow					
At mouth	1.1	175	-	325	-
North Fork Mill Creek					
Approximately 10,000 feet upstream of unnamed tributary from Fourmile Lake	39.56	240*	460*	600*	950*
At Dexter-Chelsea Road	38.48	240*	460*	600*	950*
Approximately 500 feet downstream of confluence point with Letts Creek.	35.46	240	460	600	950
McKinley Road	14.59	160*	310*	400*	650*
At M-52	12.90	160	310	400	650
At Ivey Road	7.23	110	200	260	410

TABLE 4 – SUMMARY OF DISCHARGES (continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ. MILES)	PEAK DISCHARGE (CFS) 10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	1-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
Northwest Branch Malletts Creek					
At mouth	4.9	470	680	840	1,060
At Ann Arbor Railroad	2.3	470	680	790	1,000
At Ann Arbor - Saline Road	1.49	280	420	490	620
Paint Creek					
Confluence with Stony Creek	37.5	1,200	1,800	2,100	3,000
Approximately 2,000 feet upstream of Willow Road	34.5	1,200	1,800	2,100	3,000
Downstream of McCarthy Drain	32.8	1,200	1,800	2,100	3,000
Downstream of confluence with West Branch Paint Creek	28.0	1,000	1,600	1,900	2,600
Upstream of confluence with West Branch Paint Creek	23.0	700	1,100	1,200	1,600
Approximately 2,000 feet downstream of Willis Road	22.7	700	1,100	1,200	1,600
At Bemis Road	21.5	700	1,000	1,200	1,500
Upstream of divergence from West Branch	17.3	583	962	1,521	2,511
At Stony Creek Road	14.8	706	1,292	1,888	2,950
Upstream of Chicking Ditch	5.8	149	279	506	885
At Interstate Highway 94	4.4	469	589	644	1,269
At West Michigan Avenue	4.1	585	1,075	1,407	2,662
At South Congress Street	3.1	585	980	1,215	2,250
Tributary of Paint Creek					
Approximately 2,400 feet downstream of Munger Road	6.22	210	350	420	590
Approximately 700 feet downstream of Munger Road	5.90	200	330	400	560
At Crane Road	2.55	130	190	230	310
At Merritt Road	1.01	60	90	110	160
Pittsfield – Ann Arbor Drain					
At mouth	10.9	1,130	1,600	1,870	2,400
Upstream of Platt Road	9.30	910	1,300	1,500	1,920
Upstream of confluence with Northwest Branch	3.00	260	410	490	640
Upstream of confluence with West Branch	0.91	70	120	140	190
Upstream of Ann Arbor Railroad	0.63	40	60	80	110
River Raisin					
At Manchester Mill Dam	148.0	610	1,000	1,160	1,490
At Manchester Ford Dam	142.0	560	920	1,060	1,360

TABLE 4 – SUMMARY OF DISCHARGES (continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ. MILES)	PEAK DISCHARGE (CFS) 10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	1-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
Saline River					
Below Saline Dam	78.2	1,880	3,220	3,700	4,600
Above Saline Dam	76.6	1,860	3,150	3,640	4,620
Swift Run Drain					
Confluence with Huron River	4.91	220	350	420	570
At Carpenter Road	3.40	180	280	330	450
Approximately 1,000 feet downstream of I-94.	2.04	100	170	210	290
At Morgan Road	0.26	50	80	90	130
Traver Creek					
Just downstream of Ann Arbor Railroad	6.70	290	380	430	530
Just upstream of Ann Arbor Railroad	6.50	360	580	680	890
US-23	1.21	140	230	280	410
Approximately 840 feet upstream of Tuscola and Saginaw Bay Railway	2.41	200	320	380	550
Approximately 1,150 feet upstream of US 23 NB	1.30	100	190	230	350
Traver Creek No. 3 Dam, ID #2380	0.44	50	100	130	200
Approximately 1,250 feet upstream of Traver Road	0.43	40	70	80	120
At Traver Road	0.55	110	180	210	310
West Branch Malletts Creek					
At mouth	1.67	160	250	290	370
At Interstate 94	1.24	140	210	240	300
West Park-Miller Drain Overland Flow					
At mouth	1.3	366	513	594	809
West Park-Miller Drain North Branch Overland Flow					
At confluence with West Park-Miller Drain South Branch Overland Flow	0.5	-	-	205	-
West Park-Miller Drain South Branch Overland Flow					
At confluence with West Park-Miller Drain Overland Flow	0.7	238	367	380	584

TABLE 4 – SUMMARY OF DISCHARGES (continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ. MILES)	PEAK DISCHARGE (CFS) 10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	1-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
West Branch Paint Creek					
At mouth of Paint Creek	5.0	440	750	900	1,300
At Judd Road	4.9	440	750	900	1,300
Downstream of Hewens Drain	3.5	440	750	900	1,300
At Bemis Road	1.8	360	600	750	1,100
Wood Outlet Drain					
Upstream of confluence with the Saline River	14.2	480	850	980	1,250
Upstream of confluence with Unnamed Tributary (located downstream of Ann Arbor Street)	3.3	195	285	325	420
Approximately midway between Textile Road and Morgan Road	2.1	270	395	465	640
Downstream of Unnamed Tributary (located downstream of Morgan Road)	1.7	205	300	350	485
At Morgan Road	1.3	180	265	310	415

* Conservatively used higher discharge from upstream design point at this location

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristic of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data tables in the FIS report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS report in conjunction with the data shown on the FIRM.

Water surface elevations of floods with the selected recurrence intervals were computed using the HEC-2 step-backwater computer program (Reference 27) developed by the USACE for the detailed studies in the previous FIS reports.

The USACE HEC-RAS program was used for the new detailed study reaches listed below: Allen Creek, Letts Creek, Mill Creek, Millers Creek, North Fork Mill Creek, Paint Creek, Swift Run Drain, Tributary to Paint Creek, Traver Creek, West Branch Paint Creek, West Park Miller Drain, and West Park-Miller Drain South Branch (Reference 28).

For Miller Creek and Traver Creek, diversionary flow was calculated using the split flow optimization feature of the HEC-RAS steady state analysis. For Miller Creek Diversion flow, a diversion channel was drawn with overland flow exiting the main channel at approximately River Station 3920, then reentering the main channel at approximately River Station 1570. The diversion channel will pass through the series of lakes east of the main channel. For Traver Creek, an unsteady HEC-RAS model was developed since a detention basin and control structures south of US-23/M-14 were constructed based on plans from 1979. This detention site was most likely designed to prevent downstream areas from flooding. This unsteady state model will allow routing of inflow hydrographs so that timing and attenuation at the control structure can be accurately modeled.

Flood profiles were prepared for all streams studied by detailed methods and show computed water-surface elevations to an accuracy of 0.5 foot for floods of selected recurrence intervals. In cases where the 1-percent-annual-chance and 0.2-percent annual chance flood elevations are close together, only the 1-percent-annual-chance profile has been shown due to limitations of the map scale. For this countywide FIS, flood profiles and approved Letter of Map Revisions (LOMRs) have been consolidated in continuous stream reaches and adjusted to reflect the new vertical datum as described in section 3.3.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the DFIRM (Exhibit 2).

Stream cross sections and dimensions of hydraulic structures (bridges, culverts, dams, control weirs, etc) were obtained from several resources.

Cross sections for the backwater analyses of Allen Creek, West Park-Miller Drain, and West Park-Miller Drain South Branch were obtained from the Digital Terrain Model (DTM), which was generated from five-foot interval contour data. The City of Ann Arbor prepared one-foot contours based on the five-foot contour shapefile. This elevation data was obtained from the City of Ann Arbor in June 2005. The channel sections were obtained by field surveys completed in July 2005. All bridges and culverts were field surveyed to obtain elevation data and structural geometry.

Plans for Allen Creek, West Park-Miller Drain and West Park-Miller Drain South Branch were obtained from the Washtenaw County Drain Commissioner. The plans for Allen Creek were prepared by R.A. Dodge in 1925. As part of the Allen Creek Drain Improvement Project, plans were prepared by McNamee, Porter Seeley in 1993 to identify the existing conditions and repairs performed on Allen Creek, West Park-Miller Drain and West Park-Miller Drain South Branch. These plans were used to construct the storm sewer section of Allen Creek, West Park-Miller Drain and West Park-Miller Drain South Branch.

The storm sewer portion of each cross section of Allen Creek was added to each surveyed overland cross section and was constructed by creating a deepened rectangular channel, whose invert would match the invert of storm sewer taken from the 1925 plans. A lid was placed in this channel that would match the ground surface and the inside top of pipe from the plans. The width of the channel at each cross section was adjusted so that the conveyance of the channel would be equivalent to the conveyance of the concrete arch pipe of the existing storm sewer. Conveyance figures for sections of Allen Creek were calculated using cross sectional data taken from the 1980 Allen Creek

Report performed by Wade Trim & Associates. The channels for West Park-Miller Drain and West Park-Miller Drain South Branch were constructed in the same manner, with conveyance calculations based on 1993 plans and with an estimated Manning's n value of 0.015. This value is consistent with calculations as performed in the 1980 Wade Trim Study used in the 1992 FIS for Allen Creek and is the suggested value for concrete storm sewer by HEC-RAS.

