

CHRISTIAN COUNTY STORMWATER MANAGEMENT PROGRAM



Prepared by:
Christian County Planning Department
202 West Elm Street
Ozark, MO 65721
May 2013



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CHRISTIAN COUNTY, MISSOURI

APPLICATION FOR STORMWATER PERMITS FOR SMALL MUNICIPAL SEPARATE SEWER SYSTEMS (MS4)

Purpose and Scope

The application for the general permit requires the ongoing maintenance and implementation of our stormwater management program (SWMP) in accordance with the terms of the general permit. The primary purpose of this stormwater management program is the development and implementation of programs throughout Christian County that effectively minimize stormwater pollutant runoff in the various watersheds located within the County. (See Appendix B to view a copy of the Watershed Map for the County).

General Information about the Covered Area

Christian County covers approximately 564 square miles in Southwest Missouri and is bordered by Greene, Lawrence, Stone, Taney, Douglas and Webster Counties. Christian County's northern boundary is situated immediately south of Springfield, the major metropolitan center in Southwest Missouri.

Christian County has experienced continuous and rapid growth since the 1970s, far outpacing the rate of growth for the State of Missouri and the United States. Christian County is on the list of the 100 fastest growing counties in the United States. The County's rate of growth has been explosive since 1990, with the population increasing from 32,644 in 1990 to 77,422 in 2010, a 42.6 percent rate of growth. In migration overwhelmingly accounts for the County's rapid increase in population. Although Christian County is one of the fastest growing counties in the State of Missouri and is considered part of the Springfield Metropolitan Statistical Area (Greene and Christian Counties), the southern part of the

County is predominantly rural, with a large land area being a part of the Mark Twain National Forest.

The vast majority of the County is Unincorporated. Incorporated cities in Christian County include: Billings, Clever, Fremont Hills, Nixa, Ozark, Saddlebrooke and Sparta. Of these cities, Nixa and Ozark are the largest with 2010 populations of 19,022 and 17,870 respectively. Both cities have grown significantly since the 2000 Census with a recent survey suggesting that Nixa has a current population closer to 15,000 people.

Primary access to Christian County is provided by U.S. Highway 65, U.S. Highway 160, U.S. Highway 60 and MO Highway 14. Both Highways 160 and 65 serve as the major north-south routes connecting Nixa and Ozark to Springfield and the ever growing tourism/recreation centers in the Branson and Table Rock Lake areas to the south. MO. Highway 14 provides the major east-west access route across the northern third of Christian County, linking the County's various cities and villages.

Christian County has a varied natural environment, ranging from relatively flat lowland areas to rugged hills and valleys. The County is characterized by karst topography. The geologic features of karst, such as sinkholes, lineaments, caves and losing streams, place limitations on development due to the potential for surface contaminants to enter the groundwater supply.

The Christian County Comprehensive Plan recognizes that, "Maintenance of groundwater quality is a critical environmental concern as development proceeds in the County. This concern is reflected in the need for appropriate disposal of sewage and solid waste materials."

INTRODUCTION

As stated earlier, the application for the general permit requires the development of a stormwater management program (SWMP) in accordance with the terms of the general permit. The requirements for the SWMP are set forth in the general permit.

Christian County has a number of programs and ordinances in place that will be a firm building block in fulfilling the Phase II Stormwater Regulation. It is our intention to comply with the policies required by this permit.

Despite the fact that we are the fastest growing County in the State, Christian County has put a number of steps in place to preserve the natural resources that make our county such a desirable place to live. This has been accomplished through the cooperative efforts of the Planning and Zoning Department, the County Health Department, and the overview by a very dedicated County Commission.

We adopted the Stormwater & Erosion Control Regulations for Christian County, MO on July 8, 2010. We adopted an Illicit Discharge Ordinance on October 31, 2011. (See Appendix D)

GENERAL PERMIT REQUIREMENTS FOR SWMP

Application Requirements for Small MS4's

3 Special Conditions

3.1 Discharges to Water Quality Impaired Waters

Some of the water discharge from the regulated areas of Christian County does enter water bodies that are on the MoDNR 303(d) list of impaired waters. These water bodies that are on the list include the James River and Wilson's Creek. At the present time only the James River has a Total Maximum Daily Load (TMDL) that has been approved by the EPA. Phosphorus is the primary nutrient of concern with approximately 64% of the phosphorus loading coming from municipal wastewater treatment facilities which are independently permitted and regulated. The remaining load is attributed to agricultural and urban runoff and sediment loading. The County, along with OEWR, continues to work with the other small MS4s in these watersheds to coordinate efforts to monitor several sites for water quality monitoring. This cooperative monitoring effort is one of the recommendations of the Data Gap Analysis, conducted to identify areas of needed research on water quality in the area. (See Appendix C for a description of the Southwest Missouri Water Quality Improvement Project (WQIP) – Data Gap Analysis).

The pollutants that have been identified by the EPA as approved TMDLs for the James River of most concern are phosphorus and sediment. Christian County has a number of measures currently in place which we feel effectively control runoff from construction sites. Post-construction runoff is specifically addressed in Stormwater and Erosion Control Regulations.

3.1.1 Discharges to Water Quality Impaired Waters

Some discharges from Christian County are upstream of MoDNR 303(d) listed waters.

3.1.1.1 Monitoring Program for Stormwater Discharges to MoDNR 303 (d) Listed Waters

Christian County is currently working with OEWRI and other area MS4s on a cooperative monitoring program to determine if significant contributions of measurable pollutants exist. Test results are monitored on a quarterly basis.

3.1.1.2 EPA Approved TMDLs

The James River has TMDLs that have been developed by the MoDNR and approved by the EPA. A small area within Christian County's regulated MS4 is upstream of both of these water bodies.

3.1.2 Water Quality Controls for Discharges to Impaired Watersheds

As Christian County begins a cooperative monitoring program it will allow the County to determine if discharges from this small MS4 are contributing significantly to the measurable pollutants of concern. (Phosphorus is the primary nutrient of concern.) As stated in our Stormwater and Erosion Control Regulations, quality BMPs are required in all watersheds within Christian County.

3.1.3 Consistency with TMDL Allocations. *If a TMDL has been finalized for any water body into which Christian County discharges, the County must:*

3.1.3.1 Determine Whether the Approved TMDL is Likely in Stormwater Discharge

The TMDLs are for phosphorus, which is likely to be found in stormwater discharges.

3.1.3.2 Determine a Wasteload Allocation

The TMDL does include a load allocation (LA) for non-point pollution sources, but not specifically for stormwater discharges.

3.1.3.3 Determine if TMDL Addresses a Flow Regime

The TMDL does address a flow regime for stormwater flows.

3.1.3.4 Additional Control Measures

Monitoring will need to be conducted to determine if Las are being met.

3.1.3.5 Current and Planned Control Measures

Christian County has and will continue to adopt a number of regulations and policies which are very effective non-structural BMP's with regard to water quality protection. These current and proposed regulations include:

- Stormwater and Erosion Control Regulations (Appendix D)
- Urban Services Area Agreement (Appendix C)
- Zoning Regulations (Appendix C)
- Comprehensive Plan (Appendix E)
- Floodplain Management Regulations (Appendix D)

3.1.3.6 Cooperative Monitoring Program

Christian County is currently cooperating with both the MoDNR and other area MS4s and has established a regional monitoring program.

3.1.3.7 Additional or Modified Controls

If additional or modified controls are necessary the type and scope of controls will be determined by the results of the water quality monitoring program.

3.2 Duty to Comply

3.2.1 Christian County shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of Missouri Clean Water Law and is grounds for enforcement action; permit termination, revocation and reissuance, or modification; or for denial of a permit renewal.

Appendix A includes charts to show OEWR's monitoring data for the past five years. These analytical results help us to determine if waters are within the levels needed as well as if there are any dramatic changes that need to be investigated.

4.2 Six Minimum Control Measures:

4.2.1 Public Education and Outreach

4.2.1.1 Permit Requirement: *Christian County shall implement a public education program to distribute education materials to the community or conduct equivalent outreach activities about the impacts of stormwater discharge on water bodies and the steps the public can take to reduce pollution in stormwater runoff.*

4.2.1.1.1 Target Pollution Sources

Christian County's primary pollutant sources will include residential and commercial development.

4.2.1.1.2 Target Audiences of our education program that can have significant stormwater impacts

Our target audiences will be landowners, architects, engineers, real estate professionals, and contractors.

4.2.1.1.5 Outreach strategy including the type of media we intend to use to reach our target audience and how many people we expect to reach

Being a cooperative partner with other local jurisdictions as well as numerous not for profit organizations whose mission is focused on water quality. We are able to reach a much larger audience with this shared approach. We issue press releases to local newspapers and other local media outlets of these events and encourage their attendance in order to generate additional interest. We also utilize numerous types of printed brochures and flyers to be distributed at expos as well as in our planning office.

4.2.1.1.6 Evaluation of the success of this approach

By tracking attendance to these events as well as the number of educational materials that we distribute.

4.2.1.2 Decision Process

The decision process is documented in the ensuing paragraphs.

4.2.1.2.1 Plans to Inform Individuals & Households of Steps to Reduce Stormwater Pollution

Christian County has provided its citizens and business and property owners with stormwater education and outreach, through cooperative efforts between the Christian County Planning and Zoning Department, the Greene County Resource Management Department, the city of Nixa, the city of Ozark, the James River Basin Partnership (JRBP), the Watershed Committee of the Ozarks, the Christian County Soil and Water Conservation District (SWCD), the Natural Resources Conservation Service (NRCS) and the Ozarks Environmental and Water Resources Institute (OEWRI). All entities expect continued success as additional target audiences are identified and modifications to the current program are phased in.

The focus of these education efforts, both past and in the future, will be to educate the public concerning stormwater discharges and their relative impacts on storm water quality, as well as informing the public of measures they can take to reduce pollutants in storm water runoff. As stated earlier, the Christian County Planning and Zoning Department, has and will continue to work with the Greene County Resource Management Department, the city of Nixa, the city of Ozark, the James River Basin Partnership (JRBP), the Watershed Committee of the Ozarks, the Christian County Soil and Water Conservation District (SWCD), the Natural Resources Conservation Service (NRCS) and the Ozarks Environmental and Water Resources Institute (OEWRI) to provide a public education and outreach program to its citizens, businesses and property owners.

The Greene County Resource Management Department has provided workshops and training seminars to the employees of the Christian County Planning and Zoning Department.

Much of Christian County is considered a sensitive karst region. The north central and northwestern parts of the county have been classified by the MoDNR as a sensitive area for well construction due to the karst topography. This is also the area that falls directly under this regulated small municipal storm sewer system program. Due to these factors,

water quality protection has historically been of the utmost importance. In the early 1980's the Watershed Committee of the Ozarks was born out of the recommendation of a Springfield/Greene County Watershed Task Force. The Watershed Committee of the Ozarks is funded in part by Greene County and therefore the majority of its efforts take place in the County immediately to our north. But the Watershed Committee of the Ozarks has provided the Christian County Planning and Zoning staff with information and educational materials which are distributed to the public by the County staff and are used to educate and inform these members of the public about water quality issues.

As concerns over water quality in Table Rock Lake grew in the 1990's Christian County joined other counties and cities within the James River Watershed in the formation of the James River Basin Partnership. The James River Basin Partnership's mission is to implement programs that positively impact water quality and to increase citizen awareness and participation in water quality issues. These goals are accomplished through a variety of programs, grant projects and other initiatives. Some of the recent and current programs of the James River Basin Partnership include the following:

- 1. County Wide Watershed Festivals:** The Christian County Planning and Zoning Department works in conjunction with the James River Basin Partnership, the University of Missouri Extension, the Missouri Department of Conservation, the local NRCS Office and a number of other agencies and volunteers to offer a County Wide Watershed Festival to 5th grade students in school districts throughout Christian County. The watershed festivals reach over 1200 students, teachers and volunteer chaperons annually. Students participating in this half-day event have the opportunity to visit five interactive stations, each dealing with an aspect of water quality, watersheds, conservation, groundwater, and point/non-point pollution. Following the tour of the educational stations, the students are tested on the information presented. Post surveys completed by teachers indicated that 75% of the students gained new information.
- 2. Septic Pump-Out Program:** This is a cost share program where participants are offered a monetary incentive for participation in the pump-out program. The primary goal of this program is to prevent septic tank failures and impending water pollution. Through this

program each homeowner is also visited by a representative from the JRBP or the Table Rock Lake Inc. and given a packet of educational information. JRBP's "Get Pumped" program has helped to keep over a million gallons of effluent from ever reaching our waterways.

- 3. Rain Gardens Implementation:** The James River Basin Partnership has established a number of demonstration rain gardens throughout Greene and Christian Counties which encourage homeowners to install rain gardens as a means of reducing stormwater runoff and pollution, while also encouraging water conservation. Using funds from the Stormwater 319 grant awarded through the Missouri Department of Natural Resources, they worked with the Ozark Environmental Water Resource Institute (OEWRI) to study local effects of rain gardens. Partnering with residences in Park Hill Subdivision in Nixa. A monitoring station was placed to collect stormwater samples coming from the subdivision. Then 15 rain gardens were implemented and post data was collected.
- 4. Annual River Rescue:** Volunteers are organized for this annual James River clean-up and benefit concert. Information on water quality issues is also distributed at the benefit concert that follows the river clean-up.
- 5. Urban lawn-testing Program:** A JRBP representative collects a soil sample from the lawn participants. The soil sample is analyzed by a state soil testing laboratory. The JRBP staff along with the NRCS prepares an urban fertilizer plan for their yard based on a soil test. All residents of the James River Basin are eligible for this program.

The Christian County Soil and Water Conservation District (SWCD) has been involved in a number of stormwater education and outreach efforts throughout the County. The Christian County Soil and Water Conservation District (SWCD) is a board of vested stakeholders who provide leadership for environmentally sound stewardship of natural resources in the county with the goals of promoting voluntary participation of landowners and citizens in District programs by informing, educating and motivating them to use land and water in ways that will insure supplies of these resources for the future.

- 1. Ground Water Demonstrations:** The Information-Education Specialist with the Christian County Soil and Water Conservation District has used a Ground Water Flow Model purchased from Iowa

State University to complete a number of stormwater demonstrations in elementary and middle school classrooms throughout the County.

The Environmental Division of the Christian County Health Department conducts training seminars every two months for on-site wastewater installers, for whom certification is required to do work in the County.

Each of the organizations mentioned above plays an active and effective role in public education and outreach, providing a strong framework of existing initiatives for this required minimum control measure.

Besides being directly involved with many of the efforts listed above the Christian County Planning and Zoning staff have been active in public education and outreach activities. It is our intent to continue to form a working relationship with our local school districts in order to provide educational handouts and classroom activities to promote stormwater and environmental impact education. Some of the recent, on-going and planned programs of the Christian County Planning and Zoning Department include the following:

- 1. County Wide Watershed Festivals:** The Christian County Planning and Zoning Department works in conjunction with the James River Basin Partnership, the University of Missouri Extension, the Missouri Department of Conservation, the local NRCS Office and a number of other agencies and volunteers to offer a County Wide Watershed Festival to 5th grade students in school districts throughout Christian County. The watershed festivals reach over 1200 students, teachers and volunteer chaperons annually. Students participating in this half-day event have the opportunity to visit five interactive stations, each dealing with an aspect of water quality, watersheds, conservation, groundwater, and point/non-point pollution. Following the tour of the educational stations, the students are tested on the information presented. Post surveys completed by teachers indicated that 75% of the students gained new information.
- 2. Informational Guides:** BMP informational guides developed by the MoDNR, the EPA, the Watershed Committee of the Ozarks, the James River Basin Partnership, the Christian County Soil and Water Conservation District, the NRCS, and other entities are provided to

developers, builders, and the general public throughout the subdivision and building process.

3. **Stormwater and Erosion Control Seminars:** The Christian County Planning and Zoning Staff in conjunction with other area MS4's have been active in attending several Stormwater and Erosion Control seminars, as well as inviting local contractors and developers to these functions.

The County plans to continue and expand upon all of these efforts to both meet the requirements of the permit and improve the quality of the area's water resources.

4.2.1.2.2 Plans to Inform Individuals & Groups on Becoming Involved in the Stormwater Program

The programs mentioned above such as the JRBP's annual River Rescue and the Christian County SWCD's ground water demonstrations will help to fulfill this permit requirement.

4.2.1.2.3 Target Audiences

The target audience for our stormwater education program is very diverse. The Planning and Zoning Department will continue to train contractors and builders on soil and erosion control regulation and installation. The Planning and Zoning Staff works directly in conjunction with the James River Basin Partnership, the University of Missouri Extension, the City of Branson, the Missouri Department of Conservation, the NRCS and a number of other agencies to put on a County-Wide Watershed Festival for 5th grade students throughout the County. Through this Watershed Festival school age children are taught about the need to protect water quality, since they will be managing stormwater in the future. By providing education to children, homeowners, developers, engineers, and contractors we hope to improve the quality of not just stormwater but all of our water resources.

4.2.1.2.4 Target Pollutant Sources

All of the above organizations and programs are aimed at reducing sediment and nutrients in surface and groundwater.

4.2.1.2.5 Outreach Strategy

These programs utilize brochures, pamphlets, educational workshops, speaking presentations, and media advertisements to get the message out to the public. The JRBP's County-Wide Watershed Festivals reach thousands of students, teachers and volunteer chaperons. The County Health Department has also reached nearly every septic installer in the county.

4.2.1.2.6 Responsible Parties

The Christian County Planning and Zoning Department is responsible for the management and implementation of the stormwater program. Although the Planning and Zoning Department is ultimately responsible for the management and implementation of this program, we must work in cooperation with several of other entities in order to effectively implement a number of the activities and programs. The Planning and Zoning department will continue to work with Greene County, the City of Nixa, the City of Ozark, the James River Basin Partnership, the Watershed Committee of the Ozarks, the Christian County Soil and Water Conservation District, the local NRCS Office, the Ozarks Environmental and Water Resources Institute (OEWR) and others in order to attain the best management program possible.

4.2.1.2.7 Evaluation

The best measurable goal for the Public Outreach and Education Control Measure is to document the number of people reached by the education program.

The Watershed Committee of the Ozarks has begun keeping track of the number of attendees at each educational program (see Appendix A).

The Christian County Health Department currently keeps an up-to-date list of state and county certified on-site wastewater installers. The Health Department also documents the number of installers trained per year.

The JRBP also hosts the County Wide Watershed Festival. The JRBP documents the number of students, teachers, and volunteer chaperones this festival includes. Last year, the number it reached was over 1,200 participants.

4.2.2 Public Involvement/Participation

4.2.2.1 Permit requirement: *Christian County shall implement a public involvement/participation program that complies with State and local public notice requirements.*

4.2.2.2 Decision Process

The decision process is documented in the ensuing paragraphs.

4.2.2.2.1 Public Involvement in the Development of the Stormwater Program

All development which takes place within the unincorporated areas within Christian County must meet the required regulations of the Christian County Zoning Regulations and the Christian County Stormwater and Erosion Control Regulations. Both the Zoning Regulations and the Stormwater and Erosion Control Regulations were adopted on July 8, 2010 and became effective on August 9, 2010. This replaced our previous regulations, the Unified Development Codes (UDC). Under the UDC, the Stormwater and Erosion control regulation were a section of that document. With the adoption of these new regulations, it is now its own separate document.

The annual budget has and will continue to include a line item for Phase II Stormwater Management implementation. The budget is considered and adopted by the Christian County Commission. The budget is reviewed in public hearings which are open for public comment and review. A copy of the budget can be obtained from the Christian County Commission Office, 100 West Church Street, Ozark, Missouri 65721. (A copy of the 2007 Christian County Planning and Zoning Department Budget can be found in Appendix I. The 2008 budget is under consideration by the Christian County Commission at this time.)

On August 7, 2007, the voters of Christian County approved County Wide Building Codes. The County has adopted the 2006 International Building Codes. The County Commission has appointed a Building Commission. County-wide Building Codes went into effect in 2008, in which all new construction will be inspected after a specific effective date. A Building Regulations Department was also formed in 2008 and

works jointly with the Planning and Zoning Department to ensure that specific requirements relating to stormwater are met including both pre and post-construction stormwater management.

4.2.2.2.2 Plan for Continued Public Involvement in the Development and Implementation of the Program

As Christian County continuously works to improve its Stormwater Management Program the Stormwater & Erosion Control Regulations will require modifications. These future revisions will be held to the same high standards of public notice and input. Any revisions to the Stormwater & Erosion Control Regulations, the Building Codes or any other County regulations will be submitted to the general public, the local engineering community and the local development and building community.

4.2.2.2.3 Target Audiences

Christian County has attempted to identify and target as many stakeholder groups as possible, for involvement in the overall stormwater management program and any modifications that are made to it. The primary target audiences involved in the program are:

- *Citizens*
- *Engineers*
- *Builders/Developers*
- *Students*
- *Business Leaders*
- *Watershed Partnership Groups*
- *Local Government Officials*
- *Missouri State University (OEWRI)*
- *Environmental and Conservation Groups*
- *Mass Media*

4.2.2.2.4 Types of Public Involvement Activities

A number of different types of activities have been used to involve the target audiences listed above.

The James River Basin Partnership (JRBP) has conducted a series of stakeholder meetings with citizens residing within each of the James River's six sub-watersheds. These stakeholder meetings are designed to collect citizens input concerning the development of a watershed

management plan for each of the six sub-watersheds. These six management plans have been combined in order to create a basin wide watershed management plan. A draft plan has been submitted to the Missouri DNR. The action plans of many of the sub-basin plans have focused on stormwater related issues.

The JRBP also conducts an annual James River clean-up and benefit concert.

The JRBP is also responsible for promoting the use of rain barrels, septic tank pumping initiatives, urban lawn testing and other demonstration projects which help to involve the citizens directly in the protection of our ground and surface water resources.

The Christian County Soil and Water Conservation District has also conducted a series of stakeholder meetings with citizens residing within the Finley River Watershed. These stakeholder meetings were designed to collect citizens input concerning the development of a watershed management plan. As with the JRBP, the action plans have focused on a number of stormwater related issues.

4.2.2.2.5 Parties Responsible

The Christian County Planning and Zoning Department is responsible for the management and implementation of the stormwater program. Although the Planning and Zoning Department is ultimately responsible for the management and implementation of this program, we must work in consultation with several of other entities in order to effectively implement a number of the activities and programs. The Planning and Zoning department will continue to work with Greene County, the City of Nixa, the City of Ozark, the James River Basin Partnership, the Watershed Committee of the Ozarks, the Christian County Soil and Water Conservation District, the South Missouri Water Quality Project of the NRCS, the Ozarks Environmental and Water Resources Institute (OEWRI) and others in order to attain the best management program possible.

4.2.2.2.6 Evaluation

Through the combined efforts of Christian County, the James River Basin Partnership, the Christian County Soil and Water Conservation District and a number of other groups this program complies with state and local public notice requirements. The Christian County Planning and Zoning Department will strive to involve all of the identified target groups in the various aspects of this Stormwater Management Plan.

4.2.3 Illicit Discharge Detection and Elimination

4.2.3.1 Permit Requirement: *Christian County shall develop, implement and enforce a program to detect and eliminate illicit discharges (as defined in 10 CSR 20-6.200) into Christian County's regulated small MS4;*

4.2.3.1.1 Illicit Discharge Program

Christian County adopted an Illicit Discharge Ordinance on October 31, 2011 which will be included as Appendix B of the Christian County Stormwater and Erosion Control Regulations.

4.2.3.1.2 Storm Sewer System Map

Christian County has no storm water system per se. The County has developed a map showing the location of outlets of storm systems from the City of Nixa and the City of Ozark which are located within the regulated MS4 as well as the major outfalls for streams and tributaries in the unregulated parts of the county. This map also contains the locations and names of all waters of the State that receive discharges from these outlets. This map has been incorporated into Christian County's GIS system and can be found in the front pocket of the MS4 Stormwater Plan.

4.2.3.1.3 Regulatory Mechanisms Prohibiting Illicit Discharge

Our Illicit Discharge Ordinance, adopted in 2011, as well as the Christian County Building Codes (2006 International Building Codes) address this issue. These regulations include requirements for discharges and connections which are permitted and prohibited to the storm drainage system or to surface waters, as well as enforcement and penalty provisions for violations. The Christian County Health Department has adopted regulations for on-site septic systems.

4.2.3.1.4 Illicit Discharge Detection

Reported actions are inspected by the Code Enforcement/Environmental Officer and remedies are sought by compliance or other actions. Illegal dumping complaints are investigated by the Christian County Sheriff's Department, the Christian County Health Department or the MoDNR. The County Emergency Management Office is involved with hazardous or suspicious materials. The county also works with neighboring jurisdictions to be on the lookout for sources of Illicit Discharge.

4.2.3.1.5 Informing the Public

Septic system installers must obtain a biennial certification from the Christian County Health Department. A written examination is required for certification. The Health Department provides certification training classes for on-site wastewater system installers.

4.2.3.1.6 Non-significant Contributors

None of the following discharges are known to be a significant contributor of pollutants to Christian County's MS4:

- *Landscape irrigation or rising groundwater*
- *Uncontaminated groundwater infiltration (as defined in 10 CSR 20-6.200)*
- *Uncontaminated pumped groundwater*
- *Discharges from potable water sources including waterline flushing and fire hydrant testing, foundation drains and air conditioning condensation*
- *Springs*
- *Water from crawl space pumps*
- *Footing drains*
- *Lawn watering*
- *Flows from riparian habitats and wetlands*
- *Street wash water*

4.2.3.1.7 Other Non-significant Contributors

At this time Christian County has not yet addressed any occasional incidental non-stormwater discharges.

4.2.3.2 Decision Process

The decision process is documented in the both the previous and ensuing paragraphs.

4.2.3.2.1 Development of a Storm Sewer Map

Christian County has no storm sewer systems per se but the Planning and Zoning Staff have completed a map showing outfalls coming into the County from the cities of Nixa and Ozark along with the major stream outfalls leaving the County's boundary. (A copy of the map has been provided in the front pocket of this MS4 Stormwater Permit.)

4.2.3.2.2 Regulatory Mechanism

Reported violations are inspected by the County's Environmental Inspector. Subsequent penalties for violations are included in the County's Illicit Discharge Ordinance.

4.2.3.2.3 Implementation of Illicit Discharge Regulatory Mechanism

Currently, reported actions are inspected by our Environmental Inspector and remedies are sought by compliance with the County's Illicit Discharge Ordinance. The penalties for violations are specified in the ordinance.

4.2.3.2.4 Plan to Detect and Address Illicit Discharges

At present, Christian County does not have sufficient staff to perform dry weather screening of major outfalls.

4.2.3.2.5 Public Information

This requirement is addressed by several JRBP and WCO programs that include discussions of no-point sources of stormwater pollution. We will develop programs to inform County employees of the hazards associated with illegal discharges and improper waste disposal.

4.2.3.2.6 Parties Responsible

The Christian County Planning and Zoning Department is responsible for the management and implementation of the stormwater program. Although the Planning and Zoning Department is ultimately responsible for the management and implementation of this program, we must work in consultation with several of other entities in order to effectively implement a number of the activities and programs.

4.2.3.2.7 Evaluation

One of the best current measures of success are the numbers of sanitary sewer permits issued and the on-site wastewater system inspections conducted by the Environmental Division of the Christian County Health Department. Other measures of success include the number of wastewater and solid waste complaints that are successfully resolved and the number of filing septic systems that are successfully repaired annually.

4.2.4 Construction Site Stormwater Runoff Control

4.2.4.1 Permit Requirement: *Christian County shall develop, implement, and enforce a program to reduce pollutants in any storm water runoff to their regulated small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of storm water discharges from construction activity disturbing less than one acre shall be included in the program if that construction activity would disturb one acre or more. The County's program shall include the development and implementation of, at a minimum:*

4.2.4.1.1 Regulatory Mechanism – Erosion and Sediment Controls

On July 8, 2010, Christian County adopted the Stormwater and Erosion Control Regulations originally adopted as Chapter 19 of the Unified Development Codes. These regulations apply to all non-agricultural land disturbance of over one acre. At this time, there are no regulations for a development disturbing a land area of under one acre (43, 560 Sq. feet) unless it is deemed necessary due to topographic considerations. These regulations deal in great detail with issues concerning both stormwater quantity and quality and became effective on August 9, 2010. In order to obtain a Soil and Erosion Control Permit through the County, the applicant must provide a sediment and erosion control plan that must be prepared by and bear the seal of an engineer, land surveyor, architect, landscape architect or geologist registered to practice in the state of Missouri or by a Certified Professional in Erosion and Sediment Control (CPESC).

Christian County has a locally approved program for construction site runoff control under a general permit from the Missouri Department of Natural Resources. Any land disturbance activity disturbing more than one acre requires a land disturbance permit from the Missouri DNR as well a Christian County Soil and Erosion Control permit. Construction site stormwater runoff control is administered and enforced by the Christian County Planning and Zoning Department. This department consists of five employees: The administrator, one senior planner, one administrative clerk, one secretary, and one code enforcement/stormwater inspector.

4.2.4.1.2 Requirements - Implementation of Best Management Practices

Prior to issuance of a County soil and erosion control permit the applicant/developer must first submit an engineering plan which is reviewed by both county personnel and Great River Engineering (The County's contract engineer).

4.2.4.1.3 Requirements for Other Construction Site Wastes

Construction site operators are required to follow the SWPPP regulations to control other wastes. Wastes required to be controlled include discarded building materials, concrete truck washouts, chemicals, litter and sanitary waste.

4.2.4.1.4 Site Plan Review

All site plans are reviewed for approval by the Planning and Zoning Administrator and/or the Senior Planner. The soil and erosion control plan is reviewed by the Planning and Zoning Administrator and/or the Senior Planner in direct consultation with the County Engineer (Great River Engineering). See the Stormwater and Erosion Control Draft in Appendix E for submittal and review procedures.

4.2.4.1.5 Receipt and Consideration of Public Information

All new commercial land use requests or major subdivisions (subdividing a tract of land into over 3 lots) must be presented through a series of public hearings before the Christian County Planning and Zoning Commission. All neighboring property owners within 1000 feet of the proposed development are contacted first by a regular mailing, prior to the Pre-application Conference and later by a certified mailing prior to the first Public Hearing before the Planning and Zoning Commission. These Public Hearings are also advertised in the local paper and are posted on-site 15 days prior to the public hearing. All of these notice requirements are per Missouri State Statutes governing public hearings. These hearings are a forum for the public to provide any relevant information for any and all proposed developments.

4.2.4.1.6 Procedures for Site Inspection and Enforcement

All land disturbance sites are inspected on a regular basis by the Code Enforcement/ Environmental Inspector as a part of their required job duties.

4.2.4.2 Decision Process

As stated earlier, on April 29, 1996, Christian County adopted a Soil and Erosion Control Section to the Unified Development Codes (Chapter 19). On July 8, 2010, Christian County adopted the Stormwater and Erosion Control Regulations originally adopted as Chapter 19 of the Unified Development Codes. These regulations apply to all non-agricultural land disturbance of over one acre. At this time, there are no regulations for a development disturbing a land area of under one acre (43, 560 Sq. feet) unless it is deemed necessary due to topographic considerations. These regulations deal in great detail with issues concerning both stormwater quantity and quality and became effective on August 9, 2010. In order to obtain a Soil and Erosion Control Permit through the County, the applicant must provide a sediment and erosion control plan that must be prepared by and bear the seal of an engineer, land surveyor, architect, landscape architect or geologist registered to practice in the state of Missouri or by a Certified Professional in Erosion and Sediment Control (CPESC).

4.2.4.2.1 Regulatory Mechanism Requiring Erosion and Sediment Controls

The Stormwater and Erosion Control Regulations require sediment and erosion controls as applicable at construction sites. These can be found in Appendix E.

4.2.4.2.2 Plan to Ensure Compliance Including Enforcement

Inspection requirements and penalties for violation are found in the Stormwater and Erosion Control Regulations.

4.2.4.2.3 Requirements for Construction Site Operators

Construction site operators must follow the requirements of the SWPPP as mandated by the United States Environmental Protection Agency.

4.2.4.2.4 Consideration of Potential Water Quality Impacts During Site Plan Review

As previously stated, all site plans are reviewed for approval by the Planning and Zoning Administrator and/or the Senior Planner. The soil and erosion

control plan is reviewed by the Planning and Zoning Administrator and/or the Senior Planner in direct consultation with the County Engineer (Great River Engineering). See Appendix D for current submittal and review procedures and Appendix E for the Stormwater and Erosion Control Regulations.

4.2.4.2.5 Procedures for Receipt and Consideration of Public Information

As required by Chapter 64 of the Missouri Revised Statutes, the Christian County Planning and Zoning Commission is required to hold public hearings when considering commercial land use requests or major subdivisions (subdividing a tract of land into over 3 lots). See the procedure described above in Section 4.2.4.1.5.

4.2.4.2.6 Procedures & Requirements for Site Inspections

The procedures and requirements for site inspections by the Christian County Staff are set forth in the Stormwater and Erosion Control Regulations. The Code Enforcement Officer/Environmental Inspector conducts inspections of sediment and erosion control measures. In addition, construction site operators are required under the requirements of the MoDNR issued land disturbance permit to perform weekly and post rainfall self-inspections of erosion control measures.

4.2.4.2.7 Parties Responsible

The Christian County Planning and Zoning Department is responsible for the management and implementation of the stormwater program. Although the Planning and Zoning Department is ultimately responsible for the management and implementation of this program, we must work in consultation with several of other entities in order to effectively implement a number of the activities and programs.

4.2.4.2.8 Evaluation

The success of this minimum control measure can be evaluated in part by the number of County soil and erosion control permits issued per year and the number of those sites that require a MoDNR land disturbance permits. But success can also be measured by the number of inspections that have been completed by the county staff through the year and the number of soil and erosion control permits that are successfully closed.

The following actions will be needed:

- Develop and formalize reporting procedures.
- Define measurable goals for the BMPs.
- Coordinate requirements with the TMDLs established for the James River.

4.2.5 Post Construction Stormwater Management

4.2.5.1.1 Permit Requirement: Christian County shall develop, implement and enforce a program to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development of sale, that discharge into the Christian County's small MS4. The County's program shall ensue that controls are in place that would prevent or minimize water quality impacts;

4.2.5.1.2 Development and Implementation Strategies

In the past, Christian County's regulations and requirements traditionally focused primarily on temporary stormwater management BMP's for construction sites. With the adoption of the Stormwater and Erosion Control Regulations the County also plans for the design, construction, operation and maintenance of permanent stormwater management facilities.

