YAZOO BACKWATER AREA, MISSISSIPPI
REFORMULATION STUDY
Flood Control, Mississippi River and Tributaries, Yazoo Basin, Mississippi

ANALYSIS OF ENVIRONMENTAL JUSTICE CONSIDERATIONS

May 2007

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I. PURPOSE OF REPORT

A. Introduction

The purpose of this report is to provide an analysis of Environmental Justice issues associated with the proposed Yazoo Backwater (YBW) Reformulation Project. The U.S. Army of Engineers (USACE) has invested more than a decade conducting studies of the environmental and socioeconomic impacts of flooding in the Yazoo Backwater Area. Many of the comments/conclusions presented in this report are based on the initial framework of environmental and socioeconomic impacts outlined in these studies (mainly the Yazoo Backwater, Mississippi, Reformulation Report, September 2000).

Federal authorization for this project preceded the introduction of many other Federal and State requirements, including those under the National Environmental Policy Act (NEPA) of 1969, as amended, and the even more recent requirements for the inclusion of Environmental Justice considerations (Executive Order 12898, "Federal Actions to Address *Environmental Justice* In Minority Populations and Low-Income Populations," February, 1994). The latter requirement calls for Federal agencies to make Environmental Justice (EJ) considerations part of their mission in conducting or preparing Environmental Impact Statements.

This report intends to present an objective analysis of the Yazoo Backwater Project's impact on the minority and low-income populations located within the study area and to consider whether that impact is "disproportionately high or adverse," in accordance with Federal guidelines outlined in Section II, below. This report also contains an assessment of prior efforts relative to EJ, such as community outreach and public awareness. This includes an outline of the dissemination of project information among the affected low-income and minority communities in the area, as well as, their opportunity for representative input regarding the proposed project.

This assessment is intended to become an attachment to the Socioeconomic Profile (Appendix 8) of the Yazoo Backwater Reformulation Report and will be utilized to address EJ issues prevalent in the study area. The report begins with a description of EJ and continues with a brief history of the project, explanation of the potential project impacts, a discussion of the EJ assessment, and the results of the analysis.

The objective of this analysis is two-fold—to identify and independently evaluate any "disproportionately high or adverse" impacts in the YBW area based on the current 2006 Reformulation Study; and to determine if EJ had been properly addressed in previous YBW studies. Thus, it should be noted that, although previous environmental documentation from the

2000 Study was complete when this EJ analysis began, environmental evaluations for the current YBW Reformulation Study were still ongoing. Therefore, the assessments contained in this report include a thorough examination of the evaluations and conclusions from the 2000 Study as they relate to environmental justice. A separate, independent EJ analysis has also been conducted, including studies of applicable documents, interviews with local officials and citizenry, and research of various socioeconomic parameters to determine sources of "disproportionately high or adverse" impacts. Impacts from both the independent assessments and the previous study findings were correlated to create a complete picture of potential minority and low-income sources that could be "disproportionately" impacted in the YBW area with and without the project. Then, each of the impacts was assessed according to its "disproportionate high or adverse" effect.

B. Preliminary Review of Previous EJ Efforts

After reviewing many previous documents concerning meetings, community outreach efforts, and public awareness activities on the part of the USACE and other entities, such as the Mississippi Levee Board (MLB), it was noted that the activities conducted from previous studies constituted proper environmental justice efforts under the relevant EJ guidance documents. While many of the efforts were not specifically designated as EJ, a review of the EJ guidance documents demonstrates that they qualify as EJ considerations. This is partially due to the fact that the initial documentation process for the 2000 Study preceded the promulgation and clarification of EJ requirements which were established in 1994. Thus, while the terminology was not designated as EJ at the time the activities took place and the related documentation was not captured as such, it appears that sufficient actions in consideration of EJ were addressed in previous YBW studies.

C. Preliminary Conclusion

Since the overall potential outcome of proposed flood reduction improvements are deemed to be of substantial benefit to the study area population and the fact that the majority of this population consists of minority and low-income persons, it does not appear that any "disproportionately high and/or adverse" impacts will occur relative to this population if the project is completed. Conversely, the result of not building or completing the proposed project will pose an adverse impact on the minority and low-income population in the study area. Flood damage reduction in this segment of the Mississippi Delta will contribute to the overall health, safety and welfare of the citizens by helping to sustain and stimulate economic growth in the area**.** Overall, this equates to a positive benefit to the minority and low-income populations in the study area.

In this analysis, benefits to the minority and low-income populations are realized through an indepth study of various socioeconomic parameters deemed pertinent to EJ for the existing study area. For this analysis, these parameters include population, housing, income, employment, poverty levels, agriculture, and business. Benefits to the EJ population are measured by the potentially positive and/or negative consequences of implementing the project. It should be noted that these benefits are not the same as the flood damage reduction benefits determined by the standard economic analysis of the project (Appendix 7 of the 2007 YBW Reformulation Report). Flood damage reduction benefits and costs evaluated in the standard economic analysis are not calculated specific to race, minority population, or income level.

Some adverse impacts were identified that may ensue if the project is implemented, but these do not negatively impact the EJ area. The overall project benefits, however, outweigh the adverse impacts, which will be discussed in detail later in this report.

II. ENVIRONMENTAL JUSTICE

Executive Order 12898**, "*Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations,*"** directs Federal Agencies to identify and address, as appropriate, ***"disproportionately high and adverse"*** human health or environmental effects of their programs, policies, and activities on minority and low-income populations and communities. The order states:

> *"To the greatest extent practicable by law . . . each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations . . ." (Subsection 1-101*).

The overall Environmental Justice principles may be summarized by the following goals:

- ***Avoid or mitigate high and adverse impacts*** *on minority and low income populations.*
- *Ensure* ***full and fair participation*** *by all, particularly minority and low-income populations.*
- *Provide a proportionate* ***share of benefits*** *to minority and low income populations*.

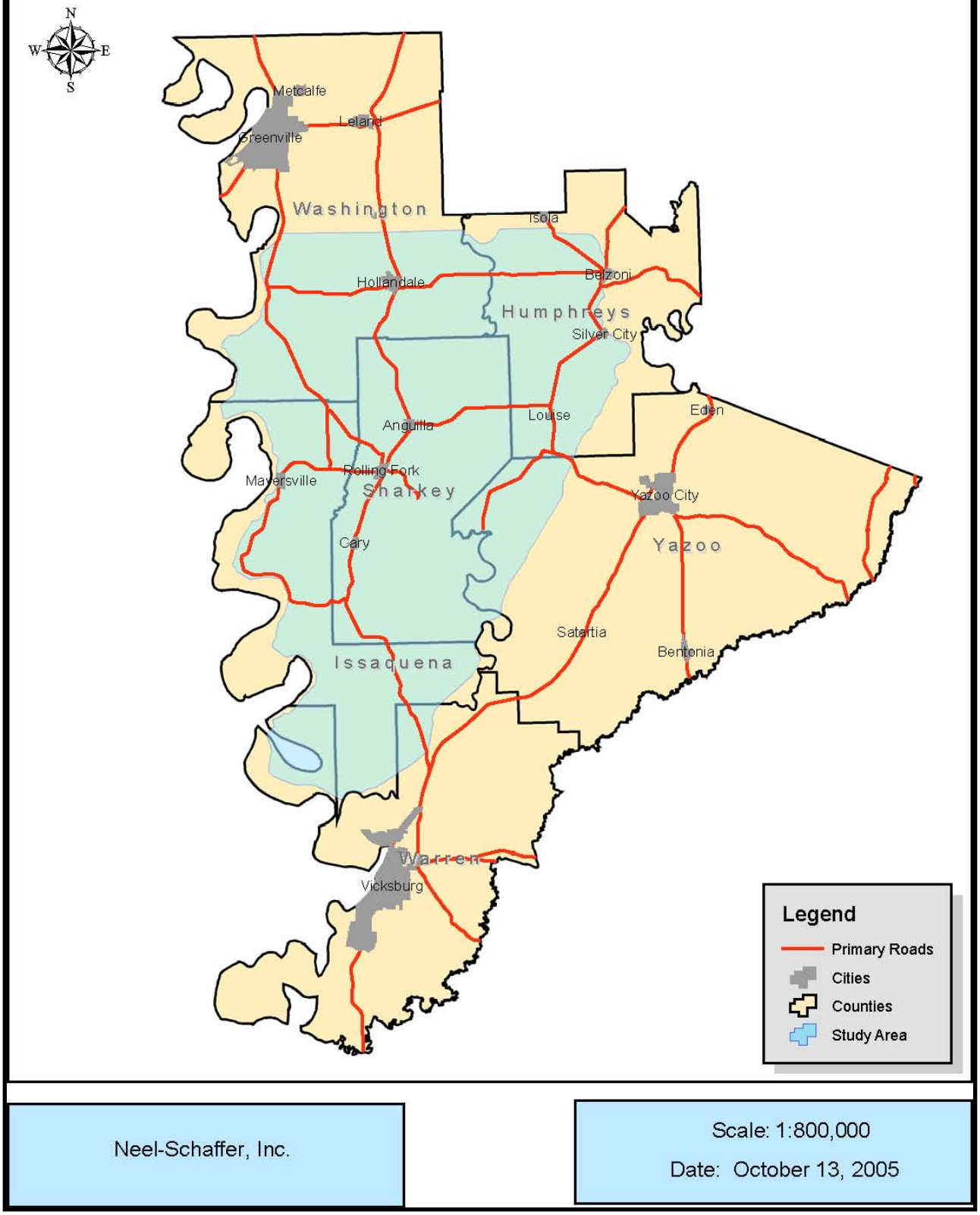
The USACE, Vicksburg District, is the Federal Agency coordinating this effort for the Yazoo Backwater Reformulation Study. The project study area, which will be presented in additional detail in the following section, is located within the area known as the lower Mississippi Delta.

The Yazoo Backwater Area consists primarily of Sharkey and Issaquena Counties and portions of four (4) other counties in Mississippi and one parish in Louisiana. These include Washington, Humphreys, Warren, and Yazoo Counties in Mississippi, and Madison Parish, Louisiana. Since the vast majority of the area impacted by the YBW Project is concentrated in Issaquena and Sharkey Counties, which are almost totally encompassed by the study area (**Figure 1**), the impact assessment in this report concentrates primarily on those counties.

The other four (4) counties and parish comprise only 13 percent of the total area. Although some of the Delta's larger cities are located in some of these counties, e.g., Greenville, Vicksburg, Belzoni, and Yazoo City, they are not directly impacted by the project. The majority of the impacted area lies significantly outside of these larger communities (**Figure 2**). Therefore, these cities are not included in any of the detailed assessments.

The most populated communities impacted by the proposed project are Belzoni, Hollandale, and Rolling Fork, which include towns with populations greater than 1,000 persons. Among the smaller communities within the impacted area are Anguilla, Cary, Delta City, Eagle Lake, Fitler, Glen Allan, Holly Bluff, Louise, Mayersville, Onward, Silver City, Valley Park, and many more. Even though detailed data and assessments were not available for the smaller communities, these areas are also disrupted during flood events.

Figure 1. Yazoo Backwater Study Area

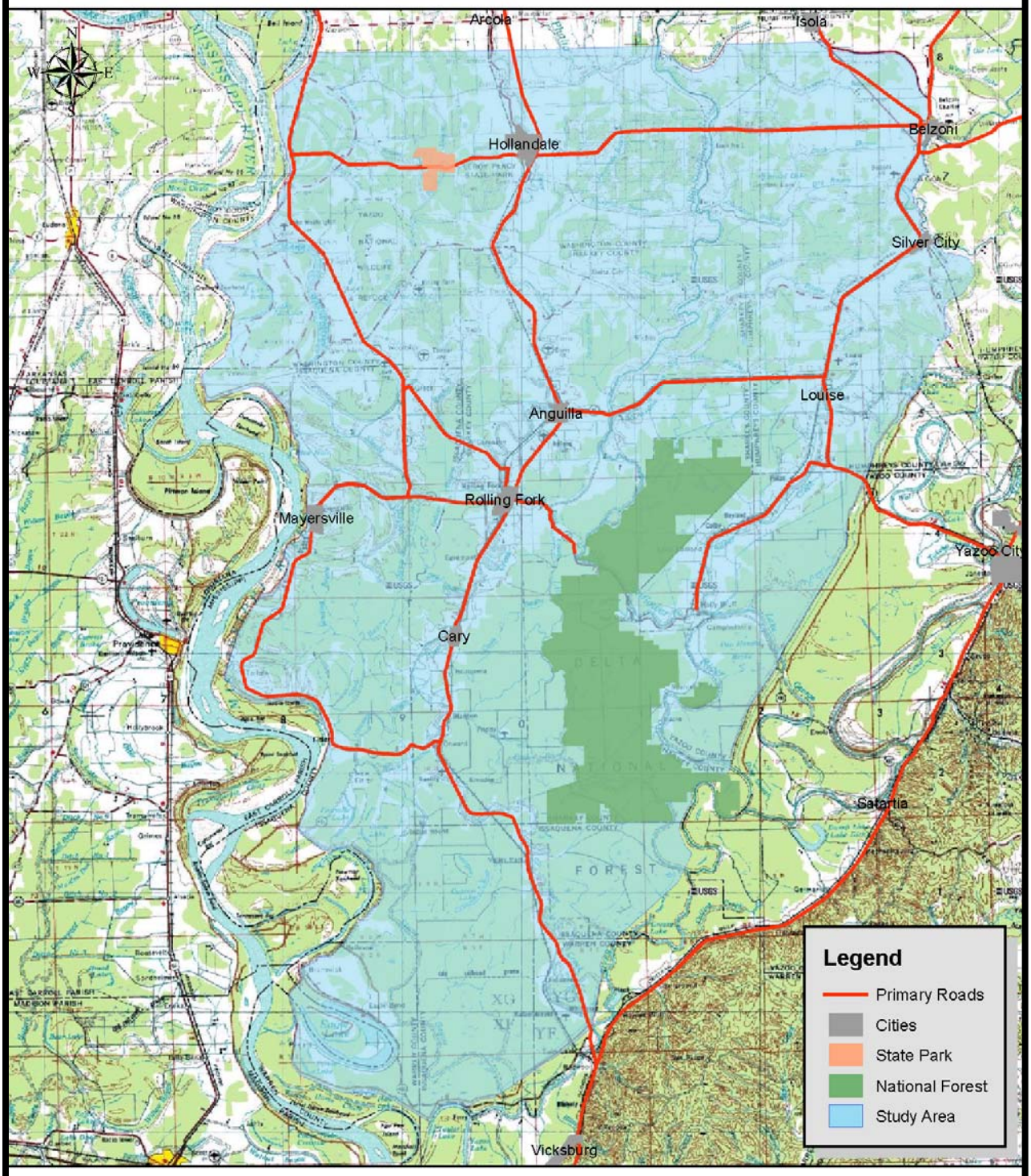


Neel-Schaffer, Inc.