A diversion channel was established to accurately model the divided overland flow that occurs around the railroad embankment between River Stations 3184 and 4288 of Allen Creek. The divided overland flow begins as discharges exit the main channel at West Huron Street, then parallels the railroad embankment to rejoin the main overland flow channel near Catherine Avenue. Cross sections for the diversion channel were cut from the DTM. Diversionary flow was calculated using the split flow optimization feature of the HEC-RAS steady state analysis.

Cross section data for the detailed studies in the previous FIS was obtained from field surveys combined with photogrammetrical techniques and data received from USACE and MDEQ. While cross section geometries above water were derived from aerial photographs, the below water sections were obtained by field survey. Bridges and culverts for detailed study reaches were surveyed to obtain the structural geometry and elevation data (Reference 1-11).

The above water section geometries of cross sections used in the new detailed study for the following reaches were extracted from 30-meter USGS Digital Elevation Models (DEM) provided by the State of Michigan Center for Geographic Information (CGI): Allen Creek, Letts Creek, Mill Creek, Paint Creek, Tributary to Paint Creek, West Branch Paint Creek, West Park Miller Drain, West Park-Miller Drain South Branch. The channel sections were obtained by field surveys completed in February 2005 by Spicer Group Surveyors. The above water section and channel section geometries for diversion channels were extracted from the 30-meter DEM. The above water section geometries of cross sections of Millers Creek, Swift Run Drain and Traver Creek were obtained from a DTM that was generated from five-foot interval contour shapefiles provided by the City of Ann Arbor in 2005. The channel sections were obtained by field surveys completed in March 2005. All bridges and culverts were field surveyed to obtain elevation data and structural geometry.

Roughness factors (Manning's "n" values) were obtained from on-site inspections or evaluation of aerial photographs obtained for this study (References 1-11). The values for this study are tabulated in Table 5.

TABLE 5 – CHANNEL AND OVERBANK ROUGHNESS
(MANNING'S "N") FACTORS

STREAM NAME	ROUGHNESS COEFFICIENT	
	CHANNEL	OVERBANK
Allen Creek	0.015-0.03	0.013-0.15
Eberwhite Drain Overland Flow	0.07-0.1	N/A
Honey Creek	0.03-0.06	0.03-0.07
Honey Creek Tributary No. 1	0.03-0.06	0.03-0.07
Honey Creek Tributary No. 2	0.03-0.06	0.03-0.07
Honey Creek Tributary No. 3	0.03-0.06	0.03-0.07
Huron River (the rest)	0.03-0.035	0.04-0.1
Huron River (within the City of Ypsilanti)	0.045-0.05	0.04-0.1
Letts Creek	0.03-0.04	0.03-0.16
Malletts Creek	0.013-0.045	0.015-0.1
Mill Creek	0.063-0.18	0.035-0.15
Miller Creek and Diversion	0.015-0.03	0.03-0.15
Murray-Washington Overland Flow	0.07-0.1	N/A
North Fork Mill Creek	0.03-0.04	0.03-0.16
Northwest Branch Malletts Creek	0.013-0.045	0.015-0.1
Paint Creek (within the Township of Augusta)	0.035-0.048	0.035-0.1
Paint Creek (within the Township of Ypsilanti)	0.03-0.1	0.03-0.1
Paint Creek (within the City of Ypsilanti)	0.022-0.04	0.03-0.06
Pittsfield - Ann Arbor Drain	0.013-0.045	0.035-0.07
River Raisin	0.04-0.05	0.05-0.12
Saline River	0.046-0.065	0.078-0.169
Swift Run Drain	0.03-0.07	0.03-0.12
Tributary to Paint Creek	0.03-0.07	0.03-0.1
Traver Creek	0.013-0.1	0.03-0.1
West Branch Malletts Creek	0.013-0.045	0.015-0.1
West Branch of Paint Creek (within the Township of Augusta)	0.035-0.048	0.035-0.1
West Branch of Paint Creek(Within the Township of Ypsilanti)	0.027-0.045	0.03-0.05
Wood Outlet Drain(upstream of Conrail)	0.05-0.055	0.075-0.12
Wood Outlet Drain(downstream of Conrail)	0.035-0.065	0.078-0.156

Starting water-surface elevations for the hydraulic analyses were determined using the modified *Puls Routing* technique and discharge-elevation curves (Reference 29) for the following streams: the portion of Paint Creek and West Branch Paint Creek within the Charter Township of Ypsilanti, and the portion of Huron River within the Charter Townships of Ann Arbor and Ypsilanti and the City of Ypsilanti. For the portion of the Huron River within the Township of Dexter, the starting water surface elevation was obtained from the USGS gage station at North Territorial Road (Reference 4).

A Slope-Area method was used to determine the starting-water surfaces for the following streams: Eberwhite Drain Overland Flow, Honey Creek and its three tributaries, previously studied portion of Malletts Creek, Northwest Branch Malletts Creek, Swift Run Drain, Traver Creek, Pittsfield-Ann Arbor Drain, West Branch Malletts Creek, and Wood Outlet Drain (Reference 1-11).

For Saline River and River Raisin, the normal depth was computed and then was used as the starting surface elevation. For the approximate study of Willow Run in the Charter Township of Ypsilanti, the normal depth was determined and used as the starting water surface.

For new detailed study reaches as listed below: Allen Creek, Letts Creek, Mill Creek, Paint Creek, Swift Run Drain, Tributary to Paint Creek, upstream portion of Traver Creek, Millers Creek, West Branch Paint Creek, West Park-Miller Drain, West Park-Miller Drain South Branch, normal depth was used as the starting water surface elevation in HEC-RAS program. A downstream hydraulic gradient was estimated using survey data. A steady flow simulation was run to obtain the water surface profiles.

For new approximate study areas, hydraulic analyses were performed using HEC-RAS models. Structural measurements and field surveys were not performed. No structures were modeled in the new approximate study. Cross section geometry was derived from topographic maps obtained from City of Ann Arbor, USGS and Washtenaw County (Reference 32, 33 and 34) with an a verage spacing of approximately 2,000 feet. Average roughness factors (Manning's "n" values) were estimated based on field inspections and assumed to be uniform through the cross section geometry. The starting water surface elevation is specified as a known water surface elevation if the downstream water surface elevation can be determined from an effective detailed study or a discharge-elevation curve. If the downstream water surface elevation is not available, the starting water surface elevation is assumed to be normal depth.

For the hydraulic analysis of lakes, if gage data are available at any point in the watershed, a drainage area proportion method was used (Reference 30). The drainage area proportion method assumes that there is a pow er relationship between the drainage area and the peak discharge. This method has been used to calculate the discharges for Little Portage Lake, Halfmoon Lake and Blind Lake. For lakes where no gage data is available in the watershed, a SCS TR-20 computer program was used to obtain the discharges. The TR-20 program computes runoff from a given storm. It also routes flood hydrographs through detention and retention areas. Losee, Silver and North Lakes were studied using this method. Elevations for selected recurrence intervals of the studied lakes are shown in Table 6 (Reference 4).

TABLE 6 SUMMARY OF STILLWATER ELEVATIONS

		PEAK ELEVATIONS (NAVD)			
FLOODING SOURCE	DRAINAGE AREA (SQUARE MILES)	10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	1-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
Blind Lake	N/A	884.6	885.2	885.4	886
Halfmoon Lake	72	884.6	885.2	885.4	886
Horseshoe Lake	N/A	N/A	N/A	904.6	N/A
Little Portage Lake	84	851.6	852	852.5	853.6
Losee Lake	0.3	879.6	879.8	879.9	880.2
North Lake	1.7	838.9	839	839.1	839.4
Portage Lake	522	851.6	852	852.5	853.6
Silver Lake	1.1	875.3	875.4	875.5	875.6

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the Flood Profiles (Exhibit 1) are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail and if the channel and overbank conditions remain essentially the same as ascertained during the study.

3.3 Vertical Datum

All FIS reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the finalization of the NAVD88, many FIS reports and FIRMs are now being prepared using NAVD88 as the referenced vertical datum. It is important to note that the adjacent counties may be referenced to NGVD29. This may result in differences of Base Flood Elevations (BFEs) across the county boundary.

Flood elevations shown in this FIS report and on the FIRM are referenced to NAVD88. Structure and ground elevations in the community must be referenced to NAVD88. Effective information for this FIS was converted from NGVD 29 to NAVD88 based on data presented in Figure 1 and Table 7. An average conversion of -0.4 feet (NGVD29 – 0.4 = NAVD 88) was applied uniformly across the county to convert all effective BFEs and other profile elevations.