Christian County being in a highly sensitive geological area has been the site of several recent studies on water run off and water quality. The Ozarks Environmental and Water Resources Institute (OEWRI) through Missouri State University and some members of the Watershed Committee of the Ozarks are and have been working in our County and are providing information in these areas.

Christian County will develop and implement strategies, which include a combination of structural and non-structural BMP's. We have adopted the following definitions of non-structural and structural BMP's:

Non-structural BMP's include practices which affect stormwater quality by activities and requirements which do not include construction of stormwater facilities per se. Examples of non-structural BMP's are public education, standards for land use planning and design, etc.

Structural BMPs are those which result in the actual construction of a stormwater management facility. Permanent structural BMPs include extended detention basins, bioswales, vegetative filter strips, sand filters, etc. Structural BMP's may be "hard" (a concrete sand filter chamber, for example) or "soft" (bio-swale, vegetative filter strip) depending upon their design and application.

4.2.5.1.3 Mechanism for Addressing Post-Construction Runoff

As of 2008, all new developments in Christian County will be required to provide stormwater detention to limit post-construction peak discharges to the pre-construction rate or lower as a part of the Stormwater and Erosion Control Regulations. (Appendix E)

4.2.5.1.4 Operation and Maintenance of Best Management Practices

At present the County only provides operation and maintenance for permanent stormwater facilities located on County road right-of-way. Operation and maintenance for permanent stormwater facilities located on private property are the responsibility of the property owner. For commonly owned private facilities, the Zoning Regulations include requirements for the formation of either home owners' or property owners' association and mandatory collection of dues to provide for operation and maintenance of stormwater facilities. Covenants including the formation of the association must be provided to the Planning and Zoning department prior to even being placed on the Planning and Zoning Commission Agenda. All permanent BMP's are required to be located within one single lot where maintenance is the property owner's responsibility, or in dedicated common space where maintenance is the responsibility of the homeowner's association. The Stormwater and Erosion Control Regulations address permanent BMP operation and maintenance (Appendix D).

To more adequately address the long term operation and maintenance of permanent stormwater BMP's Christian County is investigating long term funding options to enable the County to play a greater role in stormwater system maintenance.

4.2.5.1.5.1 Policies which direct growth to identify areas and to protect sensitive areas

Our floodplain ordinance does not allow development in the 100 year floodplain, our stormwater regulations address setbacks and protection of streams, sinkholes, caves, springs, faults and fracture trends, and wetlands.

4.2.5.1.5.2 Polices that encourage development in higher density areas with sewer infrastructure

We have an Urban Service Agreement with Nixa and Ozark, our two largest cities. This encourages development within these areas, providing sanitary sewer services.

4.2.5.1.5.4 Policies to minimize impervious surface area

Maximum impervious surface is addressed in the Stormwater regulations and the use of grass swales, vegetative filter strips, or other Best Management Practices are encouraged. Also preservation of open space is encouraged by the PUD zoning classification.

4.2.5.1.6.1 Practices that provide or re-use such as grass swales

Addressed in Stormwater Regulations, also our Building Regulations address and allow the use of green roofs and other green building methods.

4.2.5.2 Decision Process

The decision process is documented in both the previous and ensuing paragraphs.

4.2.5.2.1 Discharge Requirement for Stormwater Detention

As stated above all new developments in Christian County are required in the Stormwater and Erosion Control Regulations to provide stormwater detention to limit post-construction peak discharges to the pre-construction rate or lower.

4.2.5.2.2 Tailoring the Program

As of 2008, all new developments in Christian County will be required to provide stormwater detention volume for the 100 year storm event with discharge rates of all required frequencies (2, 10, and 100 year) not to exceed the pre-developed conditions.

4.2.5.2.3 Non-Structural Best Management Practices

Christian County has adopted a number of regulations and policies which are very effective non-structural BMP's with regard to water quality protection.

These include:

- Comprehensive Plan (Appendix E)
 - Sets the goals of the County including general environmental and water quality policies.
- Zoning Regulations (Appendix C)
- Urban Services Area Agreement (Appendix C)
 - Encourages urban level growth near established infrastructure.
- Floodplain Management Regulations: (Appendix D)
 - Regulates all development within a FEMA Floodplain area.
- Stormwater and Erosion Control Regulations (Appendix D)
 - Sets specific standards for stormwater system design and erosion control.

4.2.5.2.3.1 Policies and Ordinances that Direct Growth

Currently, high density development is allowed only in areas that can be served by both municipal sewer and water services. In order for an application to even be placed on the Planning and Zoning Commission Agenda a high density development must connect to municipal services. Only lots greater than 3 acres are allowed to have on-site waste water systems. This greatly encourages centralized growth around already urbanized areas where sanitary sewer can be easily extended. Christian County is in the process of enacting an Urban Service Area Policy which would require all developments that are contiguous to the city and within 300 feet of municipal services to begin annexation procedures with the city in question. All developments within the Urban Service Area of a municipality but outside of the 300 foot service requirement would receive a negative score in the scoring process when seeking approval before the County Planning and Zoning Commission. This plan has already undergone public hearings and a vote by the Planning and Zoning Commission and must now be voted on by the County Commission at a public hearing.

4.2.5.2.3.2 Policies or Ordinances that Encourage Infill Development

See the proposed Urban Service Area Policy and the Zoning Regulations (Appendix F and D respectively). Both mechanisms help to limit high density growth to areas close to existing infrastructure.

4.2.5.2.3.3 Education Programs Concerning Project Design

The James River Basin Partnership has established a number of demonstration rain gardens throughout Greene and Christian Counties which will encourage homeowners to install rain gardens as a means of reducing stormwater runoff and pollution, while also encouraging water conservation. The JRBP has recently implemented a demonstration rain garden at the 4-H building in Ozark and plans to implement a series of 16 rain gardens in a Nixa subdivision. This Nixa subdivision project will involve the monitoring of the reduction of stormwater with automatic samplers.

The water retention area at the Common One District contains a vegetative filtering system which was designed by the County Engineer to remove a number of pollutants through the use of cattails and other plants that remove pollutants from the stormwater runoff. The County will have to investigate sources of funding

4.2.5.2.3.4 Other Measures

Specific standards for development in sinkhole areas and around karst features are a part of the Stormwater and Erosion Control Regulations (see Appendix E).

An issue that we feel needs to be addressed is the stability of stream channels in urban and urbanizing areas. We feel that urban stream channel erosion is likely a significant contributor to water quality impairment.

4.2.5.2.4 Structural BMPs

4.2.5.2.4.1 Storage Practices

The soils in Christian County are generally not suited for standard bioretention cells and sand filters. However, in the sediment and erosion control plan review process engineers and designers are required to leave existing grass and vegetation undisturbed wherever possible as a means of erosion and sediment control.

4.2.5.2.4.2 & .3 Filtration and Infiltration Practices

Christian County currently allows Low Impact Development but the County has yet to be directly involved in an LID development.

4.2.5.2.5 Non-Structural BMPs

As mentioned above Christian County already has several ordinances and policies in place to reduce post-construction runoff.

- Comprehensive Plan (Appendix E)
- Zoning Regulations(Appendix C)
- Urban Services Area Agreement (Appendix C)
- Floodplain Management Regulations (Appendix D)
- Stormwater & Erosion Control Regulations (Appendix D)

4.2.5.2.6 Long-Term Operation and Maintenance of BMPs

At present the County only provides operation and maintenance for permanent stormwater facilities located on County road right-of-way. Operation and maintenance for permanent stormwater facilities located on private property are the responsibility of the property owner. For commonly owned private facilities, the Zoning Regulations include requirements for the formation of either home owners' or property owners' association and mandatory collection of dues to provide for operation and maintenance of stormwater systems. Covenants including the formation of the association must be presented to the Planning and Zoning Department before the application is even allowed to be placed on the Planning and Zoning Commission agenda. (Appendix C) The Stormwater and Erosion Control Regulations address permanent BMP operation and maintenance. (Appendix D)

The County does not presently have sufficient staff to monitor maintenance activities by private property owners. Staffing needs to effectively address this requirement. Minimum maintenance requirements will need to be drafted and adopted. An inventory of privately owned storm drainage facilities will need to be made and a schedule of maintenance developed. The provision of operation and maintenance drainage facilities off of County road right-of-way is permitted by State Statute. However, the County does not currently have the financial or staffing resources to provide this service. This is a significant issue and will require community input and discussion. If this service is provided by the County a source of additional revenue will be needed. Christian County is also investigating long term funding options to enable the County to play a larger role in stormwater system maintenance.

4.2.5.2.7 Parties Responsible

The Christian County Planning and Zoning Department is responsible for the management and implementation of the stormwater program. Although the Planning and Zoning Department is ultimately responsible for the management and implementation of this program, we must work in consultation with several of other entities in order to effectively implement a number of the activities and programs. The Planning and Zoning department will continue to work with other Federal, State and local jurisdictions.

4.2.5.2.8 Evaluation

The success of this minimum control measure can be evaluated in part by ensuring that new development meets the requirements for detention and retention areas as stated in the Stormwater and Erosion Control Regulations. The staff will have to evaluate the success of each structural BMP on its effects on water quantity and quality on an individual basis.

4.2.6 Pollution Prevention/Good Housekeeping for Municipal Operations

4.2.6.1.1 Permit Requirement: Christian County shall Develop and implement an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations;

“Municipal” operations for Christian County include:

The Christian County Road Department is split into two separate road districts, Common District One and Common District Two, along with six special road districts which operate and maintain all public roads, including the storm drainage system contained within the public road right-of-way.

Special Road Districts

Ozark Special

Sparta Special

Billings Special

Garrison Special

Selmore Special

Stoneshire Special

Common Road Districts

Common District One

Common District Two

Only Common District One, Common District Two and the Ozark Special Road District fall within the Springfield urbanized area as determined by the latest Decennial Census. The remaining special road districts are very small in size, are located in rural areas of the County and have limited equipment and funding. The County Road Department operations are located near Sparta (Common District One), near Nixa (Common District Two) and within the City limits of Ozark (Ozark Special Road District). Each Road District provides for its own routine upkeep and maintenance. The upkeep and maintenance for all other County vehicles is contracted out to a licensed service provider.

Both the Common Road Districts and the Planning and Zoning Department are under the direct control of the Christian County Commission. The Special Road Districts have been given their own authority and tax funding

sources by Missouri State Statutes. Christian County does not own or operate any other facilities or services.

4.2.6.1.2 Training

The staff of the Christian County Planning and Zoning Department holds an annual training session with the employees of the County's two Common Road Districts.

4.2.6.2 Decision Process

The decision process is documented in the previous and ensuing paragraphs.

4.3.6.2.1 Operation & Maintenance Program to Prevent or Reduce Pollutant Runoff from "Municipal" Operations

The County Road Districts presently manage the following programs for operation and maintenance:

Salt Storage

The Christian County Road Department presently utilizes two enclosed salt storage facilities, one located near Sparta (Common District One) and the other near Nixa (Common District Two). The enclosed salt storage facility for the Ozark Special Road District is located within the City of Ozark. Even though they are enclosed, any runoff leaving the area will flow into the detention basins lined with 6 x 10 filter stone and located at each site.

Equipment Washing

Both, trucks and other heavy equipment are washed at each of the Road District complexes. Products such as EC-510 Citrus Solvent are utilized in place of petroleum or chlorinated solvent products. The County is currently in the process of designing a sediment trap and trash baffle system which would treat the wash water before it is released into a detention basin. The Common District One detention area also contains a vegetative treatment system which was designed by the County Engineer.

Shop Activity

Used motor oil is stored in waste oil barrels. These barrels are transported to the Christian County Recycling Center, where a licensed contract vendor transports the used oil barrels to an approved facility for recycling and disposes of used oil filters. A licensed contracted service provider is responsible for changing the anti-freeze in the heavy equipment tires. Anti-

freeze which is used in heavy equipment tires for weight is of the R/V environmental type.

Fuel Storage Facility

The Common District One near Sparta currently operates a fuel storage facility which meets the 1998 EPA FRP Clad Steel Storage UST (underground storage tanks) requirement. This fuel storage facility services only the trucks and large equipment used by the Common District One. All other fuel needs for all other County owned vehicles are provided by commercial establishments, through the use of gas cards.

Herbicide Program

The two Common Road Districts and the Ozark Special Road District each currently have a certified herbicide applicator. The program utilizes GLY-4 as the primary herbicide. This herbicide is stored in small (10 gallon) EPA approved containers. All containers are triple rinsed and disposed of as prescribed by labeling. Chemicals are applied per labeling direction. Chemicals are stored in a secure area located within each Road District Facility.

County Road and Special Projects

Environmental Concerns are dealt with through preliminary plan and monitored through all phases of construction.

Surface Water

Each of the Common Road District Complexes has its 6x10 stone filter retention areas which were designed by the County Engineer. The water retention area at the Common One District also contains a vegetative filtering system.

4.2.6.2.2 Government Employee Training Program

Currently the Foreman for each Road District is responsible for the training of Road District employees in the safe handling, storage, and disposal of materials such as salt and fuel. As stated earlier, the staff of the Christian County Planning and Zoning Department holds an annual training session with the employees of the County's two Common Road Districts.

4.2.6.2.3.1 Maintenance Activities, Maintenance Schedules & Long-Term Inspection

The County will need to develop procedures for routine maintenance and inspection to prevent floatables and other pollutants.

4.2.6.2.3.2 Controls for Reducing or Eliminating the Discharge of Pollutants

As stated above, all salt and sand storage facilities are enclosed from the weather. Any runoff with entrained pollutants is captured in each of the detention basins located at each facility.

4.2.6.2.3.3 Procedures for Proper Disposal of Waste

All debris, sediment, and floatables are disposed of in accordance with state law. These disposal procedures will be formalized.

4.2.6.2.3.4 Procedures to Ensure Assessment of Flood Management Projects for Water Quality Impacts

All flood management projects are reviewed by the County stormwater engineer (Great River Engineering) to ensure consideration of water quality impacts.

4.2.6.2.4 Parties Responsible

The Christian County Planning and Zoning Department is responsible for the management and implementation of the stormwater program. Although the Planning and Zoning Department is ultimately responsible for the management and implementation of this program, we must work in consultation with the Common Road Districts, the Special Road Districts and other entities in order to attain the best management program possible. The Planning and Zoning department will also continue to work with other Federal, State and local jurisdictions.

In order to comply with this requirement we need to:

- Inventory stormwater facilities on public road right-of-way.
- Develop a routine maintenance schedule for maintenance activities related to stormwater quality.
- Formalize documentation and schedule for employee training.

4.2.6.2.5 Measurable Goals and Evaluation

The County Road Department has further set the following goals:

- Training annually for employees on environmental awareness issues (re-engineering or in place modifications)

Although the each Road Foreman of each District provides training in the following areas the County needs to incorporate more emphasis on stormwater pollution prevention during training. We need to document and formalize training for County employees, including training in the following specific areas:

- Routine inspection of equipment yards, material storage facilities, and stormwater facilities.
- Procedures for storage, handling, application and disposal of herbicides and pesticides.
- Spill response and clean-up.
- Salt storage and application.
- Used oil recycling.
- Truck and large equipment maintenance procedures (Other County Vehicles are maintained by a contracted service provider).

4.3 Sharing Responsibility

As noted in the foregoing sections, most of the activities included in Public Education and Outreach and Public Involvement and Participation are funded jointly by Christian County, Greene County, the City of Springfield, the City of Nixa, the City of Ozark, and other agencies.

4.4 Reviewing and Updating Stormwater Management Program

The plan will be reviewed and updated annually in conjunction with preparation for the annual report in accordance with the procedures outlined in the Missouri State Operating Permit.

5 Monitoring, Record Keeping and Reporting

5.1 Monitoring Requirement; Christian County shall evaluate program compliance, the appropriateness of identified best management practices, and progress toward achieving identified measurable goals. If Christian County discharges to a water for which a TMDL has been approved, Christian County will have additional monitoring requirements under Section 3.1.3.6.

5.1.2 Monitoring

Christian County along with the surrounding MS4s developed a comprehensive regional water monitoring program with OEWR. The sampling techniques comply with the requirements of this permit.

5.2 Record Keeping

Records of all permits and inspection reports are kept on file for the requisite time period in the offices of the Christian County Planning and Zoning Department and are available for public inspection upon request during normal business hours.

Copies of the general permit are kept on file and will be available for inspection by the public as required in the general permit.

5.3 Reporting

Annual reports will be submitted as required.

The annual report is prepared and submitted to the Director of the Department of Natural Resources by July 28th of each calendar year. In accordance with the requirements of the general permit the annual report contains the following:

- Status of compliance with permit conditions.
- Assessment of the appropriateness of identified best management Practices.
- Progress toward achieving measurable goals for each of the six minimum control measures.
- Progress toward the statutory goal of reducing the discharge of pollutants to the maximum extent practicable.

- Results of information collected and analyzed including monitoring data, if any.
- A summary of stormwater activities which are plan during the next reporting cycle, including an implementation schedule
- Any changes in identified measurable goals that apply to the program elements.

We have listed a number of activities that are ongoing within Christian County's MS4 Program. Based on these requirements as well as our audit in 2011, we believe to be in full compliance with all the terms of the general permit.

APPENDICES

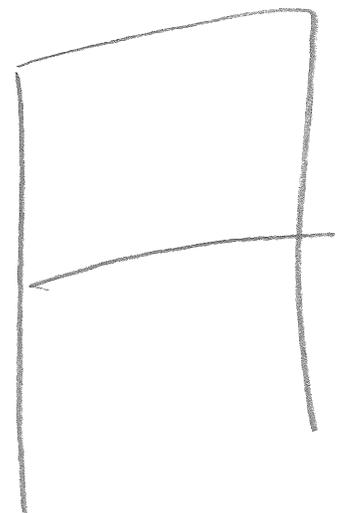
APPENDIX A: OEWRI Monitoring Data

APPENDIX B: Christian County Watershed Map & Road Districts Map

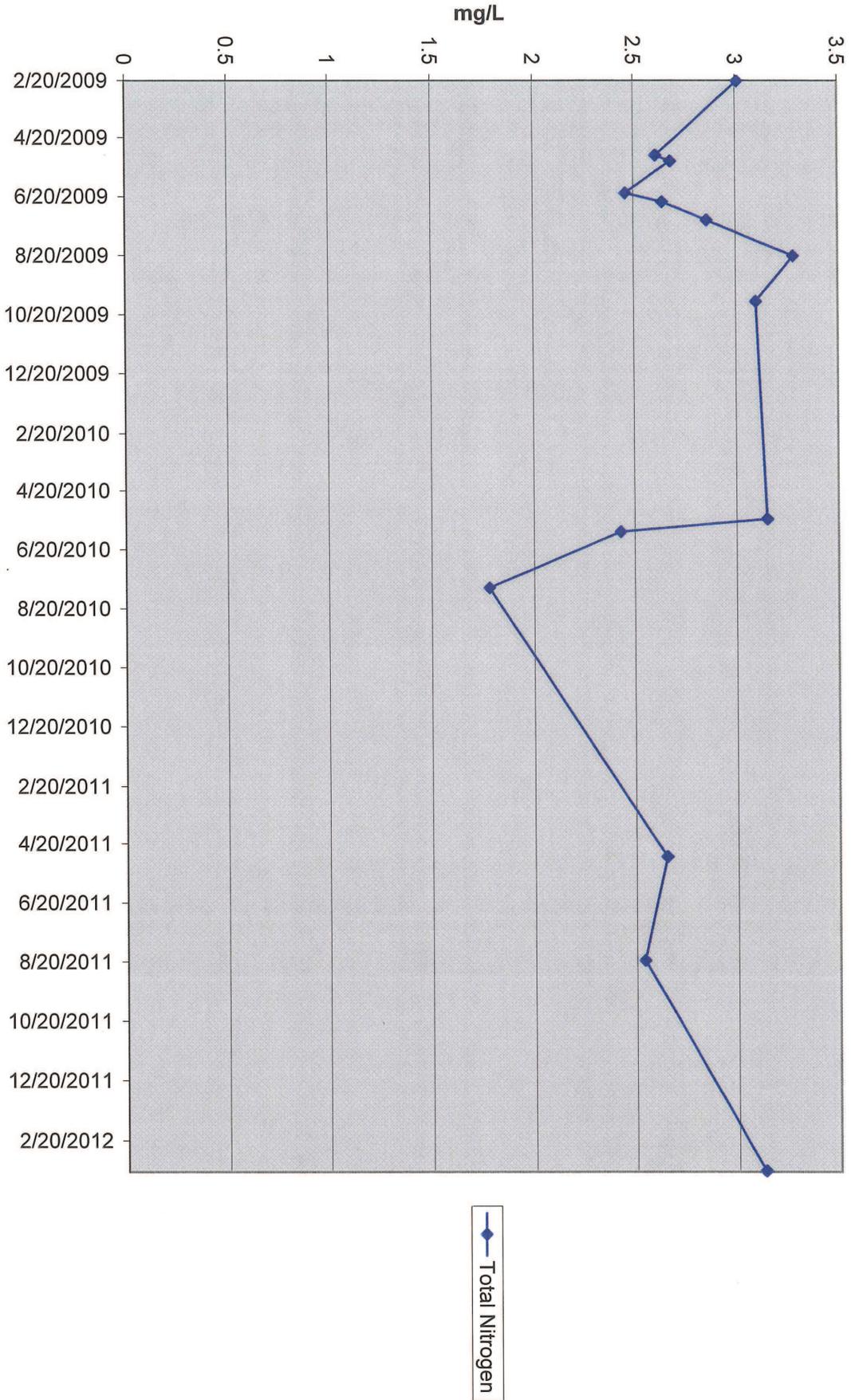
APPENDIX C: Zoning Regulations
-Urban Services Area Agreement

APPENDIX D: Stormwater and Erosion Control Regulations
-Illicit Discharge Ordinance
-Floodplain Management Ordinance

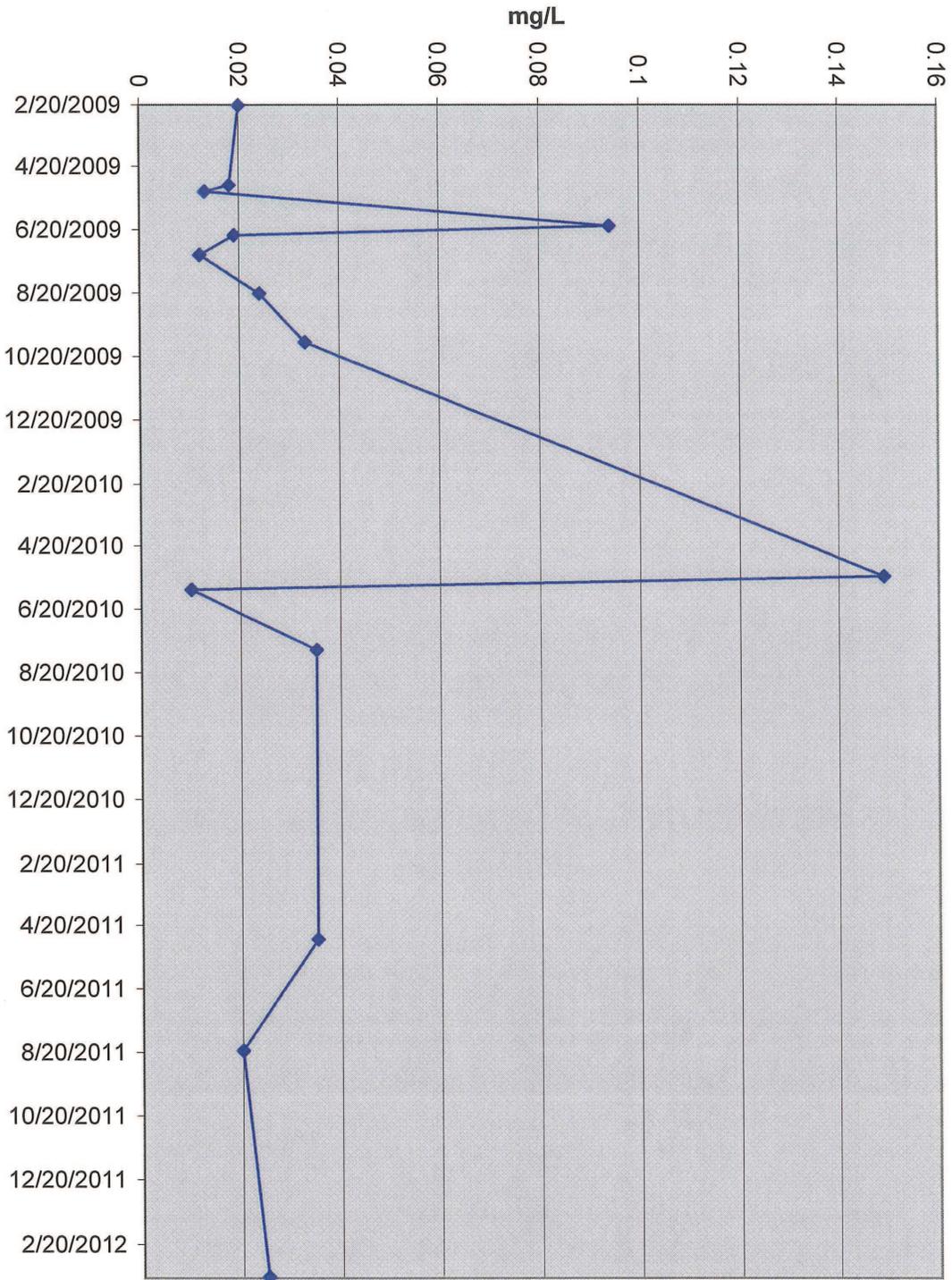
APPENDIX E: Comprehensive Plan



Total Nitrogen - Terrell Creek

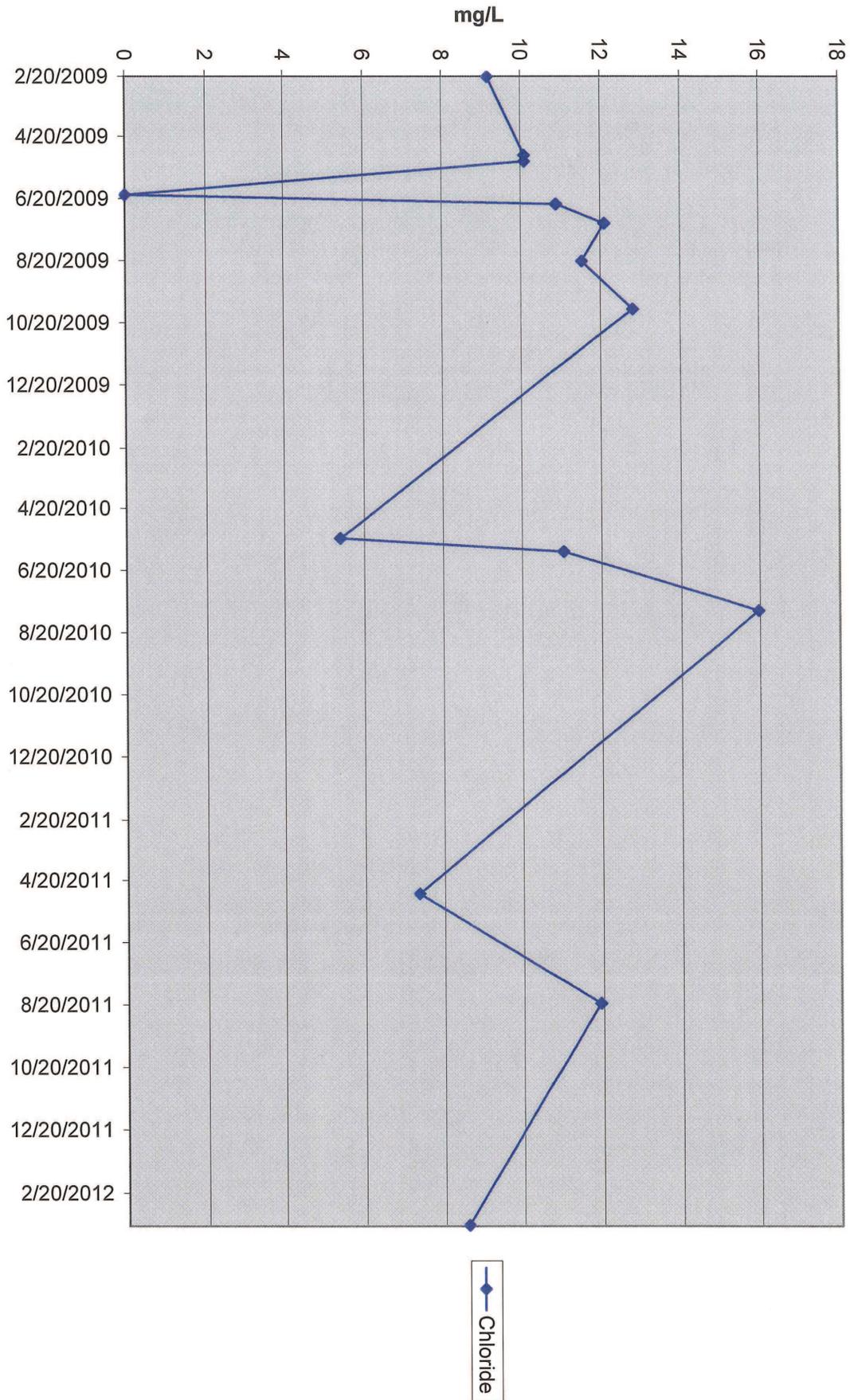


Total Phosphorus - Terrell Creek

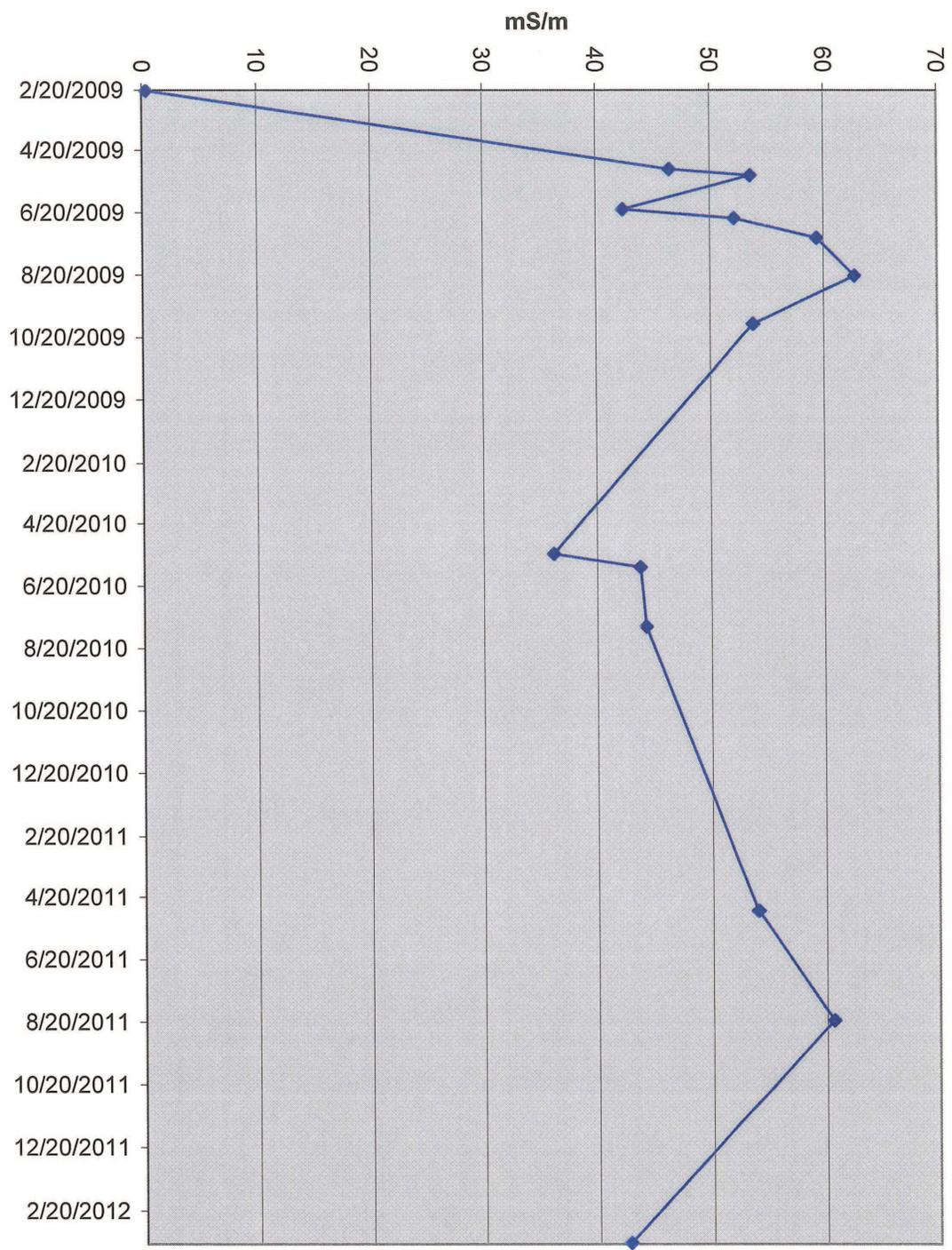


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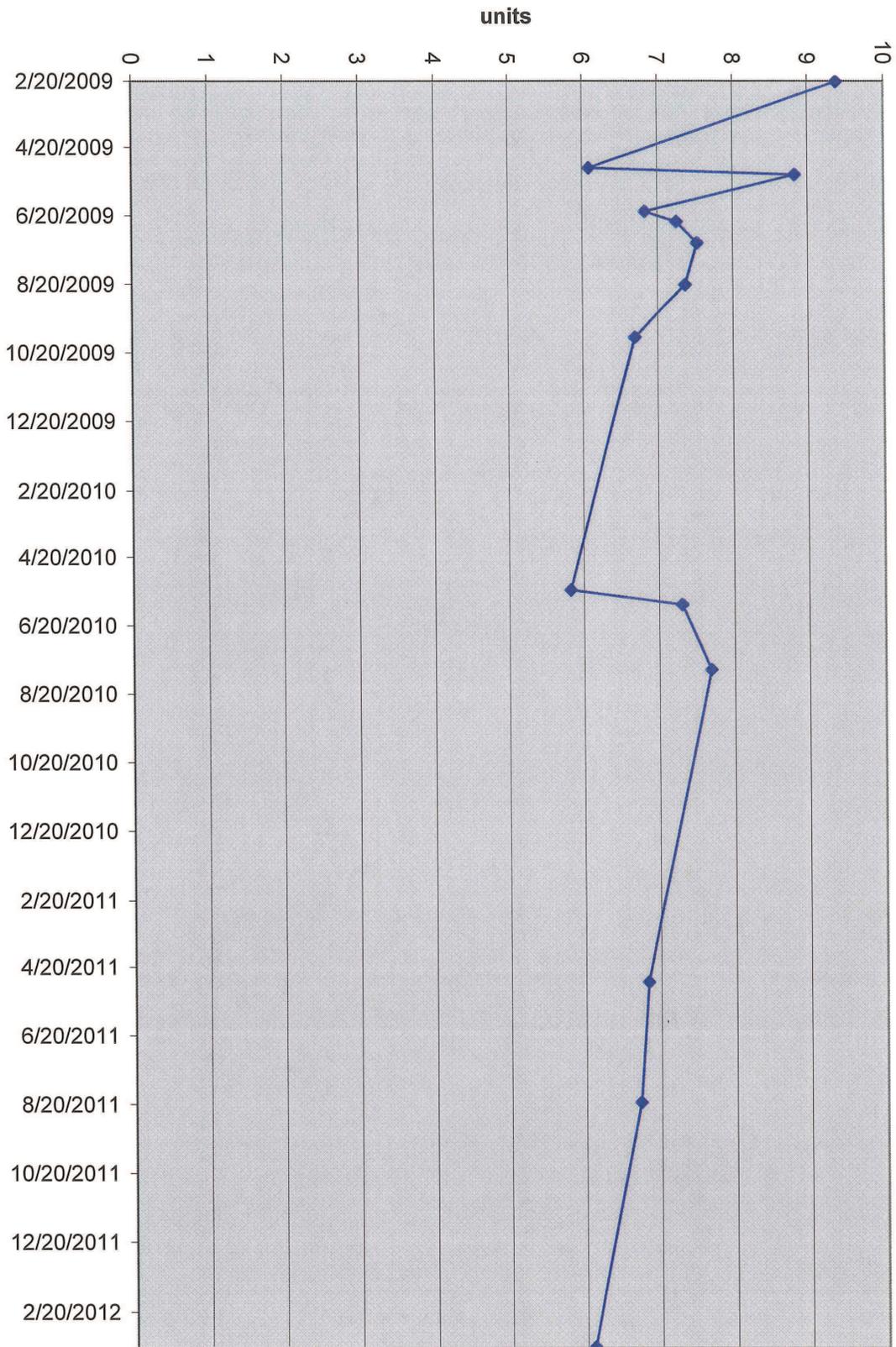
Chloride - Terrell Creek



