Waterloo, Alabama

Wastewater Facilities Plan

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TOWN OF WATERLOO, ALABAMA

WASTEWATER FACILITIES PLAN

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Wastewater Facilities Plan
TOWN OF WATERLOO
LAUDERDALE COUNTY, ALABAMA

1.0 EXECUTIVE SUMMARY

The purpose of the Wastewater Facilities Plan for the Town of Waterloo is to evaluate the demographic and physical features that influence the growth or decline in population, the ways in which land is allocated and used, and the necessity for a centralized wastewater treatment system in Waterloo, Alabama. First, the physical characteristics of both the town and the county were studied so as to know what factors could possibly restrict development. The second step included the study of the demographic and economic characteristics of the town as well as the housing trends and land use. These data were reviewed in order to understand the patterns of growth and development within Waterloo. The expected current and future flow rates were also calculated. Other options for the collection and treatment of extra wastewater flows were also considered.

Four alternatives were considered. First, an approach relying on the existing system of septic tanks and private treatment and disposal was evaluated. This was determined to be the lowest cost alternative and the one that best accommodated present demand and future low-growth projections. Second, the development of a centralized treatment system to accommodate special events was evaluated. This would consist of a centralized tank and restroom facility for servicing large events. It was a relatively low cost alternative that also accommodated present demand and low-growth future projections. Third, a centralized collection system was evaluated to serve many residents and the commercial areas of Waterloo. The system would utilize the proposed central treatment and storage tank year round to serve many residents. Finally, a full service treatment plant option was evaluated and dismissed due to cost.

Based on input from both elected officials, and that obtained at a public meeting held on February 9, 2012 for the wastewater study, it is recommended that continuing with Alternative 1 is the most logical course of action for Waterloo. Until there is a

proven need for the capital expenditure to install a centralized collection and treatment system, staying on the current system of individual septic tanks and leaching fields will satisfactorily meet the needs of the town. The septic systems are reported as being in compliance, and water quality has not been noted as being poor.

However, it is encouraged for the town to continue to search for ways to expand upon its growth potential and marketability in the future. The town has an opportunity to market its historic and cultural elements and foster tourism-based growth. One of the ways to foster growth is to implement a wastewater treatment system so that greater densities and a wider variety of land uses can be realized. Alternative 2 would represent a logical future step in that direction in that the town could accommodate additional tourists and campers, particularly during the annual Trail of Tears weekend. To achieve this step, it is recommended that the town make steps to acquire matching grant type funding as discussed in Chapter 11 and develop a method for managing the potential restroom facility at the campground with both staff and law enforcement personnel.

2.0 GENERAL SCOPE OF WORK

This study examines trends in land use and economic growth in the Town of Waterloo in west Lauderdale County as well as the area immediately surrounding it. These analyses were performed in order to aid in the development of a long-range wastewater facilities plan for Waterloo, Alabama.

The Northwest Alabama Council of Local Governments (NACOLG) completed the general scope of work and the summary along with the examination of the physical and demographic features of the town. NACOLG also studied the economic trends as well as evaluated housing and land use data. Possible funding sources were also researched. The study area was located in western Lauderdale County, Alabama and included the Town of Waterloo as well as the area immediately surrounding it. The coordinates of the town center are approximately 34°55'0"North, 88°3'51"West. The aims of this evaluation were to:

1. Make introductory calculations for likely sewage flow rates from the study area.
2. Determine the sizes and locations for prospective collection and treatment facilities.
3. Assess options for collection, treatment and disposal.
4. Recommend a course of action to accommodate physical, demographic and land use impacts on waste water treatment in the study area.

Croy Engineering, Inc. was asked to join in the study to evaluate physical characteristics and provide an analysis of feasible alternatives from the perspective of technical cost characteristics.

3.0 CHARACTERISTICS OF STUDY AREA

3.1 General Information

The Town of Waterloo is located in the southwestern portion of Lauderdale County **(Map 3.1: Waterloo Location)**. The Tennessee River runs along Waterloo's southern border and Second Creek runs along the town's eastern border. The Florence-Muscle Shoals metropolitan area is just over 25 miles from Waterloo. The business/industrial area is in the southeastern portion of the town and near to Second Creek. Educational facilities include Waterloo Elementary School and Waterloo High School. The Edith Newman Culver Memorial Museum is also considered an educational facility.

3.2 Climate

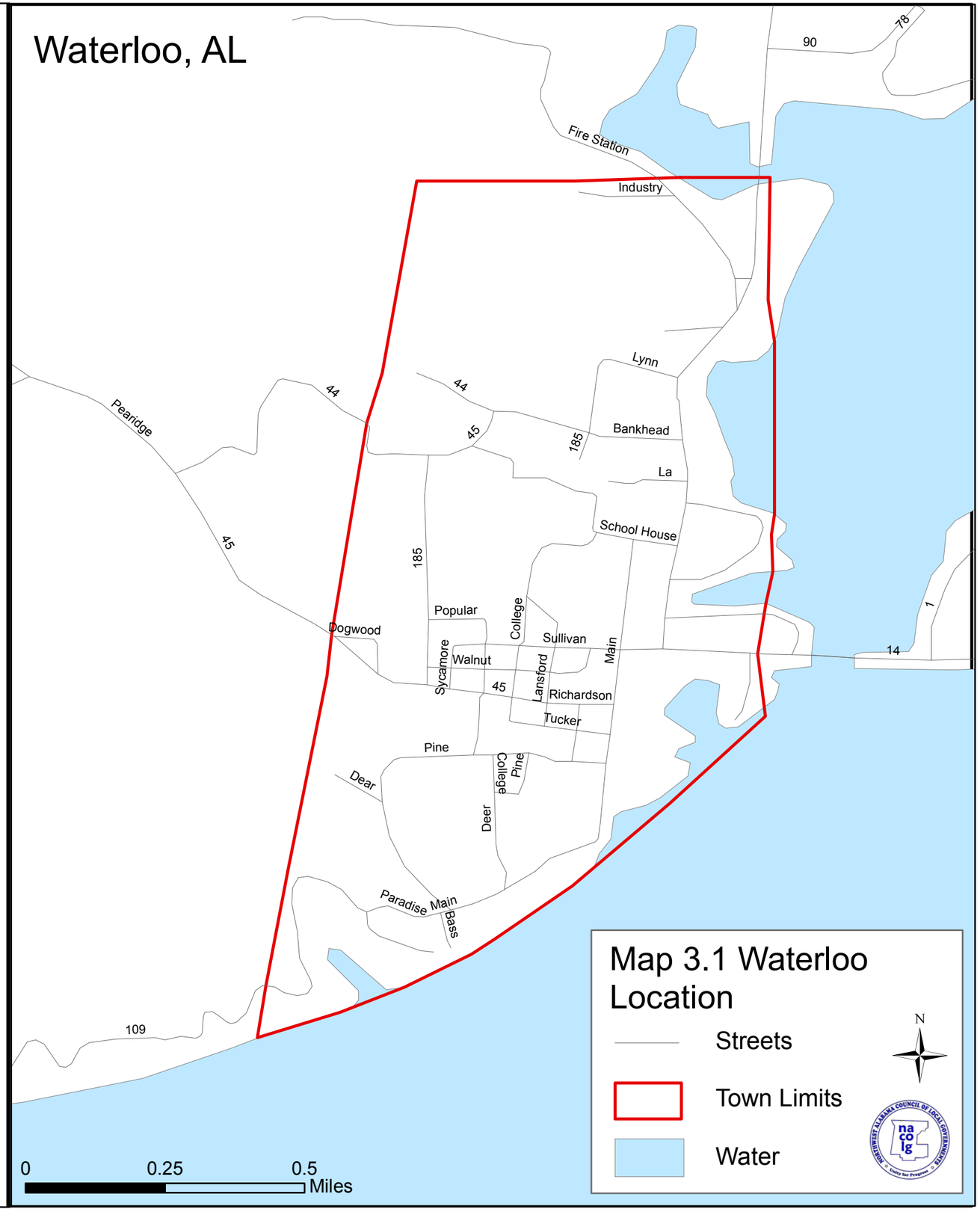
The town of Waterloo and the surrounding region has a history of long, hot summers and mild winters. Between the years 1971 and 2000, the annual maximum temperature was 71.7 °F, the annual minimum temperature was 50.2 °F and the annual mean temperature was 61 °F. The annual precipitation normal for the region was 55.8 inches. The minimum temperature dropped significantly in October and continued to decline until late in April or early in May. The coldest average temperature during this time was 30.7 °F and occurred in January. The warmest average temperature was 90.6 °F and occurred in July.

3.3 Topography

Over half of Lauderdale County is in the Physiographic region called the Interior Low Plateaus and the remaining western portion is in the Coastal Plains. The town of Waterloo is within the Coastal Plains region. The eastern and central portions of the town are relatively level with the most populated area of the town standing at an elevation of around 450 ft. The elevation of the terrain increases moving west. The terrain also becomes very hilly moving south. Most of the terrain in the area has a slight to medium slope (0%-10%). However, some of the land along Second Creek has slopes from 10%-35%. Within the corporate limits of Waterloo, the elevation rises from about 450 ft. to


Waterloo
N
0 20 40 60 80 100
Miles

Waterloo, AL


Fire Station
Industry
Lynn
Bankhead
La
School House
Popular
College
Sullivan
Main
Walnut
Sycamore
Lansford
Richardson
Tucker
Pine
College
Dear
Deer
Paradise Main
Bass
Dogwood
Pearidge
90
78
44
45
185
14
1
109
0 0.25 0.5
Miles
Map 3.1 Waterloo Location
Streets
Town Limits
Water
N

almost 600 ft. The elevation varies greatly along the northern edge of the river just outside of the town. Just north of the town limits is Bumpass Creek which flows into Second Creek at an elevation of roughly 400 feet.

(Map 3.2: Waterloo Topography)

3.4 Soils

It is essential to understand the attributes of the soils in the study area when deciding whether or how a particular site should be developed. Some of the traits that should be taken into account include soil slope, depth and permeability. These traits help developers know what kinds of construction are advisable in the study area. It is also essential to consider the elements that will affect other treatment options under consideration, including spray fields, lagoons, reservoirs and septic tanks.

Soils in the Town of Waterloo are primarily associated with Saffell gravelly fine sandy soils and Saffell and Bodine soils. The Saffell and Bodine soils appear to be slightly more prevalent than the Saffell gravelly fine sandy soils. Other soil types within the city limits include Etowah silt loam, Lobelville cherty silt loam and Smithdale fine sandy loam. The majority of the soils in the town are “Very Limited” when it comes to soil septic limitations. These soils include Saffell gravelly fine sandy soils, Saffell and Bodine soils, Lobelville cherty silt loam and Smithdale fine sandy loam.

Some of the soils along the water can be classified as “Somewhat Limited”. The only soil in this category within the city limits is the Etowah silt loam soil. The primary soil septic limitations for the soils within Waterloo fall primarily into the categories of “Seepage, bottom layer” and “Slope”. These limitations are found in Saffell and Bodine soils, Saffell gravelly fine sandy soils and Smithdale fine sandy loam. Other, less pervasive, limitations include “Slow water movement” and “Flooding”. These limitations are found in the Etowah silt loam and the Lobelville cherty silt loam. Most of the soil types within the Waterloo city limits have slopes of either “0 to 2” or “6 to 10”. The soils associated with these slopes are Saffell and Bodine soils, Saffell gravelly fine sandy soils and Lobelville cherty silt loam. In a few other areas the slopes include “5 to 10” and “10 to 35”. These soils include Etowah silt loam and Smithdale fine sandy loam.