Scale: 1:800,000

Date: October 13, 2005

Figure 2. Yazoo Backwater Study Area on USGS Quadrangle



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Scale: 1:450,000

Date: October 13, 2005

The purpose of EJ is to ensure the opportunity for fair and full participation by all involved parties, particularly minority and low-income populations; avoidance or mitigation of impacts on these affected populations; and the proportionate spreading of benefits associated with the proposed project. The potential for EJ impacts of the YBW Project on the study area is determined based on the relative presence and assessment of two foundational parameters, i.e., minority populations and/or low income and poverty concentrations. An assessment of these parameters is presented after a brief review of the project's background.

III. BACKGROUND

The Yazoo Backwater Area, which is part of the Lower Mississippi Delta Region and shaped by a series of rivers (including the "Mighty Mississippi"), has historically been recognized as some of the richest and highest yielding agricultural land in the United States. It is also known for its vast and abundant crops of cotton, soybeans, rice, and farm-raised catfish as well as the industries that they support. These industries, such as catfish processing, and rice processing, along with agriculture/aquaculture, provide the main economic base for much of the rural Delta area of Mississippi.

Historically, however, the Delta is also known for its high incidence of flooding and the subsequent social, physical and economic disruption and devastation that often accompany such floods. From 1897 to 1937, massive floods inundated the region regularly. Then for a 35-year period less severe flooding occurred, causing many to dismiss massive floods as a thing of the past. However, in 1973, a severe flood again devastated the area. Other destructive floods followed in rapid succession in 1974, 1975, 1979, 1983, 1984, 1991, 1993, and 1997.

Characteristically, in the YBW Area, during a flooding event, the force of the Mississippi River's swollen waters prevent the much smaller Yazoo and Sunflower Rivers from draining back into the Mississippi. Consequently, the force of the larger, stronger, Mississippi River forces the waters of the smaller, but swollen Yazoo and Sunflower Rivers "backward" into the Delta giving way the term "backwater" flooding. This type of flooding, if it is to be reduced or managed, requires a solution customized for the area.

A. Description of the Overall Project Area, YBW Study Area, and Economic Base Area

The greater Yazoo Backwater Project Area, which is located in west-central Mississippi, is bounded on the west by the left descending bank of the Mississippi River levee, on the east and south by the west levees of the Yazoo River, and on the north by State Highway 12. While the project area covers nearly 930,000 acres, the primary area affected by the proposed project is only a portion of the total project area. Hereafter referred to as the "study area," this is the area subject to flooding by the 100-year frequency flood event and is delineated to be about 630,000 acres, or 68% of the total project area. The "economic base area" is also discussed later in this document for various socioeconomic characteristics and their impacts on the minority and low-income populations. For this study, the economic base area, represented by Issaquena and Sharkey Counties, was deemed to appropriately reflect the socioeconomic problems, needs, conditions, and opportunities indicative of the YBW study area.

B. History of the Project

The historic interest in flood damage reduction in the Yazoo Basin is extensive, as noted in portions of previous environmental documents, including the September 2000 Draft Reformulation Report. This history includes:

- In 1928, the United States Congress passed the Flood Control Act of 1928 in response to the Great Flood of 1927 when the Mississippi Delta experienced the most devastating flood in United States history.
- In 1936, the Eudora Floodway in Arkansas and Louisiana was authorized as part of the Mississippi River and Tributaries (MR&T) Project.
- In 1941, Congress adopted the Flood Control Act authorizing the MR&T Project and various features, including the removal of the Eudora Floodway and the approval of the Yazoo Backwater Project in Mississippi. The Floodway was proposed to carry floodwater from the Mississippi River from a point near the mouth of the Arkansas River across the States of Arkansas and Louisiana to the Gulf of Mexico, never reentering the main river. The Yazoo Backwater Project was proposed to provide protection to the backwater areas of the Yazoo Basin in Mississippi from floodwater due to higher stages on the Mississippi River. The YBW Project was to consist of constructing drainage structures, levees, and proposed pumps to remove the rainwater from the interior of the Delta during a high-water event.
- Though some of the elements of the 1941 Act were accomplished, some others have not been completed.
- The following YBW Project components have occurred to date (in chronological order):
    1. Authorization—in 1941—for a study to evaluate a system of pumps to remove interior rainfall. The pump project was approved for completion in the 1980's and initial construction was begun.
    2. Completed construction of the Steele Bayou Drainage Structure—1969; Little Sunflower Drainage Structure—1975.
    3. Construction of the Yazoo Backwater Levee—completed in 1978.
    4. Construction of a channel to connect the Big and Little Sunflower Rivers, Deer Creek and Steele Bayou—completed in 1978.
    5. Construction of the inlet and outlet channels and the coffer dam around the pumping plant site—completed in 1987.

The most significant remaining uncompleted elements of the Yazoo Backwater Project consist of a combination of structural and nonstructural features including a pumping plant for surface water removal during high water on the Mississippi River, and the reforestation of up to 55,600 acres of agricultural land. The proposed recommended plan under the current 2006 analysis calls for a 14,000-cfs pump and is designed to provide structural flood damage reduction above 87 feet, NGVD, and the reforestation feature provides nonstructural flood damage reduction at or below the 1-year flood frequency. These features would reduce interior flooding in the YBW Area when the gates of the Steele Bayou and Little Sunflower Drainage Structures are closed due to high stages on the Mississippi and/or Yazoo Rivers. Interior drainage has no outlet during these times, which causes a large amount of acreage to be inundated. Operation of the drainage structure at Steele Bayou would also be modified to maintain a 70 to 73 foot elevation during

low water periods. The pumping plant at issue has been a proposed feature of the YBW Project since its authorization in 1941.

In regard to the uncompleted works of the 1941 Act, there are some significant points that should also be noted which are relevant to the completion of the proposed YBW Project. These are listed below:

- In 1941, the Eudora Floodway and YBW Project were key features of flood control along the lower Mississippi Valley to be implemented to reduce flooding. As land values increased in the States of Arkansas and Louisiana, the State of Arkansas sponsored language in the Flood Control Act of 1941 Act to remove the Floodway from the MR&T Project. As compensation, the YBW feature was added. However, while removal of the Floodway feature continued to benefit portions of the Arkansas and Louisiana sides of the Mississippi River, the resulting impacts east of the Mississippi River were less favorable. Without the completion of the final part of the MR&T Project, the Mississippi Delta region has continued to experience significant flooding events, especially in the years from 1973 to 1997.
- Based on the results of community interviews (Attachments 3 and 4 of this document), many residents and local interests in the YBW study area have concerns that the removal of the Eudora Floodway feature from the original project has compromised the initial flood protection intended for their communities.
- In addition, eliminating the Eudora Floodway is estimated to increase stages on the Mississippi River by about six (6) feet at Vicksburg. The YBW Project was authorized in the Act to keep the additional water from high stages on the Mississippi River from flooding the Mississippi Delta. The Mississippi River provides the outlet for water from about 41% of the continental United States. This includes drainage from 31 states and parts of 2 provinces in Canada. Thus, this water comes through the Mississippi River and its tributaries, which means, when the stage increases at Vicksburg, it has a significant impact on the YBW Area.

In regard to the completed features of the YBW Project, some flood relief to the Mississippi Delta has been achieved since these have become operable. The completion of the YBW levee system, channels, and drainage structures (Items 2 through 5, above) has prevented approximately 1 to 8 feet of water from "backing up" into the study area during various flood events. However, interior drainage has no outlet when the gates of the Steele Bayou and Little Sunflower Drainage Structures are closed due to high stages on the Mississippi and/or Yazoo Rivers. The completed features of the YBW Project are segments of an overall project design, in which implementation of each of the segments works best when all of the features of the overall project are complete. Therefore, the project's effectiveness in reference to flood damage reduction hinges on the completion of each feature, including the pump, which is the last feature to be completed.

IV. EXISTING CONDITIONS

A. The Yazoo Backwater Economic Base Study Area

As noted previously, the reaches of the Yazoo Backwater Area extend to parts of six (6) counties in west-central Mississippi and one (1) parish in southeastern Louisiana, all within the Yazoo River Basin. These counties include; Issaquena, Sharkey, Humphreys, Warren, Washington, and

Yazoo Counties, Mississippi, and Madison Parish, Louisiana. However, as also noted previously, 87 % of the hydrological boundaries of the YBW watershed are physically located within Issaquena and Sharkey Counties. In terms of socioeconomic impact, these two counties were used as the primary focus of the EJ evaluation. Since these two counties were previously identified to represent the economic base area of the study area in previous studies, they were deemed appropriate for this evaluation, as well. They are also considered to be the most economically representative of the study area in terms of primary EJ impact—based on location, race, population size, and the rural nature of the area.

Within the study area, the majority of residents live in or near the two towns of Rolling Fork, the largest town in Sharkey County, or Mayersville, the largest concentrated community in Issaquena County. Rolling Fork basically serves as the local retail center for both counties by providing essential services, such as grocery shopping, banking, schools, churches, agricultural supplies, and similar needs. Rolling Fork also provides some professional, government, and basic medical services to the area. According to interviews with the local residents, they conduct most of their business activity in the local area due to convenience of services and the high expense of travel. However, in some cases, residents have to travel to larger surrounding cities (e.g., Vicksburg, Greenville, Yazoo City, Jackson, etc.) to fulfill greater needs such as major health concerns, medical emergencies, financial ventures, and retail shopping.

The potential for flooding in the YBW Area affects approximately 1,576 structures and an estimated 630,000 total acres of land within the 100-year floodplain. Of these, an estimated 316,000 acres are cleared agricultural land, the major attribute in the development of this region's economy. Flood events bring disruption to the lives and livelihood of the area citizens, whether they are located in small communities or in remote rural areas. Impacts, which range from homes to farms to businesses and interrupt everyday services and operations, can last for days at a time and take months from which to recover.

B. Population of the Study Area

Table 1 presents population data for the Yazoo Backwater Area for the years from 1980 through 2000. The statistics illustrate an overall population decline in the area over the period. It is also worth noting that the greatest population decline since 1980 has been in Issaquena and Sharkey Counties—the two counties most impacted in this study. The trend corresponds to substantial out-migration of the minority population, particularly African-American, which could have resulted from a number of social and economic factors. Among these factors could be poverty; fear of flood disasters; mechanization of large farms and less demand for manual labor; the resulting loss of employment and the possibility of better employment and housing opportunities outside of the lower Delta region. Many former Delta residents migrated to more industrialized areas in northern and mid-western urban areas.

C. Population by Race

Population trends for Issaquena and Sharkey Counties and the State of Mississippi are shown in **Table 2** by race for the years from 1980 to 2000. The data illustrate that the minority population, which is primarily African American, has fluctuated during the period. Still, the percentage of minority populations in Issaquena and Sharkey Counties remains well above statewide averages. ("Minority" when related to Census data, refers to racial populations other than Caucasian.) With a 2000 Census level of nearly 63.7%, and 70.6%, respectively, the relative percent of minority population in those counties increased between 1980 and 2000. By comparison,

Mississippi's minority population was estimated to be 38.6% in 2000. This is a significant factor in the consideration of the potential for EJ concerns.