Specific Conductivity - Terrell Creek

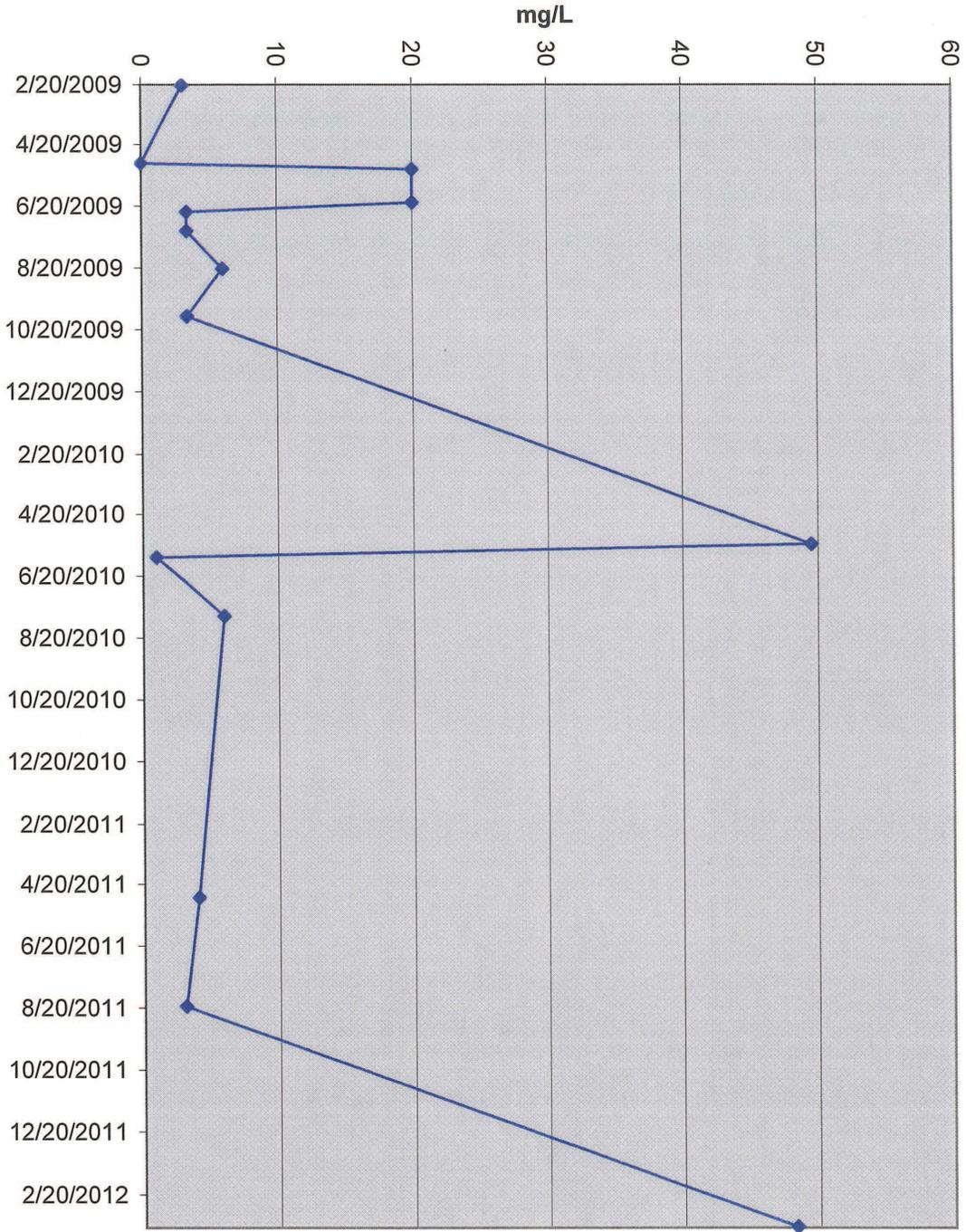


Specific Conductivity



pH - Terrell Creek

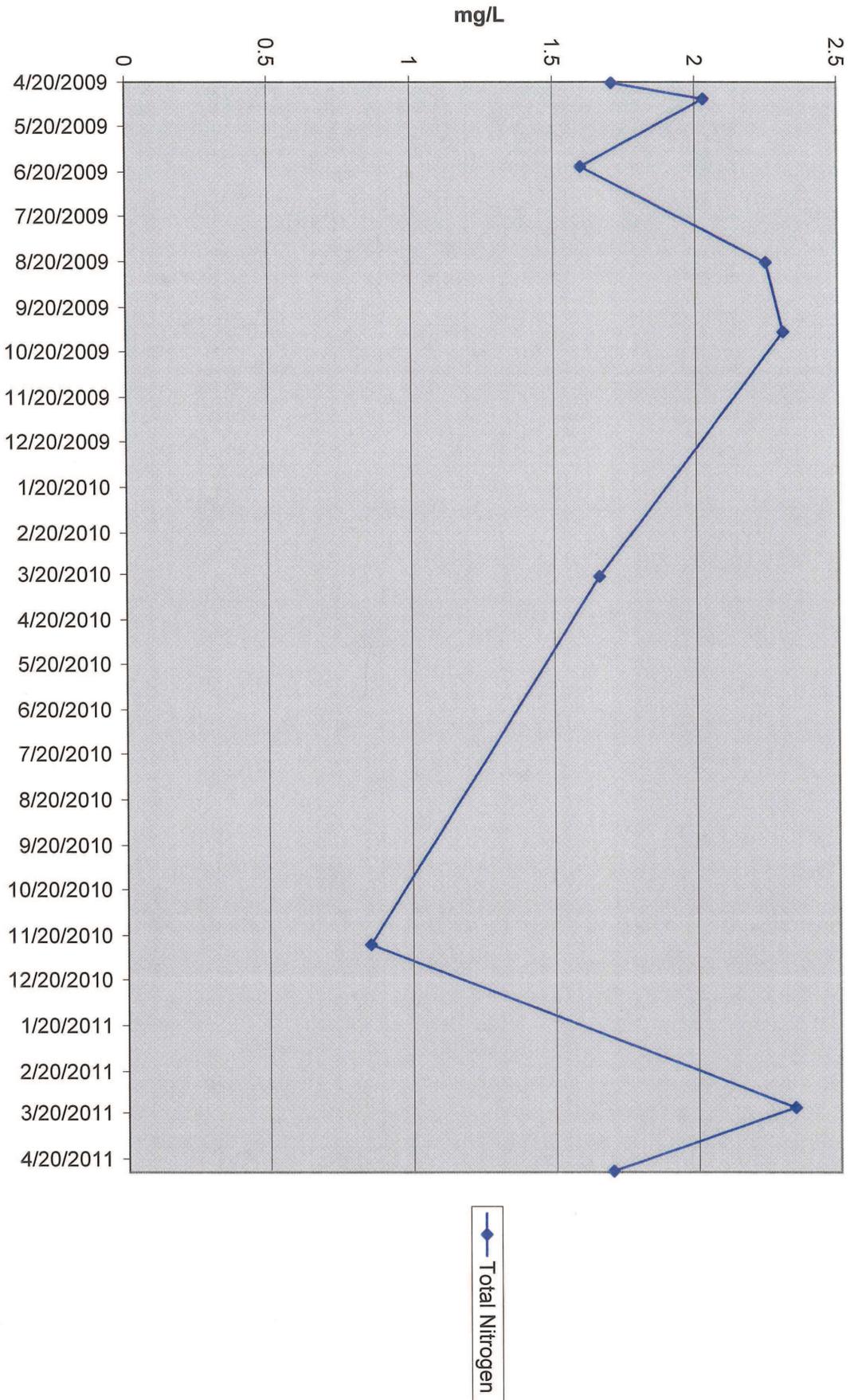
pH



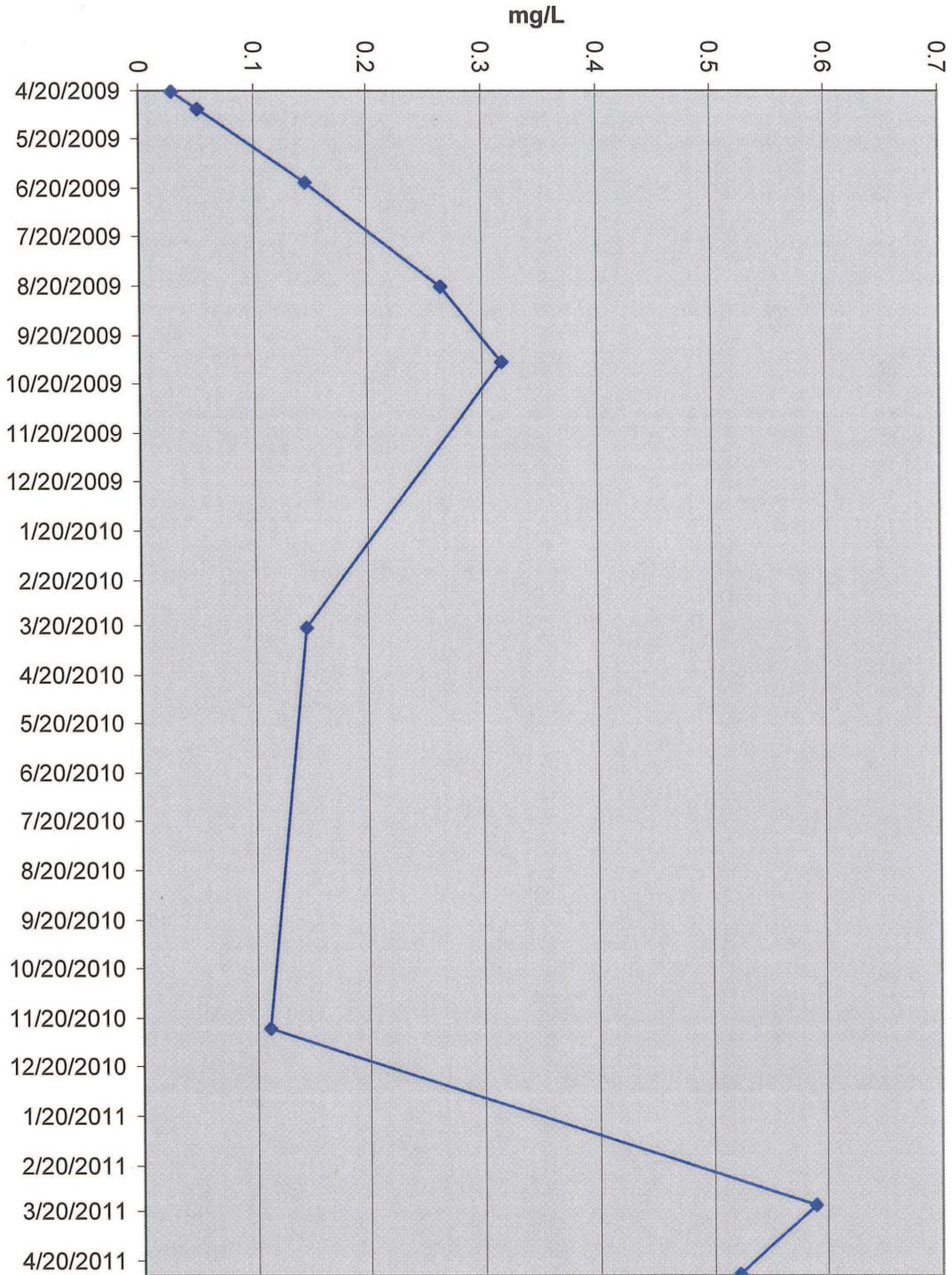
Total Suspended Solids - Terrell Creek

—◆— Total Suspended Solids

Total Nitrogen - trib to Finley Creek

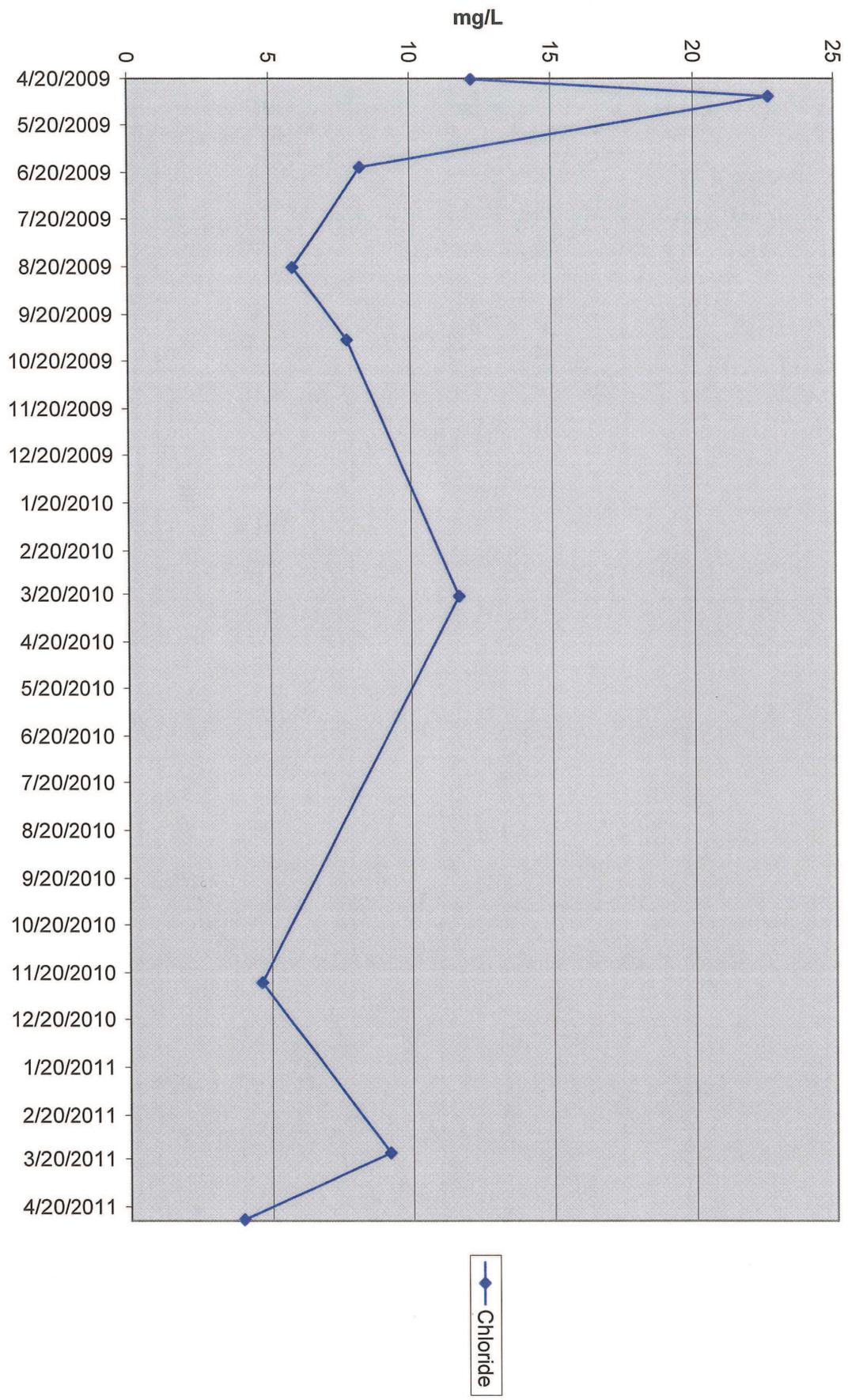


Total Phosphorus - trib to Finley Creek

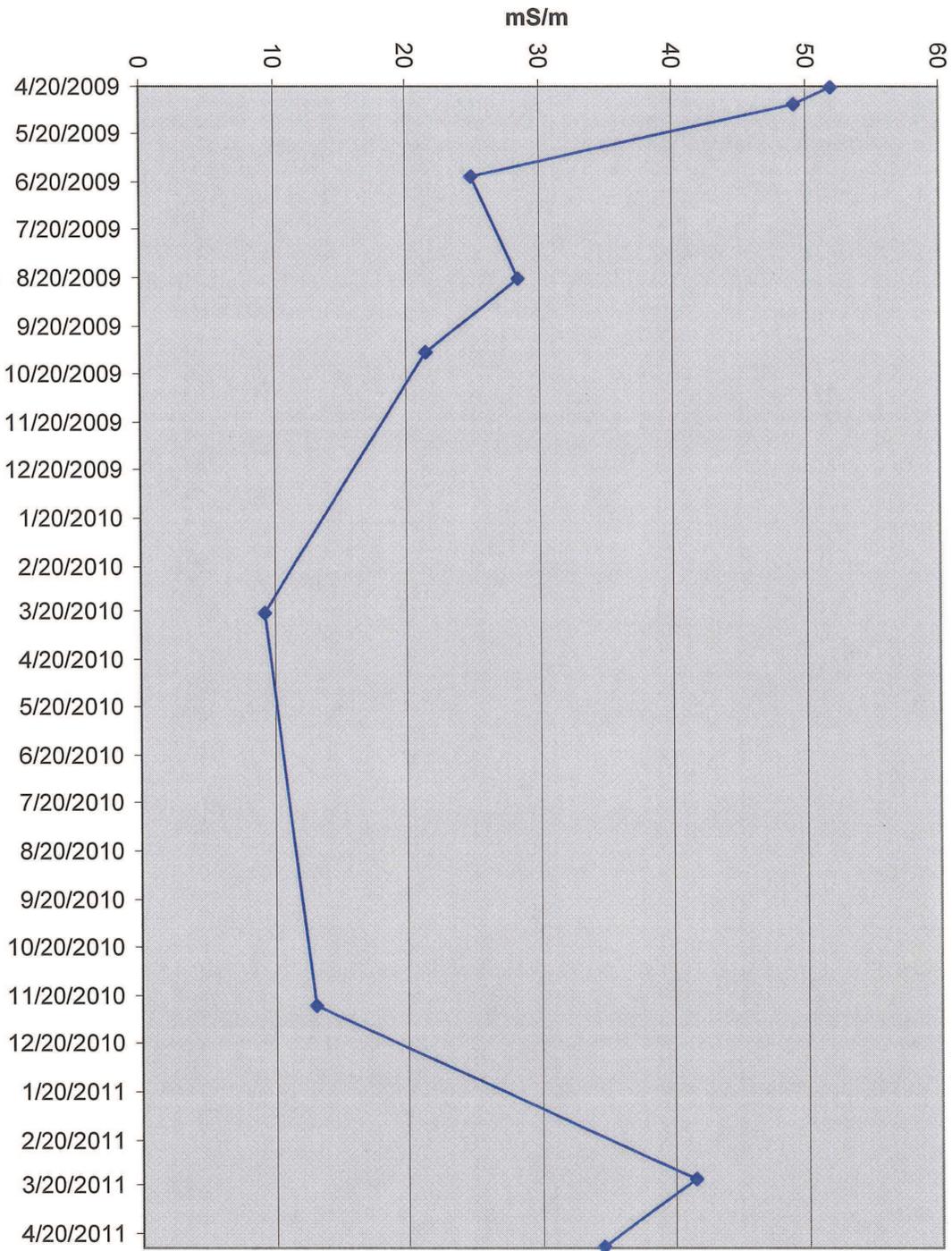


Total Phosphorus

Chloride - trip to Finley Creek

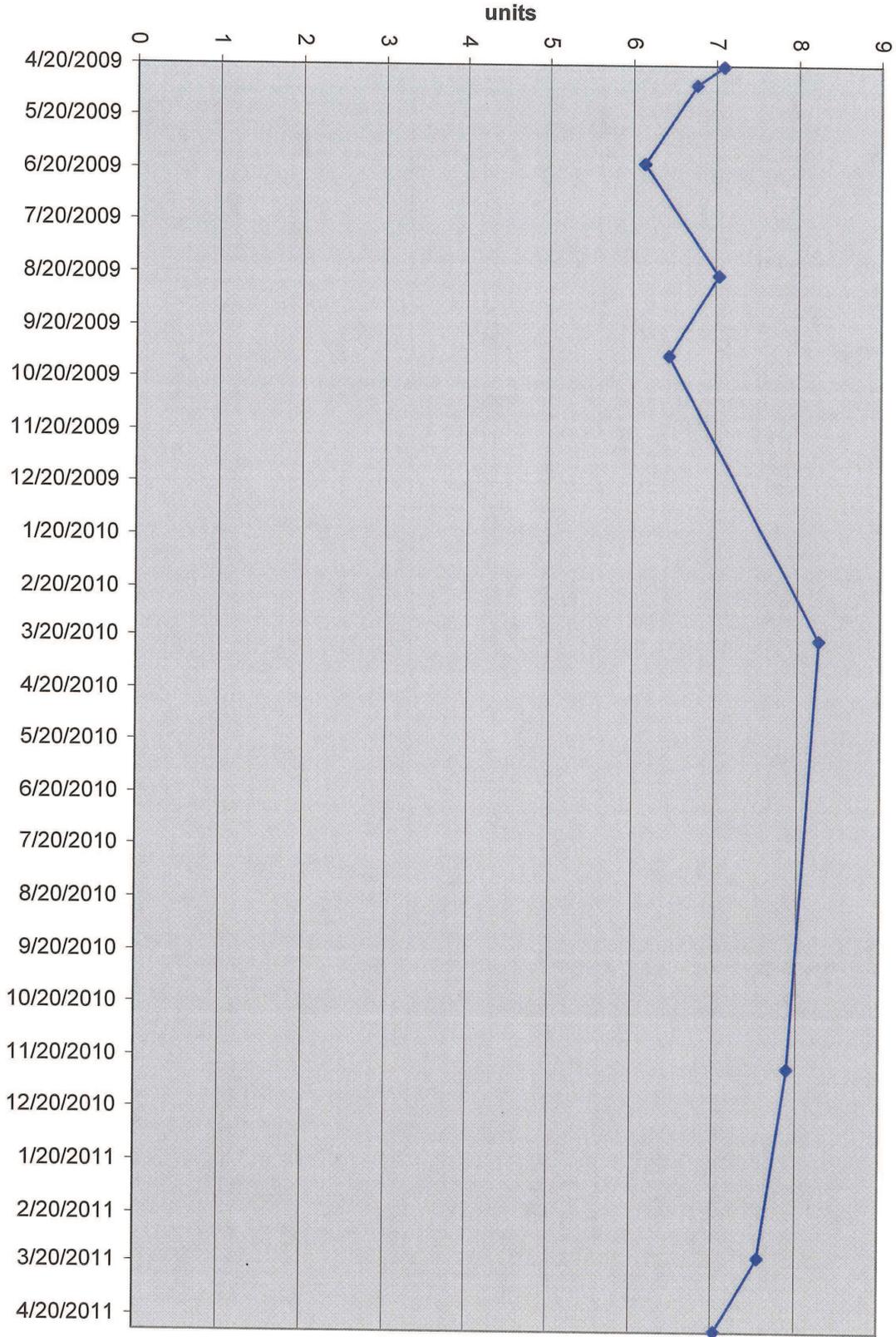


Specific Conductivity - trib to Finley Creek



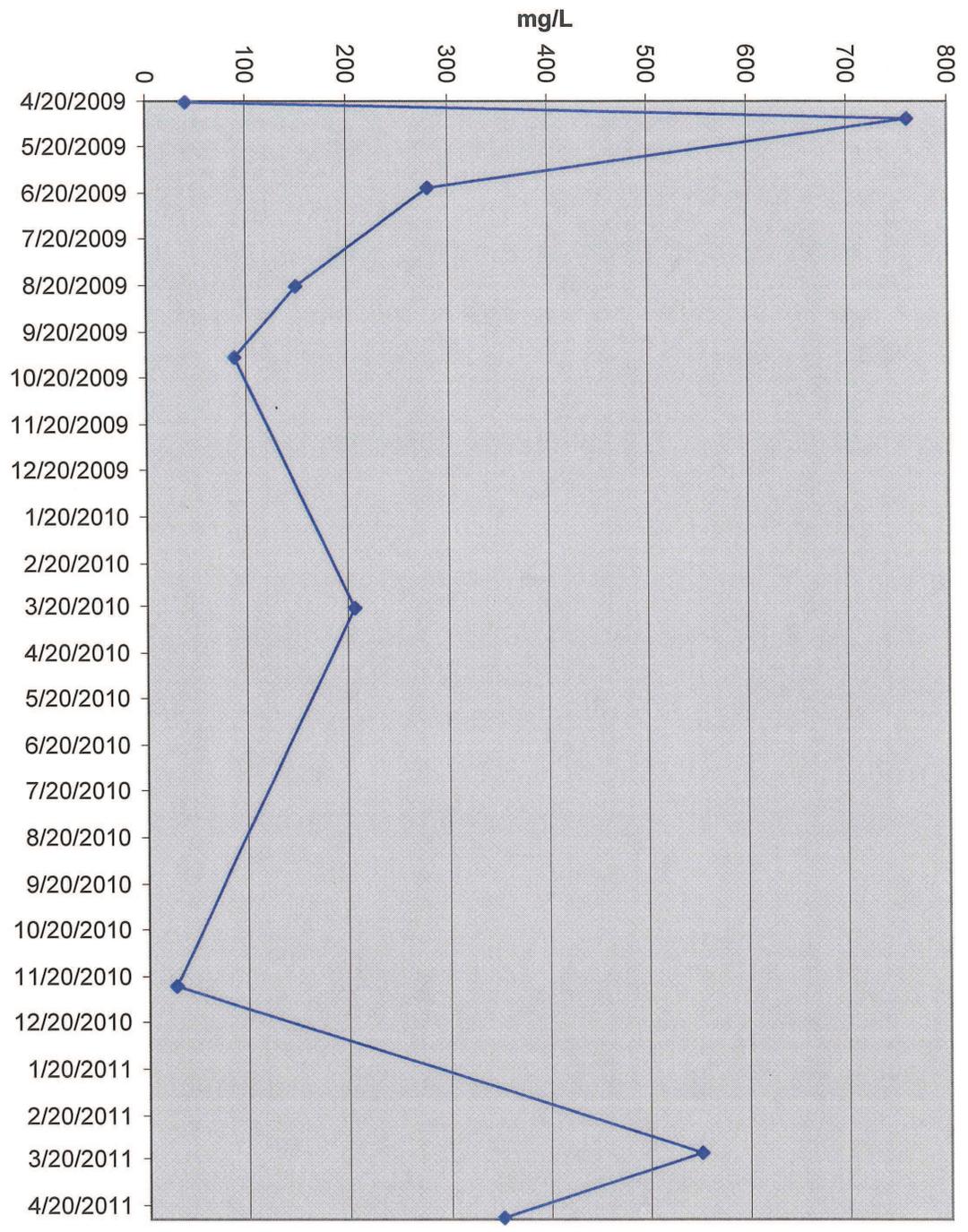
Specific Conductivity

pH - trib to Finley Creek



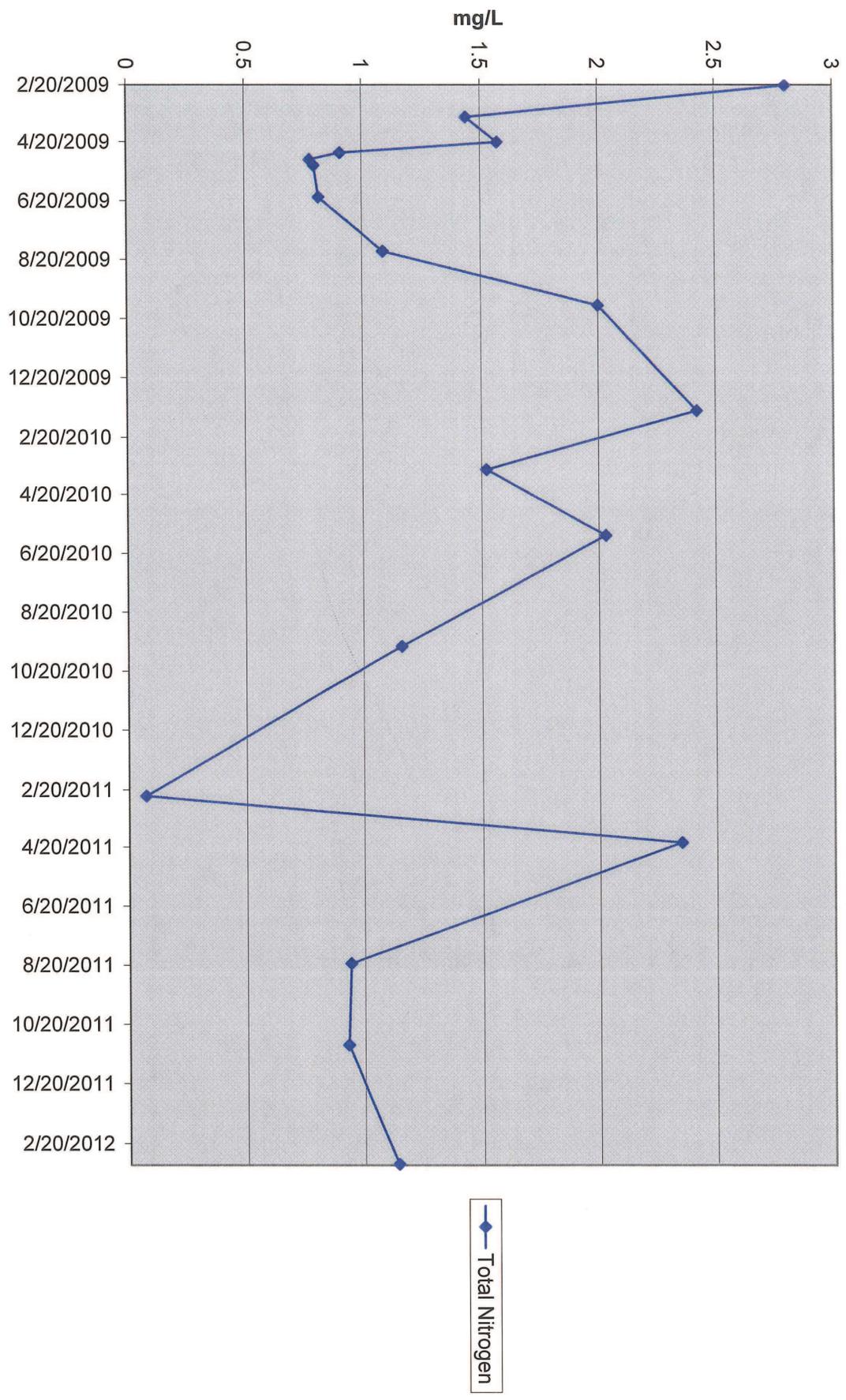
pH

Total Suspended Solids - trib to Finley Creek

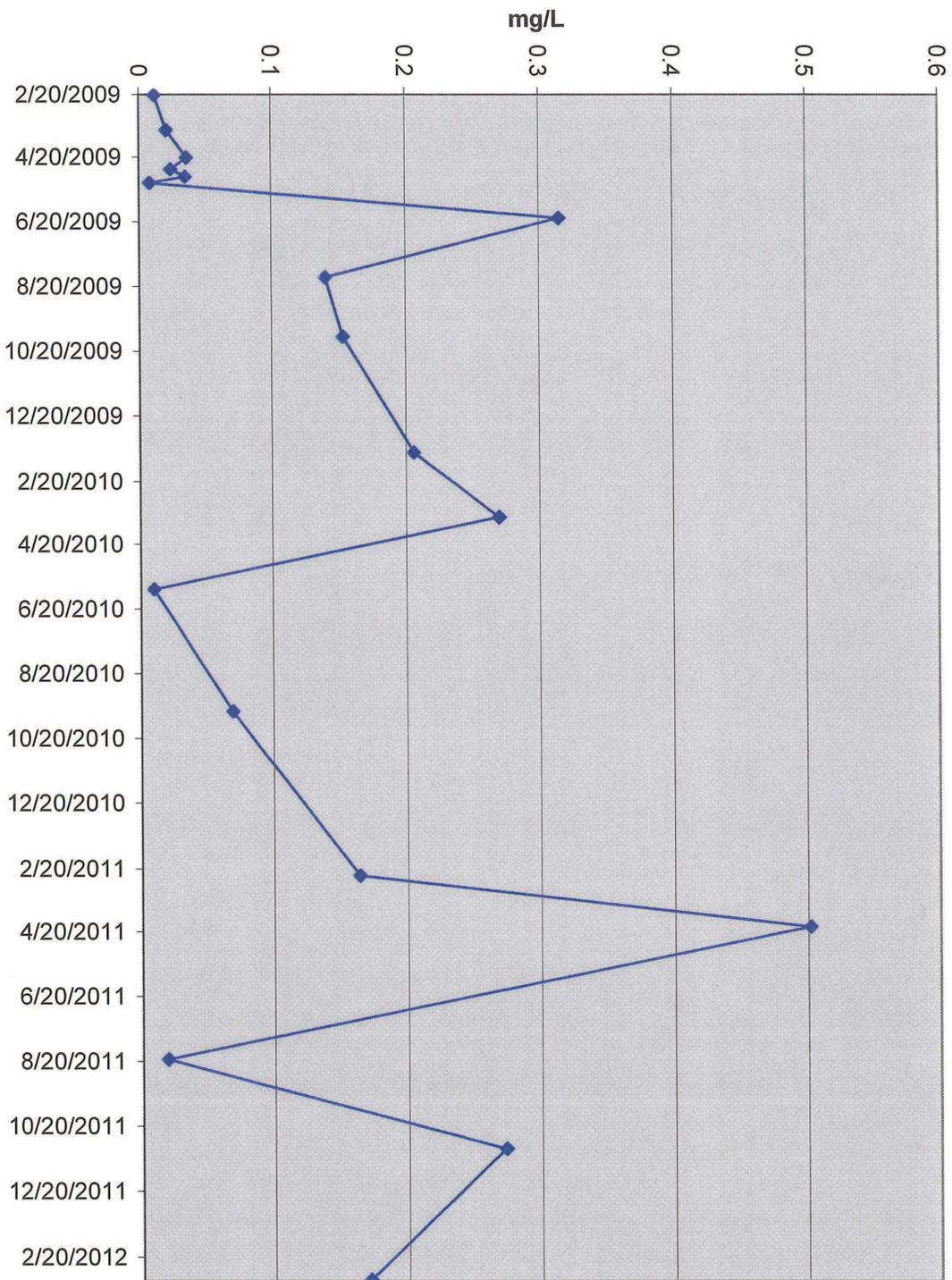


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Total Nitrogen - trib to James River