The Alabama Department of Public Health and the State of Alabama have created policies that dictate where septic systems can be built. There are two permitted


Mills
Hollow
BM SC 3 R
444
BM GN 183
480
PICKWICK RES BDY
36
31
Keaton
Hollow
Cem
SECOND
BM SC 2
492
City Rd
Waterloo
Richardson
Branch
Salt
Mile 0
BM PSR
489
Gaging station
1
6
Bald Oak Hollow
Richardson Cem
ELEV 414
BM GN 198
BM GN 199
428
PICKWICK
TENNESSEE
12
BM PSR 19 R
420
Map 3.2 Waterloo
Topography
Waterloo City Limits
Roads
N
0
0.25
0.5
Miles

systems that use the appropriate methods for disposing of wastewater, which are referred to as: conventional and engineered. Conventional systems can be used for areas with minor or moderate soil septic limitations. Engineered systems are needed for areas that have additional soil septic limitations.

(Map 3.3: Waterloo Soil Classifications)

(Map 3.4: Waterloo Soil Septic Limitations)

(Map 3.5: Waterloo Primary Septic Limitations)

(Map 3.6: Waterloo Soil Slopes)

3.5 Geology

Lauderdale county's geologic formations include Chattanooga Shale, Eutaw Formation, Tuscaloosa Group (Gordo Formation), Fort Payne Chert, Tuscumbia Limestone and Silurian System undivided (Includes Wayne Group and Brassfield Limestone). The Chattanooga Shale takes up only 0.061% of the area and has a lithology of shale, sandstone and limestone. The Eutaw Formation covers approximately 2.4 % of this area and has a lithology of sand, clay or mud and sandstone. The Tuscaloosa Group (Gordo Formation) covers about 11% of the county and has a lithology of sand, clay or mud, gravel and chert.

The Fort Payne Chert covers the most area of any single geologic formation, 45%, and has a lithology of limestone, chert, siltstone, shale and claystone. Tuscumbia Limestone covers about 35% of the county and has a lithology of limestone and chert. The Silurian System undivided (includes Wayne Group and Brassfield Limestone) takes up only 0.51% of the county and has a lithology of limestone, shale, dolostone, sand and chert.

Waterloo is surrounded by and partially within the area that contains sand and gravel deposits. Tripoli, a microcrystalline form of quartz with excellent abrasive qualities, was mined just northeast of Waterloo during the mid-1960s. Tripoli is used mainly as a component of buffing and polishing compounds. The Tripoli that was mined in Waterloo was intended to be used as silica brick and foundry facing.

3.6 Natural Resources

The state of Alabama contains a variety of natural resources. Tree types in Alabama include Long Leaf (slash pine), Loblolly (shortleaf pine), Oak-Pine, Oak-

Soil Classification

- Etowah silt loam
- Lobelville cherty silt loam
- Saffell and Bodine soils
- Saffell gravelly fine sandy
- Smithdale fine sandy loam

- Waterloo City Limits
- Water

N

Northwest Alabama
Council of Local Governments
10/2011

0 0.25 0.5 Miles

Map 3.3 Waterloo Soil Classifications

Waterloo City Limits

Water

Very Limited

Somewhat limited

N

Northwest Alabama
Council of Local Governments
10/2011

0 0.25 0.5 Miles

Map 3.4 Waterloo Combined Soil Septic Limitations

Flooding

Seepage, bottom layer

Slope

Slow water movement

Waterloo City Limits

Water

N

Northwest Alabama
Council of Local Governments
10/2011

0 0.25 0.5 Miles

Map 3.5: Waterloo Primary Septic Limitations

5 to 10
6 to 10
6 to 15
0 to 2
10 to 35
2 to 6
2 to 8

Waterloo City Limits
Water

N

Northwest Alabama
Council of Local Governments
10/2011

0 0.3 0.6
Miles

Map 3.6: Waterloo Soil Slopes

Hickory and Oak-Gum Cypress. The state also has a supply of Lignite and Bituminuos coal. The western region of Lauderdale County is home to the Lauderdale Wildlife Management Area and is an excellent resource for hunters. The town of Waterloo has an access area with a boat ramp for boating and fishing. The forests surrounding Waterloo are composed predominantly of Oak and Pine. Geological resources in the area include sand and gravel deposits.

3.7 Critical Sites Within Planning Study Area

3.7.1 Historical Sites

Waterloo is the last stop on the Alabama Trail of Tears Corridor as well as the last stop on the annual Trail of Tears Commemorative Motorcycle Ride. Historically, Waterloo was the last spot in the state along the Water Route of the Trail of Tears. The significance has been denoted by a historic marker. A weekend long event is held in the town at the end of the annual motorcycle ride.

3.7.2 Landfill and Solid Waste Disposal(s)

No landfill operations are located within the study area. The Lauderdale County Solid Waste Department administers all solid waste services for the Town of Waterloo. Non-hazardous waste is transported to the Underwood Landfill operated by the Lauderdale County Solid Waste Department, approximately 25 miles east of Waterloo. There are no sanitary solid waste landfills located within Lauderdale County. Underwood Landfill transfers all sanitary solid waste collected to Morris Farm Sanitary Landfill in Hillsboro, Lawrence County, Alabama.

3.8 Hydrology

3.8.1 Hydrologic Cycle

There is technically no starting point in the hydrologic cycle. Earth's water is considered to be in storage in the ocean. The heat of the sun evaporates the water off the ocean as well as sublimates ice. Moisture is also added to the air by evapotranspiration, which is water evaporated from the plants and the soil. This vapor is lifted up by air currents where it is cooled and condensed into clouds. The precipitation that results ends up in the oceans or on land where it flows over the ground as surface runoff. Some of this

runoff flows into valleys and begins to move towards the ocean. Some of the runoff will also become freshwater lakes. The water that does not become rivers or lakes seeps into the ground and replenishes aquifers. Sometimes the groundwater emerges as a freshwater spring. Some of the groundwater is absorbed by plant roots and goes through the process of evapotranspiration. The cycle then repeats.

3.8.2 Groundwater

Ground water is the result of the hydrologic cycle and the constant circulation of moisture between the earth and the atmosphere, which work together to deposit water in porous rock formations, or aquifers, beneath the earth's surface. The term "availability" when used here refers to the quantity of water within the aquifer as well the rules which manage withdrawal methods and uses. These rules are put in place to avoid adverse effects on the water quality and to make sure the supply is sustainable. The availability of water within the aquifer system relies on several variables. Examples of these variables include the stored reservoir, the withdrawal rate and the amount of water matriculating through the recharge zone.

The northwestern portion of Waterloo is associated with the Southeastern Coastal Plain aquifer system which is made up of semi-consolidated sand formations. The rest of Waterloo is labeled as being associated with "Other rocks." Aquifers characterized by semi-consolidated sand have "moderate to high hydraulic conductivity". Because of this, the water runs more easily through these aquifers at the higher topographic points of the recharge area but can become confined at lower levels. This has the potential of occasionally harming the quality of the water in the lower aquifers.

3.8.3 Surface Water

Wetlands within the city limits are very scarce. The wetland within the city limits consists of a freshwater pond near the southeastern border. There are also three streams that run over the lower, middle and upper portion of the town. Just north of the city limits there are freshwater ponds and freshwater emergent wetland areas.

(Map 3.7: Waterloo Wetlands)

Waterloo City Limits

Roads

Hydro

Freshwater Emergent Wetland

Freshwater Forested/Shrub Wetland

Freshwater Pond

Lake

N

Northwest Alabama
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10/2011

0 0.25 0.5 Miles

Map. 3.7 Waterloo Wetlands

3.8.4 Flooding

Several FEMA created flood hazard maps that show the flood potential of the area within and around Waterloo can be found at the end of this report **(Appendix B: Flood Hazard Maps)**. The town lies within "Zone X (unshaded)" which is defined by FEMA as an area of minimal flood hazard, usually depicted on Flood Insurance Rate Maps (FIRMs) as above the 500-year flood level.

3.9 Prime Farmland

The term "prime farmland" is defined by the United States Department of Agriculture as having the physical, chemical and climate characteristics needed to produce sustainably high agricultural yields when acceptable farming methods are utilized. Prime farmland is evaluated by features of the soil in the area. Within the town of Waterloo, the majority of the soil would be considered "not prime farmland". These include Smithdale fine sandy loam, Saffell and Bodine soils, and Saffell gravelly fine sandy loam. The areas that contain soil that is "prime farmland" all run along the edge of the river. These include Lobelville cherty silt loam and Etowah silt loam.
(Map 3.8: Waterloo Prime Farmland)

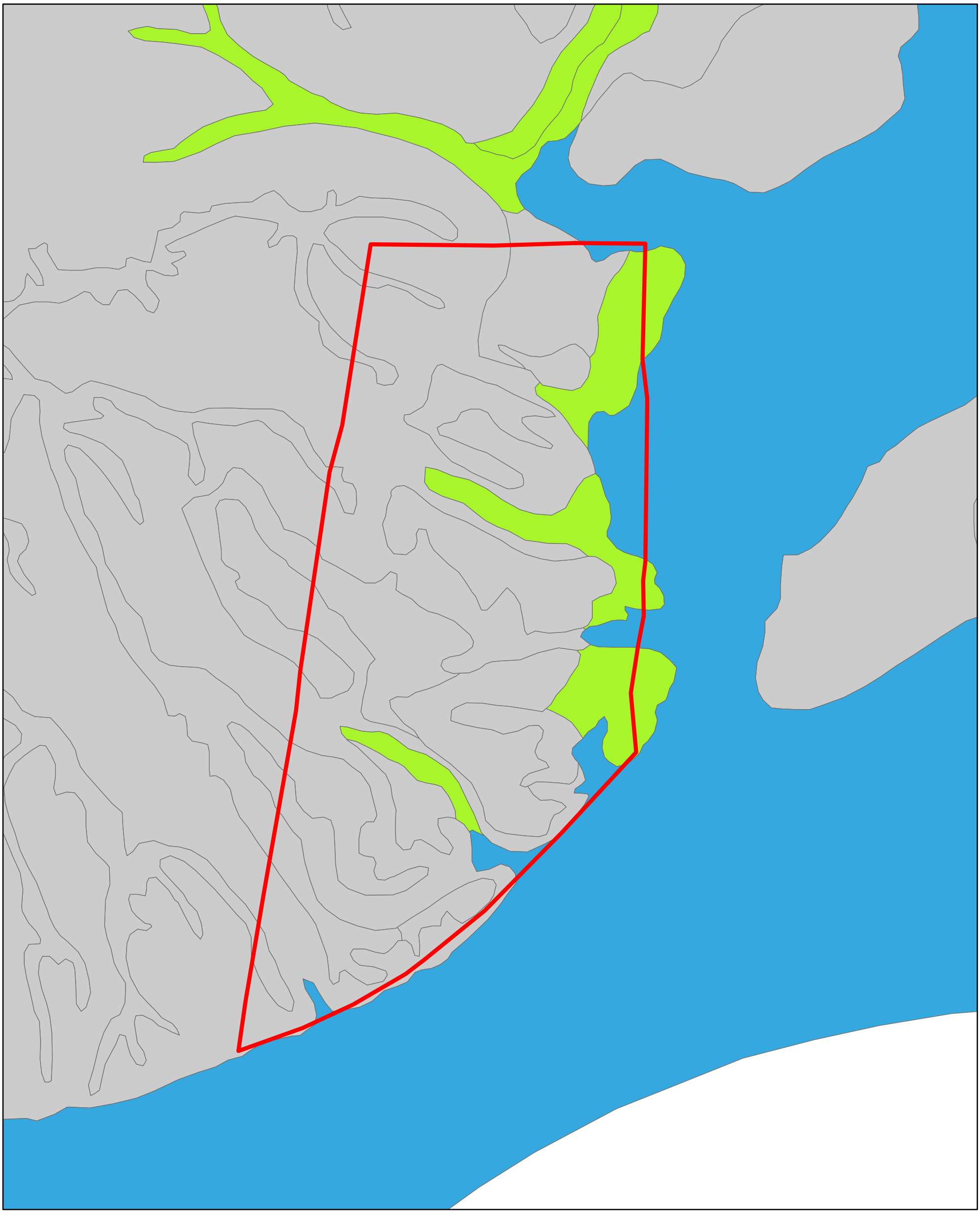
3.10 Threatened and Endangered Species

The U.S. Department of Fish and Wildlife has identified the endangered or threatened species listed below as potentially found within the study area:

Pink mucket (*Lampsilis abrupta*) – endangered – a medium-sized (reaching up to approximately 100 mm in length) freshwater mussel with a smooth, yellow or yellowish green shell and faint green rays. The Pink mucket is known or believed to occur in eight counties in Alabama: Colbert, Jackson, Lauderdale, Lawrence, Limestone, Madison, Marshall and Morgan.