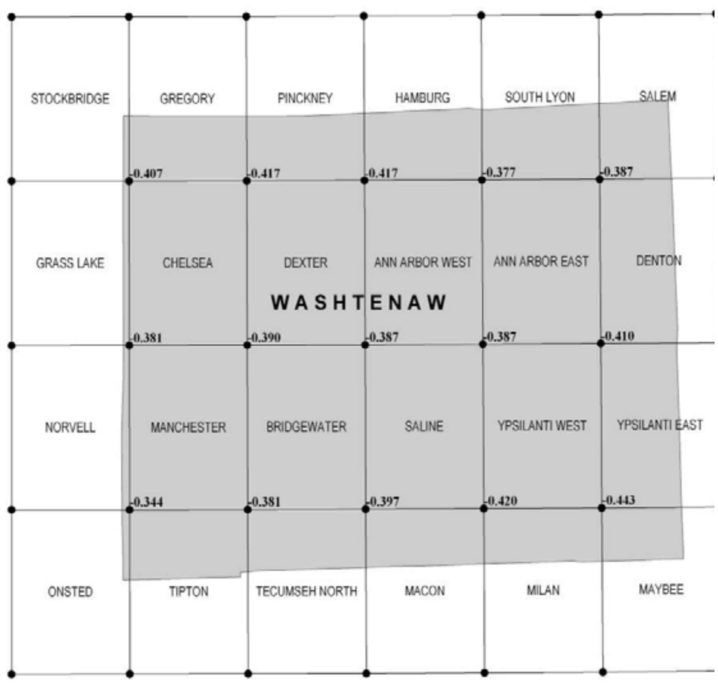

Figure 1. Vertical Datum Conversion

For more information on NAVD88, see the FEMA publication entitled *Converting the National Flood Insurance Program to the North American Vertical Datum of 1988* (FEMA, June 1992), or contact the Spatial Reference Division of the National Geodetic Survey, National Oceanic and Atmospheric Administration, Silver Springs Metro Center 3, 1315 East-West Highway, Silver Springs, Maryland 20910-3282 (301) 713-3242 (Website: www.ngs.noaa.gov).

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the TSDN associated with the FIS report and FIRMs for this community. Interested individuals may contact FEMA to access this data.

TABLE 7 VERTICAL DATUM ADJUSTMENT

QUADRANGLE NAME	CORNER	NAD 27 LONGITUDE (DEC. DEG)	NAD 27 LATITUDE (DEC. DEG)	CHANGE (FEET)
ANN ARBOR EAST	SE	42.25	83.62	-0.41
ANN ARBOR WEST	SE	42.25	83.75	-0.387
BRIDGEWATER	SE	42.13	83.87	-0.397
CHELSEA	SE	42.25	84	-0.39
DENTON	SE	42.25	83.5	-0.433
DEXTER	SE	42.25	83.88	-0.387
GRASS LAKE	SE	42.25	84.12	-0.381
GREGORY	SE	42.37	84	-0.417
HAMBURG	SE	42.37	83.75	-0.377
MANCHESTER	SE	42.12	84	-0.381
NORVELL	SE	42.12	84.12	-0.344
PINCKNEY	SE	42.38	83.88	-0.417
SALEM	SE	42.38	83.5	-0.42
SALINE	SE	42.12	83.75	-0.42
SOUTH LYON	SE	42.37	83.63	-0.387
STOCKBRIDGE	SE	42.37	84.12	-0.407
YPSILANTI EAST	SE	42.12	83.5	-0.466
YPSILANTI WEST	SE	42.12	83.62	-0.443
		Min		-0.377
		Max		-0.466
		Average		-0.4
		Maximum Offset		0.066

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each FIS provides 1-percent-annual-chance flood elevations and delineations of the 1- and 0.2-percent-annual-chance floodplain boundaries and 1-percent-annual-chance floodway to assist communities in developing floodplain management measures. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles, Floodway Data Tables and Summary of Stillwater Elevations Tables. Users should reference the data presented in the FIS report as well as additional information that may be available at the local map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance flood is employed to indicate additional areas of flood risk in the community. For each stream studied by detailed methods, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps. The topographic maps used for floodplain delineation have a 5 and 10 foot contour interval in a scale of 1:24000 generated in 1981 by USGS and a 5 foot contour interval in a scale of 1:2400 generated in 1997 by the City of Ann Arbor (Reference 32 and 33). In the City of Ypsilanti, 5-foot contour interval topographic maps with a scale of 1:24000 were used for floodplain delineation in the previous FIS (Reference 10). In the City of Saline and the Village of Manchester, 4-foot contour interval topographic maps with a scale of 1:4800 were used for floodplain delineation in the previous FIS (Reference 5 and 8). Floodplain boundaries for these two communities were directly digitized from previously effective FIRMs except for floodplain boundaries of new study streams. Floodplain boundaries of the new study streams were redelineated using new topographic maps.

The 1- and 0.2-percent-annual-chance floodplain boundaries are shown on the FIRM (Exhibit 2). On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A, AE); and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards (shaded Zone X). In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studies by approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM (Exhibit 2).

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent-annual-chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

In Michigan though, under Michigan Act 245, Public Acts of 1929, as amended by Act 167, Public Acts of 1968, encroachment in the floodplain is limited to that which will cause only an insignificant increase in flood heights. Thus at the recommendation from MDEQ, a floodway having no more than 0.1 foot surcharge has been delineated in this study. The floodway has been presented to the local community as minimum standards that can be directly adopted or that can be used as a basis for future floodway studies.

The floodway presented in this FIS report and on the FIRM was computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations have been tabulated for selected cross sections (Table 8). In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary has been shown. If a case exists where the 1-percent-annual-chance flood is contained by a levee, the floodway boundary would be shown on the landward side of the levee to prevent encroachment that may adversely affect the integrity or effectiveness of the levee.

Upstream of the Saline River Dam, a portion of the floodway for the Saline River was not shown due to the low conveyance in that area.

The area between the floodway and 1-percent-annual-chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 1-percent-annual-chance flood more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.

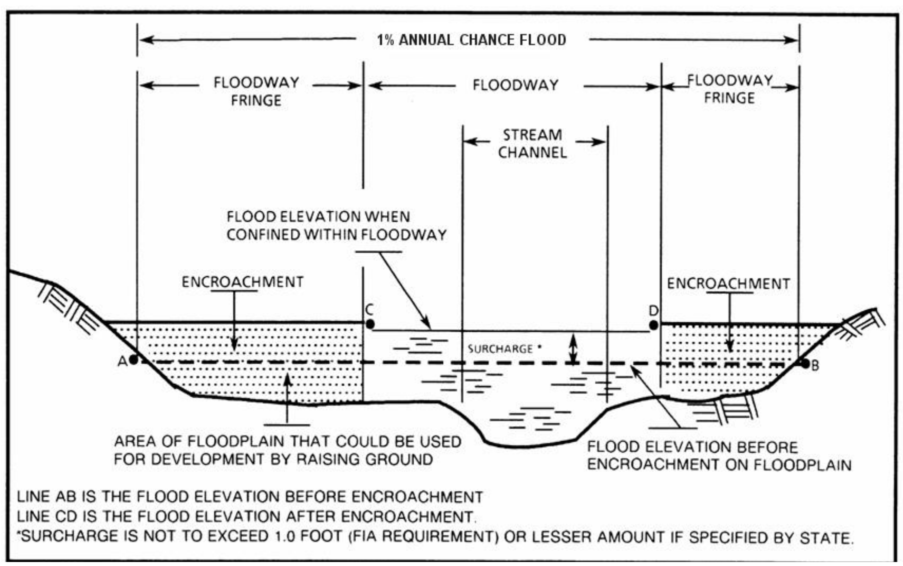

Figure 2. Floodway Schematic

As part of the redelineation efforts of this project, the floodway was not recalculated. As a result, there were areas where the previous floodway did not fit within the boundaries of the 1-percent-annual-chance floodplain. In these areas, the floodway width was reduced as necessary. Table 8 – Floodway Data lists the water surface elevations, both with and without a floodway, the mean velocity in the floodway, and the location and area at each surveyed cross-section as determined by hydraulic methods. The width of the floodway depicted on the FIRM panels is also listed along with the amount of reduction needed to contain the floodway within the 1-percent annual chance floodplain, if applicable.