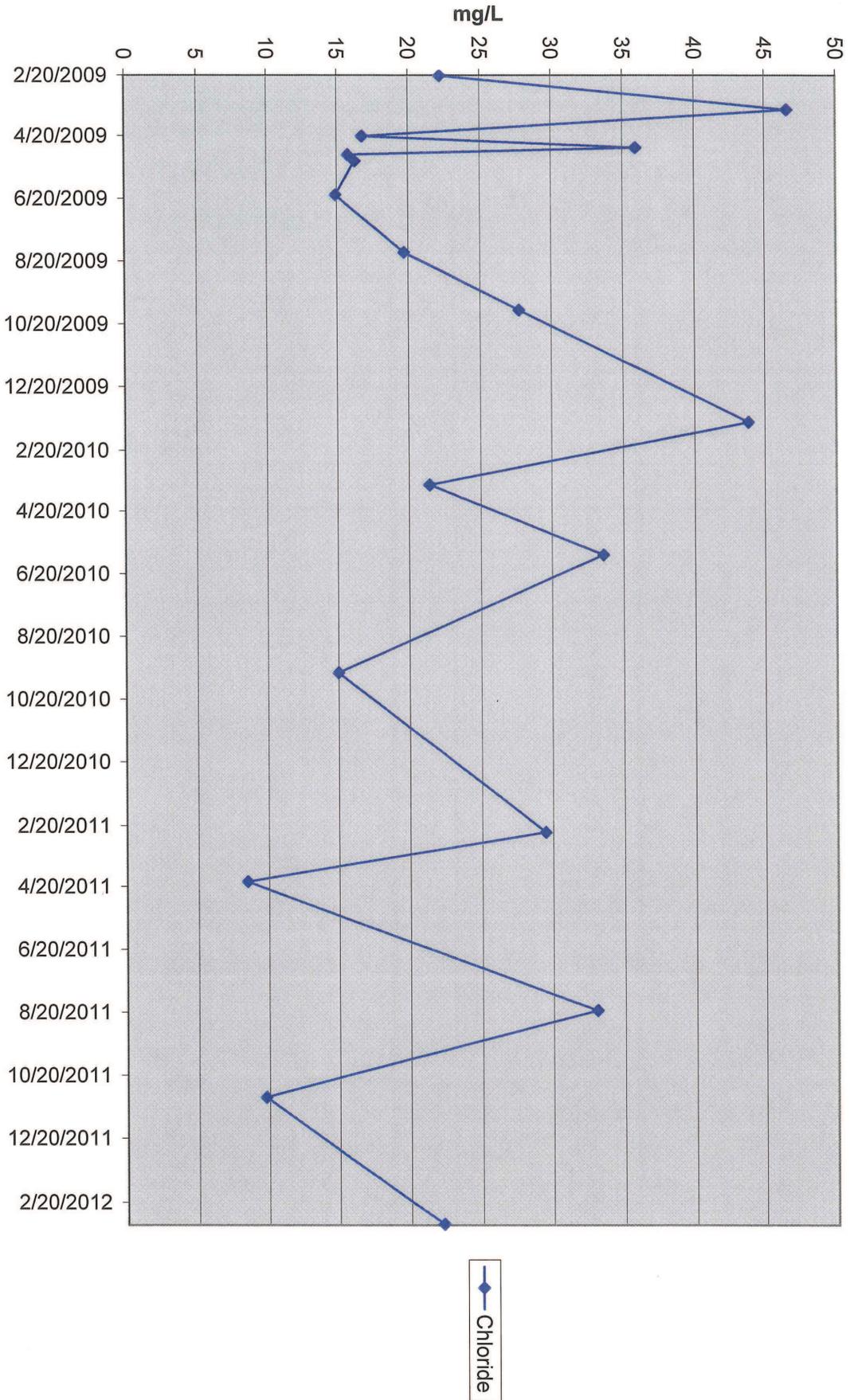


Total Phosphorus - trib to James River

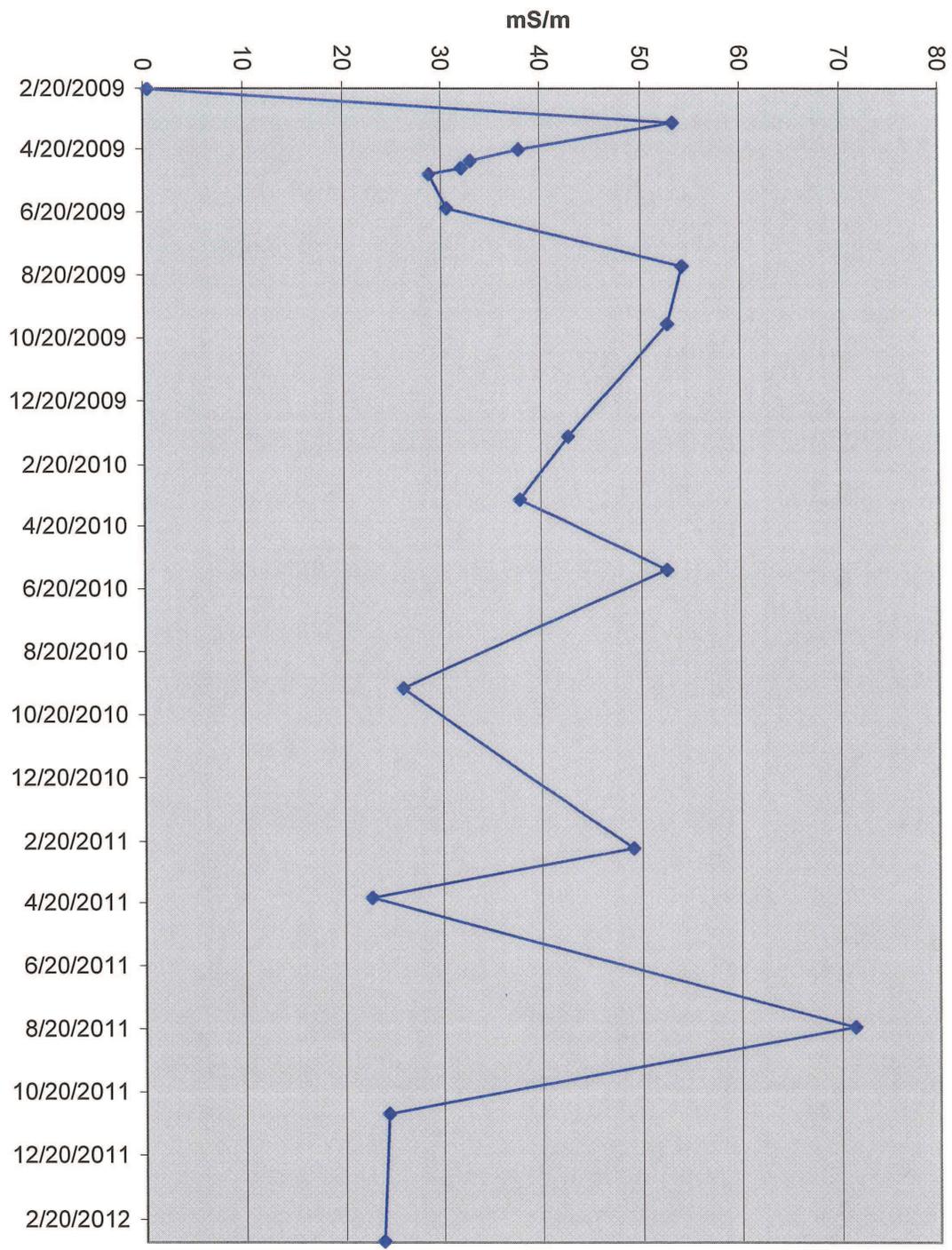


—◆— Total Phosphorus

Chloride - trip to James River

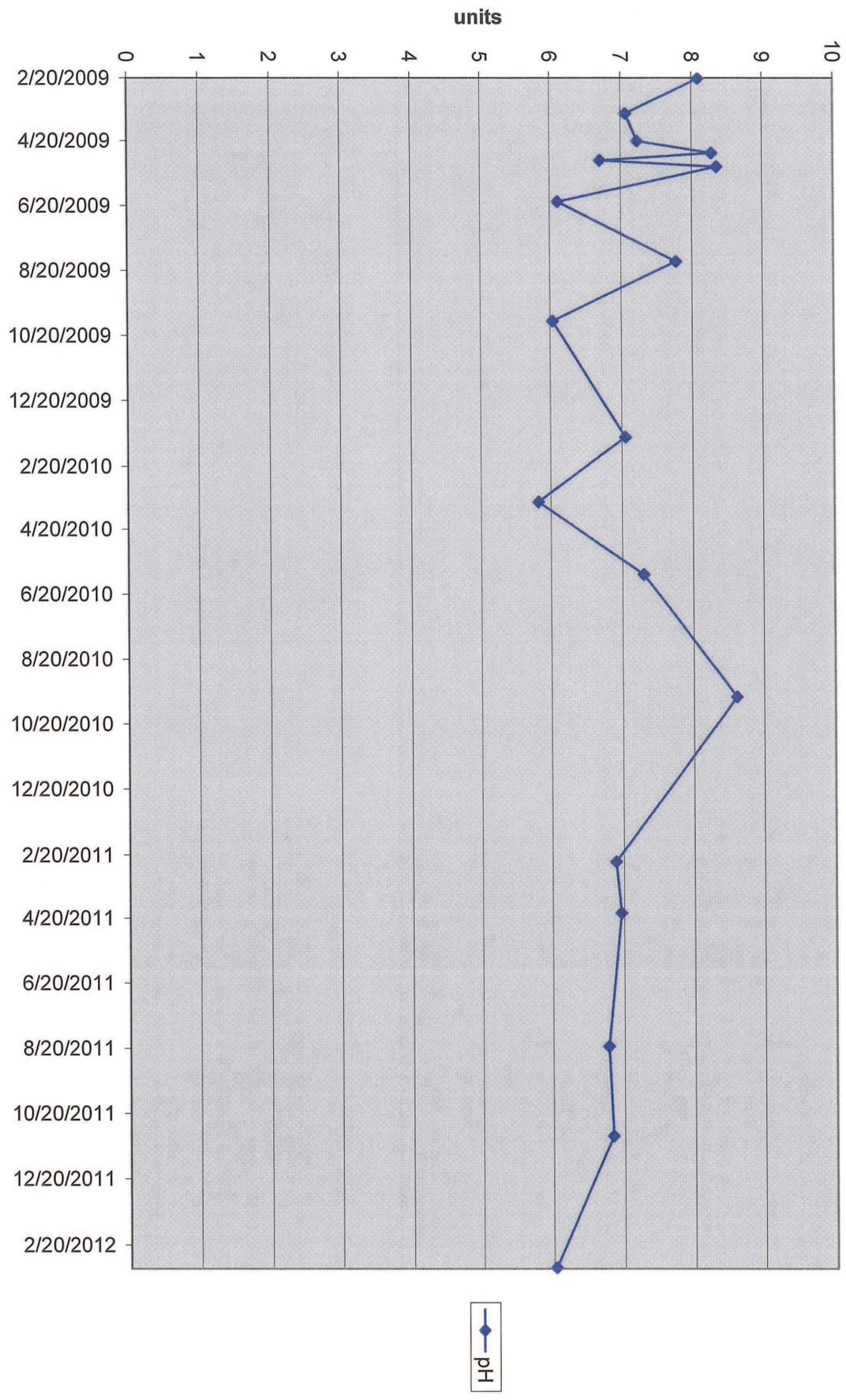


Specific Conductivity - trip to James River

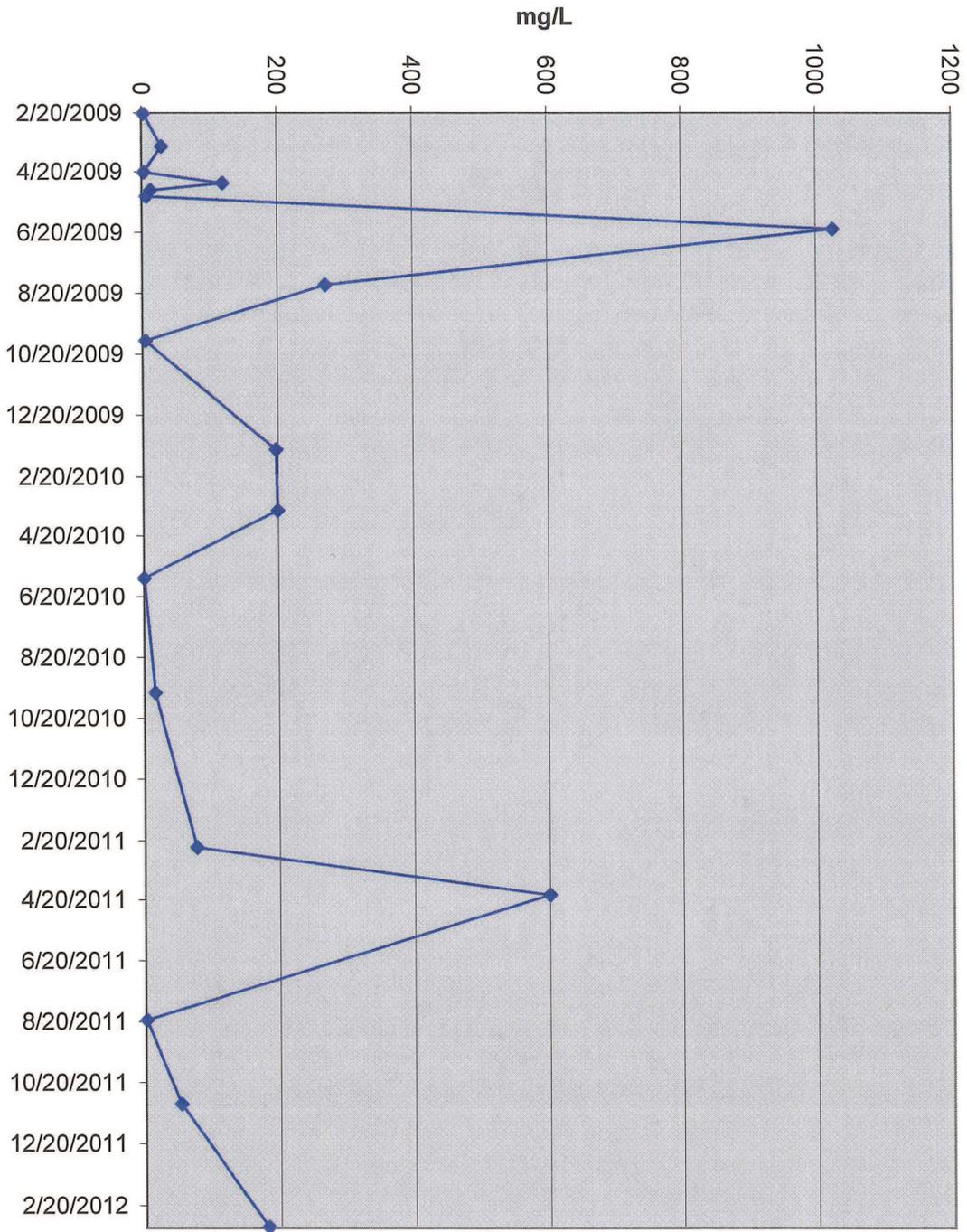


Specific Conductivity

pH - trib to James River



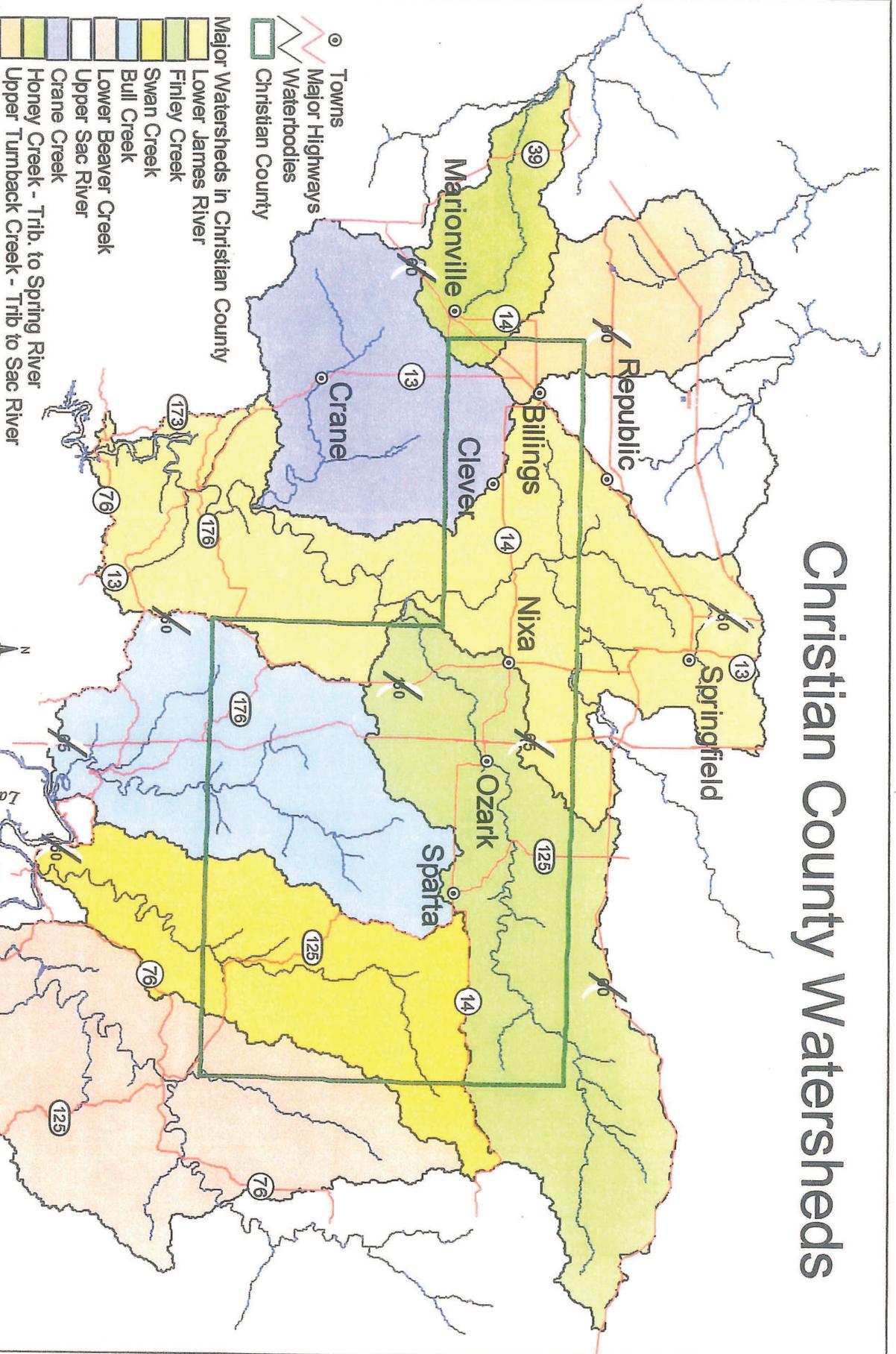
Total Suspended Solids - trib to James River



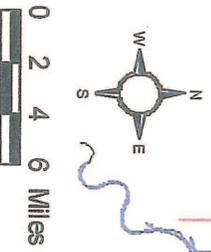
—◆— Total Suspended Solids

B

Christian County Watersheds

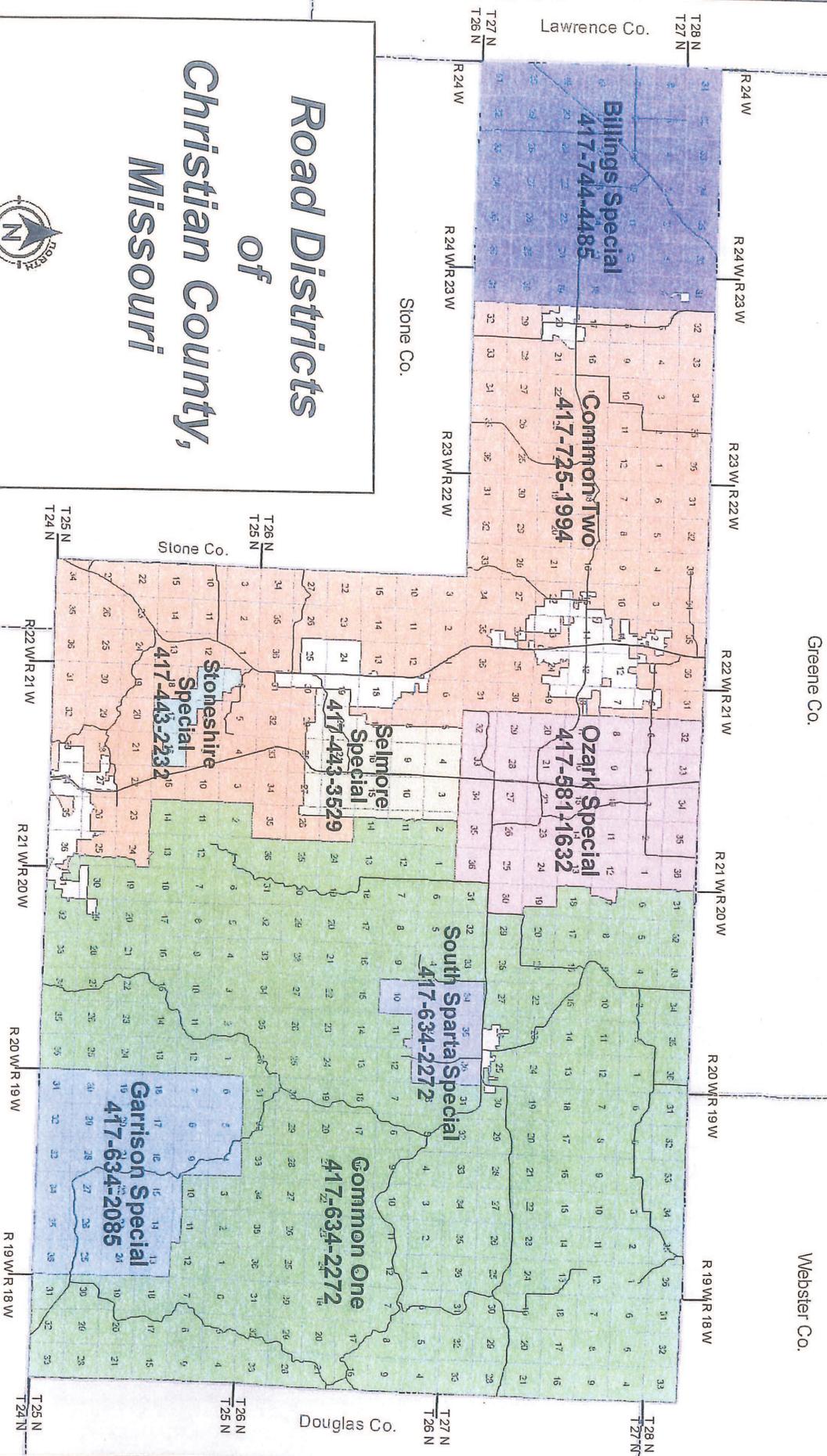
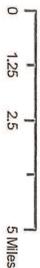


Missouri Department of Natural Resources
 Water Pollution Control Program
 August 2003



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Road Districts of Christian County, Missouri



ZONING REGULATIONS

for

CHRISTIAN COUNTY, MISSOURI



Originally Adopted as the Unified Development Codes January 22, 1993
Effective February 1, 1993

Adopted July 8, 2010
Effective August 9, 2010

Last Amended December 9, 2010
Effective Date of Last Amendments
January 1, 2011

ZONING REGULATIONS

for

CHRISTIAN COUNTY, MISSOURI

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Bill Barnett, Western District Commissioner
Tom Huff, Eastern District Commissioner

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ZONING REGULATIONS CHRISTIAN COUNTY, MISSOURI

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ZONING REGULATIONS CHRISTIAN COUNTY, MISSOURI

ARTICLE 1. TITLE and INTENT

Section 1. Title

The Unified Development Codes for Christian County Missouri were adopted on January 22, 1993 by order of the Christian County Commission pursuant to the authority granted by the Legislature of the State of Missouri in Sections 64.510 through 64.695 of the Revised Statutes of Missouri. The Unified Development Codes created only one district, which included all of Christian County, while segregating incompatible land uses with use permits and performance standards based on absolute and relative policies. These Codes, in pursuance of the authority granted by Section 64.670 of the Revised Statutes of Missouri, are henceforth amended and shall be known as the "Zoning Regulations for Christian County, Missouri" and shall be cited as such. The map portion of these Zoning Regulations may also be cited separately as the Christian County Zoning Map. A further result of the adoption of this amendment is the removal and separation of the subdivision regulations formerly known as Section 4-70 and 4-80 of the Unified Development Codes, the Christian County Road and Access Standards formerly known as Chapter Fifteen of the Unified Development Codes and the Stormwater and Erosion Control Regulations formerly known as Chapter Nineteen of the Unified Development Codes, resulting in the creation of three sets of regulations to be cited separately as the Christian County Subdivision Regulations, the Christian County Road and Access Standards and the Christian County Stormwater and Erosion Control Regulations.

Section 2. Purpose and Legislative Intent

- A. In pursuance to the above act Christian County, Missouri, as provide by said statutes purposes:
1. To preserve the health, safety, and general welfare;
 2. to secure safety from fire, panic and other dangers;
 3. to prevent the overcrowding of land;
 4. to facilitate the adequate provision of adequate facilities for transportation, water, sewage, schools, parks and other public requirements;
 5. to promote a more homogeneous relationship of land use within unincorporated Christian County;
 6. to protect property values;
 7. to regulate the use of the land and to promote the orderly development of the County in accordance with the Comprehensive Plan for Christian County as adopted by the Planning and Zoning Commission; and
 8. to effectuate the use of other accepted purposes of zoning.

ARTICLE 2. DEFINITIONS, INTERPRETATIONS and STANDARDS

Section 1. General rules of construction

- A. Certain words used in the Regulations have been defined in this Article. Where this is the case, they shall have the meaning given in the applicable Section of the Article.
- B. Where words have not been defined, the standard dictionary definition shall prevail.
- C. Where there is doubt, the Planning and Zoning Administrator shall have the right of interpretation. In construing the meaning of these Zoning Regulations, the following rules shall apply:
 - 1. Words used in the present tense shall also include the future tense.
 - 2. Words used in the singular number shall also include the plural, and vice versa.
 - 3. The word "**shall**" is mandatory.
 - 4. The word "**may**" is permissive.
 - 5. The words "**used**" or "**occupied**" shall be construed to include "intended, designed or arranged to be used or occupied."
 - 6. Where reference is made to either the Regulations or the Zoning Regulations, it shall be construed to mean the Christian County Zoning Regulations, recommended by the Planning & Zoning Commission, and adopted by the County Commission, as originally passed and all subsequent amendments, supplements, and revisions.
 - 7. Except where otherwise specified, the provisions of these Zoning Regulations shall be construed to mean the minimum standards and requirements adopted in pursuit of the purposes of these Zoning Regulations.

Section 2. Definitions

Accessory Use or Accessory Structure

A use or structure subordinate to the principal use of a building on the same lot and serving a purpose customarily incidental to the use of the principal building.

Administrative Officer

The Planning & Zoning Administrator, who is charged with the administration of planning and zoning matters, and the Planning and Zoning Department.

Agriculture

1. The use of land for agricultural purposes, including farming, dairying, pasturage, apiculture, horticulture, floriculture, viticulture, and animal and poultry husbandry, and the necessary accessory uses for parking, treating or storing the produce or products;
2. provided, however, that the operation of any such accessory uses shall be secondary to that of normal agricultural activities and provided further that the above uses shall not include the commercial feeding of garbage or offal to swine or other animals.
3. Animal feeding operations must conform to the Missouri Department of Natural Resources regulations pertaining to waste water management and odor control.

Alley

A passage or way generally affording a means of vehicle access to abutting properties and not intended for general traffic circulation.

Animal, Dangerous

Any animal that by its nature or design presents a physical danger. Specifically this includes predators and carnivores, plus any venomous or oversized animal and any other animal so designated by the Christian County Commission.

Apartment Hotel

A facility offering transient lodging accommodation to the general public and where rooms or suites may include kitchen facilities and sitting rooms in addition to the bedroom.

Basement

1. A story whose floor is more than twelve (12) inches, but not more than half of the story height below the average level of the adjoining ground (as distinguished from a "cellar" that is a story more than one-half below such level).
2. A basement, when used as a dwelling, shall be counted as a story for purposes of height measurement, and as a half-story for purposes of side yard determination.

Bed-and-Breakfast Facility (also known as B&B)

A private home in which guests are accommodated in private bedrooms with private bathrooms, or in a suite of rooms including an *en suite* bathroom, or in private bedrooms with a bathroom that is shared with other guests. Breakfast may be served in the bedroom, a dining room, or the host's kitchen. B&Bs may be operated either as a secondary source of income or a primary occupation. The owners themselves must live in the private home, prepare the breakfast and clean the room, *et cetera*. If the B&B has hired staff for cleaning or cooking, the facility is no longer a B&B, but is a Hotel.

Beginning of Construction

The incorporation of labor and material for the purpose of placing or erecting a building or structure.

Billboard or Signboard

Any structure or portion thereof, situated on private premises, on which lettered, figured or pictorial matter is displayed for advertising purposes, other than the name and occupation of the user of the premises or the structure of the business conducted thereon or the products primarily sold or manufactured thereon.

Board

The Board of Adjustment of Christian County, Missouri.

Board, Planning

See Commission, Planning and Zoning and Planning and Zoning Commission

Boarding House

See Hotel.

Building

Any structure having a roof supported by columns or walls, used or intended to be used for the shelter or enclosure of persons, animals or property.

Building Administrator

The public official designated by the Christian County Commission to issue building permits and carry out such inspections as required by the normal functions of the Building Inspections Department.

Building, Height of

The vertical distance from the average contact ground level at the front wall of the building to the highest point of the coping of a flat roof or to the deck line of a mansard roof, or to the mean height level between eaves and the ridge for gable, hip or gambrel roofs.

Building, Nonconforming

A legally existing building that fails to comply with the provisions of these Zoning Regulations that is applicable to the zone in which such building is located.

Building, Principal

A building or buildings in which the principal use of the building site is conducted. In any Residential District, any dwelling shall be deemed to be the principal building on the building site.

Bulk Limitations (Floor Area Ratio)

The number of square feet of floor area that is permitted for each square foot of lot area.

Business Area

Any zoning district designed for office, government and institutional, commercial and industrial use.

Cellar

A story the floor of which is more than one-half ($\frac{1}{2}$) of its story height below the average contact ground level at the exterior walls of the building. A cellar shall be counted as a story, for the purposes of height regulations, only if used for dwelling purposes.

Change in Use

A change from one land use to another, or a change in intensity of use, e.g., from one type of equipment to another type that makes more noise, etc.

Cluster Development

A development approach in which building lots may be reduced in size and buildings sited closer together, usually in groups or clusters, provided that the total development density does not exceed that which could be constructed on the site under conventional zoning and subdivision regulations. The additional land that remains undeveloped is then preserved as open space and recreational land.

Commercial

Relating to the sale or barter of goods or services.

Commercial Feed Lot (CFL)

Any livestock or poultry feeding operation that is carried out over short periods of time in buildings or unvegetated lots, for the purposes of fattening livestock or poultry immediately before shipment to market.

Commercial Vehicle

Any vehicle designed, maintained, or used primarily for the transportation of property or persons for hire.

Commercial Motor Vehicle, Large

1. A commercial motor vehicle designed and regularly used for carrying more than sixteen (16) passengers, including the driver, but not including a vehicle used for public school transportation; or
2. A commercial motor vehicle license for more than eighteen (18) thousand pounds; or
3. A panel truck regularly used for the carrying of freight or merchandise in the regular course of business; regularly advertising the name of a commercial business; and/or regularly used for responding to calls for service in the regular course of business;
4. Examples include but are not limited to, semi-truck and trailer, box truck, dump truck, panel truck.