Littlewing pearlymussel (*Pegias fabula*) – endangered – the freshwater mussel is small, not exceeding 1.5 inches (3.8 cm) in length and 0.5 inches (1.3 cm) in width. The mussel is known or believed to occur in two counties in Alabama: Lauderdale and Limestone.

White wartyback (*Plethobasus cicatricosus*) – endangered – a medium-sized (reaching up to approximately 130 mm in length) freshwater mussel with



Waterloo City Limits

Water

Not prime farmland soil units

Prime farmland soil units

N

Northwest Alabama
Council of Local Governments
10/2011

0 0.25 0.5
Miles

Map 3.8 Waterloo Prime Farmland

a light brown to greenish-yellow shell with a row of large tear-shaped tubercles along its side. The mussel is known or believed to occur in two counties in Alabama: Lauderdale and Colbert.

Rough pigtoe (*Pleurobema plenum*) – endangered – a medium-sized (reaching up to approximately 100 mm in length) freshwater mussel with a yellowish brown or light brown shell (becoming dark brown in adults) with faint green rays. The mussel is known or believed to occur in seven counties in Alabama: Lauderdale, Colbert, Lawrence, Limestone, Madison, Marshall and Morgan.

Orangefoot pimpleback (*Plethobasus cooperianus*) – endangered – a medium-sized (reaching up to approximately 100 mm in length) freshwater mussel with a rayless, light brown shell which becomes more chestnut or dark brown as the animal matures. The mussel is known or believed to occur in two counties in Alabama: Lauderdale and Colbert.

Ring pink (*Obovaria retusa*) – endangered – the ring pink, also known as the golf stick pearly mussel, is a medium to large freshwater mussel with a round shell that is yellow-green to brown in color and lacks rays. The mussel is known or believed to occur in two counties in Alabama: Lauderdale and Colbert.

Fanshell (*Cyprogenia stegaria*) – endangered – a medium-sized (reaching up to approximately 80 mm in length) freshwater mussel with light green or yellow with green mottling or rays. The mussel is known or believed to occur in two counties in Alabama: Lauderdale and Colbert.

Alabama cavefish (*Speoplatyrhinus poulsoni*) – endangered – the Alabama cavefish is an eyeless, pinkish-white (almost transparent) cave dweller distinguishable from other cavefish by its long, anteriorly-depressed head, flat snout, absence of branching fin rays, notably incised fin membranes, and other features. The maximum known size is 58.3 millimeters. The fish is known or believed to occur in Lauderdale County, Alabama.

Spotfin Chub (*Erimonax monachus*) – threatened – a slightly compressed, elongated body ranging in standard length from about 20mm early in the

first year to about 85mm in the third year of growth. The fish is believed to occur in Lauderdale and Colbert County, Alabama.

3.11 Air Quality

The average air quality for Lauderdale County became better between the years 1999 and 2009. From 1999 through 2000 the air quality for the county was considered "moderate". From 2001 to 2009 the air quality was considered "good". Although the quality dropped in 2005 and again in 2007, the quality increased in the years following. Lauderdale County had lower levels of SO_2 than both the state or Alabama and the United States from 1999 to 2008. In 2009 the levels were slightly higher than the state average but still much lower than the U.S. average. The average air quality for the town of Waterloo was similar to Lauderdale County in that it increased in quality from 1999 to 2009. It was also moderate from 1999 through part of 2000 and "good" from then on. The air quality had the same points of decrease in 2005 and 2007 as the entire county. The average SO_2 level was almost identical to Lauderdale County's up until mid-2008. Instead of dropping, the level plateaued in Waterloo from mid-2008 through 2009.

3.12 Transportation

No interstates or major highways run through or near Waterloo. The most prominent road that runs through Waterloo is County Road 14. This road terminates near the center of the town. The town of Waterloo can be accessed from the northwest via County Road 45 and accessed from the south by using County Road 109. The Tennessee River is also a factor for accessibility. The river provides transportation and tourism as well as the potential for economic development for the Waterloo area.

3.13 Recreation

Waterloo is about ten miles southeast from the Lauderdale Wildlife Management Area (18,194 acres). This area is an Alabama Wildlife Management Area, or WMA, and is managed by the Alabama Department of Conservation and Natural Resources. Other attraction nearby and within Waterloo includes Waterloo City Park, which is inside the city limits (5.4 acres), Brush Creek Park, which is about five miles from city limits to the east (4.5 acres), Threets Park is just outside city limits to the north (128.7 acres) and the

Second Creek Recreation Area is across Second Creek from Waterloo and a little north (8.3 acres).

3.14 Water System

Public water is available in the Town of Waterloo through the West Lauderdale Water Authority.

(Map 3.9: Waterloo Water System Infrastructure)

Map 3.9 Waterloo Water System Infrastructure

4.0 DEMOGRAPHIC TRENDS

4.1 Current Population Profile and Trends

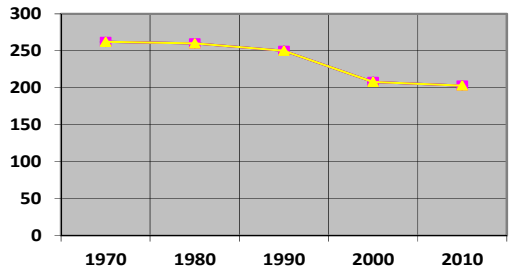
4.1.1 General Population Description and Trend

The town of Waterloo's population decreased by 22.52% between 1970 and 2010. The town population was relatively stable in 1970 and 1980 at 262 and 260 respectively. By 1990 the population had decreased to 250. The decade from 1990 to 2000 witnessed a large decline, 16.8%, down to 208. The decease continued but slowed between 2000 and 2010 to a decrease of 2.4%. In 2010 the population was at 203.

Table 4.1 Population Trends

	1970	1980	1990	2000	2010
Waterloo	262	260	250	208	203
% change		-0.76	-3.85	-16.8	-2.4
# change		-2	-10	-42	-5
Lauderdale County	68,111	80,546	79,661	87,966	92,709
% change		18.26	-1.1	10.43	5.39
# change		12,435	-885	8,305	4,743

Meanwhile, Lauderdale County's total population increased by 36.11% between 1970 and 2010. From 1970 to 1980 the population went from 68,111 to 80,546. In 1990 the population had dropped to 79,661. By 2000 the population had increased to 87,966. In 2010 the population had risen to 92,709.



4.1.2 Population by Age Group and Age Cohort

One method that can be used to understand population dynamics is "age cohort analysis". Age of the population can be described in terms of age groups, that is, the number in a given five year range at a given point in time, as well as age cohort, or the number of individuals of similar age throughout successive time periods. Waterloo experienced almost no population change overall from 2000 to 2010. The most significant declines were among ages 10 to 14, 80 to 84, and over 85. The largest increase was in population age 60 to 69. The following tables show the population distribution by age group in Waterloo in 2000 and 2010.

Table 4.2 Waterloo Population By Age

	2000	2010	Numeric change	Percent change
Under 5	5	8	3	60
5 to 9	7	12	5	71.43
10 to 14	15	5	-10	-66.67
15 to 19	14	19	5	35.71
20 to 25	14	14	0	0
25 to 29	11	12	1	9.09
30 to 34	6	5	-1	-16.67
35 to 39	17	16	-1	-5.88
40 to 49	20	13	-7	-35
45 to 49	17	16	-1	-5.88
50 to 54	18	19	1	5.56
55 to 59	16	18	2	12.5
60 to 64	10	12	2	20
65 to 69	6	13	7	116.67
70 to 74	5	9	4	80
75 to 79	10	6	-4	-40
80 to 84	10	4	-6	-60
85+	7	2	-5	-71.43

Age cohort analysis differs slightly in that it views groupings of individuals of the same age across time. For example, those in the 0 to 5 age group in 2000 would be

compared to the 10 to 14 group ten years later in 2010. Although individuals can be expected to enter and leave the cohort through in-migration and out-migration, comparing cohorts allows some understanding of which groups have grown or reduced population over time. The largest gains in Waterloo were in the 5 to 9/15 to 19 cohorts, which grew by 12 individuals or 171.43% from 2000 to 2010, indicating a net in-migration of school age children into Waterloo. The second largest gain was in the 30 to 34/40 to 44 cohorts, indicating net in-migration among this solidly working age population. These gains were generally offset by smaller losses across other cohorts.

Table 4.3: Waterloo Population by Age Cohort

	2000		2010	Numeric Change	Percent Change
Under 5	5	10 to 14	5	0	0.00%
5 to 9	7	15 to 19	19	12	171.43%
10 to 14	15	20 to 24	14	-1	-6.67%
15 to 19	14	25 to 29	12	-2	-14.29%
20 to 24	14	30 to 34	5	-9	-64.29%
25 to 29	11	35 to 39	16	5	45.45%
30 to 34	6	40 to 44	13	7	116.67%
35 to 39	17	45 to 49	16	-1	-5.88%
40 to 44	20	50 to 54	19	-1	-5.00%
45 to 49	17	55 to 59	18	1	5.88%
50 to 54	18	60 to 64	12	-6	-33.33%
55 to 59	16	65 to 69	13	-3	-18.75%
60 to 64	10	70 to 74	9	-1	-10.00%
65 to 69	6	75 to 79	6	0	0.00%
70 to 74	5	80 to 84	4	-1	-20.00%

4.2 Population Forecasts for Waterloo

Two projection techniques were used to calculate the population change in Waterloo up to the year 2025. An arithmetic projection was used to extrapolate from the historic population trends of the area. After that, an exponential method founded on the historic rate of change was used. While each technique has a different result, comparing and contrasting the end results can give a better understanding of the makeup and probable distribution of population that may occur in the coming years.

4.2.1 General Assumptions and Limitations

Predicting population changes based on historical data can be tricky. Each projection technique here tries to illustrate a key element of population growth while assuming that the population will grow or shrink the same as it has in recorded years. These methods also take for granted that the population trend will not be skewed by outside influences. These influences could include the addition of a new industry or major transportation project. The result is an analysis that includes a range of projections and a final forecast, which represents a realistic account of future population given an assessment of existing conditions, assumptions, and trends.

Table 4.4: Arithmetic Population Projections				
2000	2010	2015	2020	2025
208	203	200	198	195

Table 4.5: Exponential Population Projections				
2000	2010	2015	2020	2025
208	203	198	193	189

4.2.2 Wastewater Study Area Population Trends

The limited variation in population change in the study area indicates that future demand for wastewater treatment will decline slightly in the next ten to fifteen years. With an average household size of 2.39 persons and an average flow rate of 200 gallons per day household, the demand from residential wastewater sources is likely to fall slightly as population continues to decline. A loss of 10 residents, for example, could reasonably result in a loss of four units or approximately 800 GPD less wastewater. As most treatment facilities are designed to accommodate tens of thousands of gallons plus excess capacity for storm water infiltration, this is a negligible fluctuation for design considerations.