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Allen Creek									
A	316	531	5346	0.5		779.7	779.7	779.7	0.0
B	685	220	1616	1.8		779.7	779.7	779.7	0.0
C	874	141	603	4.9		779.7	779.7	779.7	0.0
D	1,604	146	483	6.1		782.6	782.6	782.6	0.0
E	2,391	118	711	5.6		786.1	786.1	786.1	0.0
F	2,921	330	699	4.2		789.0	789.0	789.0	0.0
G	3,184	136	393	7.5		793.7	793.7	793.7	0.0
H	3,298	50	218	10.0		795.7	795.7	795.7	0.0
I	3,395	52	207	10.5		796.8	796.8	796.8	0.0
J	3,614	176	1212	1.7		800.7	800.7	800.7	0.0
K	3714	64	465	4.0		800.7	800.7	800.7	0.0
L	4,069	107	500	1.7		800.9	800.9	801.0	0.1
M	4,872	143	336	4.1		810.2	810.2	810.2	0.0
N	5,576	175	497	2.6		811.5	811.5	811.5	0.0
O	5,875	149	690	2.2		811.8	811.8	811.8	0.0
P	6,661	125	250	5.1		814.9	814.9	814.9	0.0
Q	7,307	195	347	3.7		818.3	818.3	818.3	0.0
R	7,767	144	489	2.6		819.9	819.9	819.9	0.0
S	8,411	291	360	3.5		821.2	821.2	821.2	0.0

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

ALLEN CREEK

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Allen Creek Diversion									
A	144	43	96	8.3		794.7	794.7	794.7	0.0
B	211	38	100	8.6		797.5	797.5	797.5	0.0
C	367	82	246	3.2		798.9	798.9	798.9	0.0
D	719	77	111	6.9		800.2	800.2	800.2	0.0
E	787	63	222	3.4		800.9	800.9	800.9	0.0

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

ALLEN CREEK DIVERSION

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Eberwhite Drain Overland Flow									
A	350	72	98	3.3		816.1	816.1	816.1	0.0
B	880	110	140	2.3		822.6	822.6	822.6	0.0
C	1,230	72	92	3.5		827.1	827.1	827.1	0.0
D	1,650	155	190	1.7		831.1	831.1	831.1	0.0
E	2,070	112	75	4.3		842.1	842.1	842.1	0.0
F	2,320	99	144	2.2		846.6	846.6	846.6	0.0
G	2,440	124	73	4.4		850.2	850.2	850.2	0.0
H	2,640	112	211	1.5		851.9	851.9	851.9	0.0
I	2,940	86	66	4.9		856.9	856.9	856.9	0.0
J	3,390	116	147	2.2		865.4	865.4	865.4	0.0

[1] FEET ABOVE CONFLUENCE WITH ALLEN CREEK OVERLAND FLOW
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

EBERWHITE DRAIN OVERLAND FLOW

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Honey Creek									
A	176	33	155	11.2		801.6	801.6	801.6	0.0
B	850	124	507	3.4		804.9	804.9	804.9	0.0
C	2,800	102	334	5.2		818.4	818.4	818.5	0.1
D	4,500	108	378	4.6		825.8	825.8	825.9	0.1
E	6,000	233	583	3.0		830.3	830.3	830.4	0.1
F	7,730	338	1142	1.5		836.0	836.0	836.1	0.1
G	9,120	233	614	2.8		836.8	836.8	836.9	0.1
H	11,550	413	847	2.1		840.6	840.6	840.7	0.1
I	13,350	256	816	2.1		848.2	848.2	848.3	0.1
J	13,400	262	834	2.1		848.2	848.2	848.3	0.1
K	14,740	269	1296	1.3		848.8	848.8	848.9	0.1
L	16,290	408	1231	1.4		849.5	849.5	849.6	0.1
M	19,706	16	113	8.8		855.6	855.6	855.7	0.1
N	21,300	121	862	0.5		861.8	861.8	861.9	0.1
O	23,186	53	317	1.3		861.8	861.8	861.9	0.1
P	25,000	254	684	0.6		862.1	862.1	862.2	0.1
Q	27,600	97	223	1.9		868.8	868.8	868.9	0.1
R	31,340	62	246	1.7		881.5	881.5	881.6	0.1
S	35,520	226	365	1.2		884.3	884.3	884.4	0.1

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

HONEY CREEK

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Honey Creek Tributary No. 1									
A	950	38	143	5.8		857.3	857.3	857.4	0.1
B	1,750	46	152	5.5		861.3	861.3	861.4	0.1

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

HONEY CREEK TRIBUTARY NO. 1

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Honey Creek Tributary No. 2									
A	2,686	152	532	1.2		863.1	863.1	863.2	0.1
B	5,500	70	211	3.0		870.4	870.4	870.5	0.1
C	12,900	206	255	1.4		875.6	875.6	875.7	0.1

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

HONEY CREEK TRIBUTARY NO. 2

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Honey Creek Tributary No. 3									
A	1,000	55	84	1.8		885.9	885.9	886.0	0.1
B	2,409	26	49	3.1		888.3	888.3	888.4	0.1
C	4,650	138	287	0.5		889.8	889.8	889.9	0.1

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

HONEY CREEK TRIBUTARY NO. 3

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Huron River									
A	190,917	404	3889	2.6		654.1	654.1	654.2	0.1
B	191,687	348	2927	3.4		654.3	654.3	654.4	0.1
C	192,862	508	3619	2.8		655.0	655.0	655.1	0.1
D	193,702	416	3151	3.2		655.5	655.5	655.6	0.1
E	194,712	353	3077	3.3		656.1	656.1	656.2	0.1
F	196,592	295	3169	3.2		656.9	656.9	657.0	0.1
G	216,630	294	1910	5.2		687.2	687.2	687.2	0.0
H	217,973	893	3076	3.2		689.1	689.1	689.1	0.0
I	219,593	1306	5750	1.7		690.5	690.5	690.5	0.0
J	221,043	111	869	11.3		690.8	690.8	690.8	0.0
K	222,444	212	1545	6.4	80	695.3	695.3	695.3	0.0
L	224,630	169	1603	6.1		699.2	699.2	699.2	0.0
M	225,490	169	1816	5.4		700.8	700.8	700.8	0.0
N	226,023	385	2623	3.8		702.3	702.3	702.3	0.0
O	228,593	254	2315	4.3		705.3	705.3	705.3	0.0
P	229,593	210	1830	5.4		706.4	706.4	706.4	0.0
Q	232,280	401	5155	1.9	90	717.9	717.9	717.9	0.0
R	233,548	633	7340	1.3		718.7	718.7	718.7	0.0
S	235,010	589	4884	2.0		719.4	719.4	719.4	0.0
T	248,360	202	2138	4.5	194	738.1	738.1	738.1	0.0
U	250,210	295	3278	3.5		739.1	739.1	739.1	0.0
V	251,067	296	3278	2.6		740.8	740.8	740.8	0.0
W	251,542	308	3818	2.2	73	748.2	748.2	748.2	0.0
X	252,972	490	4949	1.7		748.7	748.7	748.7	0.0

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

HURON RIVER

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Huron River									
Y	257,212	439	3409	2.3		748.9	748.9	748.9	0.0
Z	259,612	655	4860	1.7		749.2	749.2	749.2	0.0
AA	264,933	286	1540	5.2		752.9	752.9	752.9	0.0
AB	266,333	127	1152	6.9		754.7	754.7	754.7	0.0
AC	269,162	115	979	8.2		758.6	758.6	758.6	0.0
AD	269,803	126	1157	6.9		760.2	760.2	760.2	0.0
AE	270,103	455	2570	5.0		761.2	761.2	761.2	0.0
AF	272,073	621	3289	3.1	199	762.2	762.2	762.2	0.0
AG	273,893	160	790	10.5	300	762.5	762.5	762.5	0.0
AH	276,384	104	746	10.1		766.1	766.1	766.1	0.0
AI	278,089	405	3260	2.3		773.8	773.8	773.8	0.0
AJ	280,159	432	3344	2.2		774.0	774.0	774.0	0.0
AK	283,922	150	1628	4.6		776.9	776.9	776.9	0.0
AL	287,472	422	2412	3.1		778.2	778.2	778.2	0.0
AM	290,072	1195	21347	0.3	73	798.4	798.4	798.4	0.0
AN	291,172	1651	21392	0.3		798.4	798.4	798.4	0.0
AO	292,622	904	12848	0.6	68	798.4	798.4	798.4	0.0
AP	294,572	832	8581	0.9	65	798.4	798.4	798.4	0.0
AQ	297,516	435	3792	2.0		798.9	798.9	798.9	0.0
AR	364,386	157	1092	3.1		845.0	845.0	845.1	0.1
AS	364,506	106	704	4.8		845.0	845.0	845.1	0.1
AT	364,706	237	1546	2.2		845.5	845.5	845.6	0.1
AU	366,016	255	1452	2.3		845.8	845.8	845.9	0.1
AV	367,486	315	1789	1.9		846.2	846.2	846.3	0.1

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

HURON RIVER

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Huron River									
AW	369,021	189	1058	3.2		846.7	846.7	846.8	0.1
AX	370,051	170	844	4.0		847.5	847.5	847.6	0.1
AY	370,421	98	558	6.1		847.9	847.9	848.0	0.1
AZ	370,536	253	1148	3.0		848.8	848.8	848.9	0.1
BA	372,036	126	908	3.8		850.1	850.1	850.2	0.1
BB	373,646	133	1033	3.3		851.0	851.0	851.1	0.1
BC	375,361	145	1051	3.2		851.7	851.7	851.8	0.1

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

HURON RIVER

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Letts Creek									
A	1,688	46	153	2.7		892.3	892.3	892.4	0.1
B	3,663	32	122	3.5		897.4	897.4	897.5	0.1
C	4,227	153	350	1.2		898.2	898.2	898.3	0.1
D	4,820	113	385	1.8		899.7	899.7	899.8	0.1
E	7,070	36	134	3.1		901.5	901.5	901.5	0.0
F	7,564	80	225	1.9		901.9	901.9	901.9	0.0
G	9,403	82	217	1.9		903.2	903.2	903.2	0.0
H	10,460	107	292	1.4		903.9	903.9	904.0	0.1
I	11,992	46	227	1.9		906.7	906.7	906.9	0.1
J	13,162	101	395	1.1		907.7	907.7	907.8	0.1
K	14,473	275	1041	0.4		908.3	908.3	908.4	0.1
L	16,048	170	396	1.1		908.3	908.3	908.5	0.1
M	18,694	108	576	0.7		912.0	912.0	912.0	0.0
N	20,435	137	419	0.9		912.1	912.1	912.1	0.0
O	22,977	140	250	1.3		915.0	915.0	915.0	0.0
P	25,136	131	216	1.5		917.8	917.8	918.0	0.1
Q	26,877	80	130	2.5		921.3	921.3	921.4	0.1
R	28,731	320	493	0.7		924.0	924.0	924.0	0.0
S	30,216	120	390	0.9		927.6	927.6	927.7	0.1