Commercial Trailer, Large

A trailer licensed for more than ten (10) thousand pounds.

Commission, Planning and Zoning

The Christian County Planning and Zoning Commission.

Compensation

The receiving of goods, services, or money in exchange for or as a result of a service performed.

Comprehensive Plan

The document, which sets out official goals, objectives and policies related to the future development of Christian County, Missouri and is a long-range plan for the desirable use of land in the County as officially adopted, and as amended from time to time by the Planning & Zoning Commission per the requirements of Missouri Revised Statutes.

Conditional Use Permit

A procedure whereby the Board of Adjustment may grant permission for a use that is listed as a conditional use in the Zoning Regulations. The Board of Adjustment must review the application and determine whether specific conditions for protection of the area and maintenance of the character of the Zoning District in which the conditional use is proposed, are incorporated in the plans for the proposed use. A Conditional Use Permit may be approved by the Board of Adjustment for a specified time period on a case by case basis. It is not necessary to show practical difficulty or hardship, as the permit is not asking for permission to violate these Zoning Regulations, but rather it must be shown that the proposed use is included in the list of conditional uses of the Zoning District in which the conditional use is proposed, and that adequate safeguards are specifically included in the plans to insure that the use will not be in any way a detriment to the locality. (also, See Article 6.)

Condominium

Multi-family dwelling units intended for sale as individual single family dwelling units, providing for absolute ownership of the unit itself and an undivided interest in the common elements that are jointly owned by all condominium owners within the development.

Concentrated Animal Feeding Operation (CAFO)

Commercial agricultural activities such as feedlot operations, poultry operations and associated uses that involve the confinement of animals in mass for the purpose of breeding, feeding, boarding, slaughter or for the production of animal products for consumption or other uses. This is an operating location where animals have been, are or will be stabled or confined and fed or maintained for a total of forty-five (45) days or more in any twelve (12) month period and a ground cover of vegetation is not sustained over at least fifty percent (50%) of the animal confinement area. A feeding operation shall not be considered a CAFO unless the operation is expected to meet or exceed the animal populations indicated in Sections 640.700 to 640.755 of the Missouri Revised Statutes.

Convalescent Home

A convalescent home, a nursing home, a rest home, or a home for the aged, recuperating, chronically ill or incurable persons, in which two (2) or more persons not of the immediate family are received, kept or provided with food and shelter or care for compensation, but not including hospitals, clinics, or similar institutions devoted primarily to the diagnosis and treatment of disease or injury.

Commission, County

The Christian County Commission, the County’s governing body.

Court

An open unoccupied and unobstructed space, other than a yard, on the same lot with a building or group of buildings.

Court, Outer

A court that extends directly to and opens for its full length on a street or other permanent open space or yard at least twenty-five (25) feet wide.

Day care operation:

1. **Day Care Home**

A home where not more than six (6) children are kept in addition to the caregiver’s own children, subject to state licensing requirements.

2. **Day Care Group Home**

A home where not more than ten (10) children are kept in addition to the caregiver’s own children, subject to state licensing requirements.

3. **Day Care Center**

A commercial business where eleven (11) or more children are kept, subject to state licensing requirements.

District (Also known as Zoning District)

A defined area of Christian County for which these Zoning Regulations impose uniform regulations and requirements or various combinations thereof apply.

1. The term Agricultural District, or A District, shall mean any A-1 or A-R District;
2. The term Residential District, or R District, shall mean any RR-1, MH-1, UR-1, R-1, R-2, R-3, R-4 or CD District;
3. The term Office District, or O District, shall mean any O-1 or O-2
4. The term Commercial District, or C District, shall mean any C-1 or C-2 District;
5. The term Manufacturing District, or M District, shall mean any M-1 or M-2 District;
6. The term Flood Plain District shall mean any F-1 District;
7. The term USA shall mean any Urban Services Areas Overlay District;
8. The term PUD shall mean any Planned Unit Development.

District, More Restrictive or Less Restricted

Each of the Zoning Districts in the following listing shall be more restricted than any of the other Zoning Districts succeeding it, and each shall be less restricted than any of the other Zoning Districts preceding it: F-1, A-1, A-R, RR-1, MH-1, R-1, UR-1, R-2, R-3, R-4, O-1, O-2, C-1, C-2, M-1, M-2, PUD.

Dwelling

Any building or portion thereof designed or used exclusively for residential occupancy of one or more persons including one-family, two-family and multi-family dwellings, but not including tents, travel trailers, hotels or motels.

Dwelling, Mobile Home

See Mobile Home or Manufactured Home

Dwelling, Multi-Family (Household)

A dwelling or portion thereof designed, arranged or occupied as a residence by two or more families or housekeeping units having separate quarters and living independently of each other.

Dwelling, Single-Family (Household)

A building designed exclusively for residence purposes by one family or housekeeping unit.

Dwelling, Two-Family (Household)

A building designed exclusively for residence purposes by two families or housekeeping units living independently of each other.

Dwelling Unit

One or more rooms in a dwelling designed for occupancy by one family or housekeeping unit for living and sleeping purposes and having kitchen or kitchenette facilities.

Essential Services

The erection, construction, alteration or maintenance by public or private utility or municipal or other governmental agencies, of underground or overhead gas, electrical, steam or water transmission or distribution systems, collection, communication, supply or disposal systems, including poles, wires, transformation and regulation stations, mains, drains, sewer, pipes, conduits, cables, fire alarm boxes, police call boxes, traffic signals, street and area lighting facilities, hydrants and other similar equipment and accessories thereof; reasonably necessary for the furnishing of adequate services by such public or private utilities or municipal or other governmental agencies, or for the public health and safety or general welfare, but not including bridges.

Establishment

An economic unit, generally at a single physical location, where business is conducted or service or industrial operations performed.

Family

Two or more persons living together and related by blood, marriage or adoption, who share a single housekeeping unit, in a dwelling unit, as distinguished from a group occupying a hotel, motel fraternity or sorority house, or group home.

Floodplain

Any land area in Christian County susceptible to being inundated by flood waters from any source, as shown on the adopted Flood Insurance Rate Map (FIRM) for the unincorporated area of Christian County.

Garage, Private

A detached accessory building or a portion of the principal building used only for the storage of self-propelled passenger vehicles or trailers by the families or households resident upon the premises; and provided that, except on farms, such garage shall not be used for the storage of more than one (1) commercial vehicle of greater than one and one-half (1½) ton rated capacity per family or household resident upon the premises.

Garage, Public

A structure or portion thereof other than a private garage, used for the storage, sale, hire, care, repair or refinishing of self-propelled vehicles or trailers; except that a structure or part thereof used only for storage or display of self-propelled passenger vehicles, but not for transients, and at which automobile fuels and oils are not sold and motor driven vehicles are not equipped, repaired or hired, shall not be deemed to be a public garage.

Garden Apartment

A building containing three or more dwelling units and rising to no more than three stories, in which each dwelling unit has outside access at ground level.

Grade, Curb

The elevation of the top of the face of the curb.

Grandfathered Use

See Nonconforming Use.

Group Home, Non-Residential

A single-family detached dwelling in which eight or fewer persons reside, and may include two (2) additional persons acting as staff members who need not be related to each other or to any of the persons residing in the home. Non-Residential Group Homes are classified as follows:

1. Rehabilitative, defined as individuals living together for short-term recuperating from drug, alcohol or other maladies requiring special care and supervision.
2. Corrective, defined as individuals living together as a result of penal action directing incarceration requiring special supervision.

Group Home, Residential

A single-family detached dwelling in which eight or fewer unrelated mentally or physically handicapped persons reside, and may include two (2) additional persons acting as staff members, house parents or guardians who need not be related to each other or to any of the mentally or physically handicapped persons residing in the home.

Guest House

A living area in an accessory building of 1,000 square feet or less.

Home Occupation

Any occupation carried on by the inhabitants of a dwelling that is clearly incidental and secondary to the use of the dwelling for dwelling purposes, that does not change the character thereof, and that is conducted entirely within the main or accessory building, as described by Article 10.

Hospital

A building or portion thereof used for the accommodation of sick, injured or infirm persons.

Hotel

A building or group of buildings in which lodging is provided to the public, usually on a transient basis, but not including trailer court or recreation vehicle (RV) park, hospital, asylum, orphanage, or building where persons are housed under a restraint.

Household or Housekeeping Unit

One (1) or more related or unrelated persons living together as a single housekeeping unit in a dwelling unit.

Industry

Storage, repair, manufacture, preparation or treatment of any article, substance or any commodity for commercial use.

Inspector

Inspector of buildings, zoning and land use.

Inn

See Hotel.

Institutional Uses

Those uses organized, established, used or intended to be used for the promotion of public, religious, educational, charitable, cultural, social or philanthropic activities normally operated on a non-profit basis.

Junkyard or Salvage Yard

A place where waste, discarded or salvaged materials, inoperative or wrecked motor vehicles and their parts, inoperative machinery or trailers and their parts are dismantled, stored, bought, sold, exchanged, bailed, packed, disassembled or handled, including all auto salvage yards, wrecking yards, house wrecking yards, used lumber yards, and place or yards for storage of salvaged house wrecking and structural steel materials and equipment; but not including such places where such uses are conducted entirely within a completely enclosed building, and not including pawn shops and establishments for the sale, purchase or storage of used furniture and household equipment, used cars in operable condition, or salvage material incidental to manufacturing operations.

Kennel, Commercial

Any lot, building, structure, enclosure or premises where five (5) or more dogs over the age of six (6) months of age are kept for commercial purposes, including boarding, breeding, wholesale and retail sales of goods or animals, or the rendering of services for profit, or any facility that is classified as a regulated business by the Department of Agriculture.

Land Use Plan

The Comprehensive Plan.

Loading Space

An off-street space or berth on the same lot with the building or contiguous to a group of buildings, for the temporary parking of a commercial vehicle while loading or unloading merchandise or materials.

Lodging House

See Hotel.

Lot

A parcel of land identified by a number on a subdivision plat or survey recorded in accordance with the provisions of these Zoning Regulations.

Lot Area

The computed area within the lot lines.

Lot, Corner

A lot located at the intersection of, and abutting on two (2) or more streets.

Lot Depth

The mean horizontal distance between the front and rear lot lines.

Lot, Double Frontage or Through

A lot that has two (2) non-intersecting sides abutting on two (2) or more streets.

Lot, Interior

A lot other than a corner lot.

Lot Lines

The property lines bounding the lot as defined in these Zoning Regulations.

Lot Line, Front

The front of a lot shall be considered to be that side of the lot that fronts on a street. On corner lots, the side of least dimension fronting said street shall be the front. If said corner lot has equal frontage on two or more streets, the lot shall be considered to front on that street on which the greatest number of lots front.

Lot Line, Rear

The lot line opposite and most distant from the front lot line.

Lot Line, Side

Any lot line other than a front or rear lot line. A side lot line separating a lot from a street is called a side street line. A side lot line separating a lot from another lot or lots is called an interior side lot line.

Lot Line, Street or Alley

A lot line separating the lot from a street or alley.

Lot, Wedge Shaped

A lot situated so that the front is either wider or narrower than the rear of the lot.

Lot Width

The mean distance between side lot lines, which distance shall be measured parallel to the front lot line and through any portion of a building erected or to be erected.

Lot of Record

A separate and distinct parcel on a legally-recorded subdivision plat or a legally recorded deed filed in the office of the Recorder of Deeds of Christian County, Missouri.

Major or Secondary Highway

See Thoroughfare - Primary or Secondary

Manufactured Home

A factory-built structure that is manufactured or constructed according to the standards of the *National Manufactured Housing Construction and Safety Standards Act of 1974*, 42 United States Code §5401 *et seq.*; 24 CFR Part 3280 and Part 3282, that became effective June 15 1976, that is built on a permanent chassis and is to be used as a place for human habitation, but that is not constructed or equipped with a permanent hitch or device allowing it to be moved other than for the purpose of moving to a permanent site, and that does not have permanently attached to its body or frame any wheels or axles.

Manufactured Home Park

See Mobile Home Park

Manufactured Home Subdivision

See Mobile Home Subdivision

Master Plan

The Comprehensive Plan.

Maximum Coverage

The maximum amount of land that may be covered by buildings on any lot.

Mean Lot Elevation

The average elevation of a single lot.

Mobile Home

A structure designed for human habitation and so constructed as to permit its transport on wheels, temporarily or permanently attached to its frame, from the place of its construction to the location, or subsequent locations, at which it is intended to be a habitation and designed to permit the occupancy thereof as a dwelling place for one or more persons. The term "mobile home" shall include manufactured homes constructed pursuant to the standards of the *National Manufactured Housing Construction and Safety Standards Act of 1974*, 42 United States Code §5401 *et seq.*; 24 CFR Part 3280 and Part 3282, that became effective June 15 1976. A travel trailer is not considered a mobile home.

Mobile Home Park

A site containing spaces with required improvements and utilities that are rented or leased for the long-term placement of mobile homes or manufactured homes and that may include services and facilities for the residents. Mobile Home Park sites must be platted in accordance with the provisions of the Christian County Subdivision Regulations.

Mobile Home Subdivision

A subdivision of single-family dwelling units that meets all the requirements set forth in the Christian County Subdivision Regulations. The principal feature that sets this subdivision apart from conventional subdivisions is that the subdivision is designed primarily, although not necessarily exclusively, for mobile homes, manufactured homes or modular dwellings. Each lot is privately owned and the residential use of the land is regulated by the Christian County Subdivision Regulations and whatever deed restrictions or private covenants may be required by the subdivision developer. These dwellings are to be set up as permanent structures.

Modular Home

Factory built housing certified as meeting county building codes for modular housing. Once certified by the County Building Inspections Department, modular homes shall be subject to the same standards as site built homes and shall be considered as single-family detached dwellings.

Motel

A hotel intended primarily for occupancy by persons traveling by car, in rooms usually having easy access to a parking area.

Non-Business Area

Any area within a Residential Zoning District, including areas therein where legal non-residential uses are present.

Nonconforming Use

A parcel of land lawfully occupied by a use that does not conform to the Zoning Regulations applicable to the Zoning District in which it is located. This term is also referred to as a “Grandfathered Use”.

Open Space – Private

Land that is dedicated or reserved by any owner(s) for private use by residents of the subdivision, such as recreation areas, green areas and community centers. Also known as common space or common area, or green space or green area.

Open Space – Public

Land that is dedicated or reserved by any owner(s) for acquisition for general use by the public, including parks, recreation areas, school sites, community or public building sites. Also known as common space or common area, or green space or green area.

Overnight Shelter

A facility operated by a nonprofit agency that provides overnight shelter to homeless or transient youths or adults. An overnight shelter is not allowed to provide residential care during daytime hours.

Parking Area, Private

An open area for the same uses as private garage.

Parking Area, Public

A parking lot.

Parking Lot

An open area other than a street or other public way, used for the parking of automobiles and available to the public whether for fee, free, or as an accommodation for clients or customers.

Parking Space

A permanently surfaced area of not less than two hundred (200) square feet, either within a structure or in the open exclusive of driveways or access drives for the parking of motor vehicles.

Permitted Use

The use of a structure or a tract of land allowed by the use regulations of this ordinance.

Planning and Zoning Commission

The Christian County Planning and Zoning Commission.

Planned Unit Development (PUD)

A zoning district with a minimum area of five (5) contiguous acres, to be planned, developed, operated, and maintained as a single entity and containing one or more structures and parcels to accommodate industrial, retail, service, commercial, office, or residential uses, or a combination of such uses, and appurtenant common areas and accessory uses incidental to the predominate uses. The intent of the PUD is to create a more flexible, creative and efficient approach to the use of land.

Plot Plan

A graphic representation delineating the outlines of the land included in the Plan and all proposed use locations, drawn to scale in a horizontal plane with accurate dimensions indicating the relation of each use to the adjoining and to the boundary of the property.

Premise

Any tract of land. A premise may consist of one (1) or more lots, tracts, or units, under single or multiple ownership that operates as a functional unit. A **shared premise**, when developed, shall also possess one or more of the following criteria:

1. shared parking;
2. common management;
3. common identification;
4. common access; or
5. shared circulation.

Principal Use

The primary or predominant use of any lot.

Private Person

Any natural person, partnership, corporation, or entity.

Profession

Architecture, engineering, law, medicine, dentistry or other activity in which specialized service to clients are performed by persons possessing a degree from a recognized institution of higher learning, demonstrating successful completion of prolonged course of specialized intellectual instruction and study, and also possessing evidence of professional capability, such as membership in a professional society requiring standard of qualifications for admission.

Public Sewer or Wastewater System

Any sewer or wastewater system or any part of such a system that is owned, maintained and operated by a governmental entity.

R District

Any approved Residential District.

Recreational Vehicle (RV) Park

Any tract of land, meeting these Zoning Regulations that is used or offered as a location for two (2) or more travel trailers or similar recreational vehicles for temporary parking and providing primarily overnight or short-term accommodations.

Regulations, Subdivision

The Christian County Subdivision Regulations.

Regulations, Zoning

The Christian County Zoning Regulations.

Resort

See Hotel.

Restaurant

An establishment where food and drink is prepared and served for consumption on or off the property. If alcoholic beverages are served, more than fifty (50) percent of gross income must be derived from the sale of food and non-alcoholic beverages, for consumption on the property, for the establishment to be classified a restaurant.

Road

See Street.

Roadside Stand

A temporary structure designed or used for the display or sale of agricultural products produced on the premises upon which such a stand is located.

Rooming House

Hotel.

Shared Premise

(See Premise)

Sewer, Public

A sewage collection and treatment system, or any part of a system that is owned, maintained, and operated by a municipal or governmental entity.

Sign

Any permanent or temporary structure, device, letter, word, model, banner, pennant, insignia, trade flag or representation used as, or that is in the nature of, an advertisement, announcement or direction, or is designed to attract the eye by intermittent or repeated motion or illumination.

Sign, Illuminated

A sign designed to give forth artificial light, or designed to reflect light from one or more sources, natural or artificial.

Sign, Projecting

A sign erected on the face or outside wall of a building that projects out from the wall at any angle.

Sign, Temporary

A sign of temporary nature used to advertise a political candidate, or used to advertise the premises for sale, rent, or lease.

Sinkhole

Any depression in the surface of the ground with or without collapse of adjacent rock that provides a means through which surface water can come into contact with subsurface water.

Sinkhole Watershed

The ground surface area that provides drainage to the sinkhole.

Site Plan

The same as Plot Plan.

Special Exception

A procedure whereby the Board of Adjustment may grant a deviation from the requirements of these Zoning Regulations in specific cases, but only as provided and in such manner by these Zoning Regulations. (See Article 53, Section 11).

Special Use Permit

(See Conditional Use Permit.)

Stable, Private

An accessory building for the keeping of no more than four (4) horses, donkeys, mules, or ponies owned by the person living on the premises, and for which no remuneration is received.

Stable, Public

Any stable for the housing of horses, donkeys, mules, and ponies operated for remuneration, hire, sale or stabling whether or not owned by persons residing on the premises.

Story

That portion within a building, included between the surface of any floor and the surface of the floor next above it, or, if there be no floor above it, then the space between the floor and the ceiling next above it.

Story, First

The lowest story or the ground story of any building the floor of which is not more than twelve (12) inches below the average contact ground level at the exterior walls of the building, except that any basement or cellar for residence purposes shall be deemed the first story.

Story, Half

A partial story under a gable, hip or gambrel roof, the wall plates of which on at least two (2) opposite exterior walls are not more than four (4) feet above the floor of such story, and that has an average height of not more than eight (8) feet and covering a floor area of not more than seventy-five (75) percent of the area of the floor on the story next below.

Street

The full width between the property lines bounding every way of whatever nature for the purpose of vehicular traffic, whether designed as a street, highway, freeway, expressway, thoroughfare, parkway, road, avenue, boulevard, lane, place, circle, or however otherwise designed.

Street Classification

Streets and roads are classified by function according to relative importance and design standards are related to functional classification. These classifications are as follows:

1. Primary arterials or expressways are facilities devoted primarily to traffic movement, performing little or no land service function and should have some access control.
 - a. Freeways have full access control and separation of all conflicting traffic movements, such as the interstate highway system or other freeways connecting large population centers carrying heavy volumes of traffic for long distances.
 - b. Parkway are usually located within a park or park-like green area, and are restricted to non-commercial vehicles.
 - c. Other expressways are generally divided highways with some grade-separated interchanges, some cross streets not carried across the median, and the other intersections controlled by signals or stop signs, such as primary state highway.
2. Secondary arterials are facilities that bring traffic to and from primary arterials and accommodate major movements and traffic not served by primary arterials. Designed mainly for through traffic, secondary arterials may also perform some land service functions, particularly in low density agricultural areas. Typical secondary arterials are secondary state highways and primary county roads.

3. Collectors are streets that serve internal traffic movements within an area, such as a subdivision, and connect the area with the arterial system such as secondary county highways (farm roads). They do not handle long through trips, but connect small communities and developed areas and also provide a land service function. Direct frontage of single-family lots on collectors is normally discouraged.
4. Local or land access streets have the sole function of providing access to immediately adjacent land, whether industrial, commercial or residential.
5. Minor local or land access streets are streets whose length is limited by design as a loop or cul-de-sac that will not be extended into adjacent development, normally serving not more than fifteen (15) dwelling units on a cul-de-sac or thirty (30) dwelling units on a loop.

Street, Intersecting

Any street that adjoins another street at an angle, whether or not it crosses the other.

Structural Alteration

Any change in the structural members of a building such as walls, columns, beams or girders.

Structure

Anything constructed, the use of which requires permanent location on the ground or attachment to something having a permanent location on the ground (not including sidewalks, driveways and similar improved areas).

Subdivision Regulations

The Christian County Subdivision Regulations.

Tavern

An establishment where fifty (50) percent or more of the gross income is derived from the sale of alcoholic beverages by the drink, for the consumption on the property, and where the serving of food and non-alcoholic beverages, for consumption on the property, and the sale of package liquors may be accessory uses.

Tea Room

An establishment used primarily for the serving of non-alcoholic beverages by the drink for consumption on the premise with the sale of food for consumption on the premises is accessory to the primary use.

Thoroughfare Plan

An official thoroughfare plan that may be adopted or amended from time to time by the Christian County, establishing the general location and official right-of-way width of the major and secondary highways and thoroughfares in Christian County.

Tourist Court

Motel.

Townhouse

Multi-family dwelling units intended for sale as individual single-family dwelling units, each unit having its own yard (front and rear) and each having its own lot number designated on a recorded subdivision plat.

Traffic Signaling Device

A sign, light(s), device, or mechanical contrivance used for the control of motor vehicular and pedestrian movement.

Trailer

Any portable or mobile vehicle or structure on wheels, skids or rollers not structurally anchored to a foundation, either self-propelled, or propelled by an attached vehicle or other propelling apparatus that is used or may be used for the conduct of any business, trade or occupation, or use as a selling or advertising device, or use for commercial hauling, storage, or conveyance.

Travel Trailer or Recreational Vehicle (RV)

A portable vehicular structure built on a chassis and designed to be used on the highways, either towed or self-propelled and also designed to be used as a temporary dwelling for travel and recreational purposes.

Travel Trailer Park

See Recreational Vehicle (RV) Park

Usable Open Space

The space on a lot (or exterior balcony or roof surface up to a total of fifty (50) percent of the requirement) that is unoccupied by a principal or accessory building above the finished lot grade, at least seventy-five (75) percent unenclosed and available to the occupants of the building or buildings on the lot.

Use

The purpose for which land or a building is arranged, designed or intended, or for which either land or a building is or may be occupied or maintained. (See also Change in Use.)

Utility Service Installation

Any structure or installation by utility company deemed to be necessary for the safe or efficient operation of that utility.

Variance

A procedure whereby relief may be granted from the strict letter of these Zoning Regulations where it can be clearly shown that by complying with these Zoning Regulations, the owner of the property would suffer practical difficulties or unnecessary hardships. The conditions for granting a variance are stated in Article 53, Section 6.

Water Supply, Central

A community or non-community water supply system that is regulated by the Missouri Department of Natural Resources.

Water Supply, Public

A water supply system that is owned, maintained, and operated by a municipal or governmental entity.

Watercourse

Land that has conformation so as to give to surface water flowing from one tract of land to another tract of land, a fixed and determinate course so as to uniformly discharge it upon the servient tract at a fixed and definite point. It shall include but shall not be limited to ravines, swales, sinkholes or depressions of greater or less depth extending from one tract and so situated as to gather up the surface water flowing upon the dominate tract and to conduct along a definite course to a definite point of discharge upon the servient tract. It shall not be deemed to be important that the force of water flowing from one tract of land to another has not been sufficient to wear out a channel or canal having definite well-marked sides or banks. If the surface water, in fact, uniformly or habitually flows over a given course, having reasonable limits as to the width of the line of its flow, it shall be considered to have a definite course.

Wholesale Trade

An establishment or place of business that is primarily engaged in selling merchandise to retailers; to industrial, commercial, institutional, or professional business uses, or to other wholesalers; or acting as agents or brokers and buying merchandise for, or selling merchandise to, such individuals or companies.

Winery

An establishment at which wine is made.

Yard, Front

An open space extending the full width of the lot between a building and the front lot line, unoccupied and unobstructed from the ground upward except as otherwise provided in these Zoning Regulations.

Yard, Front, Least Depth

The shortest distance, measured horizontally, between any part of a building and the front lot line.

Yard, Front, Least Depth, How Measured

Such depth shall be measured from the right-of-way line of the existing street on which the lot fronts (the front lot line); provided, however, that if the proposed location of the right-of-way line of such street as established in the Thoroughfare Plan differs from that of the existing street, then the required front yard least depth shall be measured from the right-of-way line of such street as designated in said Thoroughfare Plan.

Yard, Rear

An open space extending the full width of the lot between a building and the rear lot line, unoccupied and unobstructed from the ground upward except as otherwise provided in these Zoning Regulations.

Yard, Rear, Least Depth, How Measured

The shortest distance, measured horizontally, between any part of a building, other than such parts excepted in these Zoning Regulations, and the rear lot line.

Yard, Side

An open space extending from the front yard to the rear yard between a building and the nearest side lot line, unoccupied and unobstructed from the ground upward except as specified in these Zoning Regulations.

Yard, Side, Least Width, How Measured

Such width shall be measured from the nearest side lot line, and, in case the nearest lot line is a side street lot line, from the right-of-way line of the existing street; provided, however, that if the proposed location of the right-of-way line of such street as established on the Thoroughfare Plan differs from that of the existing street, then the required side yard least width shall be measured from the right-of-way of such street as designated on the Thoroughfare Plan.

Zoning Map

The Christian County Zoning Map, as is from time to time amended to reflect zoning changes. The County maintains a database in digital form, created using Geographic Information System (GIS) mapping software.

Zoning Certificate

A document issued by the Planning & Zoning Administrator, authorizing buildings, structures, or uses consistent with the terms of these Zoning Regulations and for the purpose of carrying out and enforcing its provisions.

ARTICLE 3. DISTRICTS and DISTRICT BOUNDARIES

Section 1. Districts

For the purposes of the Regulations, the unincorporated area of Christian County, Missouri is hereby divided into the following categories of zoning districts:

AGRICULTURE DISTRICTS

- A-1 Agriculture District
- A-R Agriculture Residential District

RESIDENTIAL DISTRICTS

- RR-1 Rural Residence District
- MH-1 Manufactured Home (Mobile Home) Park or Subdivision District
- UR-1 Urban Residence District
- R-1 Suburban Residence District
- R-2 One and Two-Family Residence District
- R-3 Multi-Family Residence District
- R-4 Multi-Family Residence District
- CD Conservation Development District

OFFICE DISTRICTS

- O-1 Professional Office District
- O-2 General Office District

COMMERCIAL DISTRICTS

- C-1 Neighborhood Commercial District
- C-2 General Commercial District

MANUFACTURING DISTRICTS

- M-1 Light Manufacturing or Industrial District
- M-2 General Manufacturing or Industrial District

OVERLAY DISTRICTS

- USA Urban Service Areas Overlay District
- F-1 Floodplain Overlay District

PLANNED UNIT DEVELOPMENT

- PUD Planned Unit Development

Section 2. Quick Reference to Area Measurements by Zoning District

This Section of Article 3 is intended to serve as a quick reference guide for the area, frontage, height and yard requirements for each of the Zoning Districts. Please note that this information is also contained within the descriptions of each individual Zoning District as well as additional information pertaining to road or street setbacks which must be met in addition to the following required yard depths.

A-1 AGRICULTURE DISTRICT	Minimum Lot Area	Minimum Frontage	Front Yard Depth	Side Yard Depth	Rear Yard Depth	Dwelling's 1st Floor Minimum Area
Lot Area Customarily agricultural uses, as specified in Article 31	5 acres	None	50 feet	50 feet	50 feet	-
Individual single-family dwelling with individual well and approved on-site sewage system	5 acres	200 feet	50 feet	25 feet	50 feet	640 sq. ft. 1 st floor minimum
Recreational facilities, hospitals	5 acres	None	100 feet	75 feet	100 feet	-

A-R AGRICULTURAL RESIDENCE DISTRICT	Minimum Lot Area	Minimum Frontage	Front Yard Depth	Side Yard Depth	Rear Yard Depth	Maximum Height
Individual single-family dwelling with individual well and approved on-site sewage system	3 acres	150 feet	40 feet	25 feet	50 feet	2½ stories (35 feet)
All other permitted uses (Article 32)	3 acres	150 feet	25 feet	50 feet	50 feet	50 feet

RR-1 RURAL RESIDENCE DISTRICT	Minimum Lot Area	Minimum Frontage	Front Yard Depth	Side Yard Depth	Rear Yard Depth	Maximum Height
Individual single-family dwelling with individual well and approved on-site sewage system	3 acres	150 feet	40 feet	25 feet	50 feet	2½ stories (35 feet)
All other permitted uses (Article 33)	3 acres	150 feet	40 feet	25 feet	50 feet	2½ stories (35 feet)

Christian County Zoning Regulations
 Article 3 – Districts and District Boundaries

MH-1 MANUFACTURED PARK SUBDIVISION DISTRICT	Minimum Lot Area	Minimum Frontage	Front Yard Depth	Side Yard Depth	Side Yard Width – Both Sides	Rear Yard Depth
Individual home site – Lot Size with public sewer and water supply	4,000 sq. ft.	40 feet	25 feet	6 feet	Side yards may be reduced to zero lot lines, if the other side yard is not less than 12 feet, but two lots may not share the same zero lot line.	10 feet

UR-1 URBAN RESIDENCE DISTRICT	Minimum Lot Area	Minimum Frontage	Front Yard Depth	Side Yard Depth	Side Yard Width – Both Sides	Rear Yard Depth
Single-family dwelling with public sewer and public water supply	7,000 sq. ft.	50 feet	25 feet	5 feet	10 feet	20% of lot depth
Other permitted uses with public sewer and water supply	7,000 sq. ft.	50 feet	25 feet	5 feet	10 feet	20% of lot depth

R-1 SUBURBAN RESIDENCE DISTRICT	Minimum Lot Area	Minimum Frontage	Front Yard Depth	Side Yard Depth	Side Yard Width – Both Sides	Rear Yard Depth
Single-family dwelling with public sewer and public water supply	10,000 sq. ft.	70 feet	30 feet	6 feet	12 feet	25 feet
Other permitted uses	None	100 feet	40 feet	20 feet	40 feet	50 feet
Single-family dwelling without public sewer and public water supply	3 acres	150 feet	40 feet	25 feet	50 feet	50 feet

Christian County Zoning Regulations
Article 3 – Districts and District Boundaries

R-2 ONE & TWO-FAMILY RESIDENCE DISTRICT	Minimum Lot Area	Minimum Frontage	Front Yard Depth	Side Yard Depth	Side Yard Width – Both Sides	Rear Yard Depth
Single-family dwelling with public sewer and water supply	9,000 sq. ft.	70 feet	30 feet	6 feet	12 feet	25 feet
Two-family dwelling with public sewer and water supply	10,000 sq. ft.	70 feet	30 feet	6 feet	12 feet	25 feet
Cluster development and townhouses with public sewer and water supply	5,000 sq. ft.	40 feet each unit	30 feet each unit	Zero on common wall	12 feet per dwelling	25 feet
Other permitted uses with public sewer and water supply	1 acre	100 feet	40 feet	15 feet	30 feet	50 feet

R-3 MULTI-FAMILY RESIDENCE DISTRICT	Minimum Lot Area	Minimum Frontage	Front Yard Depth	Side Yard Depth	Side Yard Width – Both Sides	Rear Yard Depth
One-family dwelling with public sewer and water supply	9,000 sq. ft.	70 feet	30 feet	6 feet	12 feet	25 feet
Two-family dwelling with public sewer and water supply	9,000 sq. ft. 4,500 sq. ft. per double unit	70 feet	30 feet	6 feet	12 feet	25 feet
Multi-family dwelling with public sewer and water supply	3,000 sq. ft. per unit	70 feet	30 feet	6 feet	12 feet	25 feet

R-4 MULTI-FAMILY RESIDENCE DISTRICT	Minimum Lot Area	Minimum Frontage	Front Yard Depth	Side Yard Depth	Side Yard Width – Both Sides	Rear Yard Depth
Three-family dwelling with public sewer and water supply	9,000 sq. ft.	70 feet	25 feet	6 feet	12 feet	25 feet
Four-family dwelling with public sewer and water supply	10,000 sq. ft.	75 feet	25 feet	6 feet	12 feet	25 feet
Over four-family dwelling with public sewer and water supply	2,000 sq. ft. per unit	100 feet	25 feet	6 feet	12 feet	25 feet

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O-1 PROFESSIONAL OFFICE DISTRICT	Minimum Lot Area	Minimum Frontage	Front Yard Depth	Side Yard Depth	Rear Yard Depth	Maximum Height
Permitted uses with individual well and approved on-site sewage system, producing less than 1500 gallons of wastewater per day	20,000 sq. ft.	100 feet	50 feet	25 feet	50 feet	2½ stories (35 feet)

O-2 GENERAL OFFICE DISTRICT	Minimum Lot Area	Minimum Frontage	Front Yard Depth	Side Yard Depth	Rear Yard Depth	Maximum Height
Non-residential buildings with individual well and approved on-site sewage system, producing less than 1500 gallons of wastewater per day	20,000 sq. ft.	100 feet	50 feet	None, except where adjoining R District, then 15 feet	10 feet	2½ stories (35 feet)

C-1 NEIGHBORHOOD COMMERCIAL DISTRICT	Minimum Lot Area	Minimum Frontage	Front Yard Depth	Side Yard Depth	Rear Yard Depth	Maximum Lot Coverage (all structures)
Principal structure served by public sewer and water	None	70 ft.	30 feet	6 feet	25 feet	35 percent
Principal structure without public sewer and water, producing less than 1500 gallons of wastewater per day	None	100 ft.	30 feet	6 feet	25 feet	35 percent

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C-2 GENERAL COMMERCIAL DISTRICT	Min. Lot Area	Min. Frontage	Front Yard Depth	Side Yard Depth	Rear Yard Depth	Maximum Lot Coverage (all structures)
Principal structure served by public sewer and water	None	None	50 feet	None, unless adjacent to more restrictive Zoning District, then 25 feet	10 feet, unless adjacent to more restrictive Zoning District, then 25 feet	45 percent
Principal structure without public sewer and water, producing less than 1500 gallons of wastewater per day	None	100 ft.	50 feet	None, unless adjacent to more restrictive Zoning District, then 25 feet	10 feet, unless adjacent to more restrictive Zoning District, then 25 feet	45 percent

M-1 LIGHT MANUFACTURING or INDUSTRIAL DISTRICT	Min. Lot Area	Min. Frontage	Front Yard Depth	Side Yard Depth	Rear Yard Depth
Non-residential (not served by public sewer)	None	100 feet	50 feet	None, except where adjoining A or R districts, then not less than 100 feet each side	50 feet
Non-residential (served by public sewer)	None	50 feet	50 feet	None, except where adjoining A or R districts, then not less than 100 feet each side	50 feet
Residential dwelling (existing)	3 acres	150 feet	40 feet	25 feet each side	50 feet
Residential dwelling (new)	Not permitted	New residential construction not permitted	New residential construction not permitted	New residential construction not permitted	New residential construction not permitted

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M-2 GENERAL MANUFACTURING or INDUSTRIAL DISTRICT	Minimum Lot Area	Lot Frontage	Front Yard Depth	Side Yard Widths	Rear Yard Depth
Non-residential (not served by public sewer)	None	100 feet	50 feet	None, except where adjoining A or R districts, then not less than 100 feet each side	50 feet except where adjoining A or R District, then 300 feet unless specified otherwise
Non-residential (served by public sewer)	None	50 feet	50 feet	None, except where adjoining A or R districts, then not less than 100 feet each side	50 feet except where adjoining A or R District, then 300 feet unless specified otherwise
Residential dwelling (existing)	3 acres	150 feet	40 feet	25 feet each side	50 feet
Residential dwelling (new)	New residential construction not permitted	New residential construction not permitted			

Section 3. District Boundaries

The boundaries of these Zoning Districts are hereby established as shown on the Zoning Map of the unincorporated territory of Christian County, which map is hereby made a part of these Zoning Regulations. The said Zoning Map and all notations and reference and other matters shown thereon, shall be and are hereby made part of the Zoning Regulations. The Zoning Map may be modified, amended, or updated from time to time. The Zoning Map shall remain on file in the office of the Christian County Planning & Zoning Commission, Christian County, Missouri.