5.0 ECONOMIC TRENDS

5.1 Labor Force and Employment (US Census, American Community Survey-5yr est.)

Table 5.1: Labor and Employment Profile	Waterloo town, Alabama		Lauderdale County, Alabama	
	Estimate	Percent	Estimate	Percent
EMPLOYMENT STATUS				
Population 16 years and over	133	(X)	74,033	(X)
In labor force	59	44.4%	42,674	57.6%
Civilian labor force	59	44.4%	42,651	57.6%
Employed	58	43.6%	38,981	52.7%
Unemployed	1	0.8%	3,670	5.0%
Armed Forces	0	0.0%	23	0.0%
Not in labor force	74	55.6%	31,359	42.4%
Civilian labor force	59	(X)	42,651	(X)
Percent Unemployed	(X)	1.7%	(X)	8.6%
Females 16 years and over	88	(X)	39,104	(X)
In labor force	34	38.6%	20,079	51.3%
Civilian labor force	34	38.6%	20,067	51.3%
Employed	34	38.6%	18,299	46.8%
Own children under 6 years	14	(X)	5,746	(X)
All parents in family in labor force	8	57.1%	3,613	62.9%
Own children 6 to 17 years	24	(X)	12,969	(X)
All parents in family in labor force	12	50.0%	8,654	66.7%
COMMUTING TO WORK				

Workers 16 years and over	58	(X)	38,025	(X)
Car, truck, or van -- drove alone	58	100.0%	32,795	86.2%
Car, truck, or van -- carpooled	0	0.0%	3,836	10.1%
Public transportation (excluding taxicab)	0	0.0%	12	0.0%
Walked	0	0.0%	509	1.3%
Other means	0	0.0%	168	0.4%
Worked at home	0	0.0%	705	1.9%
Mean travel time to work (minutes)	38.0	(X)	23.5	(X)
OCCUPATION				
Civilian employed population 16 years and over	58	(X)	38,981	(X)
Management, business, science, and arts occupations	13	22.4%	11,021	28.3%
Service occupations	7	12.1%	6,493	16.7%
Sales and office occupations	24	41.4%	10,669	27.4%
Natural resources, construction, and maintenance occupations	2	3.4%	4,931	12.6%
Production, transportation, and material moving occupations	12	20.7%	5,867	15.1%
INDUSTRY				
Civilian employed population 16 years and over	58	(X)	38,981	(X)
Agriculture, forestry, fishing and hunting, and mining	0	0.0%	491	1.3%
Construction	2	3.4%	3,666	9.4%
Manufacturing	12	20.7%	4,874	12.5%
Wholesale trade	3	5.2%	1,172	3.0%
Retail trade	7	12.1%	5,799	14.9%
Transportation and warehousing, and	7	12.1%	2,125	5.5%

utilities				
Information	0	0.0%	689	1.8%
Finance and insurance, and real estate and rental and leasing	15	25.9%	2,017	5.2%
Professional, scientific, and management, and administrative and waste management services	0	0.0%	2,820	7.2%
Educational services, and health care and social assistance	8	13.8%	8,370	21.5%
Arts, entertainment, and recreation, and accommodation and food services	2	3.4%	3,179	8.2%
Other services, except public administration	0	0.0%	2,512	6.4%
Public administration	2	3.4%	1,267	3.3%
CLASS OF WORKER				
Civilian employed population 16 years and over	58	(X)	38,981	(X)
Private wage and salary workers	51	87.9%	29,835	76.5%
Government workers	7	12.1%	6,406	16.4%
Self-employed in own not incorporated business workers	0	0.0%	2,674	6.9%
Unpaid family workers	0	0.0%	66	0.2%
INCOME AND BENEFITS (IN 2010 INFLATION-ADJUSTED DOLLARS)				
Total households	74	(X)	37,713	(X)
Less than $10,000	27	36.5%	4,164	11.0%
$10,000 to $14,999	8	10.8%	3,500	9.3%
$15,000 to $24,999	7	9.5%	5,171	13.7%
$25,000 to $34,999	10	13.5%	4,198	11.1%
$35,000 to $49,999	6	8.1%	5,624	14.9%

$50,000 to $74,999	5	6.8%	5,954	15.8%
$75,000 to $99,999	9	12.2%	4,088	10.8%
$100,000 to $149,999	2	2.7%	3,543	9.4%
$150,000 to $199,999	0	0.0%	697	1.8%
$200,000 or more	0	0.0%	774	2.1%
Median household income (dollars)	18,214	(X)	39,345	(X)
Mean household income (dollars)	29,504	(X)	52,999	(X)
With earnings	42	56.8%	26,717	70.8%
Mean earnings (dollars)	33,986	(X)	54,042	(X)
With Social Security	25	33.8%	13,234	35.1%
Mean Social Security income (dollars)	13,460	(X)	15,766	(X)
With retirement income	16	21.6%	9,469	25.1%
Mean retirement income (dollars)	21,069	(X)	18,212	(X)
With Supplemental Security Income	6	8.1%	2,033	5.4%
Mean Supplemental Security Income (dollars)	8,217	(X)	7,440	(X)
With cash public assistance income	0	0.0%	503	1.3%
Mean cash public assistance income (dollars)	-	(X)	3,608	(X)
With Food Stamp/SNAP benefits in the past 12 months	10	13.5%	4,062	10.8%
Families	40	(X)	25,330	(X)
Less than $10,000	10	25.0%	1,447	5.7%
$10,000 to $14,999	0	0.0%	1,293	5.1%
$15,000 to $24,999	4	10.0%	2,588	10.2%
$25,000 to $34,999	6	15.0%	2,867	11.3%
$35,000 to $49,999	4	10.0%	3,947	15.6%
$50,000 to $74,999	5	12.5%	4,850	19.1%

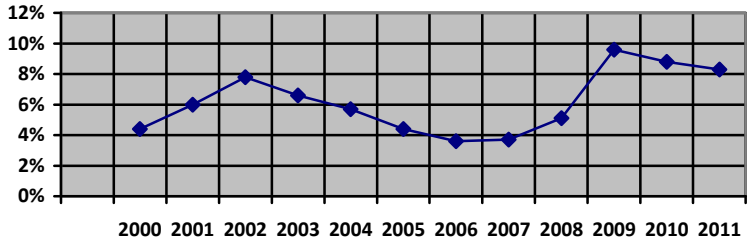
$75,000 to $99,999	9	22.5%	3,751	14.8%
$100,000 to $149,999	2	5.0%	3,189	12.6%
$150,000 to $199,999	0	0.0%	676	2.7%
$200,000 or more	0	0.0%	722	2.9%
Median family income (dollars)	35,000	(X)	51,723	(X)
Mean family income (dollars)	44,210	(X)	64,801	(X)
Per capita income (dollars)	14,462	(X)	22,341	(X)
Nonfamily households	34	(X)	12,383	(X)
Median nonfamily income (dollars)	10,000	(X)	19,262	(X)
Mean nonfamily income (dollars)	12,206	(X)	27,796	(X)
Median earnings for workers (dollars)	16,500	(X)	23,816	(X)
Median earnings for male full-time, year-round workers (dollars)	43,750	(X)	41,553	(X)
Median earnings for female full-time, year-round workers (dollars)	25,833	(X)	29,790	(X)
PERCENTAGE OF FAMILIES AND PEOPLE WHOSE INCOME IN THE PAST 12 MONTHS IS BELOW THE POVERTY LEVEL				
All families	(X)	25.0%	(X)	13.1%
With related children under 18 years	(X)	38.5%	(X)	22.2%
With related children under 5 years only	(X)	100.0%	(X)	35.0%
Married couple families	(X)	3.7%	(X)	6.8%
With related children under 18 years	(X)	7.7%	(X)	11.0%
With related children under 5 years only	(X)	100.0%	(X)	21.4%
Families with female householder, no husband present	(X)	69.2%	(X)	39.0%
With related children under 18 years	(X)	69.2%	(X)	49.7%

With related children under 5 years only	(X)	-	(X)	67.6%
All people	(X)	27.6%	(X)	17.7%
Under 18 years	(X)	31.6%	(X)	24.6%
Related children under 18 years	(X)	31.6%	(X)	24.0%
Related children under 5 years	(X)	33.3%	(X)	31.8%
Related children 5 to 17 years	(X)	30.8%	(X)	21.3%
18 years and over	(X)	26.3%	(X)	15.7%
18 to 64 years	(X)	24.7%	(X)	17.4%
65 years and over	(X)	32.0%	(X)	9.7%
People in families	(X)	20.0%	(X)	14.1%
Unrelated individuals 15 years and over	(X)	52.8%	(X)	35.2%

5.1.1 Unemployment

According to the Alabama Department of Industrial Relation, Lauderdale County's unemployment rate has fluctuated greatly in the past decade or so, showing significant improvement between 2002 and 2006, reaching a low of 3.6%. Unemployment began to increase sharply starting in 2007, peaking in 2009 at 9.6%. The Lauderdale County unemployment rate has begun level off and decline slightly from the peak in 2009.

Lauderdale County Annual Unemployment Rate



Lauderdale County Average Annual Unemployment Rate 2000-2011											
2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
4.4%	6.0%	7.8%	6.6%	5.7%	4.4%	3.6%	3.7%	5.1%	9.6%	8.8%	8.3%

5.2 Retail Sales

Retail sales per capita were estimated by the US Census Bureau in 2007 to be $12,783 per person for Lauderdale County residents. Total retail sales (including food services) in Waterloo in 2010 were $227,000.

5.3 Education Profile

Table 5.2 shows education estimates from the 2005-2009 Census Estimates. Waterloo trails the county, state and national levels when it comes to citizens having a high school degree or higher. **(Table 5.2: Education Profile)**

Table 5.2: Education Profile	United States		Alabama		Lauderdale County, AL		Waterloo town, AL	
	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent
SCHOOL ENROLLMENT								
Population 3 years and over enrolled in school	80,939,002	(X)	1,206,731	(X)	22,793	(X)	36	(X)
Nursery school, preschool	4,924,145	6.1%	69,083	5.7%	1,148	5.0%	3	8.3%
Kindergarten	4,113,849	5.1%	63,947	5.3%	1,229	5.4%	2	5.6%
Elementary school (grades 1-8)	32,578,808	40.3%	509,870	42.3%	8,915	39.1%	9	25.0%
High school (grades 9-12)	17,532,181	21.7%	258,284	21.4%	4,716	20.7%	15	41.7%
College or graduate school	21,790,019	26.9%	305,547	25.3%	6,785	29.8%	7	19.4%
EDUCATIONAL ATTAINMENT								
Population 25 years and over	199,726,659	(X)	3,108,132	(X)	61,976	(X)	109	(X)
Less than 9th grade	12,435,227	6.2%	195,799	6.3%	3,399	5.5%	2	1.8%
9th to 12th grade, no diploma	17,463,256	8.7%	383,038	12.3%	7,180	11.6%	25	22.9%
High school graduate (includes equivalency)	57,903,353	29.0%	987,491	31.8%	21,071	34.0%	42	38.5%
Some college, no degree	41,175,904	20.6%	653,096	21.0%	12,990	21.0%	30	27.5%
Associate's degree	15,021,920	7.5%	213,632	6.9%	4,020	6.5%	7	6.4%
Bachelor's degree	35,148,428	17.6%	430,068	13.8%	8,437	13.6%	3	2.8%
Graduate or professional degree	20,578,571	10.3%	245,008	7.9%	4,879	7.9%	0	0.0%
Percent high school graduate or higher	(X)	85.0%	(X)	81.4%	(X)	82.9%	(X)	75.2%
Percent bachelor's degree or higher	(X)	27.9%	(X)	21.7%	(X)	21.5%	(X)	2.8%

6.0 HOUSING

6.1 General

The total number of housing units within the Waterloo city limits for 2000 was 165. For the 2009 census estimate, the total number of estimated housing units was 151. In 2000 there were an estimated 42 vacant units, while the estimated vacant units for 2009 (and 2010) were 61. This vacancy rate represented 29.1% of the total units in 2000, increasing to 40.4% of the total number of units in 2010. The decline in housing units was registered in a loss of housing structures that included mobile homes and "Boat, RV, Van, etc." This accounts for the 18 units lost from 2000 to 2009. There was an increase in the "1 Unit Detached" group between 2000 and 2009 of four housing units. The median home value in 2000 was $61,300 and $43,800 in 2009. In 2000 two housing units (2.2%) lacked access to telephone service but in 2009 all units had telephone service. Average household size was 2.21 in 2000 and 1.93 in 2009.