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

LETTS CREEK

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Malletts Creek									
A	3,300	153	1150	1.6	67	775.1	775.1	775.2	0.1
B	5,280	54	289	6.5		778.9	778.9	779.0	0.1
C	6,300	96	451	4.1		783.8	783.8	783.9	0.1
D	9,450	65	385	4.9		791.6	791.6	791.6	0.0
E	11,200	51	289	5.2		795.1	795.1	795.1	0.0
F	12,362	66	357	4.2		798.5	798.5	798.5	0.0
G	14,950	82	337	4.5		806.3	806.3	806.3	0.0
H	15,750	69	289	1.7		807.0	807.0	807.0	0.0
I	18,800	108	428	1.1		818.7	818.7	818.7	0.0
J	20,650	77	303	0.5		818.8	818.8	818.9	0.1

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

MALLETTS CREEK

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Mill Creek									
A	262	210	1196	1.4		837.2	837.2	837.3	0.1
B	2,730	75	434	3.9		846.2	846.2	846.3	0.1
C	3,695	295	1603	1.0		846.7	846.7	846.8	0.1
D	5,956	493	2020	0.8		847.1	847.1	847.2	0.1
E	7,652	220	903	1.8		847.7	847.7	847.8	0.1
F	9,915	194	1064	1.5		850.0	850.0	850.1	0.1
G	11,241	347	1811	0.9		850.8	850.8	850.9	0.1
H	12,673	629	2898	0.6		851.2	851.2	851.3	0.1
I	14,050	335	1000	1.6		851.7	851.7	851.8	0.1
J	15,843	382	1398	1.1		854.3	854.3	854.4	0.1
K	18,358	245	1163	1.4		856.9	856.9	857.0	0.1
L	19,747	193	866	1.8		859.1	859.1	859.2	0.1
M	21,230	190	1061	1.5		860.4	860.4	860.5	0.1
N	23,063	225	1294	1.2		862.5	862.5	862.6	0.1

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

MILL CREEK

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Millers Creek									
A	354	394	860	0.4		752.5	752.5	752.6	0.1
B	1,393	140	304	1.2		752.5	752.5	752.6	0.1
C	2,560	106	584	0.5		764.0	764	764.0	0.0
D	3,728	125	810	0.4		771.1	771.1	771.1	0.0
E	4,456	88	359	0.8		775.0	775	775.1	0.1
F	5,260	38	119	2.4		775.0	775	775.1	0.1
G	5,960	67	489	0.6		786.7	786.7	786.7	0.0
H	6,711	30	42	6.9		791.1	791.1	791.1	0.0
I	7,850	24	75	3.9		814.3	814.3	814.3	0.0
J	8,837	20	37	7.8		822.2	822.2	822.3	0.1
K	9,898	48	279	1.0		846.3	846.3	846.3	0.0
L	10,699	32	80	3.5		846.4	846.4	846.5	0.1
M	11,892	44	77	3.6		854.1	854.1	854.1	0.0
N	12,389	172	514	0.5		861.0	861.0	861.1	0.1
O	13,391	31	141	0.9		874.4	874.4	874.4	0.0
P	14,000	20	18	7.0		874.8	874.8	874.8	0.0

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

MILLERS CREEK

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Millers Creek -Diversion									
A	486	12	6	11.5		754.1	753.6[3]	753.6[3]	0.0
B	863	125	425	0.2		763.5	763.5	763.6	0.1
C	1,380	106	340	0.2		766.9	766.9	766.9	0.0
D	1,996	75	244	0.3		767.3	767.3	767.4	0.1

[1] FEET ABOVE DIVERGENCE FROM MILLER CREEK
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS
[3] ELEVATIONS COMPUTED WITHOUT CONSIDERING BACKWATER EFFECTS FROM MILLERS CREEK

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

MILLERS CREEK -DIVERSION

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Murray-Washington Drain Overland Flow									
A	488	134	157	2.1		804.0	800.8[3]	800.9[3]	0.1
B	890	189	208	1.6		805.2	805.2	805.2	0.0
C	1,140	73	130	2.5		807.2	807.2	807.2	0.0
D	1,470	125	74	4.4		807.7	807.7	807.7	0.0
E	1,690	149	141	2.3		815.7	815.7	815.7	0.0
F	2,010	121	145	2.2		820.0	820.0	820.0	0.0
G	2,140	100	69	4.7		829.5	829.5	829.5	0.0
H	2,760	129	367	0.9	108	830.7	830.7	830.7	0.0
I	3,060	181	295	1.1	50	831.2	831.2	831.2	0.0

[1] FEET ABOVE CONFLUENCE WITH ALLEN CREEK
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS
[3] ELEVATION COMPUTED WITHOUT CONSIDERATION OF BACKWATER EFFECTS FROM ALLEN CREEK

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

MURRAY-WASHINGTON DRAIN OVERLAND FLOW

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
North Fork Mill Creek									
A	2,236	129	341	1.8		885.2	885.2	885.3	0.1
B	3,260	80	358	1.7		886.9	886.9	887.0	0.1
C	3,703	160	404	1.5		887.7	887.7	887.8	0.1
D	4,917	660	2287	0.3		887.8	887.8	887.9	0.1
E	7,921	450	1048	0.6		887.9	887.9	888.0	0.1
F	9,665	222	657	0.9		888.1	888.1	888.2	0.1
G	10,741	380	1018	0.6		888.2	888.2	888.3	0.1
H	11,780	250	251	2.3		888.4	888.4	888.5	0.1
I	13,095	355	447	0.9		889.9	889.9	890.0	0.1
J	14,553	89	266	1.5		894.2	894.2	894.2	0.0
K	16,000	140	354	1.1		895.3	895.3	895.4	0.1
L	17,218	24	55	7.3		897.4	897.4	897.5	0.1
M	17,426	137	717	0.5		903.0	903.0	903.0	0.0
N	18,797	33	135	2.7		903.0	903.0	903.0	0.0
O	20,068	166	507	0.7		904.5	904.5	904.6	0.1
P	22,069	185	239	1.6		905.7	905.7	905.8	0.1
Q	23,573	48	47	5.5		916.8	916.8	916.8	0.0
R	24,558	105	109	2.4		921.2	921.2	921.4	0.1
S	26,372	13	44	5.9		930.7	930.7	930.8	0.1
T	26,703	17	79	3.3		934.1	934.1	934.1	0.0

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Northwest Branch Malletts Creek									
A	350	57	283	3.0		807.4	807.4	807.5	0.1
B	4,950	81	529	1.6		831.9	831.9	832.0	0.1
C	5,330	32	121	6.9		832.1	832.1	832.2	0.1
D	6,000	32	92	8.5		837.9	837.9	838.0	0.1
E	10,100	87	218	3.6		866.9	866.9	866.9	0.0
F	14,546	78	509	1.0		895.2	895.2	895.2	0.0
G	15,600	176	871	0.6		901.4	901.4	901.4	0.0

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

NORTHWEST BRANCH MALLETTS CREEK

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCE FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Paint Creek									
A	403	494	1210	1.7		651.8	651.8	652.0	0.1
B	1,107	557	1199	1.8		653.8	653.8	653.8	0.0
C	1,744	640	1979	1.1		654.0	654.0	654.0	0.0
D	3,259	555	1438	1.5		654.4	654.4	654.6	0.1
E	5,600	430	1997	1.1		658.5	658.5	658.5	0.0
F	7,763	795	1681	1.3		658.5	658.5	658.7	0.1
G	10,846	210	713	3.0		662.6	662.6	662.6	0.0
H	14,809	320	1901	1.1		668.5	668.5	668.5	0.0
I	19,011	885	1788	1.2		669.0	669.0	669.1	0.1
J	21,755	390	1786	1.2		671.7	671.7	671.8	0.1
K	23,890	330	801	2.6		672.0	672.0	672.1	0.1
L	25,102	104	572	3.7		675.1	675.1	675.1	0.0
M	26,399	380	1650	0.7		675.5	675.5	675.6	0.1
N	27,772	360	1053	1.1		676.8	676.8	677.0	0.1
O	29,831	420	502	2.4		677.8	677.8	677.8	0.0
P	31,575	335	548	2.2		680.7	680.7	680.8	0.1
Q	33,367	580	1406	0.9		683.9	683.9	684.0	0.1
R	34,533	315	558	2.2		684.3	684.3	684.4	0.1
S	35,905	413	464	2.6		686.7	686.7	686.8	0.0
T	38,867	216	307	3.9		690.8	690.8	690.8	0.0
U	39,281	227	550	1.4		692.7	692.7	692.8	0.1
V	40,181	148	379	2.0		694.4	694.4	694.5	0.1
W	41,231	395	280	2.7		695.5	695.5	695.6	0.1
X	42,261	123	303	2.5		698.2	698.2	698.3	0.1