Section 4. District Boundaries Intended to Follow Property Lines

Except where referenced on the Zoning Map to a street line or other designated line by dimensions shown on said map, the Zoning District boundary lines are intended to follow property lines, lot lines, or the center lines of streets or alleys as they existed at the time of the adoption of these Zoning Regulations; but where a Zoning District boundary line obviously does not coincide with the property lines, lot lines or center lines, or where it is not designated by dimensions, it shall be deemed to be one-hundred twenty (120) feet back from the nearest street line in case it is drawn parallel with a street line, or its location shall be determined by scaling in other cases.

Section 5. District Boundary Line and Other District Requirements

Where a Zoning District boundary line as established in these Zoning Regulations, or as shown on the Zoning Map, divides a lot that was in a single ownership and on record at the time of enactment of these Zoning Regulations, the use authorized thereon and the other Zoning District requirements applying to the least restricted portion of such lot under these Zoning Regulations shall be considered as extending to the entire lot, provided the more restricted portion of such lot is entirely within fifty (50) feet of said dividing Zoning District boundary lines. The use so extended shall be deemed to be conforming.

Section 6. District Boundary Line Questions Determined by Board of Adjustment

Questions concerning the exact location of Zoning District boundary lines shall be determined by the Board of Adjustment.

Section 7. Vacation of Public Way Expands Adjacent Districts

Whenever any street or public way is vacated by official action as provided by law, the Zoning Districts adjoining the side of such public way shall be automatically extended, depending on the side or sides to which such lands revert, to include the right-of-way of the public way thus vacated, that shall thenceforth be subject to all regulations of the extended Zoning District(s).

Section 8. Disincorporation of Territory Reverts to A-1

In every case where territory has not been specifically included within a Zoning District, or where territory becomes a part of the unincorporated area of Christian County by the disincorporation of any village, town, city or portion thereof, such territory shall automatically be classified as an A-1 District, until otherwise classified.

Section 9. F-1 Floodplain

The Floodplain Overlay District shall encompass those areas identified on the Flood Insurance Rate Maps (FIRM) for Christian County as unnumbered A zones. Please refer to the Floodplain Management Article of the Stormwater and Erosion Control Regulations for Christian County.

ARTICLE 4. GENERAL PROVISIONS

Section 1. Conformance Required

Except as specified in these Zoning Regulations, no land, building, structure, or premises shall hereafter be used, and no building or structure or part thereof, or other structure, shall be located, erected, moved, reconstructed, extended, enlarged or altered except in conformity with these Zoning Regulations for the Zoning District in which it is located, and when all other applicable ordinances, statutes, or regulations are met.

Section 2. Continuing Existing Uses

Except as specified in these Zoning Regulations, any use, building or structure existing at the time of the enactment of these Zoning Regulations may be continued, even though such use, building or structure may not conform to the provisions of the Zoning Regulations for the Zoning District in which it is located.

Section 3. Agriculture

Nothing contained in these Zoning Regulations shall prohibit the use of any land for agricultural purposes or the construction or use of buildings or structures incidental to the use for agricultural purposes of the land on which such buildings or structures are located, except dwellings, and no zoning certificate shall be required for any such use, building or structure.

Section 4. Public Utilities

Nothing contained in these Zoning Regulations shall prevent the location, erection, construction, reconstruction, change, alteration, maintenance, removal, use or enlargement of any building or structure of any public utility, whether publicly or privately owned, or the use of land by any public utility for the operations of its business as may have been or may hereafter be specifically authorized or permitted by a certificate of public convenience and necessity, or order used by the Public Service Commission, or by permit of the County Commission.

Section 5. Outdoor Advertising

Outdoor advertising shall be classified as a commercial use and shall be permitted in the following Zoning Districts: C-1, C-2, M-1, and M-2, subject to the regulations of the Missouri Department of Transportation.

Section 6. Floodplain Overlay District

Nothing provided in these Zoning Regulations shall be so construed as to prohibit the owner of lands within any Floodplain Overlay District from lawfully filling, draining, constructing levees or otherwise improving his land, so as to eliminate or reduce the danger of flood or erosion providing that such improvements do not cause surrounding properties to be flooded or harmed by the action. Please refer to the Floodplain Management Article of the Stormwater and Erosion Control Regulations for Christian County.

Section 7. Retail Establishments and Places of Entertainment

Nothing contained in these Zoning Regulations shall prohibit the use of any land for the construction of a building or the reconstruction, change, alteration, maintenance, enlargement or use of any building for the maintenance and operation of any mercantile or retail establishment, drug store, hotel, lunch room or restaurant, or place of entertainment in any area zoned for trade or industry except those lawful provisions set forth in the establishment of those areas or Zoning Districts, but a Zoning Certificate for such uses shall be required in accordance with the provisions of the Zoning Regulations.

Section 8. Nonconforming Uses or Buildings

No existing building or premises devoted to a use not permitted by the Zoning Regulations applicable to the Zoning District in which such building or premises is located, except when required to do so by law or order, shall be enlarged, extended, reconstructed, substituted or structurally altered, unless the use thereof is changed to a use permitted in the Zoning District in which such building or premises is located, and except as follows:

A. Substitution or Extension

When authorized by the Board of Adjustment, the substitution for a non-conforming use of another non-conforming use or the extension of a non-conforming use may be made.

B. Whenever a non-conforming use has been changed to a conforming use, such use shall not thereafter be changed to a non-conforming use.

C. Where, at the effective date of the adoption of this ordinance or amendment hereto, a lot of record exists and is held in separate ownership but fails to meet the minimum requirements for area or width of the Zoning District in which it is located, such lot may have one (1) single-family dwelling and customary accessory buildings erected upon it provided that:

1. Said lot is in separate ownership and not of continuous frontage with other lots in the same ownership.
2. Said lot is able to meet the yard requirement of the Zoning District in which it is located. A variance is obtainable only through Authorization of the Board of Adjustment.

- D.** If two (2) or more lots of record exist, with continuous frontage in single ownership, any of which fail to meet the minimum requirements of the Zoning District in which said lots are located, shall be considered to be an undivided tract and no part shall be used which does not meet the minimum requirements of the respective Zoning District.
- E.** When authorized by the Board of Adjustment, the extension or completion of a building devoted to a nonconforming use upon a lot occupied by such building, or on a lot adjoining, providing that such lot was under the same ownership as the lot in question on the date the use of such building became nonconforming, and where such extension is necessary and incidental to the existing use of such building.
- F.** When authorized by the Board of Adjustment, a nonconforming use may be extended throughout those parts of a building designed or arranged for such use before the date it became nonconforming, if no structural alterations, except those required by law, are made therein.
- G. Discontinuance**
No building, structure or premises where a nonconforming use has ceased for one (1) year or more shall again be put to a nonconforming use.
- H. Replacing Damaged Buildings**
Any nonconforming building or structure damaged more than sixty (60) percent of its then fair market value, exclusive of the foundations, at the time of damage by fire, flood, explosion, wind, earthquake, war, riot or other calamity or Act of God; shall not be restored or reconstructed and used as before such happening; but if less than sixty (60) percent damaged above the foundation, it may be restored, reconstructed, or used as before, provided that it be done within twelve (12) months of such happening.
- I. Repairs and Alterations**
Such repairs and maintenance work as required to keep it in sound condition may be made to a non-conforming building or structure, provided no structural alterations shall be made except such as are required by law or authorized by the Board of Adjustment.

Section 9. Conversion of Dwellings

The conversion of any building into a dwelling or the conversion of any dwelling so as to accommodate an increased number of dwelling units or families, shall be permitted only within a Zoning District in which a new building for similar occupancy would be permitted under these Zoning Regulations and only when the resulting occupancy will comply with the requirements governing new construction in such Zoning District.

Section 10. Accessory Buildings and Uses

A. Definition

An accessory structure or use:

1. Is subordinate to and serves a principal building or a principal use;
2. Is subordinate in area, extent or purpose to the principal building or principal use served;
3. Contributes to the comfort, convenience or necessity of the occupants, business or industry in the principal building or principal use served;
4. Is located on the same lot as the principal building or principal use served; and
5. Cannot be a manufactured residential structure.

B. Allowed Accessory Structures and uses

Accessory Structures shall include, but are not limited to the following permitted structures:

1. Buildings or structures incidental to a principal building or structures, such as storage buildings, workshops, studios, carports or garages incidental to a permitted use.
2. Barn
3. Playhouse
4. Greenhouse
5. Pool and bathhouses
6. Living quarters
7. Garage/living area combination
8. Guest house or rooms for guests in an accessory building, minimum area must comply with building codes.

C. Use Limitations

All Accessory Structures and uses shall comply with the use limitations applicable in the zoning district in which they are located.

D. Setback and Spacing Regulations

All accessory structures shall comply with the following regulations:

1. Accessory buildings shall be set back a minimum of ten feet from the rear and side lot lines.
2. An accessory building shall be set back a distance equal to its side wall height.
3. No accessory building shall be permitted in any required residential front yard or required easement.
4. No accessory building shall be constructed closer than ten feet of the principle structure on the lot.
5. On a corner lot, no accessory building shall project beyond the front lot lines on the adjacent lots.

E. Additional Regulations for Accessory Structures

1. All driveways accessing accessory structures from a public right-of-way shall obtain a driveway access permit from the applicable County Road District (or their designee), Special Road District or the Missouri Department of Transportation prior to installation of the driveway.
2. The living area in an accessory structure shall be limited to 1,000 square feet.

F. Conditional Use Permit

Property owners may request approval of a Conditional Use Permit from the Board of Adjustment for the following:

1. Increase in the size of the living area within an accessory structure beyond the permitted size.
2. The following conditions shall apply and shall be included as conditions for the approval of the Conditional Use Permit:
 - a. Water and sewer facilities shall be connected directly to the Accessory Structure rather than attached to the principle structure on the lot.
 - b. The property owner lives in one of the two structures on the property.

Section 11. Traffic Visibility Across Corner Lot

In any R District on any corner lot, no fence, structure, or planting shall be erected or maintained within twenty (20) feet of the "corner" so as to interfere with the traffic visibility across the corner.

Section 12. Required Area or Space Cannot Be Reduced

- A. No lot, yard, court, parking area or other space shall be reduced in area or dimensions so as to make said area or dimensions less than the minimum required by these Zoning Regulations; and, if already less than the minimum required by these Zoning Regulations, said area or dimensions shall not be further reduced.
- B. No part of a required yard, court, parking area or other space provided about, or for, any building or structure shall be included in the requirements for another building or structure.

Section 13. Off-Street Parking and Loading

In any Zoning District, spaces for off-street parking and loading or unloading shall be provided.

Section 14. Unsafe Buildings

Nothing in these Zoning Regulations shall prevent the strengthening or restoring to a safe condition of any part of any building or structure declared unsafe by the proper authority.

Section 15. Pending Applications for Building Permits

Nothing in these Zoning Regulations shall require any change in the overall layout, plans, construction, size or designated use of any development, building, structure or part thereof, for which official approvals and required building permits have been granted before the enactment of these Zoning Regulations, the construction of which, conforming with such plans, shall have been started before the effective date of these Zoning Regulations and completion thereof carried on in a normal manner within the subsequent six (6) months period, and not discontinued until after the completion, except for reasons beyond the control of the builder.

Section 16. Multiple Uses and Structures

- A. Only one primary use is allowed on a single tract of property.
- B. All other uses, whether within the same structure or located in other structures on the same tract, must be of an accessory nature as determined by the Board of Adjustment.
- C. All applicable building codes shall be met.

ARTICLE 5. USE STANDARDS

Section 1. General Requirements

No premise, land, or structure in any Zoning District shall be used or occupied in any manner so as to create a dangerous, injurious, noxious or otherwise objectionable fire, explosive or other hazard; noise or vibration, smoke, dust, odor or other form of air pollution; heat, cold, dampness, electrical or other substance, condition or element; in such a manner or in such amount as to adversely affect a nearby or adjoining premise or surrounding area, referred to in these Zoning Regulations as "dangerous or objectionable elements"; provided that any use permitted or not prohibited by this Regulation may be established and maintained if it conforms to the provisions of these Zoning Regulations.

Section 2. Existing Uses

Use standards - review: Whenever it is alleged that a use of land or structure creates or is likely to create or otherwise produce dangerous or objectionable elements, the Planning & Zoning Commission shall make a preliminary investigation of the matter and shall forward its report, together with all preliminary findings and evidence, to the County Commission.

In the event that the Planning & Zoning Commission concurs in the allegations that there exists or is likely to be created such dangerous or objectionable elements, it shall request the County Commission to authorize the employment of a competent specialist or testing laboratory for the purpose of determining the nature and extent of said dangerous or objectionable elements and of practicable ways to remedy such condition.

Conditions:

- A. No noise from any operation conducted on the premise, other than that emanating from vehicular traffic, either continuous or intermittent, shall be detectable at any boundary line of the M-1 District.
- B. No toxic matter, noxious matter, smoke, gas or odorous or particulate matter shall be emitted that is detectable beyond the lot lines of the lot on which the use is located.
- C. No vibrations shall be detectable beyond the lot lines of the lot on which the use is located.
- D. Exterior lighting fixtures shall be shaded whenever necessary to avoid casting light upon property located in any Residential District.
- E. The manufacture of flammable materials that produce explosives, vapors or gases is prohibited.
- F. Any operation that produces intense glare or heat shall be performed within a completely enclosed building, and exposed sources of light shall be screened so as not to be detectable beyond the lot lines.

Section 3. Enforcement

Upon receipt of the findings and recommendations of such specialist or laboratory, the County Commission may approve, partially approve, or disapprove the measures recommended therein and instruct the Planning & Zoning Administrator to proceed with the enforcement of said measures.

ARTICLE 6. CONDITIONAL USES

Section 1. The Board of Adjustment Authority to Allow Any Conditional Use

The Board of Adjustment, after receiving a report and recommendation from the Planning & Zoning Commission, shall have authority to allow any conditional use permitted in a particular Zoning District:

- A. Upon finding that the proposed use meets all requirements set forth in the section allowing such conditional use, and
- B. Further finding that such use is not inappropriate for the neighborhood, or for the adjacent properties, considering both present and probable future uses.

Section 2. Limitations or Conditions

In authorizing a conditional use, the Board of Adjustment may make such requirements, limitations or conditions with respect to the location, construction, maintenance and operation as may be reasonably necessary for the protection of the neighborhood or adjacent properties.

ARTICLE 7. PARKING and LOADING AREAS, PUBLIC GARAGES, PARKING LOTS and FILLING STATIONS

Section 1. Off-Street Loading Space

- A. In any Zoning District, in connection with every building or part thereof hereafter erected and having a gross floor area of ten thousand (10,000) square feet or more, that is to be occupied by manufacturing, storage, warehouse, goods display, retail store, wholesale store, market, hotel, hospital, mortuary, laundry, dry cleaning or other uses similarly requiring the receipt or distribution by vehicles of material or merchandise, there shall be provided and maintained, on the same lot with such building, at least one (1) off-street loading space plus one (1) additional such loading space for each twenty thousand (20,000) square feet or major fraction thereof of gross floor area so used in excess of twenty thousand (20,000) square feet.
- B. Each loading space shall not be less than ten (10) feet in width, twenty-five (25) feet in length and fourteen (14) feet in height.
- C. Subject to the limitations of this Article, such space may occupy all or any part of the required yard or court space.
- D. No loading space shall be located closer than fifty (50) feet to any lot in any Residential District, unless wholly within a completely enclosed building or unless enclosed on all sides by a wall or uniformly painted solid board fence not less than six (6) feet in height.

Section 2. Off-Street Parking Space

- A. **Required Automobile Parking Spaces**
In all Zoning Districts, in connection with every industrial, business, institutional, recreational, residential, or any other use, there shall be provided, at the time any building or structure is erected or is enlarged or increased in capacity, off-street parking spaces for automobiles according to the provisions of the provisions of these Zoning Regulations.
- B. **Size and Access**
 - 1. Each off-street parking space shall have an area not less than one hundred sixty-six and one-half (166.5) square feet (18.5 feet x 9 feet) exclusive of access drives or aisles, and shall be of usable shape and condition. Except for dwellings, no parking area shall be less than one thousand (1,000) square feet in area.
 - 2. There shall be adequate provisions for ingress and egress to all parking spaces. Where a lot does not abut on a public or private alley or easement of access, there shall be provided an access drive

not less than twelve (12) feet in width in the case of a dwelling, and not more than thirty (30) feet in width in all other cases, leading to the parking or storage areas or loading or unloading spaces required hereunder in such manner as to secure the most appropriate development of the property in question, but, except where provided in connection with a use permitted in an R District, such easement of access or access drive shall not be located in any R District.

C. Handicapped Parking

Handicapped parking shall be required in sufficient amounts to be in conformance with the Americans with Disability Act. One (1) expanded handicap space (a parking space that is wide enough and deep enough for a van lift to be deployed) will be required in developments with less than twenty (20) standard spaces. For developments with greater than twenty (20) parking spaces, and for every twenty (20) parking spaces thereafter, an additional standard parking space will be required, every fifth (5th) of which must be the expanded type.

D. Floor Area Defined

1. For purpose of applying the requirements of these Zoning Regulations, "Floor Space," in the case of offices, merchandising or service type of uses, means the gross floor area used or intended to be used by tenants, or for service to the public as customers, patrons, clients or patients, including areas occupied by fixtures and equipment used for display or sales or merchandise.
2. It shall not include areas used principally for non-public purposes, such as storage, incidental repair, processing or packaging of merchandise, for show windows, for offices incidental to management or maintenance of stores or buildings, for toilet or rest rooms, for utilities, or for dressing rooms, fitting or alteration rooms.

E. Number of Parking Spaces Required

1. The minimum number of off-street parking spaces required shall be as set forth in the following table; however, final requirements shall be determined by the Planning & Zoning Administrator.
2. In the case of any building, structure or premise, the use of which is not specifically mentioned in these Zoning Regulations, the provisions for a use that is so mentioned and to which said use is similar, shall apply.

Uses	Parking Spaces Required
Retail Establishments	1 for each 200 sq. ft. of floor area
Banks, Businesses, and Professional Offices	1 for each 200 sq. ft. of floor area
Bowling Alleys	5 for each alley
Churches and Schools	1 for each 8 seats in an auditorium or 1 for each 17 classroom seats, whichever is greater
Dance Halls and Assembly Halls without fixed seats, Exhibition Halls except Church Assembly Rooms in conjunction with Auditorium	1 for each 100 sq. ft. of floor area used for assembly or dancing
Dwellings	2 for each dwelling unit
Funeral Homes and Mortuaries	4 for each parlor or 1 for each 50 sq. ft. of floor area
Hospitals	1 for each 2 beds
Hotels	1 for each 2 bedrooms
Manufacturing Plants, Research or Testing Laboratory Plants, over 1,000 sq. ft. in area	1 for each 2 employees in the maximum working shift, or 1,200 sq. ft. of floor area
Medical Clinics or Dental Clinics	1 for each 200 sq. ft. of floor area
Motels	1 space for each living or sleeping unit
Restaurants, Taverns, Beer Parlors, and Night Clubs – over 1,000 sq. ft. in area	1 for each 200 sq. ft. of floor area or 1 for each 3 seats, whichever is greater
Sanitariums, Convalescent Homes, Children's Homes	1 for each 6 beds
Sports Arenas, Auditoriums, Theaters, Assembly Halls, other than Schools	1 for each 6 seats
Swimming Pools and other recreational development associated with subdivisions	1 per each 10 dwelling units served
Wholesale Establishments or Warehouses	1 for each 3 employees on maximum shift or for each 3,000 sq. ft. of floor area, whichever is greater

F. Development and Maintenance of Parking Areas

Every parcel of land hereafter used as a public or private parking area, including a commercial parking lot and also an automobile or trailer sales lot, shall be developed and maintained according to the provisions of the following requirements:

1. Screening and Landscaping

Off-street parking areas shall be effectively screened on each side that adjoins or faces a premise situated in any R District, or an institutional premise, by masonry wall or solid fence of acceptable design. Such wall or fence shall be not less than four (4) feet or more than eight (8) feet in height and shall be maintained in good condition without any advertising thereon. In any R District, the space between such wall or fence and the side lot adjoining the premise, or the front lot line facing premise, shall be landscaped with grass, hardy shrubs or evergreen ground cover and maintained in good condition. In case the capacity of the parking area exceeds thirty (30) vehicles, it shall be screened by a masonry wall not less than four (4) feet or more than eight (8) feet in height.

2. Minimum Distances and Set-Backs

No part of any parking area shall be closer than ten (10) feet to any dwelling, school, hospital, or other institution for human care located on an adjoining lot, unless screened by an unpierced masonry wall of acceptable design. If not in an R District but adjoining an R District, the parking area shall be set back at least twenty-five (25) feet from the established street right-of-way line for a distance of fifty (50) feet from any R District.

3. Surfacing

Any off-street parking area shall be surfaced with an asphaltic binder pavement, Portland cement binder pavement, or chip and seal pavement to provide durable and dustless surface; shall be so graded and drained as to dispose of all surface water accumulated within the area, and shall be so arranged and marked as to provide for orderly and safe loading or unloading and parking and storage of self-propelled vehicles. The foregoing requirements with respect to surfacing shall not apply to a parking area in an M District, if more than two hundred (200) feet distant from any R District, except that a dustless surface shall be provided in any case.

4. Any lighting used to illuminate any off-street parking area shall be so arranged as to reflect the light away from any nearby or adjoining premise in any R District.

5. Handicapped parking will be sited, designed, and marked for the benefit of handicapped persons. All applicable building codes shall be met.

- G. No motor vehicle or trailer shall be parked in the required front yard of a lot or tract of land in any R District or a lot or tract of land used for residential purposes in any other Zoning District except in a driveway leading to a required off-street parking space for a single-family-detached, single-family semi-detached, duplex or townhouse dwelling unit or mobile home on an individual lot.
- H. The Board of Adjustment may authorize on appeal a modification, reduction, or waiver of the foregoing requirements, if it should find that, in the particular case appealed the peculiar nature of the residential business, trade, industrial, or other use, or the exceptional shape or size of the property or other exceptional situation or condition would justify such action.
- I. Large Commercial Motor Vehicles, Large Commercial Trailers and Commercial Vehicles. In all Zoning Districts the parking of large commercial motor vehicles, large commercial trailers and commercial vehicles shall require an off-street parking area with an access drive that is designed and constructed in a manner to be used by said vehicles.
1. This shall include an access on public right-of-way that is forty (40) to sixty (60) feet wide with a minimum of thirty (30) foot radius, and constructed in compliance with the Christian County Road and Access Standards for commercial drives. If the access is on Missouri Department of Transportation rights-of-ways then the construction must be in compliance with Missouri Department of Transportation design standards.
 2. The driveway extending from the access on public right-of-way shall be constructed using the same criteria as the access.
 3. Adequate parking area for the vehicles will be provided using the location requirements and screening requirements as used for automobile parking spaces.
 4. The parking area may be gravel provided that the gravel area is keep free of debris, potholes, puddles, or ruts and does not create a dusting on the surrounding area. If these items cannot be complied with then the parking area must be protected with a surface similar to the driveway and access drive that is non gravel.
 5. Large commercial motor vehicles, large commercial trailers or commercial vehicle parking requirements may be waived if only one vehicle is in use on the site that is titled or leased to the owner, leaser, or renter of the parking area, or the vehicles and/or trailer are part of an agricultural operation on which the vehicles are used to transport materials produced or grown on the property in question. If the vehicles and/or trailer in question are not titled or leased to the property owner then this operation will be considered

a commercial business and will need to be rezoned to the proper Zoning District or cease operation in the existing location.

Section 3. Restricted Business or Industrial Accessory Parking Areas

The Board of Adjustment may authorize, as a conditional use, the establishment and operation of an off-street parking area for twenty-five (25) or more automobiles in such parts of any A District, R District, or F-1 District that abut at least fifty (50) feet, either directly or across an alley, a C District, or an M District, subject to the following conditions and requirements:

- A. The parking lot shall be accessory to, and for use in connection with, one (1) or more business or industrial establishments located in an adjoining C District or M District.
- B. Each entrance and exit to and from such parking lot shall be at least twenty (20) feet distant from any adjacent property located in any R District.
- C. The parking lot shall be subject to all conditions or requirements, in respect to development, maintenance, and operation, that the Board of Adjustment deems necessary or desirable for the protection of adjacent property or the public interest.
- D. No sign of any kind, other than designating entrances, exits, and conditions of use, shall be maintained on such parking lot.
- E. No commercial repair work or services of any kind shall be conducted on such parking lot.
- F. No charge shall be made for parking in such parking lot.
- G. Any person, firm or corporation desiring to secure permission to establish and maintain a restricted business or industrial parking lot within the meaning of this subsection shall make application to the Board of Adjustment, accompanied by a plan that clearly indicates the proposed development, including the location, size, shape, design, landscaping, curb cuts and other features and appurtenances of the parking lot. Such application shall also be accompanied by the names and addresses of all owners of all properties within the same block as the proposed parking lot, and all properties separated therefrom by not more than one (1) street, any part of any one of which properties is within two hundred (200) feet of any part of said proposed parking lot and is located in an R District.
- H. Before making its final determination, the Board of Adjustment shall hold a public hearing, notice of which shall be given to owners of property above described. If the Board of Adjustment approves the aforesaid application, the Planning & Zoning Administrator shall thereafter issue a zoning certificate in accordance therewith, subject to any modification of

the foregoing requirements and to any additional requirements that may be stipulated by the Board of Adjustment.

- I. Any permit authorized by the Board of Adjustment and issued by the County Planning & Zoning Administrator may be revoked at the time that the aforementioned requirements are not complied with.

Section 4. Filling Stations, Public Garages, and Parking Lots

- A. No gasoline filling station, parking lot for twenty-five (25) or more motor vehicles, or parking garage or automobile repair shop shall have an entrance or exit for vehicles within two hundred (200) feet along the same side of a street of any school, public playground, church, hospital, public library or institution for dependents or for children, except where such property is in another block or on another street that the lot in question does not abut.
- B. No gasoline filling station or public garage shall be permitted where any oil draining pit or visible appliance for any purpose, other than filling cars, is located within twelve (12) feet of any street lot line or within twenty-five (25) feet of any R District, except where such appliance or pit is within a building.

ARTICLE 8. TRAVEL TRAILER PARKS AND RECREATIONAL VEHICLE PARKS (RV Parks)

Section 1. RV and Travel Trailer Storage

One (1) travel trailer or recreational vehicle may be stored in a driveway leading to a required off-street parking space for a single-family detached, single-family semi-detached, duplex or townhouse dwelling unit or mobile home on an individual lot or stored in an enclosed garage or other accessory building, or parked in a rear yard, provided that no living quarters shall be maintained or any business conducted in connection therewith while such travel trailer or recreational vehicle is parked or stored, and to insure compliance therewith, a zoning certificate shall be required.

Section 2. RV Parks Conformance with Health Department Regulations

Travel trailer and recreational vehicle parks are permitted in a C-2 General Commercial District but must conform to sanitary regulations prescribed by the Christian County Health Department, together with all amendments thereto subsequently adopted, and when all other applicable ordinances, statutes, or regulations are met, in addition to the following requirements:

- A. Mandatory Connection to Public Sewerage System.**
All travel trailers or recreational vehicles stationed within an authorized trailer or RV Park shall be connected to a public sewer system within seventy-two (72) hours.
- B. Mandatory Connection to Public Water System.**
All travel trailers or recreational vehicles stationed within an authorized Trailer or RV Park shall be connected to a public water system within seventy-two (72) hours. This requirement may be waived if the developer or proprietor of such trailer park provides an approved well that has been certified to comply with the requirements of the Missouri Division of Health and the Christian County Health Department.

Section 3. Access

- A.** No vehicular entrance to or exit from any travel trailer or recreational vehicle park wherever such may be located, shall be within two hundred (200) feet of any school, public playground, church, hospital, library, or institution for dependents or for children, except where such school, public playground, church, hospital, library, or institution for dependents or for children is in another block or another street that the premise in question does not abut.
- B.** All the areas for automobile access and parking shall comply with the applicable provisions of this Article.

- C. All areas not used for access, parking, circulation, buildings and services shall be completely and permanently landscaped and the entire site maintained in good condition.

Section 4. Yard Requirements

A travel trailer or recreational vehicle park shall comply with all areas and yard requirements prescribed in the Zoning District in which the recreational vehicle park is located.

Section 5. Lot Coverage

The buildings, cabins and trailers in any travel trailer or RV park together with any non-accessory buildings established on the lot, shall occupy in the aggregate not more than twenty-five (25) percent of the area of the lot.

Section 6. Enlargement or Expansion

- A. Any enlargement or extension to any existing travel trailer or recreational vehicle park shall be treated as if such enlargement or extension was a new establishment, and thus be subject to all current, applicable regulations.
- B. No enlargement or extensions to any travel trailer or recreational vehicle park shall be permitted unless the existing one is made to conform substantially to all requirements for new construction for such an establishment.

Section 7. Recreational Vehicle Park - Submission of Plans/Platting

- A. An application for the establishment of a travel trailer or recreational vehicle park shall be filed with the Planning & Zoning Administrator and must be accompanied by a stamped or sealed scale drawing certified by a registered civil engineer. All pertinent information, data and plans shall be submitted to the Planning & Zoning Administrator according to the provisions of the Subdivision Regulations.
- B. Travel Trailer or Recreational Vehicle Park – Requirements. Travel trailer or recreational vehicle park shall be designed and maintained according to the provisions of the following additional requirements:
 - 1. Park Area
The minimum travel trailer park area shall be five (5) acres.
 - 2. Distance Between
The minimum distance between adjacent travel trailers or recreational vehicles shall be according to the area requirement provisions of the respective zoning district.

3. Screening

All travel trailer parks shall provide for proper screening and landscaping of the perimeter areas so as to mitigate the impact of the project upon adjoining properties and/or to achieve appropriate transition between land uses and densities, subject to the review and approval of the Planning & Zoning Commission.

Section 8. Utilities

Each travel trailer or recreational vehicle unit shall be equipped with an electric outlet. A sanitary sewer and water system shall be installed according to the provisions of this Article and any other applicable County specifications. Recreational vehicle units not directly connected with the water and sewer system shall be located no more than two hundred (200) feet from a community utility building providing separate toilet and shower facilities for each gender.

Section 9. Recreation Areas

There shall be provided within each travel trailer or recreational vehicle park an adequate site or sites for recreation for the exclusive use of the park occupants. Such recreation site or sites shall have a minimum area in the aggregate of one hundred (100) square feet for each lot or space in said park. The recreation site or sites shall be of appropriate design and provided with appropriate equipment. Required yards between travel trailer or recreational vehicle vehicular driveways and parking spaces shall not be counted in computing recreation space or site area.

Section 10. Supplementary Requirements

In addition to the foregoing, the County Commission may impose such other conditions, requirements or limitations concerning the design, development and operation of such travel trailer park as it may deem necessary for the protection of adjacent properties and the public interest.

ARTICLE 9. MANUFACTURED HOMES & MOBILE HOMES

Section 1. Utilized for Dwelling Purposes

Manufactured homes and mobile homes shall be utilized solely for dwelling purposes and meet all applicable standards set forth in Chapter 700 of the Missouri Revised Statutes and shall be constructed pursuant to the standards of the *National Manufactured Housing Construction and Safety Standards Act of 1974*, 42 United States Code §5401 *et seq.*; 24 CFR Part 3280 and Part 3282, that became effective June 15, 1976.