Table 1
Total Population: 1980-2000 *

Area	Population and Percentage Change					
	1980 (no.)	Change 1980-90 (%)	1990 (no.)	Change 1990-2000 (%)	2000 (no.)	Overall Change 1980-2000 (%)
Humphreys County	13,931	-12.9	12,134	-7.6	11,206	-19.6
Issaquena County	2,513	-24.0	1,909	19.1	2,274	-9.5
Sharkey County	7,964	-11.3	7,066	-6.9	6,580	-17.4
Warren County	51,627	-7.3	47,880	3.7	49,644	-3.8
Washington County	72,344	- 6.1	67,935	-7.3	62,977	-12.9
Yazoo County	27,349	-6.7	25,506	10.4	28,149	2.9
Subtotal *	175,728	-7.6	162,430	-1.0	160,830	-8.5
YBW TOTAL *(Issaquena & Sharkey Counties)*	10,477	-14.3	8,975	-1.3	8,854	-15.5
Mississippi	2,520,638	2.1	2,573,216	10.5	2,844,658	12.9
United States	226,545,805	9.8	248,709,873	13.2	281,421,906	24.2

Source: U.S. Census Bureau (April 2006); University of Virginia Library Geospatial & Statistical Data Center.

** NOTE: Table 1 includes all six Mississippi counties with some portion of county in the study area. Subtotal of six counties provided as an indication of total potential population impacts. Madison Parish, LA, is excluded since it comprises less than 1 percent of the study area.*

Table 2
Total Population by Race: 1980-2000

Area	Year	Total Population	Minority Population a/		Majority Population b/	
		(no.)	(no.)	*(%)*	(no.)	*(%)*
Issaquena County	**1980**	2,513	1,410	*56.1*	1,103	*43.9*
	1990	1,909	1,076	*56.4*	833	*43.6*
	2000	2,274	1,448	*63.7*	826	*36.3*
Sharkey County	**1980**	7,964	5,232	*65.7*	2,732	*34.3*
	1990	7,066	4,727	*66.9*	2,339	*33.1*
	2000	6,580	4,648	*70.6*	1,932	*29.4*
YBW TOTAL*	**1980**	10,477	6,642	*63.4*	3,835	*36.6*
	1990	8,975	5,798	*64.6*	3,177	*35.4*
	2000	8,854	6,092	*68.8*	2,762	*31.2*
Mississippi	**1980**	2,520,638	904,909	*35.9*	1,615,729	*64.1*
	1990	2,573,216	993,166	*36.5*	1,633,461	*63.5*
	2000	2,844,658	1,098,559	*38.6*	1,746,099	*61.4*

Source: U.S. Census Bureau (April 2006).

** NOTE: The YBW Area consists of Issaquena and Sharkey counties for this report. Since these two counties comprise 87% of the study area, they are the most representative of the economy.*

a/ Minority refers to all racial populations other than Caucasian—African-American, Hispanic, Asian, Indian, etc.

b/ Majority refer to the Caucasian population.

D. Economic and Income Indicators

The economic condition and per capita income status of the study area population are key elements in the analysis of EJ considerations. This analysis considers the following indicators for Issaquena and Sharkey Counties:

- Per Capita Income
- Poverty Status
- Civilian Labor Force and Unemployment
- Household and Family Income
- Housing
- Agriculture and Aquaculture
- Total Employment
- Employment Rank by Industry
- Retail Business

1. Per Capita Income

Per capita income (PCI) within the YBW Area are low compared to the rest of the State. **Table 3** illustrates the PCI of Issaquena and Sharkey Counties compared to the State of Mississippi from 1979 to 1999 based on Census estimates updated to 1996 dollars for comparison purposes. Note that in 1999, the PCI for the YBW Area was about one-third less than the State average. Based on the updated PCI, incomes decreased in both Issaquena and Sharkey Counties as well as the YBW Area from 1979 to 1989, before growing substantially by 1999. However, the sizeable increase likely occurred as a result of the decline over the previous decade. Both counties are areas of relatively low-income concentrations as indicated in comparison to the State. They also rank among the lowest in the State.

Table 3
Per Capita Income: 1979-1999

County/Area	1979 PCI		1979-89 change	1989 PCI		1989-99 change	1999 P CI		Overall change 1979-99
	($)	*(% of State)*	(%)	($)	*(% of State)*	(%)	($)	*(% of State)*	(%)
PCI (Census data in current dollars)									
Issaquena	4,538	*87.6*	-	6,412	*66.5*	-	10,581	*66.8*	-
Sharkey	4,032	*77.8*	-	6,032	*62.5*	-	11,396	*71.9*	-
YBW TOTAL a/	4,153	*80.1*	-	6,117	*63.4*	-	11,187	*70.6*	-
Mississippi	5,183	-	-	9,648	-	-	15,853	-	-
PCI (1996 dollars) b/									
Issaquena	8,686	*87.6*	-11.3	7,701	*66.5*	31.4	10,115	*66.8*	16.5
Sharkey	7,717	*77.8*	-6.0	7,244	*62.5*	50.4	10,895	*71.9*	41.2
YBW TOTAL a/	7,949	*80.1*	-7.6	7,347	*63.4*	45.6	10,695	*70.6*	34.6
Mississippi	9,918	-	16.8	11,587	-	30.8	15,155	-	52.8

Source: U. S. Census Bureau (April 2006): Income data provided by Census for the given years; Univ. of VA Library Geospatial & Statistical Data Center.

a/ Study area total derived by dividing the total personal income for Sharkey and Issaquena Counties by their total population for each given year.

b/ Current dollars converted to 1996 dollars.

2. Poverty

Estimates of local income data based on the latest available Census indicated that nearly one-third each of the populations in Issaquena and Sharkey Counties were living below the poverty level during 2003 (32% and 31%, respectively). That percentage compares to nearly 18% for Mississippi and 13% for the United States. **Table 4** illustrates the number of persons living below poverty levels as compared to statewide numbers in the YBW Area.

Floods, like other natural or man-influenced disasters, can have a greater impact on the poor and poverty-level population than on higher income groups. Those without accumulated financial means have fewer resources or options for dealing with the disruption and loss that can be associated with a flood. Flood insurance can be expensive and, thus, many low-income residents who experience flood loss or damage may not have insurance. So, many times, flood loss for poor or low-income residents can result in total property loss.

Table 4
Population Below Poverty Level: 1999-2003 *

Area	1999			2003		
	Total Population	Total Population With Income Below Poverty Level		Total Population	Total Population With Income Below Poverty Level	
	(no.)	(no.)	(%)	(no.)	(no.)	(%)
Issaquena County	2,274	666	29.3	2,062	659	32.0
Sharkey County	6,580	2,492	37.9	6,234	1,935	31.0
YBW TOTAL	8,854	3,158	35.7	8,296	2,594	31.3
Mississippi	2,844,658	548,079	19.3	2,882,594	514,663	17.9

Source: U.S. Census Bureau (2004).

3. Civilian Labor Force and Unemployment

Most of the labor force within Issaquena and Sharkey Counties are employed in agriculture or related industries or services, which is discussed later in this document. The number of individuals and the manual labor needed to support agricultural-related services has decreased steadily over the years due to mechanization and advances in agricultural and aquaculture science. This continues to impact unemployment rates in the area. Unemployment in the YBW Area has historically exceeded the rate of unemployment for the State, sometimes by nearly double the rate of the State's unemployment. **Table 5** illustrates this trend with annual Census data for the civilian labor force (CLF) for the years 1980, 1990, and 2000.

Table 5
Civilian Labor Force and Unemployment Trends: 1980-2000

Area	1980			1990			2000		
	CLF	Unemployment		CLF	Unemployment		CLF	Unemployment	
	(no.)	(no.)	(%)	(no.)	(no.)	(%)	(no.)	(no.)	(%)
Issaquena County	822	68	8.3	749	75	10.0	814	110	13.5
Sharkey County	2,446	183	7.5	2,612	265	10.1	2,572	374	14.5
YBW TOTAL	3,268	251	7.7	3,361	340	10.1	3,386	484	14.3
Mississippi	1,009,374	72,168	7.1	1,123,485	94,712	8.4	1,267,092	93,778	7.4

Source: U.S. Census Bureau (2006).

4. Household and Family Income

Median household and family income are also reasonable indicators of disposable income and a household's ability to provide for their quality of life and the means to purchase goods and services. In 1999, household and family incomes in the YBW Area were significantly lower than those in the State as a whole. **Table 6** illustrates the change of the median household and family incomes, respectively, in Issaquena and Sharkey Counties for the years from 1979 to 1999. Both are presented in current dollars (as provided by the Census) and updated to 1996 dollars for comparison purposes.

These statistics reveal the median household and family incomes of the YBW Area closely parallel ratios of YBW per capita income to the State. Although both median household and family income showed overall growth during the 1979 to 1999 period, they remained lower than the State averages. In 1999, both median household and median family income in Sharkey and Issaquena Counties ranged from 28 to 36% less than the State for the updated values.

Table 6
Household and Family Income: 1979-1999 *

County/ Area	1979		1979-89 change	1989		1989-99 change	1999		Overall change 1979-99
	($)	*(% of State)*	(%)	($)	*(% of State)*	(%)	($)	*(% of State)*	(%)
Median Household Income									
(current dollars) a/									
Issaquena	9,167	*75.8*	-	13,005	*64.6*	-	19,936	*63.6*	-
Sharkey	8,250	*68.2*	-	13,304	*66.1*	-	22,285	*71.1*	-
Mississippi	12,096	-	-	20,136	-	-	31,330	-	-
(updated to 1996 dollars) b/									
Issaquena	17,546	*75.8*	-11.0	15,619	*64.6*	22.0	19,059	*63.6*	8.6
Sharkey	15,791	*68.2*	1.2	15,978	*66.1*	33.3	21,304	*71.1*	34.9
Mississippi	23,152	-	4.5	24,183	-	23.9	29,951	-	29.4
Median Family Income									
(current dollars) a/									
Issaquena	11,625	*79.7*	-	14,167	*58.0*	-	23,913	*63.9*	-
Sharkey	9,406	*64.5*	-	15,682	*64.2*	-	26,786	*71.6*	-
Mississippi	14,591	-	-	24,448	-	-	37,406	-	-
(updated to 1996 dollars) b/									
Issaquena	22,250	*79.7*	-23.5%	17,015	*58.0*	34.4	22,861	*63.9*	2.8
Sharkey	18,003	*64.5*	4.6%	18,834	*64.2*	36.0	25,607	*71.6*	42.2
Mississippi	27,927	-	5.1%	29,362	-	21.8	35,760	-	28.1

Source: U.S. Census Bureau (April 2006): Profile of Selected Economic Characteristics. Income data provided by the Census for the given years.

a/ Census data provided in current dollars.

b/ Current dollars converted to 1996 dollars.

5. Housing

Table 7 presents information on overall housing occupancy in the YBW Area while **Table 8** provides a comparison of the household characteristics in the YBW Area and the State of Mississippi, as represented in the 2000 Census. The total number of housing units and their relative values declined in Sharkey County, but improved in Issaquena, compared to the steady increase and value appreciation for housing units in the State during the period.

Table 7
Total Housing Units by Occupancy: 1990-2000

Area	Total Housing Units (no.)		Occupied Units a/ (no.)		Vacant Units b/ (no.)	
	1990	2000	1990	2000	1990	2000
Issaquena County	698	877	633	726	65	151
Sharkey County	2,290	2,416	2,084	2,163	206	253
YBW TOTAL	2,988	3,293	2,717	2,889	271	347
Mississippi	1,010,423	1,161,953	911,374	1,046,434	99,049	115,519

Source: U.S. Census Bureau (2006); Univ. of VA Library Geospatial & Statistical Data Ctr. - County/City Data Book.
a/ Occupied housing units are defined as households.
b/ A housing unit is vacant if no one is living in it at the time of enumeration, unless its occupants are only temporarily absent. Vacant units include new residential units not yet occupied if construction has reached a point where they are not open to the elements. This does not include houses that are condemned or are to be demolished.

According to the 2000 Census, there were 2,889 occupied housing units in the YBW Area in 2000. This is an increase of 172 households since 1990, which is an important factor in assessing the area's economic outlook.

Home and land ownership is another indicator of the culture of the area. **Table 8** illustrates various characteristics of occupied housing units (or households) in the YBW Area—including owner occupation, median value, the number of persons per household, and the number of vehicles per household. These data provide insight into social developments that influence the economic activity of an area.

The YBW Area has experienced some increase in home ownership over the last decade, with about 66% of housing inhabitants registered as owners. This trend parallels the State for the same period. While property values are significantly lower than the State as a whole, values have increased during the period. Based on median household values (expressed in 1996 dollars), values have grown approximately 14% in the YBW Area since 1990, as compared to 26% for the State. At the same time, the number of persons per household has decreased from 3.3 to 3.1 for the study area, while the State has remained the same at 2.8. Some of this is due to one-person householders which were not as common in the past. The number of vehicles per household averages about 1.5 for the study area and State as well.

Table 8
Characteristics of Households: 1990- 2000

Area	Year	Total Households	Owner Occupied				PPH * a/	VPH * a/
			Number of Units		Median Value *			
		(no.)	(no.)	*(% of Total)*	(current dollars) ($)	(1996 dollars) b/ ($)	(no.)	(no.)
Issaquena County	**1990**	633	427	*67.5*	35,600	41,200	3.0	1.57
	2000	726	486	*66.9*	58,600	54,600	2.8	1.51
Sharkey County	**1990**	2,084	1,276	*61.2*	40,800	47,200	3.4	1.41
	2000	2,163	1,417	*65.5*	49,300	45,900	3.0	1.42
YBW TOTAL	**1990**	2,717	1,703	*62.7*	38,200	44,200	3.3	1.49
	2000	2,889	1,903	*65.8*	54,000	50,300	3.1	1.47
Mississippi	**1990**	911,374	651,587	*71.5*	45,600	52,700	2.8	1.67
	2000	1,046,434	756,967	*72.3*	71,400	66,500	2.8	1.73

Source: U.S. Census Bureau (2006); Values provided by Census for the given years.
** NOTE: YBW Area totals for median value, PPH, and VPH are based on an average of the two counties computed as an indicator for comparison purposes only.*
a/ PPH = Number of persons per household; VPH = Number of vehicles per household.
b/ Current dollars converted to 1996 dollars.