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

PAINT CREEK

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	DIFFERENCE
Paint Creek									
Y	42,831	183	624	1.2		699.7	699.7	699.8	0.1
Z	43,481	210	701	1.1		699.9	699.9	700.0	0.1
AA	44,261	776	581	1.3		700.4	700.4	700.5	0.1
AB	45,561	355	436	1.8		703.1	703.1	703.1	0.0
AC	46,031	284	425	1.8		704.0	704.0	704.0	0.0
AD	47,171	224	469	1.7		706.4	706.4	706.5	0.1
AE	47,871	220	406	1.9		707.8	707.8	707.8	0.0
AF	48,621	300	761	1.0		709.0	709.0	709.1	0.1
AG	49,476	192	587	2.6		711.7	711.7	711.7	0.0
AH	49,876	430	1305	1.2		712.2	712.2	712.2	0.0
AI	50,811	181	459	3.3		713.2	713.2	713.3	0.1
AJ	52,441	248	883	1.7		716.4	716.4	716.5	0.1
AK	53,191	234	610	2.5		717.4	717.4	717.5	0.1
AL	54,191	273	714	2.1		719.7	719.7	719.8	0.1
AM	55,321	427	1317	1.2		722.8	722.8	722.9	0.1
AN	57,476	608	1701	0.9		726.0	726.0	726.1	0.1
AO	58,751	294	554	2.8		728.1	728.1	728.2	0.1
AP	59,431	628	2136	0.9		730.0	730.0	730.1	0.1
AQ	60,451	425	904	2.1		730.3	730.3	730.4	0.1
AR	61,761	339	1023	1.8		732.8	732.8	732.9	0.1
AS	62,921	218	393	1.3		734.7	734.7	734.8	0.1
AT	64,301	68	350	1.8		741.4	741.4	741.4	0.0
AU	64,541	19	164	3.9		741.4	741.4	741.4	0.0
AV	64,971	183	430	1.5		742.2	742.2	742.2	0.0

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

PAINT CREEK

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCE FROM PRIOR STUDY (FEET)[2]	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Paint Creek									
AW	65,476	205	300	2.1		742.6	742.6	742.6	0.0
AX	65,971	281	291	2.2		743.5	743.5	743.5	0.0
AY	66,576	240	384	1.7		745.6	745.6	745.6	0.0
AZ	66,971	470	459	1.4		747.8	747.8	747.8	0.0
BA	67,876	300	1216	0.5		754.5	754.5	754.5	0.0
BB	68,776	129	651	1.4		754.5	754.5	754.5	0.0
BC	69,341	485	1292	0.8		754.6	754.6	754.6	0.0
BD	69,676	922	1703	0.6		754.7	754.7	754.7	0.0
BE	70,171	513	759	1.7		754.7	754.7	754.7	0.0
BF	71,011	55	338	3.9		754.7	754.7	754.7	0.0
BG	71,421	390	787	1.8		759.5	759.5	759.5	0.0
BH	71,956	209	523	2.8		759.7	759.7	759.7	0.0
BI	72,326	158	432	3.4		759.9	759.9	759.9	0.0
BJ	72,561	114	432	3.4		760.1	760.1	760.1	0.0
BK	73,371	88	489	3.0		761.9	761.9	761.9	0.0
BL	73,551	31	145	8.4		762.0	762.0	762.0	0.0

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

PAINT CREEK

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Pittsfield-Ann Arbor Drain									
A	21,970	68	285	0.5		819.2	819.2	819.3	0.1
B	24,400	328	486	0.2		820.7	820.7	820.8	0.1

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

PITTSFIELD-ANN ARBOR DRAIN

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
River Raisin									
A	553,880	345	515	2.1		860.7	860.7	860.7	0.0
B	554,780	106	461	2.3		861.9	861.9	861.9	0.0
C	558,970	110	724	1.5		879.7	879.7	879.7	0.0
D	559,630	241	1223	0.9		879.8	879.8	879.8	0.0
E	560,890	64	318	3.3		879.9	879.9	879.9	0.0
F	561,060	46	200	5.3		880.6	880.6	880.6	0.0
G	561,880	188	1122	1.0		893.2	893.2	893.2	0.0
H	562,750	126	684	1.7		893.4	893.4	893.4	0.0
I	563,590	296	932	1.3		893.6	893.6	893.6	0.0
J	564,570	532	1354	0.9		893.8	893.8	893.9	0.1
K	565,710	433	1198	1.0		894.1	894.1	894.2	0.1
L	566,890	96/257[3]	856	1.4		894.5	894.5	894.5	0.0

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS
[3] FLOODWAY WIDTH WITHIN CORPORATE LIMITS/TOTAL WIDTH

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

RIVER RAISIN

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Saline River									
A	74,590	200	1274	3.2		684.5	684.5	684.5	0.0
B	75,140	600	2730	1.5		685.0	685.0	685.0	0.0
C	76,240	850[3]	3643	1.1		685.4	685.4	685.4	0.0
D	77,270	740[3]	3480	1.2		685.7	685.7	685.7	0.0
E	78,370	1260	5831	0.7		685.9	685.9	686.0	0.1
F	79,350	616	3050	1.3		686.1	686.1	686.2	0.1
G	80,100	1140	5528	0.7		686.3	686.3	686.4	0.1
H	80,230	1220	6605	0.6		686.9	686.9	687.0	0.1
I	81,000	553	2017	2.0	62	687.0	687.0	687.1	0.1
J	81,800	84	879	4.6		687.6	687.6	687.7	0.1
K	83,210	N/A	N/A	N/A		692.4	692.4	N/A	N/A
L	83,450	N/A	N/A	N/A		692.7	692.7	N/A	N/A
M	84,910	N/A	N/A	N/A		692.8	692.8	N/A	N/A
N	85,690	N/A	N/A	N/A		693.0	693.0	N/A	N/A
O	154,020	845[3]	3431	1.1		736.3	736.3	736.3	0.0
P	154,710	284	1374	2.7		737.6	737.6	737.6	0.0
Q	154,960	282	1684	2.2		738.5	738.5	738.5	0.0
R	155,510	429	2519	1.5		739.3	739.3	739.3	0.0
S	156,210	77	564	6.6		740.2	740.2	740.2	0.0
T	156,410	142	553	6.7		741.7	741.7	741.7	0.0
U	157,230	586	3064	1.2		744.4	744.4	744.4	0.0
V	158,330	817	3361	1.1		744.8	744.8	744.8	0.0
W	159,180	490	1638	2.3		745.5	745.5	745.5	0.0

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS
[3] FLOODWAY EXTENDS BEYOND CORPORATE LIMITS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

SALINE RIVER

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCE FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Saline River									
X	160,370	911	809	4.6		746.6	746.6	746.6	0.0
Y	161,420	100	715	5.2		749.8	749.8	749.8	0.0
Z	164,390	163	395	9.2		758.7	758.7	758.7	0.0

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

SALINE RIVER

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Swift Run Drain									
A	2	182	182	2.3		749.1	745.7[3]	745.8	0.1
B	415	98	533	0.8		753.6	753.6	753.7	0.1
C	817	52	190	2.2		754.0	754.0	754.0	0.0
D	1,153	80	731	0.6		766.1	766.1	766.2	0.1
E	1,630	44	325	1.3		766.1	766.1	766.2	0.1
F	2,065	340	1689	0.2		767.2	767.2	767.3	0.1
G	3,276	125	283	1.2		767.2	767.2	767.3	0.1
H	3,569	270	456	0.7		769.5	769.5	769.6	0.1
I	3,943	222	125	2.6		770.2	770.2	770.2	0.1
J	4,412	23	78	4.2		772.6	772.6	772.6	0.0
K	5,036	100	374	0.9		778.2	778.2	778.3	0.1
L	5,732	22	46	7.3		779.3	779.3	779.3	0.0
M	6,419	100	140	2.4		784.1	784.1	784.2	0.1
N	6,810	54	127	2.1		788.1	788.1	788.1	0.0
O	7,422	22	78	3.5		790.1	790.1	790.2	0.1
P	7,706	21	73	3.7		791.0	791.0	791.0	0.0
Q	8,368	19	84	3.2		793.9	793.9	793.9	0.0
R	8,868	31	74	3.6		795.0	795.0	795.0	0.0
S	9,283	30	80	3.4		797.3	797.3	797.3	0.0
T	10,027	27	53	5.1		800.0	800.0	800.0	0.0
U	11,021	16	67	4.0		804.1	804.1	804.1	0.0
V	12,198	39	104	2.6		813.7	813.7	813.8	0.1
W	12,834	158	316	0.7		816.2	816.2	816.3	0.1
X	13,649	68	217	1.0		817.0	817.0	817.1	0.1

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS
[3] ELEVATION COMPUTED WITHOUT CONSIDERATION OF BACKWATER EFFECTS FROM HURON RIVER