Table 6.1: Structural Characteristics of Housing Units

Units In Structure	2000	2009	Percent Of Total In 2009
1 Unit Detached	90	94*	62.3%
1 Unit Attached	0	0	0%
2 Units	0	0	0%
3 or 4 Units	0	0	0%
5 to 9 Units	0	0	0%
10 to 19 Units	0	0	0%
20 or more Units	0	0	0%
Mobile Home	69	57	37.7%
Boat, RV, Van, etc.	6	0	0%

*2009 data based on estimate from ACS; 2000 data based on 100% count.

6.2 Age of Structures

Year-Round Housing Units By Year of Construction

Table 6.2: Year-Round Housing Units by Year of Construction		
Age of Structure	Number of Units	Percent Of Total
2005 or later	0	0%
2000 to 2004	0	0%
1990 to 1999	26	17.2%
1980 to 1989	29	19.2%
1970 to 1979	23	15.2%
1960 to 1969	4	2.6%
1950 to 1959	32	21.2%
1940 to 1949	14	9.3%
1939 or earlier	23	15.2%

6.3 Condition of Housing Stock

Using units with 1.01 persons or more per room as a measure of overcrowding, there were no units in the Town of Waterloo that were overcrowded in the 2009 estimate. By comparison, the statewide average according to the 2009 estimate was 1.7%.

One of the most widely recognized methods for determining substandard housing conditions involves classifying those housing units as substandard which lack complete plumbing facilities. No units in the town of Waterloo were lacking in complete plumbing facilities in 2009. The statewide average is 0.5 percent.

In 2009, the median value of an owner-occupied housing unit was $43,800.00. In comparison, the average value of an owner-occupied unit statewide was $111,900. The median contract rent in the town of Waterloo was $350.00 per month as compared to the state average of $621.00 per month. Among renters, one-fourth paid 35.0% or more of their household income in rent.

7.0 Land Use

7.1 Existing Land Use

About thirteen acres of land is used for amusement, sports, or recreation establishments; encompassing roughly 0.72% of the total land use in the study area. **(Table 7.1 and Map 7.1: Waterloo Land Use)**. Educational services, including the school and museum, take up just over ten acres, about 0.57% of the total land use. Retail sales and services, food services, health and human services, and banking cover less than two acres, combined, approximately 0.10% of the study area. Parcels that are used for public administration as well as other government functions encompass just under four acres and 0.21% of land use.

Religious institutions cover a total of just over five acres, which comes to about 0.29% of total land use. The cemetery in Waterloo covers about three acres, 0.17% of the study area. Manufactured homes are found on 33 parcels which take up nearly 53 acres. This amounts to approximately 2.94% of land use. Threets Park is on about 129 acres of land, which is about 7.15% of the study area. Private households account for over 15.66% of total land use at about 282 acres. The vast majority of the study area is considered "unclassifiable", with most of the parcels appearing to be vacant and covering approximately 1,300 acres. This encompasses 72.19% of the study area.

While there is somewhat of a grid pattern for the streets near the center of the town, most of the streets in Waterloo do not appear to follow a pattern. The downtown area is located on the edges of the quasi-grid pattern and is not far from the water. Private households and manufactured homes are dispersed throughout Waterloo. Outside of the city limits, the homes tend to stay near the edge of the river and creek. Food and retail services seem to be located only in the downtown area. Most of the roads within the city limits are paved but there are several unpaved roads that are away from the center of the town.

Table 7.1: Waterloo Land Use			
Classification	Parcel Count	Acres	Percent of Land Area
Amusement, sports, or recreation establishment	2	12.91	0.72%
Educational Services	2	10.29	0.57%
Retail Sales or Services	4	0.92	0.05%
Death care services (cemetery)	2	3.05	0.17%
Public Administration	2	1.44	0.08%
Other government functions	3	2.33	0.13%
Natural and other Recreational parks	6	128.72	7.15%
Manufactured Home	33	52.94	2.94%
Private household	217	282.02	15.66%
Religious institutions	5	5.24	0.29%
Food services	4	0.31	0.02%
Finance and Insurance (bank)	1	0.09	0.005%
Health and Human services (clinic)	1	0.34	0.02%
Unclassifiable (mostly vacant)	55	1,299.76	72.19%
Total	278	1,800.36	100%

7.2 Future Land Use

In the foreseeable future, land use in Waterloo will continue to reflect the mix of residential, commercial, and recreational uses currently in place. Extensive new development is not anticipated. Small annexations into adjacent areas may be contemplated; however, these will not dramatically alter the current mix of land uses. Growth rates do not support expansive growth and no sweeping redevelopment plans are in place for existing parcels.

8.0 WASTEWATER FLOW RATES

8.1 Existing Conditions

The town of Waterloo is served by a system of private septic tanks and leaching fields. Each tank is individually purchased by the residents and business owners for their property, and each owner is responsible for obtaining a permit from the Lauderdale County Health Department to operate their systems. According to interviews with the town citizenry and elected officials, septic failures are minimal and the systems as a whole meet the town's current wastewater demands.

Septic tanks are dependent on the ability of the adjacent soil to percolate water and thus absorb the tank effluent. As such, the town is limited by how densely and large it can grow based on its resident soil conditions and Health Department regulations (residential lots are typically limited to a minimum size of 15,000 square feet exclusive of easements). The lack of a sanitary sewer system can therefore limit growth and the town's ability to recruit new industry and commercial establishments. The town is well advised to explore collection and treatment alternatives in order to determine the best possible solution for serving the area.

According to the 2000 census, the town of Waterloo has approximately 208 residents who live in approximately 94 households. Based on typical water usage rates, the town can be projected to generate between 21,000 and 33,000 gallons of wastewater per day. Water demands and wastewater generation spike abruptly during the Trail of Tears ride, when as many as an estimated 30,000 visitors may pass through Waterloo in a single day. The additional wastewater demands are met by the temporary rental of portable toilets for the event.

Waterloo is bounded by steep wooded hills on the west and Pickwick Reservoir to the south and east. It is bisected by Lauderdale County Roads 14 and 45. Waterloo's usable land between the toe of the slopes and the water is limited to a belt about a half mile wide and much of that area is already developed.

8.2 Future Conditions

Based on the existing land use, soil conditions, and slopes, the town of Waterloo appears to be substantially built out. Most land that can handle development is either already developed or does not possess suitable characte ristics for on-site wastew ater disposal. A dditionally, Waterloo is rem otely located and lacks good highway access. Based on these factors, limited growth can be forecast for the Waterloo community.

It would be prudent, however, for the town to be prepared to accept additional growth, should the opportunity present itself in the future. Since little growth is forecast for the area, a sewage sy stem that could treat 40 ,000-50,000 gallons per day would adequately serve the town and provide for some additional growth.

Waterloo is a major point on the Trail of Tears route, and its connection to the annual Trail of Tears ride is the town's b est opportunity for growth. Waterloo shou ld plan to continue to support the Trail and be geared for tourist growth associated with that event. The town is also in close proximity to the Natch ez Trace Parkway that can spin off tourist activities.

9.0 WASTEWATER TREATMENT ALTERNATIVES

9.1 Alternative 1: Maintain Existing System of Individual Tanks and On-Site Disposal

As this implies, Alternative 1 represents the status quo, or a "null alternative." The existing septic systems would remain in place and operate as they historically have, and new developments would be responsible for providing their own tanks and land for leaching fields. As previously mentioned the downside of this alternative is that it would severely limit the potential for any future growth in the area and cripple the town's ability to attract new tourist or commercial development. However, this system operates at little to no cost to the town, making it an attractive alternative, especially when the historical growth patterns and the forecast for little to no growth are taken into consideration.

9.2 Alternative 2: Develop a Large Septic System for Special Events

This alternative would allow the City to accommodate its largest demands for the Trail of Tears ride and any other large community events. The system would consist of a large septic tank and leaching field capable of handling the wastewater demands for up to 30,000 people in one day. The system would ideally be located on or near the campground, and would either reduce or eliminate the need for portable toilet rentals during the event. Additionally, a temporary or permanent bathroom facility would be provided. An illustration of this alternative, with a preliminary cost analysis is shown in the Alternative 2 map that follows. A more detailed cost breakdown is shown in Table 9.1.

The downside of this alternative is that it would require a potentially significant upfront cost. Land or easements would possibly need to be acquired for disposal fields and/or the septic tank. A significantly sized septic tank and field lines would be installed. A small sewer/collection system would also be installed to the temporary/permanent restroom facility, and the restroom facility would need to be constructed.

Among the positives of this alternative are that it could reduce or eliminate the need for portable bathroom facilities. It has historically been a great cost to rent and maintain the facilities during the Trail of Tears ride and other special events, and is a nuisance and hassle. The system could be either privately run by the campground or maintained by the city at very little operating cost. The system would pay for itself in a