6. Agriculture and Aquaculture

Agriculture has historically been the primary economic base in the Yazoo Backwater Area. The health and well being of agriculture directly or indirectly impacts all other segments of the economy in the area. According to the Mississippi Employment Security Commission statistics, 654 people in the study area were employed in the farming industry in 2000, accounting for approximately 23% of total wage and salary employment. Based on the North American Industrial Classification System (NAICS), the agricultural industrial sector of employment (i.e., agriculture, forestry, fishing, hunting, and mining) comprised 810 jobs in the YBW Area in 2000, ranking first in Issaquena County and second in Sharkey County in terms of total employment distribution.

Soybean and cotton production account for the majority of the agricultural activity in the YBW region. They provide the greatest number of farm-related jobs for local workers and reap the largest profits from agricultural sales. Other important crops are wheat, rice, corn, and aquaculture (i.e., catfish). If crops, planting seasons, or harvests are lost or interrupted due to flooding, the agricultural industry is disrupted and the economy of the entire region is impacted adversely.

Aquaculture, through the catfish industry, has also become a significant factor in Mississippi's economy in recent years. Over 31,000 acres of farm-raised catfish are located in the YBW Area with reported sales of an estimated $100 million annually. While catfish farming contributes significantly to the State's economy, fewer catfish farms are located in the lower Delta than in the mid or upper Delta, in part at least because of the threat of frequent flooding. "If ponds are overtopped, the entire crop will be lost…and subsequent crops may be affected by diseases or pests introduced by flooding." *(Mississippi Levee Board, 2005)*

7. Total Employment

As of the 2000 Census, the civilian labor force of Issaquena and Sharkey Counties comprised 3,386 persons that were 16 years of age or older. Of that population, 2,902 people, or 86%, were employed in the YBW Area. During flood events, everyday operations of nearly every industry are disrupted to some extent, and interruption to business generates interruption in the economy. Although losses might be minor, they can occur from physical flooding, from the inability to obtain supplies or services in a timely manner, or from the failure of employees able to report to work. Thus, other employment sectors besides farming can be impacted by flood events in the region.

8. Employment Rank by Industry

Employment by industry, presented in **Table 9,** illustrates the breakdown of employment by industrial sector in the YBW Area. Based on these statistics, agricultural-related enterprises such as agriculture, forestry, fishing, hunting, and mining comprise the majority of total employment in the study area for the year 2000 based on statistics provided for industries reported by the NAICS.

Historically, the State's economy has been rooted in farming and agriculture. Today, however, agricultural-related industries rank 12th out of the top 13 industries in Mississippi. Conversely, in Issaquena and Sharkey Counties, agricultural-related employment continues to rank first and second, respectively.

9. Retail Business

Small town and rural retail outlets generally struggle to compete with the variety in goods and the competitive prices available in larger or urban areas. The availability of retail business in rural areas or small towns like Rolling Fork or Mayersville is most attractive due to convenience to residents—particularly those who cannot afford to travel to larger areas to shop. Local retail depends on the steady stream of local wages for their survival. When flooding curtails the retailers' availability of supply and affordability for local residents, many small businesses are unable to withstand the loss of income and are forced to close or leave the area. *(Mississippi Levee Board, 2005)*

E. Environmental Considerations

Investigations into the YBW study area have also yielded environmental considerations. The recommended plan in the 2006 Reformulation Study includes a 14,000-cfs pump and reforestation of 55,600 acres of agricultural land into bottomland hardwoods. It also provides for both structural and nonstructural flood damage reduction measures at various elevations in the area. Operation of the drainage structure at Steele Bayou will be modified to make more water available in the Steele Bayou Channel during critical low-water periods. Although some adverse effects to environmental resources would result from the operation of the pump, the reforestation feature for nonstructural flood damage reduction provides substantial environmental benefits in all environmental categories that offset any adverse environmental impacts.

The best way to analyze environmental impacts is by measuring various resources according to their significance to the environment, i.e., according to detailed biological evaluation, (e.g., wetlands, terrestrial, aquatic, and waterfowl habitats). The net effect of a combination of the hydrological, structural, and nonstructural flood damage reduction measures currently proposed for the YBW Area provide a net increase of 34.5 percent in the aquatics spawning resource value; a 19.5 percent increase in wetland resource value; an 11.2 percent increase in terrestrial resource value; and a 52.8 percent increase in waterfowl foraging resource value.

Table 9
Top 3 Ranked NAICS Employment Industries: 2000 *

Industry	Mississippi		Issaquena County		Sharkey County		YBW TOTAL	
	Employment (no.)	Rank	Employment (no.)	Rank	Employment (no.)	Rank	Employment (no.)	Rank
Ag., Forestry, Fishing, Hunting & Mining	39,473	12	140	**1**	335	**2**	475	**2**
Construction	88,818	5	43	7	113	7	156	8
Manufacturing	215,203	**2**	66	4	278	**3**	344	**3**
Wholesale Trade	39,717	11	37	8	94	10	131	9
Retail Trade	138,646	**3**	60	5	204	4	264	4
Transportation, Warehousing & Utils.	63,189	6	58	6	153	5	211	5
Information	21,449	13	6	13	15	13	21	13
Finance, Insurance & Real Estate	55,744	10	20	12	47	12	67	11
Professional, Scientific, Mgt. & Admin.	60,557	7	25	10/11	53	11	78	10
Educational, Health, & Social Services	236,382	**1**	121	**2**	551	**1**	672	**1**
Arts, Entertainment, Recr., Accommodation & Food Services	97,698	4	25	10/11	139	6	164	7
Other Services	56,215	9	27	9	104	9	131	9
Public Administration	60,223	8	76	**3**	112	8	188	6
Total Employment	**1,173,314**	**-**	**704**	**-**	**2,198**	**-**	**2,902**	**-**

Source: U.S. Census Bureau (2006); Profile of Selected Economic Characteristics.

** NOTE: Based on the new NAICS Code implemented in 2001 to be uniform with industrial classification used by various trade groups between nations. In NAICS, various industrial sectors were combined, making comparisons to employment by industry of previous years difficult since those statistics were based on the on the SIC Code, or Standard Industrial Classification Code.*

V. IMPACT OF PROJECT— WITHOUT AND WITH IMPLEMENTATION

A. Incompletion of the Pump Project

While legislation intended to reduce backwater flooding problems within the Yazoo Backwater Area has been in place for many years, the final component of the 1941 Flood Control Act (i.e., the pumping system) remains incomplete. When the Eudora Floodway was removed as a feature of the MR&T Project in 1941, this compounded the flood problems on the east side of the Mississippi River. As compensation to the removal of the Eudora Floodway project, the Yazoo Backwater project was added. Since that time the States of Arkansas and Louisiana have

experienced some flood relief provided for under the Act, but the residents of the south Delta area of Mississippi continue to experience backwater flooding without the completion of the final feature of this project.

In 1973, the lower Mississippi Delta experienced another major flood, a benchmark 100-year flood event. Residents of the area are aware that, due to the topography of the land and the climatic conditions prevalent in the YBW Region, flooding remains a constant threat to their physical and economic welfare and**,** with or without additional protective measures, they may or may not be prepared or protected if another major flood occurs. The USACE is working with the local citizenry and local organizations to identify, design, and provide a feasible solution. The proposed YBW Project is designed to reduce, as much as possible, future damage from major flood events.

B. Completion of the Pump Project

The installation of the pump improvements is one of the last major elements in the MR&T Project for the Yazoo Backwater Area. The proposed project would reduce the flood stages by 4 to 4.5 feet in the study area for the 100-year frequency flood and provide flood damage reduction to many homes, personal property, businesses, agricultural lands, roads, infrastructure, and other impacted resources. Project completion would allow residents to take their children safely to school, attend to normal daily needs and continue their livelihoods without interference or hazard from floodwaters.

Completion of the Yazoo Backwater Project will also help infuse the local economy with the sense of "security" that will support local investment in business and real estate. Residents are more likely to rebuild or upgrade homes if flooding is less likely to occur.

The primary environmental impact includes the reforestation of up to approximately 55,600 acres of existing croplands into bottomland hardwoods in the YBW Area. Not only will these serve to enhance wildlife habitat in the area, but will also provide additional resources for the timber industry.

Table 10 illustrates the actual duration of recent flood events in the area and the projected impact of project completion on the same area. Based on the information for the 1997 flood event, stages would be reduced by nearly 3.5 feet with the pump project in place, thereby, decreasing the number of acres flooded by 107,000, or 27 percent (i.e., 390,000 acres minus 283,000 acres).

Table 11 illustrates the impact on urban structures by residential/nonresidential type and reach within the YBW Area upon completion of the project. Urban structures consist of properties such as residences, businesses, schools, churches, local government buildings, warehouses, and industries.

According to estimates from the 2006 economic analysis, a number of existing properties within the 100-year flood plain are subject to flooding from the backwater of the Yazoo, Little Sunflower, and Big Sunflower Rivers and their tributaries, especially when there are high stages on the Mississippi River and the gates of the Steele Bayou structure have been closed. Residential structures affected by flooding include houses and mobile homes. Nonresidential development susceptible to flooding includes retail (commercial businesses) and services (professional) buildings, industrial structures, public and semipublic buildings, warehouses, and hunting camps.

Table 10
Impacts of the Yazoo Backwater Pumping Plant
(Reflecting the Completed YBW Levees in Place)

Item	Impacts of 14,000-cfs by Year for Recent Flood Events									
	Without Pumps a/					With Pumps – Projected a/				
	1973	1975	1983	1994	1997	1973	1975	1983	1994	1997
South Delta Flood Elevation										
Elevation (ft., NDVD)	100.3	95.3	95.7	93.5	93.6	95.9	89.8	90.3	89.6	90.1
Acres Flooded (no.)										
Acres Flooded	626,000	447,000	460,000	387,000	390,000	466,000	275,000	288,000	270,000	283,000
Pump Operation (elevation pump turned on)	**Flood Water Duration** (in days)									
Above 80 feet	116 days	147 days	88 days	120 days	75 days	114 days	146 days	82 days	117 days	75 days
Above 85 feet	110 days	113 days	77 days	113 days	52 days	108 days	112 days	71 days	110 days	50 days
Above 87 feet	105 days	104 days	69 days	106 days	45 days	102 days	97 days	64 days	103 days	41 days
Above 88.5 feet	102 days	89 days	62 days	102 days	41 days	96 days	36 days	26 days	26 days	31 days
Above 91 feet	93 days	51 days	46 days	62 days	28 days	84 days	0	0	0	0

a/ Data developed from period of record routings since 1973 and 1975 flood events occurred prior to the YBW levees being completed. Assumes YBW levees are in place.

Table 11
Yazoo Backwater Project Impact on Urban Structures

By Structure Type	Total Structures Impacted by Scenario (no.)		
	Existing Conditions	**Flood Impacts Prevented**	**With Recommended Plan**
	Currently Within the 100-year Floodplain	**Removed** from the 100-year Floodplain when Project Complete	**Remaining** in the 100-year Floodplain at Project Completion
Reach 1			
Residential	377	299	78
Nonresidential	108	56	52
Total	485	355	130
Reach 2			
Residential	917	466	451
Nonresidential	174	109	65
Total	1,091	575	516
Total Area			
Residential	1,294	765	529
Nonresidential	282	165	117
Total	1,576	930	646

Source: Results of USACE Flood Damage Analysis-2006.

A total of 1,576 structures were identified to be subject to flooding from a 100-year frequency flood event in the YBW Area based on the current economic analysis. This includes 1,294 residences (82 percent) and 282 nonresidential buildings (18 percent). The majority of the urban development affected by flooding is located in Reach 2 with approximately 69 percent of the

total structures flooded. With implementation of the pump project, approximately 930 total structures are removed from the threat of floodwaters, or a flood damage reduction percent of 59 percent. Approximately 82 percent are residential properties and 18 percent are nonresidential.

Unfortunately, surveys are not conducted which provide a breakdown of urban structures by minority, thus flood damage impacts to structures could not be evaluated according to race or low-income classes. Either way, total flood damage impact information is helpful in assessing the overall flood-prone environment. One can also assume, for the most part, that the same racial distribution for population also applies to residential structures. Thus, applying the percentages by minority/majority population (**Table 2**) and below-poverty-levels (**Table 4**) to the total number of structures impacted by flooding in the study area, an estimated number of structures impacted by minority and below-poverty levels can be established. These are not used literally, but as an indicator of minority/low-income impacts by residential properties in the study area.