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

SWIFT RUN DRAIN

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Swift Run Drain									
Y	14,453	32	115	1.8		818.3	818.3	818.4	0.1
Z	14,824	47	119	1.8		818.6	818.6	818.7	0.1
AA	15,843	28	83	2.5		820.2	820.2	820.3	0.1
AB	16,510	63	330	0.6		823.3	823.3	823.4	0.1
AC	17,044	180	883	0.2		823.4	823.4	823.4	0.0
AD	17,662	180	887	0.2		823.4	823.4	823.4	0.0
AE	18,076	29	164	1.0		823.6	823.6	823.7	0.1
AF	19,354	27	96	1.7		823.8	823.8	823.9	0.1
AG	20,225	270	2209	0.1		824.4	824.4	824.5	0.1
AH	21,533	29	124	1.3		828.9	828.9	828.9	0.0
AI	22,895	70	252	0.4		829.0	829.0	829.1	0.1
AJ	23,217	130	755	0.1		829.2	829.2	829.3	0.1
AK	24,664	345	527	0.2		829.2	829.2	829.4	0.1
AL	24,999	72	93	1.0		829.4	829.4	829.5	0.1
AM	26,086	175	293	0.3		829.7	829.7	829.7	0.1

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

SWIFT RUN DRAIN

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Traver Creek									
A	649	40	137	5.4		766.1	766.1	766.1	0.0
B	1,139	134	332	3.6		770.4	770.4	770.5	0.1
C	1,634	86	241	4.9		774.9	774.9	775.0	0.0
D	2,509	61	162	6.3		781.0	781.0	781.0	0.0
E	4,138	59	244	4.0		801.7	801.7	801.7	0.0
F	5,168	46	304	2.0		810.7	810.7	810.8	0.1
G	6,542	43	106	5.4		819.9	819.9	819.9	0.0
H	6,892	34	79	8.7		822.8	822.8	822.8	0.0
I	7,133	189	522	1.0		830.6	830.6	830.6	0.0
J	7,396	183	303	1.7		831.4	831.4	831.4	0.0
K	7,844	120	188	2.7		833.6	833.6	833.6	0.0
L	8,714	125	124	4.0		834.6	834.6	834.6	0.0
M	9,629	30	80	6.2		839.8	839.8	839.8	0.0
N	10,057	40	68	7.4		843.9	843.9	843.9	0.0
O	10,559	128	249	2.0		848.1	848.1	848.2	0.1
P	10,830	130	176	2.8		849.0	849.0	849.0	0.0
Q	11,458	111	315	1.6		855.0	855.0	855.0	0.0
R	11,808	200	693	0.7		861.5	861.5	861.6	0.1
S	11,989	171	876	0.6		861.5	861.5	861.6	0.1
T	13,103	116	203	2.0		863.9	863.9	863.9	0.0
U	14,564	93	107	3.7		879.8	879.8	879.8	0.0
V	15,536	210	1451	0.3		894.0	894.0	894.1	0.1
W	16,266	84	236	1.7		894.0	894.0	894.1	0.1
X	16,438	200	1139	0.4		900.8	900.8	900.8	0.0

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

TRAVER CREEK

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Traver Creek									
Y	17,264	130	395	1.0		900.8	900.8	900.8	0.0
Z	17,733	491	6027	0.0		906.6	906.6	906.7	0.1
AA	18,203	109	484	0.1		906.6	906.6	906.7	0.1
AB	19,147	19	144	4.2		908.3	908.3	908.3	0.0
AC	19,504	234	1293	0.2		910.5	910.5	910.5	0.0
AD	20,798	101	223	1.0		910.5	910.5	910.5	0.0
AE	21,087	56	385	0.6		916.4	916.4	916.4	0.0
AF	21,624	185	807	0.5		916.5	916.5	916.6	0.1
AG	21,939	101	173	1.6		916.5	916.5	916.6	0.1
AH	23,063	29	76	3.6		923.2	923.2	923.2	0.0
AI	23,265	225	896	0.3		926.6	926.6	926.6	0.0
AJ	24,381	107	140	2.0		929.7	929.7	929.7	0.0
AK	25,077	425	1922	0.2		934.7	934.7	934.8	0.1

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

TRAVER CREEK

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Traver Creek Diversion Overflow									
A	167	54	828	0.8		906.6	906.6	906.6	0.0
B	342	243	1613	0.2		906.7	906.7	906.7	0.0
Tributary to Paint Creek									
A	6	70	140	3.0		773.0	773.0	773.1	0.1
B	2,627	43	196	1.5		784.4	784.4	784.5	0.1
C	4,784	65	203	1.4		791.2	791.2	791.3	0.1
D	5,363	96	77	3.8		795.5	795.5	795.5	0.0
E	6,071	190	796	0.4		797.8	797.8	797.9	0.1
F	7,352	146	320	0.9		800.8	800.8	800.8	0.0
G	8,362	153	75	3.2		802.8	802.8	802.9	0.1
H	10,284	99	286	0.6		809.0	809.0	809.1	0.1
I	11,657	36	95	1.2		813.0	813.0	813.0	0.0
J	12,292	157	221	0.5		814.4	814.4	814.5	0.1
K	12,714	90	304	0.4		814.4	814.4	814.5	0.1
L	13,977	14	44	2.5		816.3	816.3	816.3	0.0
M	15,357	22	24	4.6		821.2	821.2	821.4	0.1

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

TRAVER CREEK DIVERSION OVERFLOW - TRIBUTARY TO PAINT CREEK

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
West Br Malletts Creek									
A	360	118	150	1.9		818.8	813.2[3]	813.3	0.1
B	1,480	30	112	2.6		818.8	815.6[3]	815.6	0.0
C	3,210	26	71	4.1		820.9	820.9	820.9	0.0
D	4,650	17	152	1.9	76	831.0	831.0	831.0	0.0
E	7,259	32	90	2.7		844.1	844.1	844.1	0.0
F	7,462	163	1134	0.2		857.0	857.0	857.0	0.0
G	10,881	126	763	0.3		866.2	866.2	866.3	0.1

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS
[3] ELEVATIONS WITHOUT CONSIDERING BACKWATER EFFECT FROM MALLETT'S CREEK

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

WEST BRANCH MALLETTS CREEK

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
West Branch Paint Creek									
A	1,694	461	513	1.8		675.4	675.4	675.5	0.1
B	3,282	765	1047	0.9		677.3	677.3	677.5	0.1
C	4,189	90	381	2.4		681.1	681.1	681.2	0.1
D	6,352	680	898	1.0		683.2	683.2	683.3	0.1
E	8,740	280	1047	0.9		689.6	689.6	689.7	0.1
F	10,056	189	425	2.1		690.9	690.9	691.0	0.1
G	10,986	175	295	3.1		691.9	691.9	692.0	0.1
H	12,780	156	172	4.4		694.5	694.5	694.5	0.1
I	13,784	360	610	1.2		696.5	696.5	696.7	0.1
J	15,410	236	347	1.2		700.2	700.2	700.3	0.1
K	16,410	195	335	1.2		700.6	700.6	700.7	0.1
L	17,410	141	223	1.8		701.6	701.6	701.7	0.1
M	18,510	197	142	2.9		703.4	703.4	703.5	0.1
N	19,510	69	134	3.1		706.0	706.0	706.1	0.1
O	20,510	144	192	2.1		707.2	707.2	707.3	0.1
P	21,530	55	106	3.9		710.4	710.4	710.5	0.1
Q	21,730	205	436	0.9		711.5	711.5	711.5	0.0
R	22,150	113	245	1.7		711.6	711.6	711.6	0.0

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

WEST BRANCH PAINT CREEK

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
West Park Miller Drain									
A	174	205	1004	0.6		800.8	800.8	800.8	0.0
B	759	227	724	0.9		800.8	800.8	800.8	0.0
C	1,361	98	122	5.1		804.5	804.5	804.5	0.0
D	1,592	140	145	4.2		809.2	809.2	809.2	0.0
E	1,990	81	114	5.4		818.6	818.6	818.6	0.0
F	2,246	119	152	3.8		829.2	829.2	829.2	0.0
G	2,534	63	138	4.1		831.8	831.8	831.8	0.0
H	2,913	110	114	2.5		836.6	836.6	836.6	0.0
I	3,130	90	66	4.3		837.0	837.0	837.0	0.0
J	3,608	78	59	4.8		845.2	845.2	845.2	0.0

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

WEST PARK MILLER DRAIN

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCE FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
West Park Miller Drain South Branch									
A	319	171	134	2.8		805.9	805.9	805.9	0.0
B	742	72	84	4.5		813.1	813.1	813.1	0.0
C	1,060	77	119	3.2		826.3	826.3	826.3	0.0
D	1,383	88	213	1.8		827.1	827.1	827.1	0.0
E	1,837	88	123	3.1		846.4	846.4	846.4	0.0
F	2,071	88	681	1.0		849.1	849.1	849.1	0.0
G	2,510	159	1693	0.4		849.1	849.1	849.1	0.0
H	3,013	46	137	4.8		851.5	851.5	851.5	0.0