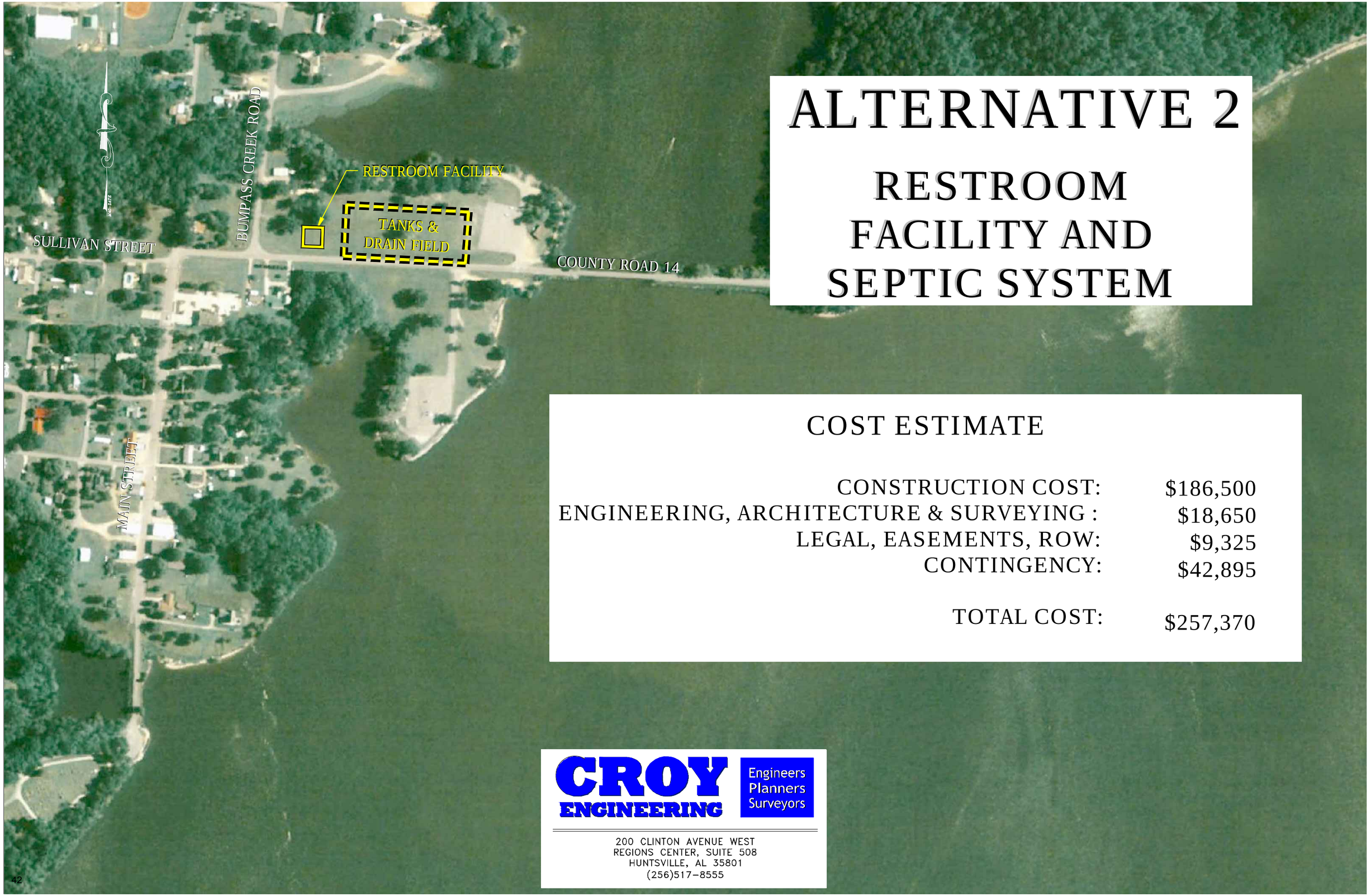
relatively short time when compared to the annual portable toilet leasing/maintenance costs. Additionally, the restrooms could be permanent facility and be used to attract more campers to the campground during all times of the year, thereby generating additional tourist traffic to Waterloo.

TABLE 9.1

DETAILED COST FOR ALTERNATIVE 2

Quantity	Unit	Unit Price	Item Description	Cost
500	SF	$ 15.00	CONCRETE SLAB FOR RESTROOM	$ 7,500
1	LS	$ 10,000.00	WALLS, ROOF, AND PARTITIONS	$10,000
20	EA	$ 200.00	TOILETS AND PLUMBING	$4,000
50	LF	$ 30.00	6" SEWER LINE TO TANK	$1,500
1	LS	$ 500.00	1" WATER LINE CONNECTION	$500
10	EA	$ 6,000.00	SEPTIC TANKS	$60,000
100,000	SF	$ 1.00	LEACH FIELD AND LINES	$100,000
1	LS	$ 3,000.00	RE-LANDSCAPE AND CLEAN UP	$3,000

Total Estimated Construction Cost:		**$**	**186,500**
Total Construction Cost		**$**	**186,500**
Right-of-way	5%	$	9,325
Engineering/Survey	10%	$	18,650
Contingency	20%	$	42,895
Grand Total Project Costs		**$**	**257,370**



ALTERNATIVE 2

RESTROOM FACILITY AND SEPTIC SYSTEM

COST ESTIMATE

CONSTRUCTION COST:	$186,500
ENGINEERING, ARCHITECTURE & SURVEYING :	$18,650
LEGAL, EASEMENTS, ROW:	$9,325
CONTINGENCY:	$42,895
TOTAL COST:	$257,370

CROY ENGINEERING
Engineers
Planners
Surveyors

200 CLINTON AVENUE WEST
REGIONS CENTER, SUITE 508
HUNTSVILLE, AL 35801
(256)517-8555

9.3 Alternative 2A: Collection System in conjunction with Alternative 2

As an option to Alternative 2, the Town could install a sewer system connecting the downtown area to the special event septic system as previously described. The size of the system in Alternative 2 could be proportionately increased to handle the additional demands of the portion of the city connected to it. An illustration of this alternative, with a preliminary cost analysis is shown in the Alternative 2A Map that follows. A more detailed cost breakdown is shown in Table 9.2.

The downsides of this alternative are that it would require additional installation costs to install and establish. Right-of-way and/or easements would likely have to be acquired for the sewer lines and manholes, and pumps would likely have to be installed if the system cannot be run on gravity alone. Existing septic systems would have to be retrofit to dispose of the effluent into the new sewer lines as opposed to their leaching fields. Additional maintenance costs would be incurred with the sewer system to keep it functioning properly. Finally, some type of governmental or quasi-governmental authority would likely be necessary in conjunction with this system.

The positives of this alternative are that it would allow for additional direct and indirect revenues to the City. Sewage disposal fees would be charged to maintain the system for those connected to it. Additional density and redevelopment would be made possible as lots would no longer be restricted by the size of the septic disposal fields that would be required. This could be attractive to different tourist industries wishing to possibly locate in Waterloo.

TABLE 9.2.

DETAILED COST FOR ALTERNATIVE 2A

Quantity	Unit	Unit Price	Item Description	Cost
500	SF	$ 15.00	CONCRETE SLAB FOR RESTROOM	$ 7,500
1	LS	$ 10,000.00	WALLS, ROOF, AND PARTITIONS	$10,000
20	EA	$ 200.00	TOILETS AND PLUMBING	$4,000
50	LF	$ 30.00	6" SEWER LINE TO TANK	$1,500
1	LS	$ 500.00	1" WATER LINE CONNECTION	$500
10	EA	$ 6,000.00	SEPTIC TANKS	$60,000
100,000	SF	$ 1.00	LEACH FIELD AND LINES	$100,000
1	LS	$ 3,000.00	RE-LANDSCAPE AND CLEAN UP	$3,000
1,700	LF	$ 43.00	SAN SEWER PIPE, 8 IN, PVC	$73,100
8	EA	$ 3,200.00	SAN SEWER MANHOLE, TP 1	$25,600
18	EA	$ 2,000.00	4" LATERALS	$36,000
1,889	SY	$ 5.00	STREET REPAIR	$9,445

Total Estimated Construction Cost:		**$**	**330,645**
Total Construction Cost		**$**	**330,645**
Right-of-way	5%	$	16,532
Eng/Survey	10%	$	33,065
Contingency	20%	$	76,048
Grand Total Project Costs		**$**	**456,290**

ALTERNATIVE 2A

ALTERNATIVE 2
PLUS
EXPANDED SERVICE

COST ESTIMATE

CONSTRUCTION COST:	$330,645
ENGINEERING & SURVEYING :	$33,065
LEGAL, EASEMENTS, ROW:	$16,532
CONTINGENCY:	$76,048
TOTAL COST:	$456,290

CROY ENGINEERING
Engineers
Planners
Surveyors

200 CLINTON AVENUE WEST
REGIONS CENTER, SUITE 508
HUNTSVILLE, AL 35801
(256)517-8555

9.4 Alternative 3: Install a Collection System and Centralized Treatment Plant

This alternative would involve the installation of a city sewer system that would collect as much of the community's wastewater as possible. The system would likely be a combination of pressure and gravity sewer, and would transport wastewater to a central point for treatment and effluent disposal. The plant would be located next to either Pickwick Lake or Second Creek, and discharge treated effluent directly into either of those two receiving waters. An illustration of this alternative, with a preliminary cost analysis of this alternative, with a preliminary cost analysis is shown in the Alternative 3 map that follows. A more detailed cost breakdown is shown in Table 9.3.

The disadvantages are that it is cost-prohibitive based on the forecasted growth for the Waterloo area. It represents the costliest alternative to install, and would require the establishment of a sewer board and hiring of personnel to operate and maintain the plant and system. As such, the implementation of this alternative should be driven by an attractive development opportunity or by water quality/pollution problems in the area that need to be abated.

The positives of this system are that it would eliminate the need for septic systems and remove that barrier to a denser development. A lively downtown could be accommodated, and the system could be sized to handle the tourist demands of the Trail of Tears ride and other events. Direct revenues would be realized in the form of sewage collection fees and the system could pay for its own maintenance.

TABLE 9.3.

DETAILED COST FOR ALTERNATIVE 3

Quantity	Unit	Unit Price	Item Description	Cost
20,000	LF	43.00	SAN SEWER PIPE, 8 IN, PVC	$860,000
50	EA	3,200.00	SAN SEWER MANHOLE, TP 1	$160,000
110	EA	4,000.00	SERVICES	$440,000
1	LS	500,000.00	TREATMENT PLANT	$500,000
1	LS	50,000.00	MISCELLANEOUS	$50,000

Total Estimated Construction Cost:		**$**	**2,010,000**
Total Construction Cost		**$**	**2,010,000**
Right-of-way	5%	$	100,500
Eng./Survey	10%	$	201,000
Contingency	20%	$	462,300
Grand Total Project Costs		**$**	**2,773,800**

ALTERNATIVE 3

TOWN-WIDE SEWERAGE SERVICE

FIRE STATION

BANKHEAD STREET

WATERLOO HIGH SCHOOL

BUMPASS CREEK ROAD

SEWER TREATMENT FACILITY

SULLIVAN STREET

COUNTY ROAD 14

COUNTY ROAD 45

PINE STREET

MAIN STREET

COST ESTIMATE

CONSTRUCTION COST:	$2,010,000
ENGINEERING & SURVEYING :	$201,000
LEGAL, EASEMENTS, ROW:	$100,500
CONTINGENCY:	$462,300
TOTAL COST:	$2,773,800

CROY ENGINEERING
Engineers Planners Surveyors
200 CLINTON AVENUE WEST
REGIONS CENTER, SUITE 508
HUNTSVILLE, AL 35801
(256)517-8555

10.0 SELECTED ALTERNATIVES

Based on input from both elected officials, and that obtained at a public meeting held on February 9, 2012 for the wastewater study, it is felt that continuing with Alternative 1 is the most logical course of action for Waterloo. Until there is a proven need for the capital expenditure to install a centralized collection and treatment system, staying on the current system of individual septic tanks and leaching fields will satisfactorily meet the needs of the town. The septic systems are reported as being in compliance, and water quality has not been noted as being poor.

However, it is recommended for the town to continue to search for ways to expand upon its growth potential and marketability in the future. The town has an opportunity to market its historic and cultural elements and foster tourism-based growth. One of the ways to foster growth is to implement a wastewater treatment system so that greater densities and a wider variety of land uses can be realized. Alternative 2 would represent a logical future step in that direction in that the town could accommodate additional tourists and campers, particularly during the annual Trail of Tears weekend. To achieve this step, it is recommended that the town make steps to acquire matching grant type funding as discussed in Chapter 11 and develop a method for managing the potential restroom facility at the campground with both staff and law enforcement personnel.

11.0 IMPLEMENTATION AND POTENTIAL FUNDING SOURCES

The expansion of Waterloo's wastewater services will be through private investment in individual septic systems. Some opportunity for external funding sources exists and is reviewed below; however, the capacity to match a program of significant impact and the need for a centralized collection and treatment system are questionable. The construction of a system based on current system revenues would be cost prohibitive. Revenues received from growth and development accompanying sanitary sewer expansion cannot be expected to provide for operation and maintenance, including capital depreciation, and additional capital investment costs are beyond the revenue capacity of the Town of Waterloo. Until such time as demand creates a need, these resources will not likely be tapped.