Using these population percentages—68.8 for minority population and 31.3 percent for poverty-level population—an estimated 890 of the 1,294 houses flooded at the 100-year frequency flood elevation are most probably resided in by a minority affiliation and an estimated 405 (1,294 times 31.3 percent) of these 1,294 houses are potentially resided in by low-income or below poverty-level families. Using the same percentage applied to the 765 residential properties protected from floodwaters with the project, approximately 526 are estimated to be resided in by a minority and/or 239 to be resided in by low-income (or below poverty-level) families.

VI. OUTREACH ACTIVITIES AND PUBLIC INVOLVEMENT

In response to Executive Order 12898 for EJ considerations, the USACE requested an independent analysis of their process to ensure that the impacts of the YBW Project on the residents most affected by flooding in the area were considered fairly and without discrimination based on race, color and/or income. Further, this addendum provides assurances that EJ considerations were addressed in previous studies and that opportunities for community participation were provided throughout the study process. Also, as stated on page 6 of this document, "the purpose of EJ is to ensure the opportunity for fair and full participation by <u>all</u> involved parties, particularly minority and low-income populations; avoidance or mitigation of impacts on these affected populations; and the proportionate spreading of benefits associated with the proposed project."

Although the main purpose of EJ is to address the "disproportionate impacts" on the minority and low-income populations, <u>all</u> involved parties must have an equal opportunity to make their views known. Thus, public coordination and outreach activities, including all interested parties, were evaluated in this EJ analysis. Interest groups comprised local residents (e.g., minorities, low-income populations, African-American, Caucasian, etc.), local government officials, local businesses, local hunting camps, environmental groups and industries, cultural groups, and other governmental agencies.

Previous environmental and economic analyses conducted by the USACE considered key EJ issues: race and income. However the data was not published in accordance with Federal EJ regulations. According to the USACE, and previously substantiated by various records, the views of the minority community have been solicited through public meetings and public comments. The minority leaders of the area have been consulted and their concerns are a matter of public record both in the previous stages of the NEPA process and in the records of the

Mississippi River Commission hearings. Additional actions, such as conferences, direct contacts, site visits, the use of web pages, have been implemented in the YBW Project development process as well. Minority and low-income representatives have also participated in visits to the area by the USACE, U.S. Environmental Protection Agency (USEPA or EPA) representatives from Region IV, and area Congressional interests. Highlights of these activities are included below.

A. Environmental Justice Outreach Activities—Prior to 2000

The demographic analysis demonstrated that the potential for EJ issues was high throughout the Lower Mississippi Delta Region. The lower Delta region has high concentrations of minority and low-income residents. Documentation previously presented in **Table 3** illustrates that the Yazoo Backwater Area's population consists of a predominantly minority population.

Many outreach activities, offering opportunities both for information exchange and input from low-income and minority citizens were conducted. One outreach plan was coordinated by both the USACE and the Mississippi Levee Board and incorporated the input and activities of a locally organized ***Consensus Building Group*** formed to address issues related to completion of the Yazoo Backwater Project. The groups' activities included:

- Identifying and establishing an oversight group representative of all related local, regional, State and Federal stakeholders—including government and non-profit organizations.

- Establishment of an area-wide ***Steering Committee*** to formulate plans for community involvement and convene meetings of study area residents.

- Convening regular meetings of the ***Consensus Building Group*** and ***Steering Committee*** from March 1999 through November 2000 to implement and monitor the public information process related to completion of the project.

- Conducting and participating in public information meetings where completion of the YBW Project was discussed, as were public concerns related to the YBW Project and intent of the USACE.

- Documenting and reporting all information which might impact project plan completion. Broad based community awareness and information dissemination are also important elements of EJ. Although some meetings may not appear to focus only on low-income and minority impacts, diversity of input from the overall community and other interests should also be taken into consideration.

Environmental Justice mandates that low-income and minority communities, in particular, be provided every reasonable opportunity to know, understand and participate in public processes related to public projects affecting the environs in which they live. Broad community representation was carefully considered and some "non-traditional" opportunities for community input were utilized. Participants included residents and staff representatives from pertinent County agencies and organizations. Their membership is recorded in **Table 12**. These individuals organized and convened public meetings for project review and consensus building around the goals for the project.

The ***Consensus Building Group*** met throughout the plan development period either as a full committee or as a smaller ***Steering Committee*** to strategize and plan process development. Participants met on a regular basis as a committee of the whole or as the ***Steering Committee*** to review project details and to disseminate summary information to the full outreach group and community for consideration.

All meetings were held in or near the study area for convenience of the public and in locations that provided a sense of neutrality for all participants.

Table 12
Yazoo Backwater Area *Consensus Building Group*

Name	Affiliation
Ken Babcock	Ducks Unlimited
Charles Baxter	U.S. Fish & Wildlife Service (USFWS)
Laurance Carter	Mississippi Levee Board (MLB)
Charles Chisolm	Mississippi Dept. of Environmental Quality (DEQ)
Jennifer Derby	EPA, Region IV
Gene Fulton	Issaquena County
Curtis Green	Mississippi Dept. of Wildlife, Fisheries, & Parks (MDWFP)
Louis Hatcher	Issaquena County
Ruby Johnson	South Delta Flood Control Committee (SDFCC) *
Jim Luckett	Delta Wildlife and Forestry
Mike McGhee	EPA, Region IV
Gaylan McGregor	MLB
Doug Moore	Sharkey County
Clifton Porter	Delta Council
Lon Strong	Natural Resource Conservation Service (NRCS)
Steve Thompson	USFWS
Jim Wanamaker	MLB
Tim Wilkins	U.S. Fish & Wildlife Service (USFWS)

* The South Delta Flood Control Committee is a citizens group of local residents from the area and includes African-Americans, Whites, male and female.

B. Public Participation—Activities Prior to 2000

Completion of the Yazoo Backwater Project has been a topic of concern and on-going dialogue between residents and public officials of the lower Delta for many years. Even though flood reduction improvements have been made to the area over the past thirty years, backwater flooding, and the subsequent damage that it causes to property, the economy and collective lifestyle, remains a consequence of living in the area.

When the USACE initiated the most recent process of studying the flood improvement system in the YBW Area, they sought public participation at all levels of the community to record the impacts of backwater flooding on the area historically and to share information on the expected impact of any plans currently under consideration.

- **Opportunity for Community Participation**

  Meetings were held from March 1999 through November 2000 to apprise the community of the project and to provide the opportunity for their participation. A chronology and summary of those meetings are presented in **Table 13** to demonstrate the public coordination effort devoted to this project and interested constituents.

Table 13
Example of Community Meetings and Workshops Held in the Yazoo Backwater Area

Date	Location	Group	Comments
30 Mar 99	Mississippi Levee Board Office, Greenville, MS	***Consensus Building Group*** (Attendance for this meeting is presented in **Table 14**.)	MLB hosted the initial meeting of representatives from interested organizations to identify & discuss unresolved YBW issues. A project presentation was made by the USACE. One of the major accomplishments of this meeting was the development of a smaller ***Steering Committee*** to formulate plans for the community information process**.**
19 Apr 99		***Steering Committee*** (Members of this group are listed in **Table 15**.)	Initial meeting of the smaller committee in which a decision was made to hold 3-day retreat "working session" at Tara Wildlife.
11 May 99	USACE, Vicksburg, MS	***Steering Committee***	Initiated plans for 3-day retreat open to all who were interested. The USACE provided a short briefing & representatives from the Mississippi Emergency Management Agency (MEMA) provided information on FEMA/MEMA (Federal Emergency Management Agency) policies & potential project funding. There was concern regarding inadequacies of current data on the project and the USACE representative assured the group that all reasonable alternatives would be considered, but that it was unlikely that an alternative that did not include a pumping system would be selected. Miscommunication among several of the organizations led to the withdrawal of environmental groups from participation in the process.
26 May 99	USACE, Vicksburg, MS	***Consensus Building Group***	Defined the following mission of the ***Consensus Building Group*** as: ***"A functional solution will provide means to implement measures to achieve sustainable and viable economic, cultural and environmental conditions in the south Delta through the use of flood damage reduction strategies, including both structural and nonstructural features."*** Participants in the meeting agreed that "status quo" alternatives were not acceptable because they did not satisfy any of the communities' interests.
22-24 Jun 99	Tara Wildlife Conference Center, Eagle Lake, MS	***Consensus Building Group*** Retreat	The 3-day retreat—included a comprehensive meeting to review all components of the project and to establish agreed upon key objectives. The full ***Consensus Building Group*** met to review historic and process information and to begin to gain agreement on a strategy moving them to completion of the project. A key agreement was that: ***…any acquisition of lands or easements for reforestation would be from willing sellers, only. There was general agreement that some means of protecting the existing tax base of the impacted counties would have to be developed, because of the large acreage being considered for conservation from cropland to forest.***
22 Jul 99	Eagle Ridge Conference Center, Raymond, MS	***Consensus Building Group***, subcommittee on nonstructural components of the project	The meeting was a follow-up to the 3-day retreat for closure of any unresolved issues or discussions. Resulted in defining the role of the project in relation to the nonstructural components of flood control, particularly regarding the issue of applicability and feasibility of implementing nonstructural measures for flood damage reduction in the YBW Area.
28 Sep 99	Eagle Ridge Conference Center, Raymond, MS	***Consensus Building Group***	The group met to review all unresolved issues including a review of the project's effect on areas at specific elevations. At the meeting's conclusion, it was agreed that no further meetings were necessary until the USACE had completed their draft report for public consideration.
21 Mar 00	Eagle Ridge Conference Center, Raymond, MS	***Consensus Building Group***	The group met to review the 7 Feb 00 Report prepared by Dr. Leonard Schabman of Virginia Tech, which was done at the request of EPA in an effort to identify viable nonstructural alternatives implementable in the YBW Area. Discussions concentrated on how the nonstructural plan was not feasible and did not address all of the flood problems prevalent in the area.
9 Nov 00	South Delta High School, Rolling Fork, MS	***Public Meeting*** Convened by the USACE	Town meeting attended by a broad spectrum of citizens from the area and agencies/associations with more than 300 in attendance. All comments were recorded and the transcript (verbatim) is included as an Appendix to the Sept. 2000 YBW Reformulation Report.

Table 14
Attendance Representation at the YBW *Consensus Building Group* Meeting—March 30, 1999

Audubon Society	Issaquena County Board of Supervisors	Mississippi Wildlife Federation	Sierra Club
Delta Council	Mississippi DEQ	NRCS	USACE
Ducks Unlimited	MDWFP	National Wildlife Federation	U.S. Forest Service
Gulf Restoration Network	Mississippi Levee Board	SDFCC	USFWS

Table 15 YBW *Steering Committee*—March 30, 1999			
Group Represented	**Representative**	**Group Represented**	**Representative**
Audubon Society	Julie Thompson	Sierra Club	Avery Rollins
Delta Council	Chip Morgan	USACE	John Meador
Mississippi Levee Board	Gaylan McGregor, Consultant	USFWS	Tim Wilkins
National Wildlife Federation	Gerald Barber		

● ***Public Town Meeting*—Including Minority and Low-Income Representation**

After the final meeting of the ***Consensus Building Group*** in March 2000, the USACE continued their work on the Yazoo Backwater Area Reformulation Report. The process entailed the inclusion of local residents' continued input into the process, including a town meeting in November 2000. Because the Yazoo Backwater Area is largely rural, individual interviews were difficult. To assess and ensure the broader community's knowledge about the project and to offset the need for individual surveys, the USACE hosted a ***Public Meeting*** on November 9, 2000 for Yazoo Backwater Area residents and community stakeholders at the South Delta High School Auditorium in Rolling Fork to review all aspects of the proposed project and to provide a forum for questions about the project. This meeting included a broad spectrum in attendance with many in attendance providing comments in support of or against the proposed project.

Attendance at the meeting was high—more than 300 individuals participated in the information review and discussion about completion of the project. Information gathered during the town meeting was helpful to project planners. It allowed them to hear directly from residents the history of physical, economic, social and emotional disparity related to backwater flooding. The representation of minorities and low-income persons was pronounced at this meeting and included testimony and comments about the impacts of flooding.

● **Public Comments and Feedback on Project—2000 *Public Meeting***

Due to the enormous public response to the ***Public Meeting*** on November 9, 2000 and the detailed recorded testimonies, the USACE did not have the need to engage in one-on-one interviews throughout the study area. The testimonies provided the information usually obtained through such personal interviews and were recorded on tape and video. This information, in the form of a verbatim transcript along with audio and digital video (DVD) tapes, is available from the USACE District Office in Vicksburg.

● **Fair and Full Participation by <u>All</u> Involved Parties**

"The purpose of EJ is to ensure the opportunity for fair and full participation by <u>all</u> involved parties, particularly minority and low-income populations; and the avoidance or mitigation of impacts on these affected populations..." (page 6) The town hall type of meeting is beneficial in EJ analyses in that it affords the opportunity to hear a variety of input and reactions from different groups and individuals—whether they are economic, environmental, aesthetic, or based on strong domiciliary emotional ties. Among the feedback from the YBW meetings, participants spoke of the personal and collective impacts of decades of flooding on their homes and communities. Local residents relayed the desire to see more people return to

their native area. They also conveyed their reasons for staying in the area despite the cost of flooding and the struggle of rebuilding. Meeting participants, including government representatives, discussed future hopes for their communities and their concerns for rebuilding the tax base of the area.