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

WEST PARK MILLER DRAIN SOUTH BRANCH

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCE FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Wood Outlet Drain									
A	60	250	336	2.9		758.6	757.5[3]	757.5	0.0
B	960	185	554	1.8		767.6	767.6	767.6	0.0
C	1,390	106	215	4.6		770.7	770.7	770.7	0.0
D	1,830	32	163	6.0		776.3	776.3	776.3	0.0
E	2,480	48	247	4.0		782.7	782.7	782.8	0.1
F	3,290	170	442	2.2		787.6	787.6	787.6	0.0
G	4,020	132	672	1.5		792.7	792.7	792.7	0.0
H	5,040	178	705	1.4		794.0	794.0	794.0	0.0
I	5,390	199	503	1.9		795.0	795.0	795.1	0.1
J	5,840	42	189	1.7		796.9	796.9	796.9	0.0
K	5,980	110	236	1.4		797.4	797.4	797.4	0.0
L	7,000	76	295	1.1		798.6	798.6	798.6	0.0
M	8,160	84	296	1.1		800.1	800.1	800.2	0.1
N	9,030	71	229	1.4		801.8	801.8	801.9	0.1
O	9,760	87	276	1.2		803.2	803.2	803.3	0.1
P	10,790	38	132	2.5		805.6	805.6	805.7	0.1
Q	10,930	67	100	3.3		806.0	806.0	806.1	0.1
R	12,530	117	480	0.7		807.6	807.6	807.7	0.1
S	14,750	88	171	1.9		808.2	808.2	808.3	0.1
T	16,120	70	114	2.9		809.1	809.1	809.2	0.1
U	19,680	539	624	0.7		816.2	816.2	816.2	0.0
V	20,355	769	1255	0.4		816.5	816.5	816.5	0.0
W	20,546	694	1493	0.3		816.8	816.8	816.8	0.0

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS
[3] ELEVATION WITHOUT CONSIDERING BACKWATER EFFECT FROM SALINE RIVER

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

WOOD OUTLET DRAIN

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCE FROM PRIOR STUDY[2] (FEET)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE (FEET)
Wood Outlet Drain									
X	20,605	663	1130	0.4		816.8	816.8	816.8	0.0
Y	22,555	315	353	1.0		818.6	818.6	818.7	0.1
Z	23,955	405	541	0.7		819.8	819.8	819.9	0.1
AA	24,660	343	1763	0.4		819.8	819.8	819.9	0.1
AB	24,890	202	870	0.4		819.8	819.8	819.9	0.1
AC	26,000	71	419	0.7		821.1	821.1	821.2	0.1
AD	26,150	346	492	1.0		821.1	821.1	821.2	0.1
AE	26,230	337	211	3.5		821.1	821.1	821.2	0.1
AF	27,410	1240	299	0.8		822.9	822.9	822.9	0.0

[1] FEET ABOVE MOUTH
[2] SEE EXPLANATION IN SECTION 4.2 FLOODWAYS

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

FLOODWAY DATA

WOOD OUTLET DRAIN

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFEs or base flood depths are shown within this zone.

Zone AE

Zone AE is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance risk zone that corresponds to the areas of 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance risk zone that corresponds to the areas of 1-percent-annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot base flood depths derived from the detailed hydraulic analyses are shown within this zone.

Zone AR

Zone AR is the flood insurance risk zone that corresponds to an area of special flood hazard formerly protected from the 1-percent-annual-chance flood event by a flood-control system that was subsequently decertified. Zone AR indicates that the former flood-control system is being restored to provide protection from the 1-percent-annual-chance or greater flood event.

Zone A99

Zone A99 is the flood insurance risk zone that corresponds to areas of the 1-percent-annual-chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No BFEs or depths are shown within this zone.

Zone V

Zone V is the flood insurance risk zone that corresponds to the 1-percent-annual-chance coast floodplains that have additional hazards associated with storm waves. Because approximate hydraulics analyses are performed for such areas, no B FEs are shown within this zone.

Zone VE

Zone VE is the flood insurance risk zone that corresponds to the 1-percent-annual-chance coast floodplains that have additional hazards associated with storm waves. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X (Shaded)

Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depth of less than 1 foot or with drainage areas less than a square mile; and areas protected by levees from 1% annual chance flood.

Zone X is the flood insurance risk zone that corresponds to areas determined to be outside of the 0.2% annual chance floodplain.

Zone X

Areas determined to be outside of the 0.2% annual chance floodplain.

Zone D

Zone D is the flood insurance risk zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance risk zones as described in Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent-annual-chance floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The current FIRM presents flooding information for the entire geographic area of Washtenaw County. Previously, separate FIRMs were prepared for each identified flood prone incorporated community and for the unincorporated areas of the county. Historical data relating to the maps prepared for each community are presented in Table 9.

7.0 OTHER STUDIES

This FIS report either supersedes or is compatible with all previous studies on streams studied in this report and should be considered authoritative for purposes of the NFIP.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Flood Insurance and Mitigation Division, Federal Emergency Management Agency Region V, 536 South Clark Street, 6th Floor, Chicago, IL 60605-1509.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Ann Arbor, Charter Township of	August 15, 1975	None	June 18, 1980	None
Ann Arbor, City of	June 28, 1974	September 5, 1975	June 15, 1982	August 5, 1985 January 2, 1992
Augusta, Township of	April 15, 1977	None	September 4, 1985	None
Barton Hills, Village of	April 3, 2012	None	April 3, 2012	None
Bridgewater, Township of*	N/A	None	N/A	None
Chelsea, City of	April 3, 2012	None	April 3, 2012	None
Dexter, Township of	July 18, 1975	October 1, 1976	February 19, 1987	None
Dexter, Village of	April 3, 2012	None	April 3, 2012	None
Freedom, Township of*	N/A	None	N/A	None
Lima, Township of	April 3, 2012	None	April 3, 2012	None
Lodi, Township of	April 3, 2012	None	April 3, 2012	None
Lyndon, Township of	April 3, 2012	None	April 3, 2012	None
Manchester, Township of	April 3, 2012	None	April 3, 2012	None
Manchester, Village of	February 22, 1974	April 11, 1975	June 15, 1982	None

* No Special Flood Hazard Areas Identified

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

COMMUNITY MAP HISTORY

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Milan, City of	January 23, 1974	June 18, 1976	August 2, 1982	None
Northfield, Township of	September 5, 1975	None	November 16, 1990	None
Pittsfield, Charter Township of	June 17, 1977	None	August 2, 1982	May 15, 1991
Salem, Township of	March 18, 1977	None	April 1, 1988	None
Saline, City of	January 23, 1974	June 11, 1976	January 18, 1984	None
Saline, Township of	April 3, 2012	None	April 3, 2012	None
Scio, Township of	November 26, 1976	None	August 3, 1989	None
Sharon, Township of*	N/A	None	N/A	None
Superior, Township of	June 17, 1977	None	April 3, 2012	None
Sylvan, Township of	April 3, 2012	None	April 3, 2012	None
Webster, Township of	April 3, 2012	None	April 3, 2012	None
York, Charter Township of	April 3, 2012	None	April 3, 2012	None
Ypsilanti, Charter Township of	April 8, 1977	None	June 15, 1981	None
Ypsilanti, City of	June 14, 1974	June 11, 1976	July 16, 1980	September 10, 1982

* No Special Flood Hazard Areas Identified

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHTENAW COUNTY, MI

(ALL JURISDICTIONS)

COMMUNITY MAP HISTORY

9.0 BIBLIOGRAPHY AND REFERENCES

1) Federal Emergency Management Agency, Flood Insurance Study, City of Ann Arbor, Michigan, January 2, 1992.

2) Federal Emergency Management Agency, Flood Insurance Study, City of Ann Arbor, Michigan, August, 1985.

3) Federal Emergency Management Agency, Flood Insurance Study, Township of Ann Arbor, Michigan, September 1979.

4) Federal Emergency Management Agency, Flood Insurance Study, Township of Dexter, Michigan, February 19, 1987.

5) Federal Emergency Management Agency, Flood Insurance Study, Village of Manchester, Michigan, December 15, 1981.

6) Federal Emergency Management Agency, Flood Insurance Study, Township of Northfield, Michigan, November 16, 1990.

7) Federal Emergency Management Agency, Flood Insurance Study, Charter Township of Pittsfield, Michigan, May 15, 1991.

8) Federal Emergency Management Agency, Flood Insurance Study, City of Saline , Michigan, July 18, 1983.

9) Federal Emergency Management Agency, Flood Insurance Study, Township of Scio, Michigan, August 3, 1989.

10) Federal Emergency Management Agency, Flood Insurance Study, City of Ypsilanti, Michigan, September 1982.

11) Federal Emergency Management Agency, Flood Insurance Study, Township of Ypsilanti, Michigan, December 15, 1980.

12) Midwest Regional Climate Center, 1971-2000 NCDC Normals,

13) U.S. Census Bureau, 2008 Population Estimate,

14) U.S. Water Resources Council, Bulletin No. 17, Guidelines for Determining Flood Flow Frequencies, Washington, D.C., March 1976, (revised by Change Bulletin, 1977).

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