Section 2. No Non-Residential Use

No manufactured home or mobile home shall be located, erected, secured and/or altered to serve as a non-residential use, including but not limited to uses such as a storage unit, tool house, private garage or wash house, in any district.

Section 3. Allowed in MH-1 District

Manufactured homes and mobile homes shall be allowed within a MH-1 District.

Section 4. Allowed in A-1 and A-R Districts with Provisions

Manufactured homes and mobile homes shall be allowed within an A-1 or A-R District provided that there is another manufactured home or mobile home within a radius of 1,000 feet (measured structure to structure) or there are no site built homes within a radius of 1,000 feet (measured structure to structure).

Section 5. Not to Serve as a Guest House, Servant's Quarters, Den or Parsonage

No Mobile home shall be located, erected, secured and/or altered to serve as a guest house, servant's quarters, den or parsonage in any district unless otherwise provided for in this regulation.

Section 6. Replacement of Existing Nonconforming Mobile Homes in Residential Zoning Districts

Existing manufactured homes or mobile homes which are lawfully occupied but do not conform to the Zoning Regulations applicable to the Residential Zoning District in which they are located (nonconforming use) upon the effective date of the Zoning Regulations (August 9, 2010) may be replaced with a manufactured home or mobile home that has been manufactured or constructed in accordance with the standards of the *National Manufacturing Housing Construction and Safety Standards Act of 1974* that became effective on June 15, 1976. It is further provided that:

- A. The space beneath the manufactured home or mobile home is enclosed by a foundation or under skirted with a durable material such as fiberglass, plywood or metal, within 90 days of placement on the property;

ARTICLE 10. HOME OCCUPATIONS

Section 1. Purpose

The purpose of the home occupations provisions is to allow for home occupations that are compatible with the neighborhoods in which they are located. Home occupations are limited to those uses that may be conducted within a residential dwelling, being clearly secondary to the residential use of the dwelling, without changing the appearance or condition of the residence.

Section 2. Residential Districts

Home occupations are permitted accessory uses in residential districts so long as all of the following conditions are observed:

- A. No more than one (1) person other than a member of the immediate family occupying the dwelling shall be employed.
- B. Not more than fifty (50) percent of the floor area of one (1) story of the dwelling is devoted to the home occupation.
- C. In no way shall the appearance of the structure be altered or the occupation within the residence be conducted in a manner that would cause the premise to differ from its residential character either by the use of colors, materials, construction, lighting, signs or the emission of sounds, noises or vibrations.
- D. The home occupation must be conducted within the principal dwelling, the garage or accessory building. The detached garage or accessory building must be located on the same lot as the dwelling, must not be larger than thirty-five (35) percent of the dwelling, must not occupy more than thirty-five (35) percent of the required yard, and must not be located farther than fifteen (15) feet from the dwelling unless located in the back yard.
- E. No traffic shall be generated by such home occupation in greater volumes than would normally be expected in a residential neighborhood, and any need for parking generated by the conduct of such home occupation shall be met off the street and other than in a required front yard.
- F. No commercial vehicle shall be used in connection with the home occupation, or parked on the property.
- G. No outdoor display of goods or outside storage of materials used in the home occupation shall be permitted.

- H.** Only one (1) nameplate will be allowed.
1. It may display the name of the occupant and/or the name of the occupation.
 2. It shall not exceed one (1) square foot in area,
 3. Shall be non-illuminated, and
 4. Shall not be erected in any required front or side yard.
- I.** The use shall not generate traffic, parking, noise, vibration, glare, fumes, odors or electrical interference beyond what normally occurs in the applicable zoning district.
- J.** The following are typical examples of uses that often can be conducted within the limits of the restrictions established in this Section and thereby qualify as home occupations. Uses that qualify as "home occupations" are not limited to those named in this paragraph (nor does the listing of a use in this paragraph automatically qualify it as a home occupation):
1. Artists and sculptors.
 2. Authors and composers.
 3. Beauty shop - one (1) chair.
 4. Dressmakers, seamstresses and tailors.
 5. Family day care home, limited to not more than six (6) children.
 6. Home crafts, such as model making, rug weaving, lapidary work and cabinet making.
 7. Office facility of a minister, rabbi or priest.
 8. Office facility of a sales person, sales representative or manufacturer's representative, provided that no retail or wholesale transactions are made on the premise.
 9. Office facility of an architect, artist, broker, dentist, physician, engineer, instructor in arts and crafts, insurance agent, land surveyor, lawyer, musician or real estate agent.
 10. Music or dancing teachers, provided that the instruction shall be limited to four (4) pupils at any given time except for occasional groups.
 11. The letting for hire of not more than two (2) rooms for rooming or boarding use for not more than two (2) persons, neither of whom is a transient.

- K. The following uses by the nature of the investment or operation have a pronounced tendency once started to rapidly increase beyond the limits permitted for home occupations and thereby impair the use and value of a residentially zoned area for residence purposes. Therefore, the uses specified below shall not be permitted as home occupations:
1. Animal hospitals
 2. Antique shops
 3. Auto repair
 4. Clinics or hospitals
 5. Dancing schools
 6. Gift shops
 7. Mortuaries
 8. Nursery schools
 9. Painting of vehicles, trailers or boats
 10. Private clubs
 11. Renting of trailers, boats or watercraft
 12. Repair shops or service establishments, except the repair of electrical appliances, typewriters, cameras or other similar small items
 13. Restaurants
 14. Stables or kennels

Section 3. Agriculture Districts

Home occupations are permitted as accessory uses in agricultural districts. The home occupations permitted in Article 10 will be considered principal uses. The home occupations permitted in the provisions for home occupations in residential districts will be considered accessory uses. Uses prohibited as home occupations in residential districts, as well as any other use deemed appropriate for a home occupation by the Board of Adjustment, may be permitted as home occupations in agricultural districts upon receipt of a conditional use permit.

- A. A conditional use permit may be granted for home occupations so long as the following conditions are observed:
1. No more than one (1) employee other than a member of the immediate family occupying the dwelling shall be employed.

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2. The home occupation must be conducted within the dwelling unit, the garage or an accessory building.
 - a. The detached garage or accessory building must not be larger than fifty (50) percent of the floor area of the dwelling,
 - b. must be located on the same tract of land as the dwelling, and
 - c. must be located farther than fifty (50) feet from the dwelling.
3. The home occupation must not occupy more than fifty (50) percent of the floor area of one (1) story of the dwelling.
4. The use shall not generate significantly greater volumes of traffic than would normally occur in the rural area. All parking shall be conducted off the street.
5. Two (2) commercial vehicles associated with an agricultural home occupation may be parked on the property. Storage shall be in an appropriate manner. Additional screening may be required for vehicles over one (1) ton or vehicles with logos printed on the sides. This additional screening could include enclosed garage, board fence (up to eight (8) feet tall) or vegetative screening.
6. No outdoor display of goods or outside storage of materials used in the home occupation shall be permitted.
7. Only one (1) nameplate will be allowed.
 - a. It may display the name of the occupant and/or the name of the occupation.
 - b. It shall not exceed four (4) square feet in area,
 - c. shall be non-illuminated, and
 - d. must be displayed on the same tract of land as the dwelling.
8. The use shall not generate traffic, parking, noise, vibration, glare, fumes, odors or electrical interference that would affect neighboring residences.
9. The property must conform to all other agricultural district requirements, or if surveyed or platted before adoption of these Zoning Regulations, the dwelling or accessory building must be at least one hundred (100) feet from the nearest neighboring residence.
10. Any other condition imposed by the Board of Adjustment.

ARTICLE 11. GARAGE and YARD SALES

It shall be unlawful for any person to advertise, conduct, carry on or permit more than two (2) garage, patio, yard or other similar sales within any twelve month period, nor shall any such sale be held or be scheduled for more than two (2) calendar days.

ARTICLE 12. TELECOMMUNICATIONS REGULATIONS

Section 1. Purpose

- A. The purpose of this regulation is to find practical solutions to the siting of any tower or any telecommunication facility and its functionally equivalent services.
1. The regulation allows for reasonable and fair action necessary to protect and advance the public interests.
 2. Maintaining quality of life by balancing community and individual interests with community health and safety is the responsibility of local government when delivering services which benefit all citizens of Christian County.

Section 2. Definitions

Alternative Tower Structure

Water Towers, clock towers, bell steeples, light poles, electric poles and similar mounting structures that camouflage or conceal the presence of antennas.

Antenna

Any exterior transmitting or receiving device mounted on a tower, building or structure and used in communications that radiate or capture electromagnetic waves, digital signals, analog signals, radio frequencies (excluding radar signals), wireless telecommunications signals or other communication signals. “Antenna” should not be used as a synonym for “cell site”.

Cell Site

A generic term for a personal wireless service facility.

Co-location

The use of a single mount on the ground by more than one (1) carrier or company and/or several mounts on an existing building by more than one (1) carrier or company.

Equipment Shelter

An enclosed structure, cabinet, shed or box at the base of the mount used to contain batteries and electrical equipment. An equipment shelter may also be known as a **base transceiver station**.

Functionally Equivalent Service

According to the Telecommunications Act, these five (5) services are considered functionally equivalent services and must receive the same treatment by local government:

1. Cellular Telephone Services
2. Personal Communications Services (PCS)
3. Enhanced Specialized Mobile Radio
4. Specialized Mobile Radio
5. Paging Services

Guyed Tower

A monopole or lattice tower that is tied to the ground or other surface by diagonal cables.

Lattice Tower

A type of mount that is self-supporting with multiple legs and cross-bracing of structural steel.

Licensed Carrier

A company authorized by the FCC to construct and operate a commercial mobile radio or television services system.

Monopole

A type of mount that is self-supporting with a single shaft of wood, steel or concrete and a platform for panel antennas arrayed at the top.

Mount

The structure or surface upon which antennas are mounted. Types of mounts include roof-mount, side-mount, ground-mount (tower) and structure-mount.

PCS (Personal Communications Services)

An advanced form of radiotelephone services, capable of transmitting and receiving voice, data, text and video messaging. PCS operates in the 1850-1990 MHz range.

Telecommunications Facility

Any antennas, microwave dishes, guy wires, or cables that send or receive radio frequency signals, and including such accessory structures as towers, equipment shelters, and fences. The definition shall not include:

1. Towers located in an area zoned for commercial or manufacturing use able to meet the setback requirements set forth within this regulation,
 - a. Such tower may be accessory to the principal use.
2. Any antenna one (1) meter or less in diameter located in any zone.
3. Any antenna in excess of one (1) meter in diameter which is utilized for the reception of broadcast license.
4. Communication towers and antennas used for non-commercial purposes, such as ham radio operation or receive only antennas, do not require a permit as long as the above-mentioned setback requirements are adhered to.

Section 3. Conditional Use Permits

A Conditional Use Permit is required for the location of all telecommunications facilities in the unincorporated areas of Christian County, Missouri, which includes:

- A. Ground-mount telecommunications facility located within any Agricultural or Residential District.
- B. Any existing telecommunication facility located within any Agricultural or Residential District;
 1. Where the mounting of additional antennas add more than twenty (20) feet to the height of the existing tower or
 2. Where the placement of additional supporting structures or equipment increase the square footage of the existing telecommunication facility compound by more than twenty-five (25) percent while still meeting all other Christian County Zoning requirements.
- C. A ground-mount telecommunication facility or functionally equivalent service shall be considered a principal use and may be located within any Office, Commercial or Manufacturing district so long as the tower is set back from the property line a distance equal to the overall height of the tower constructed, or a minimum setback for the zoning district, whichever is greater.
- D. In granting a Conditional Use Permit the Board of Adjustment may require conditions mitigating the impact of the tower location on surrounding properties.

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1. These conditions may include in part:
 - a. Screening of the compound surrounding the equipment shelter and tower,
 - b. Lighting,
 - c. Tower height,
 - d. Landscaping of the site including building materials and architectural requirements when located within or adjoining an Residential District,
 - e. Co-location,
 - f. Abandonment of the site, which may require dismantling towers and structures at the owner's expense, and the reclamation of vegetation.
- E. Communications towers and antennas used as part of a home occupation must adhere to all conditions set forth within these Zoning Regulations.
 1. Any tower associated with a home occupation and exceeding sixty (60) feet in height requires a Conditional Use Permit.
- F. The application requesting the Conditional Use Permit must include the following information:
 1. A scale site plan showing:
 - a. Property lines,
 - b. Existing land use and zoning,
 - c. Surrounding land use and zoning,
 - d. Access roads,
 - e. Proposed structures,
 - f. Setbacks of proposed structures from property lines,
 - g. Type of proposed mount,
 - h. Proposed landscaping,
 - i. Screening or fencing,
 - j. Parking areas,
 - k. Proposed signage, and
 - l. Proposed lighting of the facility.

2. A written report describing:
 - a. Tower height and design,
 - b. Engineering specification detailing the tower construction,
 - c. Information on painting,
 - d. Lighting of the tower,
 - e. Tower's capacity, including the number and type of antennas that it can accommodate as a co-location site.
 3. A statement in writing that other existing towers or structures do not provide a suitable location for the proposed tower.
 - a. Evidence submitted may cite the geographic location of other structures,
 - b. insufficient height or structural strength to meet engineering requirements,
 - c. unreasonable costs,
 - d. contractual provisions required for co-location, or
 - e. or other significant factors making co-location an unreasonable option.
 4. A statement in writing providing a position on the proposed tower for a Christian County emergency service antenna or for use by other emergency management agencies that are granted this right by Christian County.
 - a. This position will be provided at no cost to Christian County Emergency or any other emergency service entity.
 5. A statement in writing providing a climate controlled location within an equipment shelter with direct access to electrical power for the emergency service equipment.
 - a. This position will be provided at no cost to Christian County Emergency or any other emergency service entity.
- G. In granting a Conditional Use Permit the Board of Adjustment will consider, but is not limited to, the following factors:
1. Height of the proposed tower,
 2. Proximity of the tower to residential structures and boundaries,
 3. Nature of uses on adjacent and nearby properties,

4. Surrounding topography,
 5. Surrounding tree and vegetative cover,
 6. Design of the tower, including characteristics that reduce visual obtrusiveness,
 7. Availability of existing towers and other structures suitable for co-location,
- H. A Conditional Use Permit is required for the installation of an antenna on
1. An existing structure other than a tower, such as
 - a. a building,
 - b. a water tower,
 - c. a light pole, or
 - d. another non-residential structure,
 2. Provided that the antenna (including the supporting masts, *et cetera*) complies with all other provisions of these Zoning Regulations.
- I. In the instances mentioned above, when approved, the mount shall be considered to be an accessory use to the principal use.

Section 4. Additional Requirements

- A. All towers must meet or exceed current federal standards and regulations of the FAA, the FCC, and any other agency of the federal or state government regulating the construction and specifications of towers and antennas.
1. If such standards change, the tower and antenna owners governed by this ordinance shall bring such tower or antenna in compliance with the revised standards within the time mandated by the controlling agency.

Section 5. Tower Designed for Co-Location

- A. Each applicant shall cooperate with the County and with other applicants or users by designing towers such that other users may co-locate upon the same tower.
1. Specifically, unless otherwise authorized by the Board of Adjustment, towers shall have such capacity that additional equipment by the principal user of the tower may be added or secondary users might lease the balance of the tower.

- a. Towers less than sixty (60) feet in height are not required to meet the above mentioned co-location criteria.
- b. Applicants must notify the Planning & Zoning Administrator in writing of the name and address of any and all co-users of a tower or antenna.
- c. Christian County reserves the right to rent space on existing towers for county transmitters, receivers or repeaters.

Section 6. Proposal on County Owned Property

- A. Any proposal to lease space on County owned property or structures must be approved by the Board of Adjustment.

Section 7. Adherence to Building Regulations and Required Certificate of Insurance

- A. All towers governed by this ordinance constructed within Christian County must be permitted by and adhere to all Christian County Building Regulations.
 1. All towers shall be inspected before a final permit is issued and a copy of the inspection approval as well as a certificate of insurance must be on file with the Christian County Planning and Zoning Department office.
 - a. A copy of all required subsequent inspections must be filled with the Planning and Zoning Office.

Section 8. Required Fencing

- A. All ground-mount telecommunication facilities shall be secured with minimum six (6) foot security fencing, the towers equipped with appropriate anti-climbing devices, and clearly marked "No Trespassing".

Section 9. Accessory Equipment or Vehicles

- A. No accessory equipment or vehicles will be allowed to be stored on site unless used in direct support of the communication facility, unless repairs to the tower are then currently in progress.

Section 10. Setbacks

- A. All towers must be set back from the property line a distance equal to the overall height of the tower constructed, or a minimum setback for the zoning district, whichever is greater.
- B. Towers located adjacent to any residential district must be set back a minimum distance equal to the height of the tower.
- C. Guy wires and other support structures shall maintain a minimum of twenty (20) feet from the property line in any zoning district.
- D. All towers and accessory buildings must adhere to the minimum setback requirements within the Zoning District in which they are located.

Section 11. Landscaping

- A. The street frontage or front yard of any tower located within any residential district shall maintain the yard in a manner consistent with the residential character of the surrounding neighborhood.
- B. The perimeter of the telecommunications facility site shall be screened, at a minimum, with a course of coniferous trees, at least six (6) feet in height at the time of planting, ten (10) feet on center.
- C. The applicant shall, upon application for a Conditional Use Permit, submit a landscape/site plan detailing the plantings and/or other features such as privacy fencing, earthen berm, or natural vegetation buffering the proposed site to be approved.
- D. Existing mature tree growth and natural land forms on or surrounding the communication facility should be preserved to the maximum extent possible.
 - 1. In some cases natural growth around the property perimeter may be a sufficient buffer to waive the above mentioned landscape requirements.
- E. Towers located within any agricultural district must have the perimeter of the communication facility screened with a single course of coniferous trees that at the time of planting shall be at least six (6) feet in height, fifteen (15) feet on center.
- F. Those towers located within two hundred and fifty (250) feet of a residential district may be subject to the landscaping requirements within the nearby residential districts.

Section 12. Lighting

- A. Towers will be artificially illuminated if required by a FAA or other governing authority.
 - 1. The lighting shall be designed with the required guidelines, yet should cause minimal impact on surrounding or nearby properties.
 - 2. Security lighting around the base of the tower must have direct rays confined to the property and may be required to be incandescent in nature.

Section 13. Tower and Support Building Appearance

- A. The tower shall be maintained with a galvanized steel finish or subject to FAA standards, painted a neutral color to lessen visual impact or camouflaged to harmonize with the surrounding environment.
 - 1. The support buildings within a telecommunication facility shall, to the extent possible, be designed to blend into the surrounding setting in which they are being sited. This may include, in addition to landscaping and screening, residential style architecture with pitched roof, siding, and color.

Section 14. Discontinued Use

- A. Any tower no longer in use for the original purpose granted by the Conditional Use Permit or serving as an approved co-location site must be dismantled and removed within one hundred and eighty (180) days of the cessation of operations.
 - 1. The owner of the tower must notify the Christian County Planning & Zoning Department with a copy of any notice given to the FCC relating to its intent to cease operations.
 - 2. Upon removal, the tower owners will reclaim the site by obtaining the proper grading permits from the Christian County Planning & Zoning Department and reclaiming the disturbed area.
 - 3. An extension to the one (180) day period may be granted by the Christian County Planning and Zoning Administrator if a good faith effort is made to resolve the situation.
 - 4. The tower company shall post a \$75,000 bond or irrevocable letter of credit for tower removal prior to issuance of a construction permit.

ARTICLE 13. ADVERTISEMENT REGULATIONS

Section 1. Outdoor Commercial Advertising

- A. This Article regulates the use of outdoor advertising. The purpose of the ordinance is:
1. to allow businesses to inform and direct the general public,
 2. to protect the physical appearance of the county, and
 3. to ensure public safety along county streets and roadways.
- B. Outdoor advertising shall be classified as a commercial use and shall be permitted in the following Zoning Districts: C-1, C-2, M-1 and M-2, subject to the regulations of the Missouri Department of Transportation.

Section 2. Definitions

Billboard or Signboard

Any structure or portion thereof, situated on private premises, on which lettered, figured or pictorial matter is displayed for advertising purposes, other than the name and occupation of the user of the premises or the structure of the business conducted thereon or the products primarily sold or manufactured thereon.

Display Area

The area of an advertising structure including the entire area within a regular geometric shape enclosing all of the elements of informational or representational matter displayed, including blank masking or any surface shape intended to convey ideas, information, or meaning. Frames of structural members not bearing informational or representational matter shall not be included in calculating the display area.

Maximum Height

The maximum vertical distance measured from adjacent natural grade or the adjoining road surface to the highest point of the advertising structure or display area.

Maximum Sign Area

The allowable square footage of display area per side, inclusive of embellishments but not including the base, supports or other structural elements.

Minimum Spacing

The minimum radius between Advertising Structures, as measured from the nearest points of the supporting structures as measured from nearest pole to nearest pole.

Non-Conforming Advertising Structures

An advertising structure which was lawfully erected but which does not conform to the requirements of this regulation or State statutes enacted at a later date or which later fails to comply with this regulation due to changed conditions.

Off-Premise Advertising Structure

An advertising structure which is not located on the specific site for which the advertising or information indicates. Development directional signs are not considered off-premise advertising structures.

On-Premise Advertising Structure

An advertising structure which is located on the specific site for which the advertising or information indicates.

Scenic Area

Any designated area of particular scenic beauty or historical significance as determined by the state, federal or county officials having jurisdiction thereof.

Sign

Any permanent or temporary structure, device, letter, word, model, banner, pennant, insignia, trade flag or representation used as, or that is in the nature of, an advertisement, announcement or direction, or is designed to attract the eye by intermittent or repeated motion or illumination.

Sign, Illuminated

A sign designed to give forth artificial light, or designed to reflect light from one or more sources, natural or artificial.

Sign, Projecting

A sign erected on the face or outside wall of a building that projects out from the wall at any angle.

Sign, Temporary

A sign of temporary nature used to advertise a political candidate, or used to advertise the premises for sale, rent, or lease.

Section 3. Legal Nonconforming Signs

- A. Any sign in existence prior to the adoption of Christian County Advertisement Regulations, Order Number 12-22-95-6 on December 22, 1995 shall be considered a legal nonconforming use.
 - 1. No existing nonconforming use may be enlarged, extended, reconstructed, substituted or structurally altered without approval by the Board of Adjustment.
 - 2. All legal nonconforming signs are subject to Article 4, Section 8 of these Zoning Regulations.

Section 4. General Provisions

- A. Any billboard, sign or advertising structure shall comply with applicable State and Federal regulations.
- B. Any outdoor advertising structure located within one hundred (100) feet of any Residential District shall not face the front or side lot line of any residential lot; or when any outdoor advertising structure is located within three hundred (300) feet of any public parkway, public square, library, church or similar institution, it shall not face such a use.
- C. No sign shall be constructed that resembles any official marker or that by reason of position, shape, or color would conflict with any official traffic control device.
- D. All sign structures shall be constructed according to the provisions of any applicable County regulations.
 - 1. Engineering plans stamped or sealed by a registered civil engineer shall accompany any sign permit applications and are subject to the requirements of the latest adopted version of the IBC Codes.
- E. Signs shall be maintained in good and safe structural condition.
- F. No off-premise sign shall be located on property without the consent of such property's owner or legal representative.
- G. The area in the vicinity of any freestanding sign shall be kept clear of any trash and debris.
- H. No sign shall be allowed in any neighborhood or subdivision public or private open space, except signs pertaining to the neighborhood or subdivision as a whole or to a property owners' association.

Section 5. Size of Signs

- A. The maximum sign area for any one (1) face of any outdoor advertising structure not located on roads designated as interstate highways and freeways on the federal-aid primary system shall not exceed eight hundred (800) square feet, excluding the base, supports, and other structural elements.
- B. The maximum sign area on roads designated as interstate highways and freeways on the federal-aid primary system is twelve hundred (1200) square feet inclusive of embellishments but not including the base, supports or other structural elements.
- C. Temporary embellishments for off-premise signs shall not exceed twenty (20) percent of the maximum sign area allowed.
- D. The sign area shall be measured by the smallest square, circle, or rectangle that will encompass the entire sign.
- E. Off-premise signs or billboards that are back-to-back, double-faced, V-shaped, or multiple-faced are considered one structure, and no face can exceed the maximum height or size allowed by this Section.
 - 1. V-shaped or multiple faced structures if not sharing a common support or pole may not be more than fifteen (15) feet apart.

Section 6. Maximum Height and Length

- A. Any advertising structure shall maintain a minimum clearance of ten (10) feet measured from the ground level at the base of the sign to the bottom of the sign face.
- B. Any advertising structure shall have a maximum height not to exceed fifty (50) feet above grade level of the roadway to the top of the sign face, as measured from the centerline of the roadway to which the sign is oriented.
- C. The maximum length allowed is sixty (60) feet on all roadways.

Section 7. Spacing for Off-Premise Signs

- A. No off-premise sign located along a federal-aid primary route classified as having limited access may be established within five hundred (500) feet of any other off-premise sign, measured along the same side of the street or highway to which the sign is oriented.
- B. No off-premise sign located along County roadways or State highways not listed on the federal-aid primary system may be established within five hundred (500) feet of any other off-premise sign, measured along the same side of the street or highway to which the sign is oriented.

- C. No off-premise sign located along a federal-aid primary route classified as not having limited access may be established within three hundred (300) feet of any other off-premise sign, measured along the same side of the street or highway to which the sign is oriented.
- D. Spacing from directional, official or on-premise signs shall not be included in the measurement of these spacing requirements for off-premise signs.
 - 1. However, no sign shall be located in such manner as to obstruct or otherwise physically interfere with the effectiveness of an official traffic sign, signal, or device or obstruct or physically interfere with a motor vehicle operator's view of approaching, merging, or intersecting traffic.
- E. The minimum distance between off-premise signs shall be measured along the nearest edge of the pavement between points directly opposite the center of the signs along each side of the highway and shall apply to structures located on the same side of the same street or highway.

Section 8. Minimum Setbacks for Off-Premise Signs

- A. The minimum front setback for any off-premise sign with any face greater than three hundred (300) square feet shall be twenty-five (25) feet from the front property line.
 - 1. Those signs less than three hundred (300) square feet are required to be setback ten (10) feet from the front property lines.
- B. On-premise commercial advertising requires no front setback, but cannot be located so as to obscure the sight distance along a public right-of-way, intersection or private drive.
- C. The minimum side setback for any off-premise sign is five (5) feet from any adjoining C District or M District and twenty-five (25) feet from a more restrictive Zoning District.
- D. The minimum rear setback for any off-premise sign is five (5) feet from any adjoining C District or M District and twenty-five (25) feet from a more restrictive Zoning District.
- E. Setbacks shall be measured from a point on the sign nearest to the property line.
- F. No sign may be located within any utility, drainage or other easement without written authority from the easement holder.
 - 1. Such written authority must accompany any permit request.

Section 9. Lighting of Signs

- A. Signs that are illuminated by any flashing, intermittent, or moving lights are prohibited if such signs interfere with traffic safety. Reflective sign surfaces or devices on sign faces and multiple-faced signs, with illumination, are permitted, provided such signs do not interfere with traffic safety.
- B. Electronic variable message signs, both informational and commercial in nature, that function as multiple-faced signs are permitted provided such signs do not interfere with traffic safety.
 - 1. All electronic message signs must stay lit for at least 8 second intervals.
- C. The Planning & Zoning Department or the applicable Christian County or Special Road District may require any sign receive a conditional use permit if it includes flashing, moving or bright lights, variable electronic messages, emits a substance such as smoke or bubbles, or has moving parts.
- D. Signs must be effectively shielded to prevent beams or rays from being directed toward any public right-of-way, dwelling unit or any Residential District.
- E. No sign shall be illuminated as to interfere with the effectiveness of or to obscure an official traffic sign, or signal.

Section 10. Sign Permits

- A. All off-premise signs are required to have a building permit. All on-premise signs not specifically exempted by Article 13, Section 11 are also required to have a building permit. Information required for the issuance of a building permit includes:
 - 1. A set of engineering plans stamped or sealed by a registered civil engineer,
 - 2. a legal description from a legal document,
 - 3. a zoning certificate,
 - 4. a site plan and
 - 5. written authority from the easement holder if a sign is to be located within an easement.

Section 11. Signs Exempt from Permit

A. The following non-illuminated signs may be erected in compliance with this Article without the issuance of a sign permit. These signs which are exempt from permit are limited to a maximum of a 4' x 8' display. Such signs may be permitted in addition to all other signs permitted and shall conform to setbacks and other physical characteristics.

1. Real estate signs located on site
2. Construction/Builder signs
3. Yard/garage sale announcements
4. Public Signs
5. Memorial signs
6. Flags
7. Holiday decorations
8. On-site information signs
9. Window signs
10. Political signs
11. Special events signs
12. On-premise public school signs
13. Agriculture use
14. Church identification, bulletin boards
15. Licensed and operable motor vehicles

Section 12. Small Announcement or Professional Signs Where Permitted

- A. Shall not exceed six (6) square feet in area;
- B. Except that a church, school, community center or other public or institutional building may have for its own use an announcement sign or bulletin board:
1. not over twelve (12) square feet in area,
 2. that, if not attached flat against a building, shall be at least twelve (12) feet from all road right-of-ways.
 3. Any such sign(s), if lighted, must be sited so that the light does not become a nuisance to residential structures.

Section 13. Political Signs Shall be Allowed in any Zoning District

- A. At no time shall a sign be placed on a corner lot that would obscure the vision of a motorist.
- B. All signs shall be removed within twenty-five (25) days following the election for which they are used.
- C. The person or group of persons responsible for erection of the sign(s) shall also be responsible for the removal of the sign(s).

ARTICLE 14. STORMWATER RUNOFF, SEDIMENT and EROSION CONTROL AND SINKHOLE USE STANDARDS

Section 1. Stormwater Runoff

A. Stormwater Detention

1. Prior to the development of the land, surface conditions provide a higher percentage of permeability and longer time of concentration. With the construction of buildings, parking lots, *et cetera*, permeability and the time of concentration are significantly decreased, resulting in an increase in both the rate and volume of runoff. Refer to the Christian County Stormwater and Erosion Control Regulations for Stormwater Detention requirements.

Section 2. Sediment and Erosion Control

A. Statement of Intent:

The purpose of this Section is to control soil erosion on land that is undergoing development for non-agricultural uses and to preserve the natural terrain and waterways of the land within Christian County. Soil erosion scars the land and creates sediment that clogs storm sewers and road ditches; chokes streams and creates silt bars, all of which pose a threat to public health and safety. Refer to the provisions of the Stormwater and Erosion Control Regulations for Christian County for sediment and erosion control regulations.

Section 3. Sinkhole Use Standards

A. Placing Substances and Objects in Sinkholes

1. No person shall place or cause to be placed any substance or objects, other than those approved by the County, in any sinkhole.
 - a. This specifically precludes any trash, garbage, or refuse material.
 - b. If an accidental spill of any toxic, petroleum, or hazardous material occurs it shall be reported to the Missouri Department of Natural Resources immediately
2. Any property that has a sinkhole present that has been used as a site for dumping of trash, garbage, and refuse will be prohibited from building permits, zoning actions, or land subdivision until the sinkhole has been cleaned out.

- B. Alteration of Sinkholes.** The filling, grading, or excavation of sinkholes is prohibited unless the following provisions are met:
1. Approval is granted by the Planning and Zoning Department after receiving recommendation from the applicant's stormwater engineer.
 2. A sinkhole evaluation that addresses geologic and engineering factors, stamped or sealed by a registered civil engineer shall be filed with the Planning & Zoning Department detailing the method and material to be used and showing that no detrimental effect will occur to surrounding properties.
 - a. In cases of agricultural filling, where no detrimental effect on surrounding properties will occur, the Engineering Report may be waived.
 3. All other pertinent regulations are met.
- C. Development.**
1. No construction will be allowed within a sinkhole.
 - a. Any alteration of a sinkhole related to building construction, subdivision development, or landscaping, is prohibited unless approved by the Planning & Zoning Department and the Christian County Engineer.
 2. Drainage to sinkholes shall not exceed pre-development conditions unless approved by the Planning & Zoning Department and the County Engineer.
 3. No waste disposal system is allowed within a sinkhole.
 4. No excavation or stripping of vegetative cover is allowed within sinkholes, except for normal agricultural activities.
- D. Reporting Sinkholes.**
1. Whenever a new sinkhole appears or it becomes apparent that a sinkhole has not yet been identified, it shall be reported to the Christian County Planning & Zoning Department. Refer to the Stormwater and Erosion Control Regulations for Christian County for sinkhole and karst feature regulations.

ARTICLE 15. COMMERCIAL MINES, QUARRIES and GRAVEL PITS

Section 1. General Provisions

- A. Any owner, lessee or other person or entity having an interest in mineral lands may file with the Planning & Zoning Administrator an application for authorization to mine minerals, provided that such person or entity shall comply with all requirements of the Zoning District in which said mining is allowed by these Zoning Regulations and with the following additional requirements:
- B. No quarrying operation shall be carried on or any stockpile placed closer than fifty (50) feet to any property line, unless a greater distance is specified by the Planning & Zoning Commission or the Board of Adjustment where such is deemed necessary for the protection of adjacent property; however, this distance requirement may be reduced to twenty-five (25) feet by written consent of the owner or owners of abutting property;
- C. In the event that the site of the mining or quarrying operation is adjacent to the right-of-way of any public street or road, no part of such operation shall take place closer than twenty-five (25) feet to the nearest line of such right-of-way;
- D. Fencing shall be erected and maintained around the entire site or portions thereof where, in the opinion of the Planning & Zoning Commission or the Board of Adjustment, such fencing is necessary for the protection of the public safety, and shall be of a type specified by the Planning & Zoning Commission or the Board of Adjustment;
- E. All equipment and machinery shall be operated and maintained in such manner as to minimize dust, noise and vibration. Access roads shall be maintained in dust-free condition.

Section 2. Crushing, Washing and Refining

Crushing, washing, and refining or other similar processing may be authorized by the Board of Adjustment after recommendation by the Planning & Zoning Commission as an accessory use, provided, however, that such accessory processing shall not be in conflict with the land use regulations of the Zoning District in which the operation is located.

- A. In accepting such plan for review, the Planning & Zoning Commission and the Board of Adjustment must be satisfied that the proponents are financially able to carry out the proposed mining operation according to the provisions of the plans and specifications submitted.