Attention to the views of all interested parties helps provide an overall understanding of the general public opinion of the project. An attempt is made to consider both proponent and opponent viewpoints. Although some of the feedback from the locals seems somewhat emotional, their concerns are warranted. After all, it is this population that makes up the majority of the minority and lower-income segment in the YBW Area. As to environmental concerns, these groups would like to see more conservation of natural resources. Thus, coordinated efforts between all parties to resolve project design differences have led to the addition of various environmental features (e.g., the reforestation of agricultural lands). Hunting and fishing camps also have mixed interests. Times of high water can be both a benefit and a detriment depending on their activity, but camps can often be susceptible to physical damage during flood events. Farmers also have reasonable concerns since it is their crops that incur the majority of the damage during flooding.

Overall, all viewpoints were considered in this EJ analysis—positions of the locals, environmental groups, hunting clubs, fishing clubs, businesses, governmental agencies, and other interests, which include those in attendance at the ***Consensus Meetings*** (**Tables 14-15**) and the November 2000 ***Public Meeting*** (**Attachment 1**).

● Feedback Summary

In summary, the EJ populations affected the most by the project are all local residents. Testimonies from the ***Public Meeting*** revealed that many local interests expressed a willingness to have their concerns coexist with, but not be displaced by, those of natural resource and wildlife advocates. Without the pumping station, many of the locals believe reconstruction efforts are futile and potentially short-lived. Many shared their frustration with governmental processes and legislative decisions that had been in place for many years and not acted upon in the lower Delta.

C. Next Steps—Environmental Justice Revisited—2005 Follow-Up

Upon providing review comments of the USACE 2000 Draft YBW Reformulation Report in 2005, EPA requested additional analysis and documentation of public involvement and Environmental Justice considerations. Ken Weeden & Associates, Inc. (KWA) of Wilmington, North Carolina, was subcontracted through Neel-Schaffer Engineers of Jackson, Mississippi, to review the process, along with relevant documentation, in order to help determine and assure that sufficient EJ considerations were met.

The process and steps conducted by KWA included an extensive review of existing documents and conducting interviews with many principal participants from the USACE, the Mississippi Levee Board, and local citizens primarily from Issaquena and Sharkey Counties.

Historical documentation relevant to the analysis was reviewed prior to the initiation of interviews**.** These included records of applicable historical information, meetings, correspondence, reports, and letters utilized in identifying, researching, and analyzing the EJ considerations in the area. In addition, the transcripts from the November 2000 ***Public Meeting***,

which included extensive records of testimony available, provided invaluable feedback from various interest groups, citizens, and others in view of the project.

Prior to meeting with the local citizenry, a simple interview format, along with a cover letter was developed. Citizens were identified from sign-in lists from previous meetings and referrals from some of the principal participants. A list of potential interview candidates is included in **Attachment 1;** a copy of the interview form and questionnaire is presented in **Attachment 2;** feedback from the interviews conducted in October 2005 is presented in **Attachment 3;** and the results of the April-May 2006 interviews are provided in **Attachment 4.**

- **List of Potential Interview Candidates**

A list of potential interview candidates was compiled by KWA during the October 2005 interview process and recorded to establish a list of potential individuals and organizations interested in the YBW Project. The list, presented in **Attachment 1**, comprises a directory of individuals and groups representing a variety of parties interested in the project, many of whom attended various public coordination meetings for the project. This "interest pool" included entities pro and con as well as some who are neutral concerning the project. An effort was made to contact as many individuals and/or organizations as possible from this list during the interview process in order to obtain a variety of public input to assess indications of local support or opposition to the project. The input obtained was further assessed relative to "disproportionate impacts" on minority and low-income populations in the study area. The majority or consensus opinion appeared to favor the project, with no indicators of "high or adverse" impact upon the target EJ populations.

- **Interviews Conducted in October 2005**

The introductory letter and interview form along with the text of responses from the October 2005 interviews are included in their entirety in **Attachments 2** and **3** of this report.

In summary, all of the interview candidates (including African-Americans representing both minority and low-income populations) seemed to agree that the flood damage reduction project, if implemented, would have an overwhelmingly positive benefit on the area, especially to the traditionally less empowered minorities and low-income persons. Most of the individuals interviewed seemed to express an opinion that nearly all residents of the study area were in favor of the project and that most of the opposition came from individuals or groups residing outside the project area.

- **Interviews Conducted in April-May 2006**

After the citizen interviews were conducted in the fall of 2005, it was determined that additional and varied input was needed as part of the EJ outreach efforts. The same introductory letter and interview format used in the October 2005 process was used in the spring of 2006, primarily through telephone interviews. Citizens were identified through a series of telephone calls to previously identified potential interview candidates. Each was asked to identify other potential candidates. The results of the April-May 2006 interviews are presented in **Attachment 4**.

Nearly all of the respondents in this round of discussions expressed desires to see flood damage reduction in the area and were concerned about the completion date of the project. Most respondents cited positive potential economic impacts and the prospect for a better

sense of security, both of which could facilitate population growth and retention of the existing population, especially for the area's minority and low-income residents.

● Public Meeting Comments—Activities Prior to 2000

The records of testimony evaluated from the November 2000 ***Public Meeting*** provided public opinion representing groups who were not contacted during the interview process. This included feedback from both proponents and opponents of the project. These transcripts included testimonies from a list of over 300 attendees. This list is displayed in **Attachment 1** along with other interest groups identified in Volume 1 of the 2007 YBW Reformulation Report, Supplemental Environmental Impact Statement (SEIS).

VII. ENVIRONMENTAL JUSTICE ASSESSMENT

Executive Order 12898, adopted in 1994, requires Federal agencies to ***identify and address any adverse effects of Federally funded projects that are "disproportionately high" on minority and low-income populations as part of an environmental justice analysis.***

Based on the Federal definition, the Yazoo Backwater Area has potential EJ concerns related to both the predominant minority population and relative high concentrations of low-income persons. Specific EJ impacts are discussed in the following paragraphs.

A. Analysis of Potential Impacts

1. Impacts Analysis: Background

The Yazoo Backwater Area, because of the concentration of minority and low-income populations, meets the thresholds for EJ concerns. Consequently, the potential adverse impacts of the project should be reviewed in the context of how they would affect the minority and low-income populations residing in the region. A review of potential adverse impacts was based on an analysis of each relevant impact category. In keeping with the project's purpose and need, the review of impacts also included the potential for minority communities to gain or lose intended benefits from the Yazoo Backwater Project.

Additional information on the impacts to minority and low-income persons discussed in this report were addressed according to their relevance to the EJ analysis. Results and conclusions from this analysis are discussed in the following sections.

Adverse impacts were evaluated utilizing economic and demographic data (such as historic trends in population, housing, income, poverty levels, employment, and the economy) that were deemed relevant to assess the socioeconomic environment of the study area. These data were evaluated to determine their potential to "disproportionately" affect minority and low-income populations within the region. The most pertinent effects or impacts of this project, if completed, would be social and economic. Although the physical-environmental impacts are important and have been well documented, factors within the broad categories dealing with socioeconomics will receive more attention in this section.

Results from this analysis did not show any "disproportionately high or adverse" impacts from the YBW Project upon minority or low-income populations if the project is completed as proposed. However, the potential for continued occasional disruption of community cohesion under the "no action" alternative is an issue worth noting. If the project is not built, these communities would continue to be "disproportionately" affected into the future, and the past disruptive impacts would go unmitigated. And, as noted, the majority of the residents in the

primary impact area of Issaquena and Sharkey Counties are minority and low-income. Additional information is presented in the following section.

2. Environmental Justice Impacts: Completion of the Project as Proposed

This section of the report will present a summary discussion of some of the more pertinent impacts relative to Environmental Justice concerns. As discussed extensively in previous sections, the concept of "environmental justice" is intended to review, document, and mitigate if necessary, any "disproportionately high or adverse" impacts upon minority and low-income populations. In summary, the completion of the final phase of this flood reduction project involves the construction and installation of substantial pumps to be located in the vicinity of Steele Bayou. The primary physical-environmental impact will be the reforestation of up to approximately 55,600 acres of existing croplands into bottomland hardwoods. The reforested areas would once again become a thriving wildlife habitat with hardwoods. Environmental impacts are discussed in more detail in the various environmental appendices of the 2007 YBW Reformulation Report, a list of which is provided in **Attachment 5**.

Since the purpose of this document is to evaluate "disproportionate impacts" to the minority and low-income populations in the region, its main objective is the focus on "human impacts" as they relate to EJ (i.e., the equity of impacts). Thus, the main question is, "If the YBW Project was completed or not completed, what would be the impact on the following?"

- Housing and Residential Areas
- Schools
- Churches
- Health and Public Safety
- Employment and Income
- Public Roadways
- Agriculture /Aquaculture and Economic Development
- Population Growth

These areas will be addressed based on information contained in other reports provided by the USACE and from direct interviews with residents in the area.

a. Housing and Residential Areas

Implementation of the recommended plan will involve the conversion of cropland to forest under the nonstructural feature. The structural feature will involve the pump component. Neither feature will cause any displacement of residences, thus mitigating adverse impacts placed on the minority community caused by the threat of flooding. By reducing the threat of floods, this minority population will no longer bear a disproportionate share of the negative environmental consequences that result from flooding events, and will allow the residences to remain in their respective homes without fear of future flooding.

On the other hand, if the project is not completed, insecurities about future flooding will likely persist. This fear factor inhibits some growth and development in the area. Not only are flood events destructive and disruptive, often residents are forced to leave their homes for temporary housing which sometimes even divides families among several locations. The study area has already experienced population fluctuations and losses over the last several decades (**Table 1**) that can likely be attributed to the lack of economic opportunities. In addition, according to socioeconomic projections for the YBW study area (displayed in **Table 16**), the population of

the area is expected to decrease approximately 17% over the next fifty years. Implementation of the project should help decrease outmigration from the area.

Table 16
Socioeconomic Projections from the 2007 YBW Reformulation Report

Socioeconomic Parameter	Projections by Year a/ b/						
	2000 (Current Year) c/	2010	2020	2030	2040	2050	Overall Change 2000-2050 d/ (%)
Population (no.)	8,900	8,600	8,300	8,000	7,700	7,400	-17.0
Employment (no.)	2,902	3,500	3,500	3,500	3,400	3,400	17.2
Total Earnings (million $) e/	50.3	59.4	68.9	78.5	83.2	83.2	65.5
Personal Income (million $) e/	94.7	73.9	85.5	97.2	103.1	103.1	9.0
Per Capita Income ($) e/	10,700	11,900	14,400	17,000	18,700	19,400	81.0
Value of Farm Products Sold (million $) e/	64.2	64.8	67.5	71.0	74.6	78.1	21.7
Value Added by Manufacturing (million $) e/	(N)	18.5	21.1	23.7	26.3	29.0	(N)
Retail Sales (million $) e/	24.9	26.9	28.8	30.6	32.5	34.2	37.3
Wholesale Sales (million $) e/	18.0	22.2	25.8	29.2	32.6	36.0	100.0
Selected Services Receipts (million $) e/	(N)	7.0	8.3	9.8	10.9	12.5	(N)

Source: Table 8-18, 2007 YBW Reformulation Report, Appendix 8; BEA; Bureau of the Census; Census of Agriculture; and County and City Data Book.
Note: (N)=not available.
a/ Based on forecast systems using OBERS BEA regional projections.
b/ All numbers rounded to the nearest hundred, where applicable.
c/ Current year data displayed as year 2000. Actual year as reported is as follows: population (2000); employment, earnings, agriculture, manufacturing, retail, trade, wholesale trade, and selected services (1997); and earnings and income (1999).
d/ Total percent change from current year (2000) to the year 2050.
e/ All monetary values expressed in 1996 dollars.

It is estimated that 299 of the 377 (79%) residences in Reach 1 and 466 of the 917 residential structures (51%) in Reach 2 will no longer be considered to be within the 100-year floodplain if the project is completed. Approximately 529 residential structures, or 41% of the houses, would remain within the 100-year floodplain even after construction of the pumping stations. However, although these may not be completely protected by the proposed project, their flood damage impacts would be significantly reduced in terms of frequency, duration, and flood stage by the completion of the pumping station. The majority of the structures in the YBW Area, based on the population being mostly minority and low-income, will likely remain occupied by minority

and low-income persons. Based on U.S. Census averages, approximately 69% of the structures impacted by flooding that will be removed from the 100-year floodplain will be minority 31 percent will be low-income the same perentages apply to the structures impacted by flooding that will not be removed from the 100-year floodplain with implementation of the project.

b. Schools

Disruption of schooling is of serious concern during major flood events. Although schools, for the most part seem to be located on relatively high ground, the flooding of roads can impede the safe and efficient passage of buses, which could be forced to take long detours around floodwaters or be cancelled altogether. The completion of the project would not result in "disproportionately adverse" impacts upon schools.

c. Churches

Many of the small churches located within and around Rolling Fork and Mayersville are situated in the Yazoo Backwater impact area. These churches have historically been at the center of religious and social life for the residents and are also often accompanied by graveyards with historical markers dating back to the Civil War and the early exploration of Mississippi. Thus, churches do not only play a viable role in the everyday life of the residents of the region, but many churches are actually guardians of their parishioners' historical roots and heritage. Rural community churches are of priceless historical value with legacies that can be lost or severely damaged as a result of flooding. In addition, major flood events make it difficult for pastors to hold regular services or events such as community meetings, weddings, funerals, or family reunions.