11.1 Private Investment

Typically, private investment is the source of financing for most residential and commercial wastewater extensions, which occur incrementally in the course of land development. As property is taken from its natural state to accommodate the additional demand for housing and commercial and industrial development, the Town would benefit from establishing development policies, to guide the design of new developments and installation of septic systems. These regulations must be sufficient to ensure that, among other utilities, the septic systems are adequate for on-site treatment in order to maintain current levels of environmental integrity and quality of life.

11.2 Grant Opportunities

A number of sources of external funding are available for investments in centralized community wastewater facilities. Each program has its particular focus area and can be a source of support for implementing the expansion of centralized wastewater facilities. The following is a list of several of these sources and their main focal points that is provided to review opportunities that might be further explored in the future:

USDA Rural Development

Funds are available to public bodies and nonprofit corporations to develop water and waste disposal systems, including solid waste disposal and storm drainage, in rural areas and towns with a population not in excess of 10,000. To qualify, applicants must

be unable to obtain the financing from other sources and/or their own resources at rates and terms they can afford.

Community Development Block Grants Program

The State of Alabama currently participates in the state-administered Community Development Block Grant (CDBG) Program. This program is funded by the U.S. Department of Housing and Urban Development and is administered in Alabama by the Alabama Department of Economic and Community Affairs (ADECA). CDBG funds are available under four programs, or funds: Competitive Fund, Planning Fund, Economic Development Fund, and Enhancement Fund. Wastewater projects qualify frequently through Competitive applications, but can be considered for economic development funds, including both grants (with a 20% match) and loans, where an industrial prospect meets certain economic development objectives.

Environmental Protection Agency State and Tribal Assistance Grant Program (EPA STAG)

STAG funds are used to build and enhance the capacity of states and tribes to carry out compliance assurance activities within their respective jurisdictions. The projects selected cover a wide range of activities that have and will continue to enable states and tribes to demonstrate compliance assurance and enforcement outcomes from their activities while serving as models for other states and tribes. These capacity building activities include training, studies, surveys and investigations.

Appalachian Regional Commission

The Appalachian Regional Commission was established in 1965 to improve the economic conditions of Appalachian counties in 13 states, including Lauderdale County, Alabama. ARC funds are available under one of four broad goals. Wastewater improvements fall under ARC Goal 3: Develop and improve Appalachia's infrastructure to make the Region economically competitive. Grants are available for up to $200,000 per project based upon the attainment status of the county. As of 2012, Lauderdale County is considered "Transitional" and is required to provide 50% matching funds.

Economic Development Administration

EDA provides grants for utilities and infrastructure improvements in order to promote higher skill and higher wage jobs in an area suffering from economic dislocation. EDA funds are intended to leverage additional private investment through assistance to projects with broad regional and innovative foundations. Generally, EDA funds may not exceed 50% of the total project cost (50% non-federal match requirement).

11.3 Timeline for Implementation

The plan calls for Waterloo to maintain its current course with respect to private wastewater treatment options and to continually review opportunities to finance a centralized collection system to treat commercial and recreational customers. At present, demand and finances do not support a system. However, regulations addressing the design and installation of new systems should be an immediate priority.

Sewage Disposal

Lauderdale County, Alabama

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Ar:					
Armour	90	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
BoE:					
Bodine	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Ch:					
Chenneby	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.50		
Co:					
Choccolocco	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.50		
DaB:					
Decatur	90	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
				Slope	0.32
DAM:					
Urban land	95	Not rated		Not rated	
DcC2:					
Decatur	85	Somewhat limited		Very limited	
		Slow water movement	0.50	Slope	1.00
				Seepage	0.50
		Slope	0.00		

Sewage Disposal

Lauderdale County, Alabama

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
DeB:					
Dewey	85	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
				Slope	0.32
DeC:					
Dewey	85	Somewhat limited		Very limited	
		Slow water movement	0.50	Slope	1.00
				Seepage	0.50
		Slope	0.00		
DfC2:					
Dewey	85	Somewhat limited		Very limited	
		Slow water movement	0.50	Slope	1.00
				Seepage	0.50
		Slope	0.00		
DoA:					
Dickson	90	Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.75
		Slow water movement	1.00	Seepage	0.50
DoB:					
Dickson	85	Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.75
		Slow water movement	1.00	Seepage	0.50
				Slope	0.32
DoC:					
Dickson	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
				Depth to saturated zone	0.75
		Slow water movement	1.00	Seepage	0.50
		Slope	0.00		
EtB:					
Etowah	85	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Slope	0.68
				Seepage	0.50
FaB:					
Fullerton	85	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
				Slope	0.32

Sewage Disposal

Lauderdale County, Alabama

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
FaC:					
Fullerton	85	Somewhat limited		Very limited	
		Slow water movement	0.50	Slope	1.00
		Slope	0.37	Seepage	0.50
Gr:					
Grasmere	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Seepage	0.50
Gu:					
Guthrie	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Seepage	0.50
Hu:					
Humphreys	85	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Flooding	0.40	Flooding	0.40
		Depth to saturated zone	0.08		
Le:					
Lee	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.50	Seepage	0.50
Lo:					
Lobelville	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.50		
MW:					
Miscellaneous Water	95	Not rated		Not rated	

Sewage Disposal

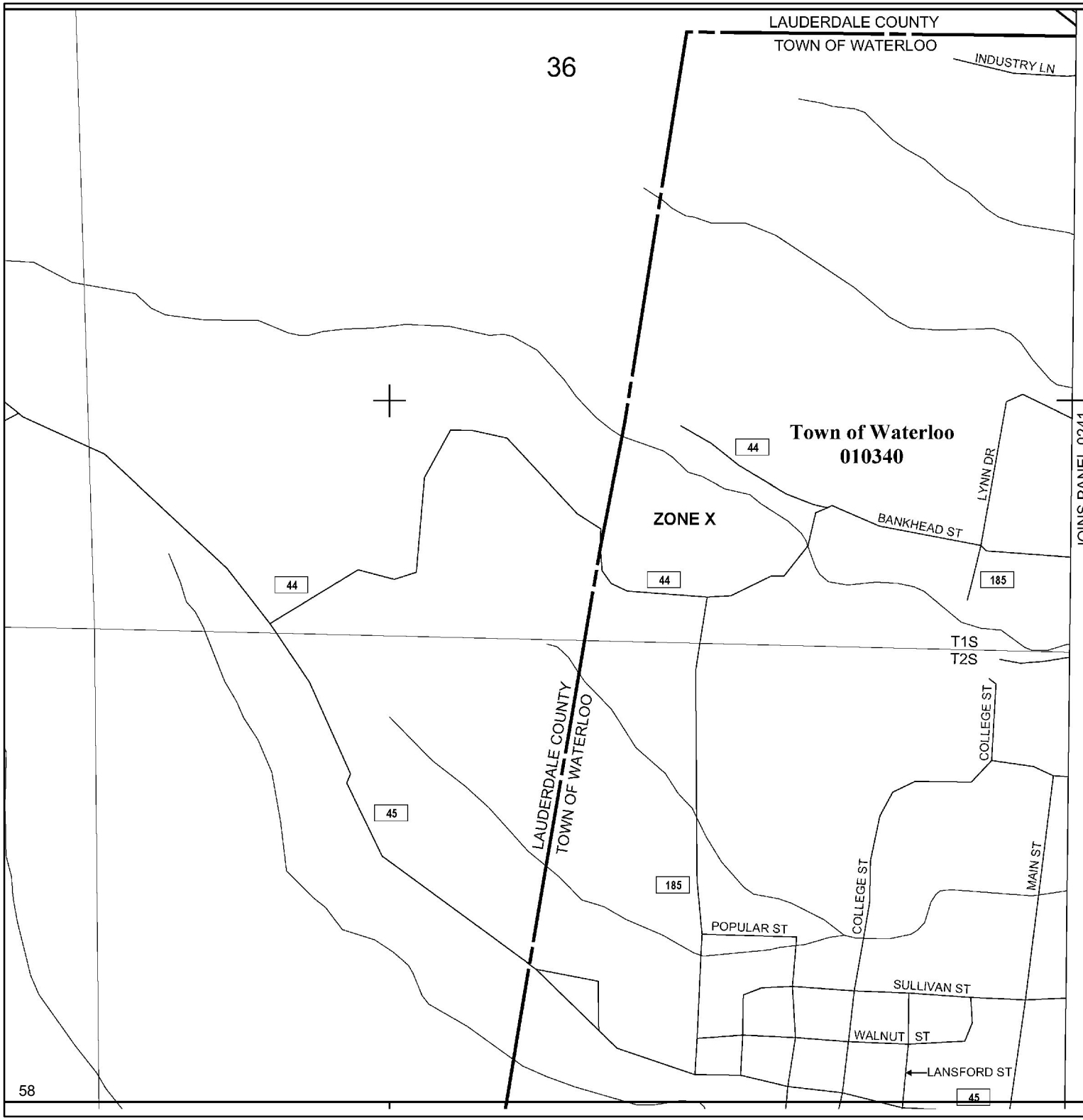
Lauderdale County, Alabama

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
PAD3:					
Paleudults, (Decatur)	85	Somewhat limited		Very limited	
		Slow water movement	0.50	Slope	1.00
		Slope	0.37	Seepage	0.50
Pg:					
Pits, sand or gravel	95	Not rated		Not rated	
Pr:					
Pruitton	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
SaC:					
Saffell	85	Very limited		Very limited	
		Seepage, bottom layer	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	1.00
		Slope	0.00		
SBF:					
Saffell	80	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.50		
Bodine	18	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
SmC:					
Smithdale	85	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.50	Slope	1.00
		Slope	0.00		

Sewage Disposal

Lauderdale County, Alabama

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
St:					
Staser	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
		Slow water movement	0.46		
W:					
Water	95	Not rated		Not rated	



MAP SCALE 1" = 500'