Flood reduction, through the implementation of the project, will help alleviate the threat of flood loss to these activities and their associated resources. The completion of the project would not result in "disproportionately adverse" impacts upon churches or religious activities in the area.

d. Health and Public Safety

Without the project's completion, flood events have the potential to cause a number of serious health issues— taking both physical and emotional tolls on residents. Not only does emotional trauma and mental stress arise out of the experience of being flooded and surrounded by water in one's home, molds and mildew can also aggravate or lead to respiratory ailments and/or allergies. These obstacles can be particularly more difficult for senior citizens and children.

Drainage infrastructure may also be impacted during flood events. Operability of various public services can be strained and interrupted. In rural areas, the operation of sanitation facilities can be challenging even in dry conditions. Septic systems, oxidation ponds, and even privies are used to deal with human waste. However, when the water table gets too high, even without flooding, these may not work. In flood events, the potential toxic mixture of human and animal wastes, dead animals, agricultural chemicals, etc., creates a very present and persistent health threat. Since wells cannot be used, potable water also has to be trucked in.

Not only do humans seek higher ground, so do vermin and pests, like ants and snakes, which can infest cars, boats, homes, or other structures. According to the residents of the area, snakes especially water moccasins are a major problem during times of flooding.

Floodwaters can also impede access to medical care. The strain on emergency personnel during flood operations can cause some limitations on access to doctors and emergency medical

vehicles. This can be further aggravated by the closure of flooded roads, which can also prohibit residents with medical conditions to obtain their regular medications from pharmacies.

Again, because of the area demographics, flood conditions are compounded by incompletion of the project. In regard to health and safety, if the project is not completed, adverse impacts are expected to be experienced by the YBW population—especially "disproportionately" low-income and minority persons in need of such services.

Overall, the completion of the proposed project would not result in "disproportionately adverse" impacts upon the health and safety conditions in the area. However, it should be noted that minimum impacts on noise, water, and air quality will occur in the study area with implementation of the project. These impacts are discussed in Section 3b, below.

e. Employment and Income

As noted in previous discussions (Section IV-D), employment and income opportunities in the study area are relatively limited. Through interviews, some residents expressed feelings that the threat of flooding may have inhibited potential employers from developing facilities in the study area. Historically, unemployment figures in the region have been among the highest in the State. In 2000, Issaquena and Sharkey Counties reported unemployment figures of 13.5% and 14.5%, respectively. According to socioeconomic projections (**Table 16**), total employment for the area is expected to remain the same over the next fifty years. Feedback from local sources, including interviews with local residents from 2005 to 2006 and reviews of testimonies from the November 2000 ***Public Meeting***, indicate that the local interests would support any improvement in their region that would encourage economic development and new employment opportunities.

Completion of the project might enhance the area's potential to attract job-creating activities. Additionally, the construction of the pumps and related nonstructural facilities would require a substantial number of construction workers—both skilled and unskilled—providing short-term labor and economic benefits to the region. Some local businesses, such as food outlets, grocery stores, small service stations, etc., should also see some benefit during construction, leading to a multiplier effect of dollars spent in the area.

f. Public Roadways

During major flood events, roadway travel can be hazardous at best. If roads are open, often they have standing water on both sides of the roadbed and their approaching shoulders. Even when roads are considered passable, they might be overtopped with an inch or two of water. These conditions can be dangerous to motorists, especially at night. Also, in this rural area, many residents (including school buses) often have to drive one-lane graveled roads atop levees to get from place to place. During backwater flood events, the levee roads can be surrounded by areas of deep water. Again, because of the area demographics, the adverse conditions from flooding can "disproportionately" affect low-income and minority persons by handicapping them in traveling to essential daily activities. At a minimum, there would be the inconvenience of detours if flooded roadways are impassable.

Based on the results of the economic analysis of flooding in the YBW Area, approximately 1,164 miles of roads and streets are impacted by flooding by the 100-year frequency flood event (Appendix 7, Table 7-60). With implementation of the project, the number of miles of road impacted by the 100-year event decreases to 727 miles, or a 38% reduction.

If the project is completed, many of the road hazards from flooding conditions could be alleviated. Thus, the completion of the project would not result in "disproportionately" adverse impacts to roads in the study area.

g. Agriculture/ Aquaculture and Economic Development

As noted, agriculture is the mainstay of the lower Delta economy. The majority of the employment reported for the YBW Area revolves around agricultural-related establishments. As noted previously in **Table 9**, agricultural-related industries rank first and second total employment for Issaquena and Sharkey Counties, respectively, for the year 2000 and earnings from the sale of agricultural products sold is expected to increase by 21.7% over the next fifty years (**Table 16**). When the agricultural sector is healthy in this region, other segments of the economy are also healthy.

Completion of the pumps and related facilities would help stabilize planting and growing plans for crops and help provide stability to the agricultural economy. The same is true for catfish farming. Overflowing and overtopping can be devastating to the catfish farming operation. An entire crop can be lost to flooding and outside water intrusion could introduce diseases or other pests into "clean" catfish ponds.

The labor intensive jobs involved in both agriculture and aquaculture are often filled by the low-income and minority residents of the area. Disruptions due to flooding not only affect agricultural-related employment for many of the area residents who are "disproportionately" minority and low-income, but also the overall economic base of the study area. Thus, completion of the project could potentially help improve employment opportunities in the area as well as stabilize and encourage current and future economic development. As noted, the potential exists for these benefits.

Based on the socioeconomic projections presented in **Table 16**, various sectors of the business economy (i.e., manufacturing, retail trade, wholesale trade, and selected services) are expected to experience moderate growth over the next fifty years. Many of the sectors employ the minority and low-income residents of the region. Thus, the completion of the project would not result in "disproportionately" adverse impacts to business activity in the region.

h. Population Growth

Population growth is not a usual item for discussion under EJ assessments. However, it is of interest here because of some of the responses to the previously referenced citizens surveys (**Attachments 3** and **4**). Several of the respondents were persons who formerly lived in the study area, moved away for a number of years and returned. The impression was strongly given, that reverse migration is quite desirable for many former residents of the lower Delta. The small town lifestyle of the rural YBW community is seen to its residents as a viable alternative to the constraints of urban living. However, the threat of occasional flooding is a concern of those wishing to return, along with the economic constraints also imposed by flood threats.

In the long term, completion of the flood reduction project, could contribute positively to population growth, as lower Delta expatriates feel more confident about returning to their roots. However, based on historical population trends (as indicated in **Table 1**), the area population has declined over the last several decades. Therefore, even if the project is implemented, there is no guarantee that future population growth in the region will occur.

3. Adverse Impacts of the Project

During the current Reformulation analysis, project impacts were evaluated concerning their environmental effects. These included losses to water resources and their associated environmental habitats; and impacts on noise, water, and air quality in the study area. Although these evaluations are directed specifically toward environmental resources, they do have an indirect impact on the human population resources in their locality. Thus, project impacts in regard to these aspects were deemed worthy of discussion.

a. Land Use Conversion and Hydrologic Impacts on Environmental Habitat

Based on the current Reformulation analysis, it was determined that project implementation would require a small number of adjustments in land use in the study area, which would result in impacts on a limited number of environmental resources. A limited number of land use conversion impacts were identified to occur at the pumping plant site and some adverse hydrologic impacts would occur in the floodplain.

Environmental impacts are evaluated by measuring various environmental resources (i.e., habitat units, or HUs) according to their significance to the environment. For the YBW analysis, the four types of habitats evaluated were aquatic, wetland, waterfowl, and terrestrial resources, which were measured by their corresponding environmental outputs. These included wetlands measured in functional capacity units (FCUs), terrestrial measured by average annual habitat units (AAHUs), waterfowl measured by duck-use days (DUDs), and aquatics measured in AAHUs.

- **Land Use Conversion Impacts**. It was determined in the current analysis that a loss of 38 acres of mature forested wetlands would have adverse land use conversion impacts on all four habitat resources at the pumping plant site in the study area. These would result in the following losses—27 aquatic AAHUs, 240 wetlands FCUs, 2,166 waterfowl DUDs, and 113 terrestrial AAHUs.

- **Hydrologic Impacts on Habitat**. Adverse hydrologic effects in the flood plain would result in the following losses to the four habitat resource categories—14,188 wetlands FCUs, 1,580 aquatic spawning AAHUs, and 4,770 aquatic rearing AAHUs. However, based on results of the current 2006 analysis, implementation of the nonstructural feature of the project—which includes reforesting 55,600 acres of frequently flooded agricultural lands—there would be net increases in all habitat resource categories.

b. Noise, Air, and Water Quality Impacts

With the implementation of a project, there is the potential to experience adverse or negative impacts, especially during the construction phase. Some of the environmental factors subjected to these impacts are noise, air, and water quality.

- **Noise and Air Quality**. While there would be some noise and air quality impacts that could be considered adverse, there should not be any significant change in noise levels or air quality impacts in the study area.

- **Water Quality**. With implementation of the project, the completion of inlet and outlet channels at the pump construction site will result in unavoidable short-term, localized increases in water turbidity and suspended solids. These temporary increases could result in the temporary displacement of fish from the localized impact area. In addition, temporary increases in turbidity could reduce light transmission leading to temporary reductions in

photosynthesis and primary productivity in the water adjacent to the construction site. However, such decreases would also be of short duration and concentrations should return to preconstruction levels following completion of project construction. Overall, results of the engineering water quality analysis showed that the YBW Project would not have any significant adverse impacts to the quality of the water in the study area.

c. Environmental Impacts on the Low-Income and Minority Population

Since each of the environmental parameters previously evaluated resulted in only minimal impacts on a biological and hydrological scale, it is assumed that these will also have only a minimal impacts on their human counterparts. In view of the fact that there are no noise, air, or water quality concerns to deal with, the residents of the study area should not be in any physical harm from the implementation of the project. It is possible that some of the area residents will experience a loss of some outdoor recreation land, primarily for hunting. However, abundant amounts of undisturbed hunting areas would still remain in the study area even if the proposed project is completed, leaving only a minor impact on the area's low and moderate-income citizens.

B. Socioeconomic Comparison to Similar Areas in the Mississippi Delta Region

The importance of Environmental Justice considerations lies in the discovery, examination and ultimate mitigation of any undue socioeconomic impacts particularly on low-income and minority individuals resulting from Federal projects. Public officials, including Federal, State and local representatives and community advocates, have consistently voiced their concern for Yazoo Backwater Area residents—their quality of life and the economic viability of the area—resulting from the impact of years of flooding.

1. Directive from U.S. Senator Thad Cochran (MS)

In a 2004 letter to the Administrator of the U.S. Environmental Protection Agency, U.S. Senator Thad Cochran of Mississippi requested that the USEPA look at the extent to which the Yazoo Backwater Area population has "…been disadvantaged when compared to other more developed rural areas…where…authorized flood control projects are near completed or completed, including the Mississippi Delta."

2. Demographic Comparison

The Mississippi Delta has long been viewed as "lagging" behind both the rest of the country and the State in social and economic growth. This has been especially true for the YBW Area and notably the principal impact counties, i.e., Issaquena and Sharkey. The decades' old and current threat of backwater flooding has undoubtedly been a significant factor in the relative under-development of this area. During the past 60 years of "discussing" flood reduction efforts in the area, other portions of the Delta, while not experiencing "exponential" growth, have done relatively well. It is useful to do a cursory assessment comparing similar areas in the state's Delta region over the last 60 years. **Table 17** illustrates population trends from 1940 to 2000 for selected small communities to mid-sized cities and towns and their respective counties in the Mississippi Delta region.

Population growth is a basic and underlying indicator of the health of a locality. Before there can be prosperity, people have to want to stay or relocate to that locality. Population increase brings with it business opportunities, retail outlets, schools and other related services. Rural Mississippi has undergone many changes—some positive and some not so positive—over the

last several decades. As noted in **Table 17**, the populations of Rolling Fork and Mayersville (2,486 and 795, respectively) are relatively small in comparison to other Mississippi Delta communities and towns. The majority of the towns evaluated in **Table 17** are county seats with populations that are significantly larger than those of Rolling Fork and Mayersville. Exceptions are Belzoni, Marks, Charleston, and Tunica with populations ranging from 1,132 to 2,663 in 2000.

Table 17
Historical Population: 1940-2000
Comparative Counties and Communities/Towns in the Mississippi Delta Region

County and City/Town	Population							
	1940 (no.)	**1950** (no.)	**1960** (no.)	**1970** (no.)	**1980** (no.)	**1990** (no.)	**2000** (no.)	***1940-2000 Change (%)*** a/
Bolivar	67,574	63,004	54,464	49,909	45,965	41,875	40,633	*-39.9*
Cleveland b/	4,189	6,747	10,172	13,327	14,254	15,384	13,841	***230.4***
Rosedale	c/	2,790	2,790	2,740	2,700	2,595	2,414	*-13.5*
Mound Bayou	c/	c/	c/	c/	c/	c/	2,102	c/
Coahoma	48,333	49,361	46,212	40,447	36,918	31,665	30,622	*-36.7*
Clarksdale b/	12,168	16,539	21,105	21,673	21,111	19,720	20,645	***69.7***
Humphreys	26,257	23,115	19,093	14,601	13,931	12,134	11,206	*-57.3*
Belzoni b/	c/	2,982	2,911	2,720	2,670	2,536	2,663	*-10.7*
Issaquena	6,433	4,966	3,576	2,737	2,513	1,909	2,274	*-64.7*
Mayersville b/	c/	c/	c/	c/	378	329	795	***110.3*** a/
Leflore	53,406	51,813	47,142	42,111	41,525	37,341	37,947	*-29.0*
Greenwood b/	14,767	18,061	20,436	22,400	20,140	18,906	18,425	***24.8***
Itta Bena	c/	c/	c/	c/	c/	c/	2,208	c/
Quitman	c/	25,885	21,019	15,888	12,636	10,490	10,117	*-60.9*
Marks b/	c/	c/	2,600	c/	c/	c/	1,551	*-40.4*
Lambert	c/	c/	c/	c/	c/	c/	1,967	c/
Sharkey	15,433	12,903	10,738	8,937	7,964	7,066	6,580	*-57.4*
Rolling Fork b/	c/	c/	c/	c/	2,590	2,444	2,486	*-4.0* a/
Anguilla	c/	c/	c/	c/	880	921	907	***3.1*** a/
Sunflower	61,007	56,031	45,750	37,047	34,844	32,867	34,369	*-43.7*
Indianola b/	3,604	4,369	6,714	8,947	8,221	11,809	12,066	***234.8***
Drew	c/	1,681	2,143	2,574	2,528	2,132	2,434	***44.8***
Ruleville	c/	3,332	3,330	3,640	3,210	3,245	3,234	*-3.0*
Tallahatchie	34,166	30,486	24,081	19,338	17,157	15,210	14,903	*-56.4*
Charleston b/	c/	2,600	2,700	2,800	2,900	c/	2,198	*-15.5*
Tunica	22,610	21,664	16,826	11,854	9,652	8,164	9,227	*-59.2*
Tunica b/	c/	c/	c/	c/	1,361	1,175	1,132	*-16.8* a/
Washington	65,576	70,504	78,638	70,581	72,344	67,935	62,977	*-6.8*
Greenville b/	20,892	29,936	41,502	39,648	40,613	45,226	41,633	***99.3***
Hollandale	c/	4,336	4,420	4,200	4,410	3,576	3,437	*-20.7*
Leland	c/	6,667	6,856	6,560	6,430	6,366	5,502	*-17.5*

Source: U.S. Census Bureau: 1940-2000.
a/ Change from last available recorded population.
b/ County seat.
c/ Not available.

In a comparison of county populations in the Delta region, Sharkey and Issaquena Counties rank last. The population of both counties has declined significantly over the last 60 years. However, in contrast, significant urbanization trends have occurred throughout the overall region over the past 60 years. In the Yazoo Backwater Area, the population of Mayersville increased 110% while Rolling Fork decreased 4% from 1980 to 2000. In comparison, the towns/cities of Cleveland, Clarksdale, Greenwood, Indianola, Drew, and Greenville showed substantial population growth over the past 60 years (see **Table 17**).

3. Regional Growth and Development

According to the latest demographics, recent trends indicate a potentially strong and positive socioeconomic shift in the overall Mississippi Delta, especially in the northern region. The Delta's historic mystique is being discovered more and more by "outsiders" many who bring with them substantial investment and the potential for socioeconomic growth. The growth and impact of the gaming industry in the Delta, especially in Tunica, which formerly held the dubious title of "the poorest county in the nation" is one indicator. Other positive indicators such as—population growth, commercial and business development, growth in agriculture and aquaculture, and increases in tourism—all point to the potential for a "new Delta" in the decades to come. The Delta overall could be changing course for the better. **Table 18** reflects the socioeconomic environment of the Delta as recorded by the 2000 Census.

Table 18
Socioeconomic Comparison for the Year 2000
Comparative Communities/Towns in the Mississippi Delta Region

Item		Jurisdiction (City/Town/Community)							
		Clarksdale	Cleveland	Greenwood	Greenville	Indianola	Mayersville	Rolling Fork	Tunica
Population	#	13,841	20,645	18,425	41,633	12,066	795	2,486	1,132
PCI (current $) a/	$	14,585	12,611	14,461	13,992	12,082	7,287	11,481	20,114
(1996 $) b/	$	13,943	12,056	13,825	13,376	11,550	6,966	10,976	19,229
Median Household Income (current $) a/	$	29,466	22,188	21,867	25,928	26,308	10,962	23,081	26,607
(1996 $) b/	$	28,169	21,212	20,905	24,787	25,150	10,480	22,065	25,436
Civilian Labor Force	#	6,657	7,665	7,330	17,169	4,825	162	947	497
Employment	#	5,382	6,843	6,489	14,847	4,300	121	806	469
Unemployment	#	1,275	822	841	2,322	525	41	141	28
	%	19.2	10.7	11.5	13.5	10.9	25.3	14.9	5.6
Housing Units	#	4,988	7,757	7,575	16,251	4,118	212	875	592
Median House Values (current $) a/	$	72,800	53,000	64,100	55,100	54,500	52,100	54,200	83,900
(1996 $) b/	$	69,597	50,660	61,280	52,686	52,102	49,808	51,815	80,200
Poverty Rate	#	3,129	7,273	6,115	12,121	3,294	278	895	263
	%	25.5	36.2	33.9	29.6	27.4	49.9	37.1	25.5

Source: U.S. Census Bureau: 2000 Demographic Profiles.
a/ Current year 1999 dollars.
b/ Expressed in 1996 dollars for comparison to other Tables in this report.

The most recent significant economic advancement for the region is the addition of the proposed construction of the I-69 corridor. Plans and studies are well underway to include at least 100 miles of the much-discussed "Canada-to-Mexico" (so-called the NAFTA highway, I-69) right through the heart of the Delta from the northern edge of Tunica County to a brand new "Great River Bridge" at Benoit in western Bolivar County. Its construction has brought much excitement to the region as well as unlimited development prospects. There are also future plans to four-lane U.S. Highway 61 north through the Yazoo Backwater Area from Vicksburg through Rolling Fork and onward through Leland to Memphis. These improvements to the transportation corridors of the Delta will make travel easier throughout the region and more accessible for interstate commerce, thus providing significant potential for future economic growth and infrastructure development. Four-lane interstate access also makes travel more feasible for people to commute to workplaces with broader employment bases—such as Jackson, Mississippi, and Memphis, Tennessee.

In addition, the growth and impact of the gaming industry along the Mississippi River has already had a positive influence on the economies in the region as evidenced by Tunica with the lowest employment rate among the areas selected for this evaluation (**Table 18**). Historically, the entire Mississippi River Delta has had flooding problems at one time or another, some areas more severe and frequent than others. The completion or implementation of flood damage reduction measures in the region has encouraged economic growth in some of these areas—for example, in communities like Tunica where the development of casinos and related services has bolstered employment and increased housing values, both of which are indicators of a strengthened economy.

4. Area Attractions

Among the attractions in the region are the peaceful environment, beautiful scenery, and natural history, all of which provide relaxation, recreation, and enjoyment. The Indian mounds, antebellum homes, steamboats, and history of the Mississippi River are a draw to Civil War enthusiasts, collectors, and historians alike. Thus, the tourism industry has developed. Also, there are many lakes and streams in the area for fishing as well as numerous National Wildlife Refuges, Wildlife Management Areas, and State Parks for hunting and other recreational opportunities. In the midst of this environment, several retirement communities are being developed along the River. This results in the need for all kinds of services including retail, medical, insurance, etc. Thus, the multiplier effect takes place and the potentials are endless.

5. Overview of the Comparison to Similar Areas

However, based on the socioeconomic comparison in **Table 18**, Mayersville and Rolling Fork fall somewhat behind the other communities in terms of having the lowest PCI's, the highest unemployment rates, the fewest opportunities for better employment, and the highest poverty levels. The YBW Area communities are already disadvantaged based on their location, being more isolated from the opportunities of bigger cities. Also, they have no major commercial developments, industries, or public institutions nearby to supplement their economy as some of the other communities have. In addition, a history of flood problems is a disadvantage in attracting business and industry for more incoming revenue. Many of these people are too poor to move, many are elderly, and many rely on government aid. The financial, physical, and emotional hardship of relocating is not an option. Thus, the implementation of flood damage reduction measures in this area would be a potential economic boost which could provide the

impoverished lower Delta with the same opportunities for economic emergence as the north Delta. The YBW Area needs to eliminate this "flood" detriment so they can benefit from future development prospects and capitalize on the new highway systems, the gaming industry, tourism, or any other spin-offs in the region that can enhance their economy.

The State of Mississippi ranks last in the Nation in many categories and the YBW Area ranks last in the State. The developments previously discussed in this section will definitely boost the emerging economies in the north Delta and should also have a multiplier effect and infiltrate the surrounding lower Delta region to some degree. However, for the Yazoo Backwater counties—Issaquena and Sharkey—a "no-build" alternative of flood reduction facilities, would almost inevitably limit the area to minimal participation in the positive aspects of a "new" Delta. The threat of flooding is all too real. If some of the other communities studied in this analysis were as impoverished as the YBW Area and faced the wide-scale floodwaters on the level of the Yazoo Backwater flooding, it is doubtful that they could have been "ready" when appropriate growth opportunities arose. The need for flood reduction has held the YBW Area to a significant "disadvantage" in terms of economic growth and development.

VIII. SUMMARY OF ENVIRONMENTAL JUSTICE FINDINGS

Environmental Justice is intended to review, document, and mitigate, if necessary, any "disproportionately high or adverse" impacts of the Federal Project on minority and low-income populations. Because minority and low-income populations are predominant within the Yazoo Backwater Area, the overall impacts of the project were examined in the context of how the proposed project would affect those populations. After reviewing recorded historic flood data within the area and conducting one-on-one interviews with residents, it was concluded that more adverse impacts would happen from a "no build" project decision than a "build" project decision in the study area. This is based on an assessment of the "disproportionately high or adverse" impacts on the minority and low-income populations in the region, economic impacts, and environmental impacts. Responses from the local residents that were interviewed indicated that completion of the project would significantly improve the quality of their lives.

Conversely, there are other parties that will be impacted by the implementation of the project. These include interests such as environmental groups and hunting clubs. However, although some of their concerns are warranted, the main purpose of this document is to identify and mitigate any "disproportionately high or adverse" impacts of the Federal Project on minority and low-income residents of the area.

Based on EJ research of past studies, reports, and records of meetings; correspondence between affected parties; field surveys; and interviews of residents, the result of this EJ evaluation remains the same. The groups that suffer the most from not building the YBW Project are the minority and low-income populations in the YBW Area of which many cannot afford to renovate, rebuild, or move. Indications of all records and interviews conducted in accordance with this EJ evaluation show the majority of the local residents to be in favor of the project. It should also be noted that much of the opposition for this project comes from environmental groups and, although their concerns are worthy of equal consideration, the main emphasis of the EJ study is the "disproportionate" impact on the impoverished segment of the population in the YBW Area.

Details of the "disproportionate impacts" of the project on the minority and low-income population of the YBW Area have been discussed throughout this document. Effects of relevant socioeconomic characteristics have been presented according to their historical and future significance to the EJ population (Section IV, pages 8-17). Based on these statistics and a comparison to similar areas in the Mississippi Delta Region (Section VII, Part B, pages 34-38), it has been demonstrated that a lagging YBW Area could be somewhat revived by the alleviation of the threat of future flooding. Population, income, and employment statistics reveal their declines in the YBW Area through the years. Local residents would like to see a change in these trends. Project impacts have also been discussed in regard to the area's infrastructure—homes, churches, schools, roads, etc. (Section VII, pages 27-32). Adverse impacts in accordance with environmental habitat and the quality of air, water, and noise have been presented (Section VII, pages 33-34).

Based on a thorough evaluation of this information, review of testimonies and transcripts of past meetings, and interviews with local residents and authorities, the conclusion of this EJ analysis is that the implementation of the project would have less harm overall than not building the project. No "disproportionately high or adverse" impacts on the minority or low-income populations have been identified. It is also recommended that, in regard to environmental considerations, a coordinated effort between all parties continue for a common goal of balancing flood protection with the conservation of natural resources. In addition, all parties need to recognize the benefit to the local residents of this area that the elimination of a future flood threat can only help revitalize economic growth and development of the region. Conversely, without the implementation of flood damage reduction measures, flood-prone communities would continue to be "disproportionately" affected into the future and past disruptive impacts would go unmitigated.

The final results of this EJ analysis conclude that, if the project is completed, there are no "disproportionately high or adverse" impacts from the YBW Project upon minority or low-income populations. Thus, it is recommended, from an environmental justice standpoint, that the proposed project be implemented as proposed.

In conclusion, it is a fact that the initial studies for the YBW flood reduction project were begun long before the specific requirements of "environmental justice." However, a review and documentation of much of the process, especially public participation activities, as well as the supplementary interviews contained in this report, show that all of the policy compliance requirements of Environmental Justice were substantially met in accordance with EPA Environmental Justice Policy and Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" dated 11 February 1994.