250 0 500 1000

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0237D

FIRM

FLOOD INSURANCE RATE MAP

LAUDERDALE COUNTY, ALABAMA

AND INCORPORATED AREAS

PANEL 237 OF 626

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

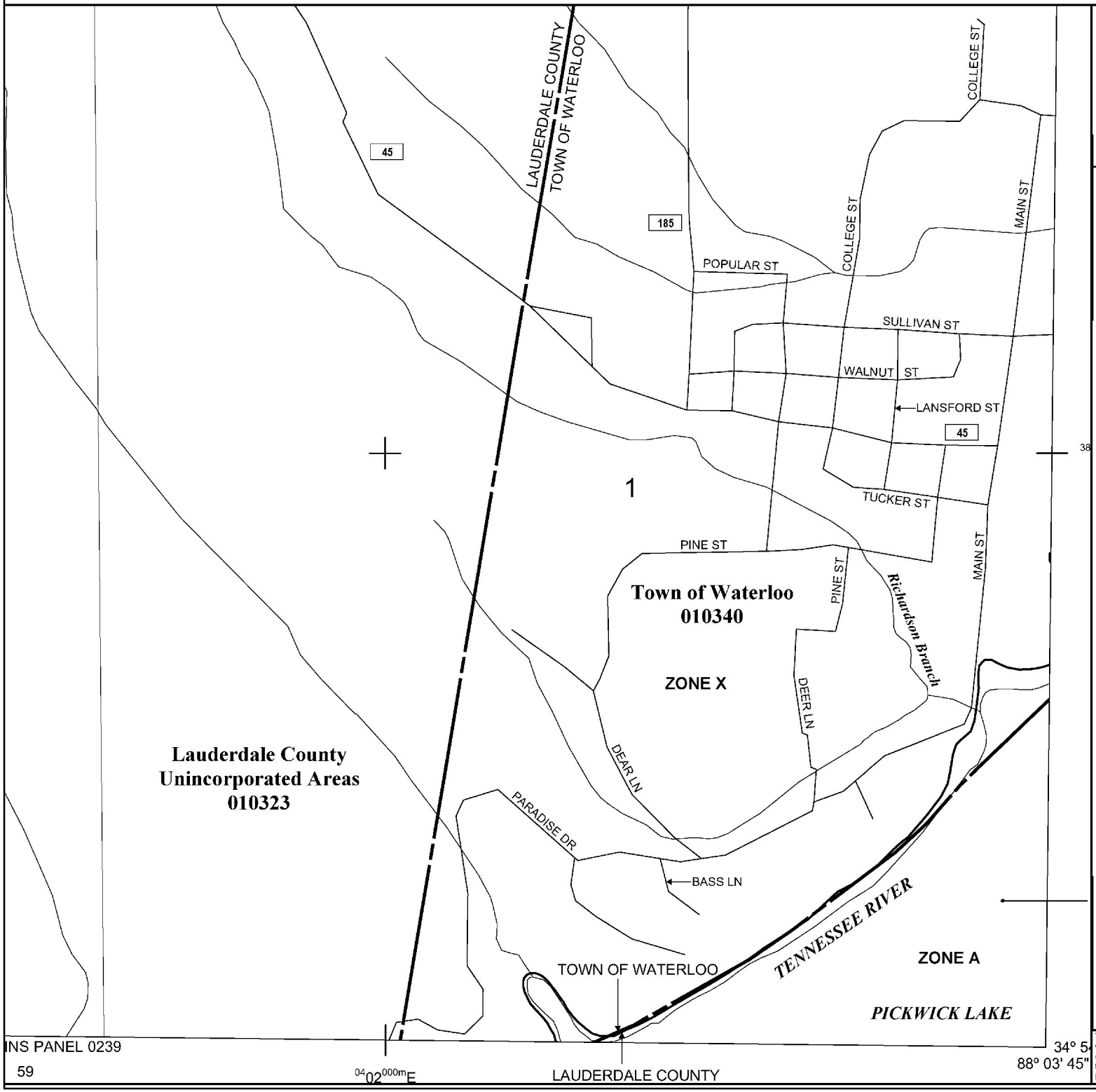
COMMUNITY	NUMBER	PANEL	SUFFIX
LAUDERDALE COUNTY	010323	0237	D
WATERLOO, TOWN OF	010340	0237	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

EFFECTIVE DATE
September 11, 2009

MAP NUMBER
01077C0237D

State of Alabama
Federal Emergency Management Agency



MAP SCALE 1" = 500'

250 0 500 1000

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0237D

FIRM

FLOOD INSURANCE RATE MAP

LAUDERDALE COUNTY, ALABAMA AND INCORPORATED AREAS

PANEL 237 OF 626

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LAUDERDALE COUNTY	010323	0237	D
WATERLOO, TOWN OF	010340	0237	D

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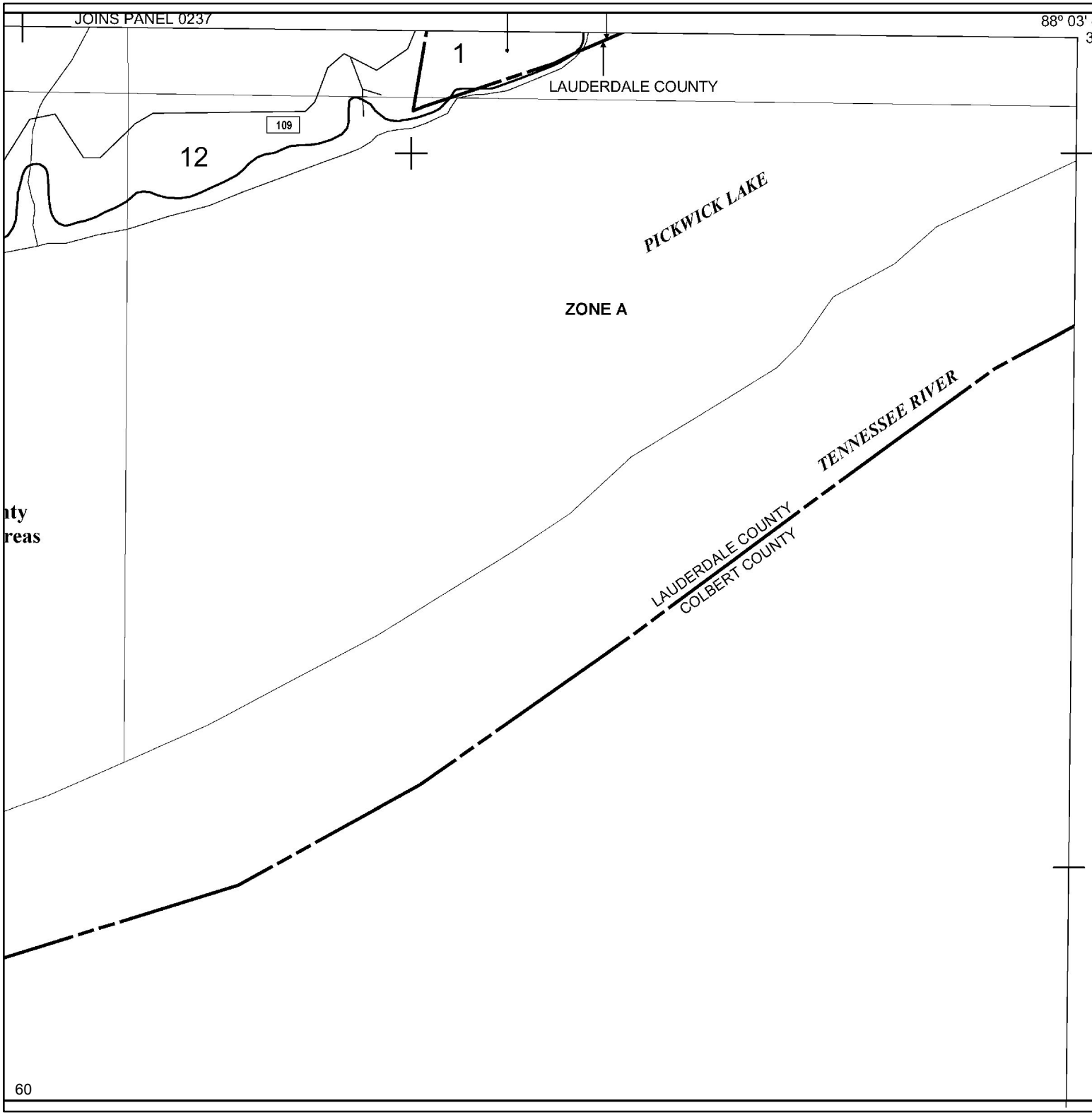
State of Alabama
Federal Emergency Management Agency



MAP SCALE 1" = 500'

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NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0239D

FIRM

FLOOD INSURANCE RATE MAP

LAUDERDALE COUNTY, ALABAMA

AND INCORPORATED AREAS

PANEL 239 OF 626

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LAUDERDALE COUNTY	010323	0239	D
WATERLOO, TOWN OF	010340	0239	D

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EFFECTIVE DATE
September 11, 2009

MAP NUMBER
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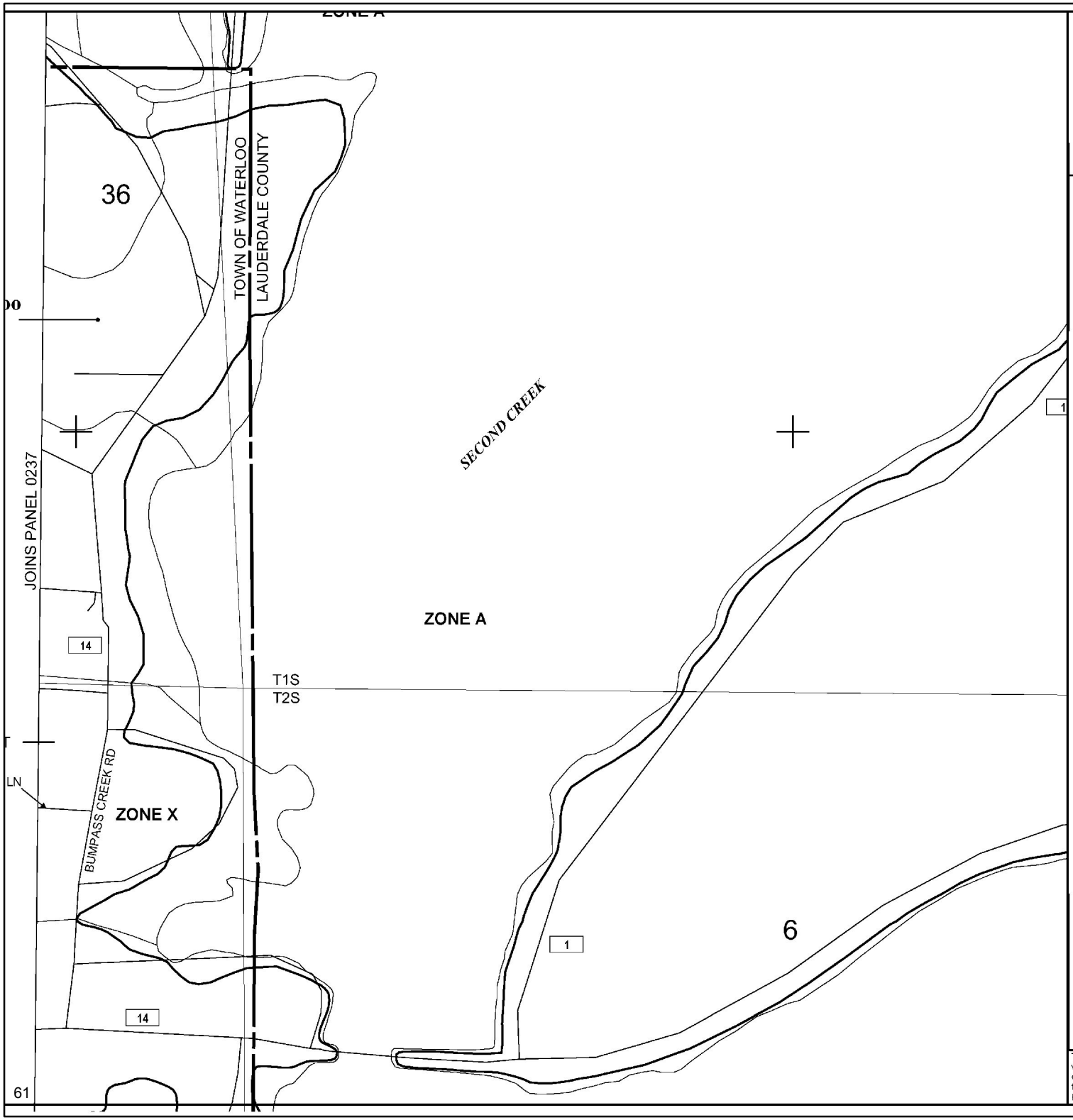
State of Alabama
Federal Emergency Management Agency



MAP SCALE 1" = 500'

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NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0241D

FIRM

FLOOD INSURANCE RATE MAP

LAUDERDALE COUNTY, ALABAMA

AND INCORPORATED AREAS

PANEL 241 OF 626

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LAUDERDALE COUNTY	010323	0241	D
WATERLOO, TOWN OF	010340	0241	D

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EFFECTIVE DATE
September 11, 2009

MAP NUMBER
01077C0241D

State of Alabama
Federal Emergency Management Agency