- B.** An application for such operation shall set forth the following information:
1. Name of the owner or owners of land from which removal is to be made.
 2. Name of the applicant making request for such a permit.
 3. Name of the person or corporation conducting the actual removal operation.
 4. Location, description and size of the area from which the removal is to be made.
 5. Location of processing plant used.
 6. Type of resources or materials to be removed.
 7. Proposed method of removal and whether or not blasting or other use of explosives will be required.
 8. Description of equipment to be used.
 9. Method of rehabilitation and reclamation of the mine area.
- C.** Upon receipt of the application, the Planning & Zoning Commission shall set the matter for a public hearing in the same manner as for a zoning change.
- D.** The Planning & Zoning Commission shall make a complete record of all testimony and witnesses heard at the public hearing and shall recommend to the Board of Adjustment within thirty (30) days of completion of said hearing, either approval, denial, or conditional approval of the application.
- E.** The Board of Adjustment shall act on the application within thirty (30) days of receipt of the report and recommendation of the Planning & Zoning Commission.
- F.** Any person or entity aggrieved by the action of the Board of Adjustment shall have the right to appeal to the Circuit Court of Christian County.

Section 3. Restoration, Rehabilitation and Reclamation

To guarantee the restoration, rehabilitation and reclamation of mined-out areas, every applicant granted a mining permit as provided in these Zoning Regulations, shall furnish a performance bond running to the County, in an amount to be determined by the County Commission as guarantee that such applicant, in restoring, reclaiming and rehabilitating such land, shall within a reasonable time and to the satisfaction of the County Commission, meet the following minimum requirements:

- A.** All excavation shall be made either to a water producing depth, such depth to be not less than five (5) feet below the low water mark, or shall be

graded or backfilled with non-noxious, non-flammable and non-combustible solids, to secure:

1. That the excavated area shall not collect and permit to remain therein stagnant water; or
 2. That the surface of such area that is not permanently submerged is graded or backfilled as necessary so as to reduce the peaks and depressions thereof, so as to produce a gently rolling surface that will minimize erosion due to rainfall and that will be in substantial conformity to the adjoining land areas.
- B.** Vegetation shall be restored by appropriate seeds of grasses or planting of shrubs or trees in all parts of said mining area where this Section provides that such area is not to be submerged under water.
- C.** The banks of all excavations not backfilled shall be sloped to the water line at a slope that shall not be less than three (3) feet horizontal to one (1) foot vertical and said bank shall be seeded.
- D.** In addition to the foregoing, the Board of Adjustment may impose such other conditions, requirements, or limitations concerning the nature, extent of the use and operations of such mines, quarries, or gravel pits as the Board of Adjustment may deem necessary for the protection of adjacent properties and the amount of the performance bond shall be determined by the Board of Adjustment before issuance of the permit.
- E. Bonds required by this Section shall be:**
1. A performance bond or surety bond issued by an insurance company licensed pursuant to the laws of the State of Missouri whose claims-paying ability is rated in the highest category by at least one nationally recognized statistical rating agency. The bond shall be written on terms acceptable to the County Commission.
 2. A cash bond,
 3. Cash that shall be deposited and held by the County,
 4. A certified check that shall be cashed and the proceeds deposited and held by County, or
 5. An irrevocable standby letter of credit issued by a Federal Home Loan Bank with offices in Missouri, possessing the highest rating issued by at least one nationally recognized statistical rating agency. The letter of credit shall be written on terms acceptable to the County Commission, and shall contain an assurance that the letter of credit will be automatically renewed or replaced by the issuing bank upon expiration, until such time as the letter of credit is released by the County.

ARTICLE 16. OIL DRILLING

The extraction of oil and other hydrocarbons is expressly prohibited in all Zoning Districts other than A-1, F-1 and M-2. Drilling sites shall be fenced and all oil or gas produced shall be carried away by pipelines unless stored in underground tanks. Applications for drilling permits shall be accompanied by a performance bond in an amount to be determined by the County Commission.

Section 1. Required Bonds

A. Bonds required by this Section shall be:

1. A performance bond or surety bond issued by an insurance company licensed pursuant to the laws of the State of Missouri whose claims-paying ability is rated in the highest category by at least one nationally recognized statistical rating agency. The bond shall be written on terms acceptable to the County Commission.
2. A cash bond,
3. Cash that shall be deposited and held by the County,
4. A certified check that shall be cashed and the proceeds deposited and held by County, or
5. An irrevocable standby letter of credit issued by a Federal Home Loan Bank with offices in Missouri, possessing the highest rating issued by at least one nationally recognized statistical rating agency. The letter of credit shall be written on terms acceptable to the County Commission, and shall contain an assurance that the letter of credit will be automatically renewed or replaced by the issuing bank upon expiration, until such time as the letter of credit is released by the County.

ARTICLE 17. FLOOD HAZARD and WATERWAYS

- A.** Whenever the Board of Adjustment or County Commission are required to make decisions about matters concerning protection of life and property from flood hazards, such Board of Adjustment or County Commission may request a report from the Federal Emergency Management Agency (FEMA) or the United States Army Corps of Engineers. Please refer to the Floodplain Management Article of the Stormwater and Erosion Control Regulations for Christian County for complete Floodplain Management regulations.
- B.** Nothing in this Article shall be so construed as to prohibit the rehabilitation or reclamation of any land, provided that any fill, drainage, works, construction of levees or other improvements intended to reduce the danger of flood or erosion shall be subject to review and authorization by the Board of Adjustment.
- C.** It shall be the developer's responsibility to document the exact delineation of flood hazards.
- D.** This request shall be at the discretion of the County reviewing officials.
- E.** It shall also be the developer's responsibility to document compliance with accepted procedures designed to prevent contamination or pollution of adjacent waterways according to the provisions of Section 208 of the Federal Water Pollution Control Act, and other state water quality regulations.

ARTICLE 18. ROAD RIGHT-OF-WAY and ROAD CROSSING PROCEDURES FOR BURIED LINES

Section 1. Procedures

- A. The Christian County Commission authorizes the following procedures to be used when any utility company or individual will be using county rights-of-way for installation of buried lines in Christian County.
1. Anyone wishing to bury wire, pipe, cable, fiber optics or other lines which will be in County road right-of-way or will cross County roads (hereinafter referred to as the "Applicant"), must complete a Utility Permit Application or an Application for Road Crossing Permit, which shall be signed by the Utility and/or an authorized contractor or representative, and present it and a copy of project plans in their entirety to the Christian County Planning and Zoning Department for approval by the County Commission as early as possible but no later than two weeks prior to construction start date. All Applications shall be accompanied by a \$100.00 non-refundable Permit Fee payable to Christian County. Applications for lines which will be buried within the 100 year flood plain must be accompanied by a Floodplain Development Permit/Application.
 2. The Applicant will require any contractor procured by the Applicant to work under this Agreement:
 - a. To carry commercial general liability insurance and commercial automobile liability insurance from a company authorized to issue insurance in Missouri, and to name Christian County and the County Commission and its employees as additional named insured in amounts sufficient to cover the sovereign immunity limits for Missouri public entities (\$400,000.00 per claimant and \$2,500,000.00 per occurrence) as calculated by the Missouri Department of Insurance, Financial Institutions and Professional Registration, and published annually in the Missouri Register pursuant to Section 537.610, RSMo.
 - b. In no event shall the language of these Procedures constitute or be construed as a waiver or limitation for either party's rights or defenses with regard to each party's applicable sovereign, governmental, or official immunities and protections as provided by federal and state constitution or law.

3. When a line is being buried, it shall be a minimum of 42 inches under the roadway and 42 inches below the flow line of the ditch. Telecommunications lines for service drops are excluded from the 42 inch minimum and are to be buried no less than 24 inches under roadway, back-slope and ditch line. Service drops are defined as copper lines with no more than 12 pairs which are buried from the serving pedestal to a single end user structure. When a pedestal is installed for telecommunication lines in County right-of-way, said pedestal shall have an orange cap on the top with an orange flag affixed and displayed at least 12" above the cap.
4. Any utility line greater than 3" in diameter must be in a steel encasement from flow line of ditch to flow line of ditch.
5. In areas where solid rock is encountered within road right-of-way, the applicant may request approval of the County (in writing) to reduce the minimum bury depth to 18".
6. Any project requiring road bore or any cutting of road surface must receive prior approval by the County Commission.
7. For any road crossings where surface rock is disturbed, the trench must be filled with 1" crushed rock and within one year, any area that has settled must be filled and brought back to Christian County specifications. See figures 1 and 2.
8. One half of the roadway shall be open at all times.
9. When approaching bridges or a stormwater culvert, lines shall be greater than 18 feet minimum from the road centerline when within 15 feet of the stormwater culvert or bridge. No lines will be attached to bridges without prior permission in writing from the County Commission. See figures 3 and 4.
10. All lines installed by a utility company on County rights-of-way shall be set back as close to adjoining property lines as possible. No lines shall be laid parallel in the road surface or in the roadbed itself except as approved by the County.
11. The Utility Provider will put up a \$1,000.00 deposit per crossing to cover installation across roads.
12. At the start of work at a job site, the necessary warning signs and traffic control must be in place for public safety. The signage shall be in accordance with the current addition of the Manual of Urban Traffic Control Devices.
13. The Applicant utility company or individual being authorized to bury lines will be responsible for all damage to County roads and

right-of-way. Reimbursement for any damages shall be made in full if adequate repairs are not made.

14. Any individual crossing County roads with a line of any kind shall make a deposit of \$1,000.00. After the project is completed and has been inspected with the work having found to be satisfactorily by the County, the deposit will be refunded.
15. Any Applicant utility and/or cable company and contractor for such utility and/or cable company using a county right-of-way for installation of any utility or cable lines shall deposit with the County \$20,000 in cash or an irrevocable letter of credit for each contract bid within the County for each project under 25 miles in total length, Projects 25 miles or greater in total length will require a bond equal to at least \$1,000.00 per mile. When a company intends to start a project, the County will have an inspector check the area before construction begins. A county inspector can make routine checks on the project. If installations are not being done according to County specifications, the County can stop construction of the project until the correct action is taken. At the discretion of the County, construction can resume. After the project is totally completed, the County will inspect the work. The project shall then be re-inspected by the County one year after the inspection that was performed at completion. At this point the County may determine that the project has been done satisfactorily according to County specifications and can release the security deposit or irrevocable letter of credit associated with this project or will direct the applicant regarding any required corrective action.
16. The procedure outlined above supersedes all previous procedures and all future right-of-way construction must conform to this procedure.

**ARTICLE 19. AIRPORTS, i.e., FAA APPROVED and PRIVATE
LANDING FIELDS**

Approval of any airport in Christian County shall be conditional and subject to any and all requirements and standards provided herein and to approval by the Board of Adjustment and other official agencies having jurisdiction.

ARTICLE 20. AIRPORT ZONE

Section 1. Statement of Intent

An Airport Zone is intended to provide for the safety of the inhabitants of those areas described below. Reference Sections 305.400 through 305.405 of the Revised Statutes of Missouri.

Beginning at a point on the end of any runway and on the centerline of the runway; thence to the right a distance of five hundred (500) feet on a course perpendicular to said centerline to a point; thence to a point two thousand (2,000) feet to the right of and perpendicular to the centerline extended that point is directly opposite a point ten thousand (10,000) feet from the end of the runway on the said centerline extended away from the runway; thence to a point two thousand (2,000) feet to the left of and perpendicular to the centerline extended that point is directly opposite a point ten thousand (10,000) feet from the end of the runway on said centerline extended away from the runway; thence to a point five hundred (500) feet to the left of the point of beginning and perpendicular to the said centerline; thence to a point of beginning.

A. Principal Permitted Uses

1. Agricultural uses, subject to the following modification.

- a. No dwellings shall be permitted to be constructed in an airport zone other than single-family dwellings, each of which is on a lot or parcel of land ten (10) acres or more.
- b. No hospitals, health institutions, clinics, sanitariums, nursing homes, convalescent homes, institutional homes or other similar facilities shall be permitted to be constructed in an airport zone.
- c. No public or private schools, libraries, sports arenas, day care centers, churches or other places of worship, auditoriums or buildings for public assembly or use, theaters or any other similar facility shall be permitted to be constructed in an airport zone.
- d. No building or structure shall be constructed nor shall any growth be maintained that exceeds fifty (50) feet in height in an airport zone; no building or structure shall be constructed nor any growth maintained that is more than one hundred (100) feet in height within any area located outside of an airport zone but located otherwise in an area two thousand (2,000) feet parallel to and on each side of the centerline of any runway extended ten thousand (10,000) feet from the end of and away from the runway.
- e. No use or activity shall be conducted in an airport zone that emits radio signals, electronic emissions or interference of

any kind with any navigational signal or radio communication between the airport or aircraft; nor anything that makes it difficult for pilots to distinguish airport lights or results in significant reflection of light or glare that impairs pilot visibility or otherwise light or glare that impairs pilot visibility or otherwise creates a hazard for aircraft.

ARTICLE 21. HEIGHT LIMITS

Section 1. Exemptions

A. Height limitations stipulated elsewhere in these Zoning Regulations shall not apply:

1. To barns, silos, or other farm buildings or structures on farms; to church spires, belfries, cupolas, and domes, monuments, water towers, fire and hose towers, observation towers, transmission towers, windmills, chimneys, smokestacks, flag poles, radio towers, sand and gravel processing plants, masts and aerials; to parapet walls extending not more than four (4) feet above the limiting height of the building.
2. To places of public assembly in churches, schools and other permitted public and semipublic buildings, provided that these are located on the first floor of such building and provided that for each three (3) feet by which the height of such building exceeds the maximum height otherwise permitted in the Zoning District in which the building is located, its side and rear yards shall be increased in width and depth by an additional foot over the side and rear yard required for the highest building otherwise permitted in the Zoning District in which the building is located.
3. To bulkheads, elevator penthouses, water tanks and scenery lofts, provided no linear dimension of any such structure exceeds fifty (50) percent of the corresponding street lot line frontage; or to towers and monuments, fire towers, hose towers, cooling towers, grain elevators or other structures, where the manufacturing process requires a greater height; provided, however, that all such structures above the heights permitted in the Zoning District in which the structure is located shall not occupy more than twenty-five (25) percent of the area of the lot and shall be distant not less than fifty (50) feet in all parts from every lot line.

Section 2. Projection Into Required Yards

A. Certain architectural features may project into required yards or courts as follows:

1. Into any required front yard, or required side yard adjoining a side street lot line:
 - a. Cornices, canopies, eaves or other architectural features may project a distance not exceeding two (2) feet, six (6) inches.

- b. Fire escapes may project a distance not exceeding four (4) feet, six (6) inches.
 - c. An uncovered stair and necessary landings may project a distance not to exceed six (6) feet, provided such stair and landings shall not extend above the entrance floor of the building except for a railing not exceeding three (3) feet.
 - d. Bay windows, balconies and chimneys may project a distance not exceeding three (3) feet, provided that such features do not occupy, in the aggregate, more than one-third (1/3) of the length of the building on which they are located.
 2. The above named features may project into any required side yard adjoining an interior side lot line a distance not to exceed one-fifth (1/5) of the required least width of such yard, but not exceeding three (3) feet in any case.
 3. The features named in Section 1 above may project into any required rear yard or into any required outer court the same distances they are permitted to project into a front yard.
 4. Fences, walls, and hedges may be located in required yards as follows:
 - a. If not exceeding at any point four (4) feet in height above the elevation of the surface of the ground at such point, they may be located in any yard or court.
 - b. If not exceeding at any point eight (8) feet in height above the elevation of the surface of the ground at such point, they may be located in any required rear yard or side yard, provided that on a corner lot, abutting in the rear the side lot line of another lot in a Residential District, no such fence, wall or hedge within twenty-five (25) feet of the common lot line shall be closer to the side street lot line than the least depth of the front yard required on such other lot fronting the side street.
 - c. Fences exceeding eight (8) feet but not greater than ten (10) feet in height in rear or side yards shall be permitted upon approval of a conditional use permit according to the provisions of Article 6.

Section 3. Setbacks for Required Yards

- A. The required yard setbacks whether side, front, or rear for each Zoning District are stipulated in the yard requirements of each Zoning District but may be modified as follows:
1. The set back requirements for any Zoning District may be modified upon approval of a written request if the following conditions are met:
 - a. The written request must include a survey or plot plan showing:
 - (1) The tract with existing set backs
 - (2) Adjacent tracts and set backs
 - (3) Existing buildings on all tracts
 - b. The tract must be a legally recorded tract and have one of the following characteristics:
 - (1) Irregular shape,
 - (2) Small size; and/or
 - (3) Encroachment into existing setbacks.
 - c. The request must be approved by the applicable Christian County or Special Road District Foreman, the Christian County Resource Manager, the Planning & Zoning Administrator, and the Chief Building Inspector within ten (10) days of receipt of the request. If the request is denied then the applicant may seek a variance through the Board of Adjustment.
 2. Any setbacks modified by the procedure described above will then be the required setbacks for any future buildings on the lots affected.

ARTICLE 22. NUISANCE

Section 1. Statement of Intent

- A. The intent of this regulation is to exercise the police power in relation to public nuisances and the abatement of such nuisances, to protect the public health, safety and welfare and to promote the economic development of Christian County.
- B. It is also the purpose of this regulation to prevent and prohibit those conditions which reduce the value of private property, create or constitute fire and other safety and health hazards and generally create a menace to the health and welfare of the public and contribute to the degradation of the character of neighborhoods and depreciation of property values.
- C. However, nothing contained herein shall be construed as a prohibition, limitation or denial of the right to engage in permitted use activities conducted in a normal and customary manner. Provided that such activities do not create a public health or safety hazard.
- D. It is necessary for the public health, safety and welfare to regulate, prevent and prohibit conditions which may constitute disorderly, disturbing, unsafe, unsanitary, fly-producing, rat-harboring, and/or disease causing places, conditions or objects.
- E. It is also necessary for the public social and economic welfare to regulate, prevent and prohibit conditions which degrade the scenic attractiveness, livability and economic development of the unincorporated areas of Christian County.

Section 2. Specific Nuisances on any Premise in Any Zoning District

It shall be unlawful and a nuisance for any person who is the owner, agent, tenant or occupant of any premises in any zoning district to allow or cause any of the following to remain on such premises:

A. Any condition, substance or thing on public or private property that is injurious or dangerous to public health or safety.

B. Any condition or thing defined as a nuisance in this Article or by the Revised Statutes and decisions of the State of Missouri.

C. Building Materials

The keeping or storage of building materials outside on private property six (6) months after a Certificate of Occupancy is issued by the County, unless the building materials are kept or stored in an orderly manner and intended to be used on site.

1. Any storage of material to be used in a different location or multiple properties will be considered a commercial use and must cease unless in a commercially zoned area in compliance with district guidelines.

2. Types of building materials shall not be intermingled and must be stored in a manner customary for that type of building material.

D. Dangerous Structures

A structure which is potentially hazardous to persons or property including, but not limited to:

1. A structure which is in danger of partial or complete collapse;

2. A structure with any exterior parts which are loose or in danger of falling;

3. A structure with any parts such as floors, porches, decks, railings, stairs, ramps, balconies or roofs which are accessible and which are either collapsed, in danger of collapsing or unable to support the weight of normally imposed loads;

4. A structure which consists of a fence, wall or enclosure device which is in danger of falling, collapse, or which does not function as a security device or a barrier around potentially dangerous conditions, including but not limited to swimming pools.

E. Dumped Snow

Accumulated snow and ice that is brought in from another location and dumped, kept or stored in such a condition that litter, gravel or melting snow/ice create a dangerous or unhealthy condition.

F. Fire Hazard

Any thing or condition on the property which creates a fire hazard or which is a violation of the fire code.

G. Garbage

Any accumulation or deposits of garbage, trash or debris other than that which is temporarily stored for lawful disposal provided that it is temporarily stored in a leak proof container designed for the storage of garbage, trash or debris.

H. Graffiti

Any initials, marks, symbols, designs, inscriptions or other drawings, scratched, painted, inscribed or otherwise affixed upon any structure without the permission of the owner.

I. Hazards

Any thing or condition on a property which, may contribute to injury of any person present on the property.

1. Hazards shall include, but not be limited to, open holes, open foundations, open wells, unfenced or unsecured swimming pools, dangerous trees or limbs, abandoned refrigerators and trapping devices
2. or safety hazards obstructing the line of sight of a motor vehicle driver at a street, intersection or interferes with the passage of motor vehicles or pedestrians upon any public right-of-way

J. Health Hazards

Any thing or condition on the property which creates a health hazard or which is in violation of any health or sanitation law.

K. Insects, Rodents, and Pest Harborage

Conditions which are conducive to the presence, harborage or breeding of insects, rodents or other pests.

L. Nuisance Building

1. A vacant building or portion of a vacant building which has multiple housing code or building code violations
2. or has been ordered vacated and which has conditions constituting material endangerment,
3. or which has a documented and confirmed history as a blighting influence on the community.

M. Odors

Any substance that emits, generates or causes noxious or toxic odor, dust, vapor, fumes or mist in the neighborhood where they exist.

N. Open Sewer Lines and Connections

Any broken sewer line or defective connection to an underground sewer system which is open, broken, disconnected or which has not been properly sealed and which could allow the egress of rodents from the sewer.

O. Pests

Pests shall include, but not be limited to , pigeons, grackles, starlings, snakes, bats, skunks, raccoons, opossums, armadillos and squirrels.

P. Pest Feeding

1. The intentional feeding of pests where such feeding reasonably can be determined to cause or contribute to the harboring, breeding or pest infestation in that area or neighborhood.
2. The enforcement officer may take into account:
 - a. The numbers of pests which are fed,
 - b. the overall population of pests in the area,
 - c. the danger and/or risk to the public health and welfare,
 - d. and the increased difficulty of control of the pests in the area in making a determination.

Q. Rank Plant Growth

Overgrown, uncontrolled grass, weeds vegetation, shrubs, trees, vines that are conducive to the accumulation of refuse, debris or the harborage of vermin.

R. Refuse, Noxious Substances, Hazardous Wastes

Refuse, noxious substances or hazardous wastes laying, pooled, accumulated, piled, left, deposited, buried or discharged upon, in, being discharged or flowing from any property, structure or vehicle.

S. Sanitary Structures

1. Structures for sanitation such as vaults, sewers, private drains, septic tanks, cesspools and drain fields which have failed or do not function properly or which are overflowing, leaking or emanating odors.
2. Septic tanks, cesspools or cisterns which are abandoned or no longer in use unless they are emptied and filled with clean fill.

T. Sewage

Any malfunctioning private sewage disposal system that allows polluted, raw or partially treated waste water or effluent to be deposited or stand upon any premises.

U. Stagnant Water

Stagnant water standing on any property. Any property, container or material kept in such a condition that water can accumulate and stagnate, other than a pond, lake, detention basin or naturally occurring conditions.

V. Vehicles

Stationary and immobilized vehicle as regulated in Article 24. Large commercial vehicles, large commercial trailers and commercial vehicles as regulated under Article 7, Section 2 Off-Street Parking Space.

W. Vermin Harborage

Conditions which are conducive to the harborage or breeding of vermin.

X. Vermin Infestations

Infestations of vermin include but are not limited to such as rats, mice, squirrels, skunks, snakes, bats, grackles, starlings, pigeons, bees, wasps, cockroaches, mosquitoes or flies; except for animals kept as part of an agricultural or commercial operation.

ARTICLE 23. WEEDS and OTHER RANK VEGETATION

Section 1. Unlawful Weeds, Brush or Rank Vegetation

- A. In any Residential, Commercial or Manufacturing District, or any platted subdivision, it shall be considered unlawful for the growth of weeds, brush or other rank vegetation to exceed twelve (12) inches in height.
1. These weeds constitute a nuisance when, in the opinion of the Zoning Enforcement Officer, any such growth in a lot or a piece of land may substantially endanger the health, safety or welfare of the public.

Section 2. Nuisance Abatement Order

- A. The Zoning Enforcement Officer shall notify the owner of the property of the order to abate the nuisance.
1. The owner shall be notified by certified mail.
 2. If the nuisance is not abated within ten (10) days from the date the notice is sent, then the Zoning Enforcement Officer shall notify the applicable County or Special Road District official, giving him/her the location thereof, and
 3. this official shall cause such nuisance to be abated by whatever means are necessary.

Section 3. Cost of Cutting and Removing Weeds

- A. The cost of cutting and removing weeds, brush and other rank vegetation shall be computed by the applicable County or Special Road District official, who shall certify the amount thereof to the County Commission.
1. The owner of the property who was such at the time that the nuisance was abated shall be personally liable to the County for the cost of such abatement and
 2. there shall also be from the time of such certification a lien upon the land where such nuisance was abated,
 - a. the same to run with the land for the full cost to the County for such abatement, and
 - b. in favor of the County which may be foreclosed by appropriate proceeding in the Circuit Court of Christian County, Missouri.

ARTICLE 24. STATIONARY VEHICLES

It shall be considered unlawful to place, assemble, park, store or display car hulks, junk vehicles, or any other form of unlicensed, immobilized vehicle, which is located outside of a structure in a stationary position for more than seven (7) days on any property other than those areas so designated by proper zoning.

ARTICLE 25. RESIDENTIAL GROUP HOMES

Section 1. Requirements and Limitations

- A. Residential group homes as defined in Article 25, may be authorized by the Board of Adjustment as Conditional Uses in the R-1, R-2, R-3, R-4, and MH Zoning Districts provided that the following requirements and limitations are adhered to:
1. The size of the facility and exterior appearance of the residential group home and property must be compatible with the surrounding neighborhood, as determined by the Board of Adjustment.
 2. The residential group home shall be located no closer than one-quarter (1/4) mile from any other group home.
 3. The residential group home must be equipped with approved fire safety systems.
 4. The residential group home must be connected to public water and sewer or approved private systems.
 5. The residential group home must meet all County, State, and Federal requirements regarding each individual group home.

ARTICLE 26. NON-RESIDENTIAL GROUP HOMES

Section 1. Requirements and Limitations

- A. Non-Residential Group Homes as defined in Article 26, may be authorized by the Board of Adjustment as Conditional Uses in the R-3 and R-4 Zoning Districts provided that the following requirements and limitations are adhered to:
1. The size of the facility, number of vehicles and the amount of personnel of each respective non-residential group home shall be restricted in order to protect and maintain the general neighborhood's integrity, as determined by the Board of Adjustment.
 2. Concentration of facilities shall be limited in order to preserve the general neighborhood's character.
 3. The non-residential group home must be equipped with approved fire safety systems as deemed necessary.
 4. The non-residential group home must be connected to public water and sewer or an approved private system.
 5. The non-residential group home must meet all County, State, and Federal requirements regarding each individual group home.

ARTICLE 27. CLUSTER DEVELOPMENTS

In any R District, the clustering of dwellings shall be permitted, providing that the following conditions shall be met:

- A. The total density of dwellings per acre does not exceed the density provided for that Zoning District.
- B. The development shall be provided with approved sewage disposal system other than conventional septic tank. Approval shall be subject to the discretion of the Planning & Zoning Commission.
- C. The developer must be able to satisfy the Planning & Zoning Commission and the County Commission that the remaining private open space shall be maintained by the residents or a responsible agent.
- D. In no case may a dwelling occupy more than seventy-five (75) percent of the lot area.
- E. The development shall be supplied by an approved water supply. Approval shall be subject to the discretion of the Planning & Zoning Commission.
- F. In no case shall the dwellings be located nearer to the paved street than twenty (20) feet.
- G. In addition to submittal of the preliminary and final plats, a plot plan shall also be required and shall be approved before the filing of a final plat. The plot plan shall show the proposed coverage on each lot.
- H. The appropriate variances pertaining to side yards and front and rear yards shall become automatic with the approval of the preliminary plat; however, the development shall remain subject to the Zoning District regulations pertaining to dwelling height and floor area.
- I. A cluster development shall also be subject to any further restrictions deemed necessary by the Planning & Zoning Commission to protect the public health, safety and welfare.
- J. Before the submittal of a preliminary plat a sketch plan shall be reviewed by the Planning & Zoning Department.
- K. Calculation of dwelling units per acre will exclude areas used for road rights-of-ways.
- L. The development must meet all applicable subdivision regulations.

ARTICLE 28. ADULT ENTERTAINMENT FACILITIES

Section 1. Intent

- A. It is not the intent of these Zoning Regulations to suppress any speech activities protected by the First Amendment, but to enact a content-neutral regulation that addresses the adverse secondary effects of sexually-oriented businesses (adult entertainment establishments).
- B. The County Commission finds that sexually-oriented businesses (adult entertainment establishments) create or enhance undesirable secondary effects that include a wide range of criminal and other unlawful activities that have regularly and historically occurred, including prostitution, narcotics, breaches of the peace, assaults and sexual conduct involving contact between the patrons. Secondary land use effects also include impacts to both residential and commercial property, including a change of character, destabilization of neighborhoods, and depressed property values that are destructive to residential areas and certain commercial zones. These secondary effects are inconsistent with goals of the Comprehensive Plan, these Zoning Regulations, and the Subdivision Regulations. Therefore, it is the intent of this Article to mitigate these secondary impacts from adult entertainment establishments.
- C. It is well documented that certain businesses providing live adult entertainment are associated with prostitution, disruptive conduct, and other criminal activity and constitute a threat to the public peace, health, and safety. This Article is intended to address these secondary impacts.
- D. The County Commission is aware of studies that have documented an increase in the crime rate generally and specifically in the rate of sexually related crime, in areas that are close to adult businesses. These studies provide convincing evidence that adult-oriented businesses provide an atmosphere supporting an increase in crimes such as assault, theft, robbery, prostitution, drug use and other serious offenses. This Article is intended to address this concern.

- E. Many cities, including surrounding metropolitan areas, have experienced negative secondary land use impacts from adult entertainment activities. The skid row effect described in case studies of Detroit is one of these secondary effects, and is evident in certain parts of Seattle and Tacoma. Such an effect could be significantly magnified in the unincorporated areas of Christian County. This Article is intended to address that concern.
- F. Secondary land use impacts to residential uses are expected when adult entertainment land uses are located adjacent or in close proximity to residential zones. At a minimum, adult entertainment uses located in close proximity to residential neighborhoods are perceived by residents to have a detrimental impact to the residential character and, therefore, an impact on the suitability of their area for residential use. This can cause a de-stabilization of the residential area, depressed property values, and have significant detrimental impacts to the health and vitality of the neighborhood. These impacts have been documented by studies in other jurisdictions. This Article is intended to address these secondary land use impacts.
- G. Both residential neighbors and commercial landlords and tenants have concerns over the secondary effects of location of adult uses in the immediate vicinity of residential and commercial uses, including a significant distraction to their residential quality of life and expected significant adverse impacts to their neighborhood character and property values as a result. This Article is intended to address these residential and commercial neighborhood concerns.
- H. By land use regulation of adult entertainment land uses it is the intent of this Section to prevent deterioration and/or degradation of the vitality of our rural community.
- I. The Comprehensive Plan and these Zoning Regulations require that adjacent land uses be compatible. It is the intent of this Article to require such compatibility when siting adult entertainment uses.
- J. Adult entertainment land uses are considered incompatible with certain land uses, such as residences, religious facilities, day care facilities, libraries, youth centers, parks and schools, and should be separated and buffered from such uses. It is the intent of this Article to implement separation and buffering strategies protecting uses that are incompatible with adult entertainment uses.

- K. In order to avoid a “skid row” effect, adult entertainment uses need to be separated from one another. It is the intent of this Section to implement a strategy to separate adult entertainment uses and avoid skid row effects in Christian County’s land use zones.
- L. Careful siting of adult entertainment uses is necessary to properly integrate such uses into compatible land use zones. It is the intent of this Article to carefully select certain zones providing for the needs of adult entertainment uses that will minimize impacts to other land uses in the selected zones.
- M. Careful site planning of adult entertainment uses is necessary to properly integrate adult uses among non-adult entertainment uses to avoid conflicts that impact the desirability of the commercial area for existing uses. It is the intent of this Article to develop and require implementation of siting techniques to minimize land use impacts from adult entertainment uses upon surrounding land uses.

Section 2. Adult Entertainment Definitions

The following words and phrases shall have the meanings set forth below when used in reference to provisions for adult entertainment businesses and uses within this Article.

Adult entertainer

Any person who provides live adult entertainment within an adult entertainment dance studio as defined in this Article whether or not a fee is charged or accepted for entertainment.

Adult entertainment

Any exhibition, performance or medium that contains, or is distinguished or characterized by:

1. Actual or simulated acts of sexual intercourse, masturbation, sodomy, fellatio, cunnilingus, bestiality, excretory functions, or lewd exhibition of the genitals or genital area;
2. Fondling or other touching of the human genitals, pubic region, buttocks or female breast;
3. Human genitals in a state of sexual stimulation or arousal;
4. Displays of less than completely and opaquely covered human genitals, pubic region, anus, buttocks, or female breast below the top of the areola;
5. Human male genitals in a discernibly turgid state even if completely covered;
6. actual or simulated sexual acts;
7. actual or simulated violent or destructive sexual acts, including but not limited to human or animal mutilation, dismemberment, rape or torture;
8. Any exhibition, performance or dance conducted in a premise where such exhibition, performance or dance is performed within the view of one or more members of the public and is intended or is likely to sexually stimulate any member of the public;
9. Adult entertainment shall not include the following:
 - a. Plays, operas, musicals or other dramatic works that are not obscene;
 - b. Classes, seminars and lectures which are held for serious scientific or educational purposes;
 - c. Exhibitions or dances that are not obscene. For this Section, any exhibition, performance, dance, or other medium is obscene, if:

- (a) The average person, applying contemporary community standards, would find, when considered as a whole, appeals to the prurient interest; and
- (b) The exhibition, performance, dance, or other medium explicitly depicts or describes patently offensive representations or descriptions, applying contemporary community standards of sexual conduct; and
- (c) The exhibition, performance, dance, or other medium, when considered as a whole, and in the context in which it is used, lacks serious literary, artistic, political, or scientific value.

Adult arcade

An establishment where, for any form of consideration, one or more still or motion picture projectors, slide projections, or similar machines, or other image producing machines, for viewing by five or fewer persons each, are used to show films, motion pictures, video cassettes, slides, video disks or other photographic reproductions that are characterized by the depiction or description of specific sexual activities or specific anatomical areas.

Adult bookstore, adult novelty store, or adult video store

A commercial establishment that has as one of its principal business purposes the offering for sale or rental for some form of consideration, books, magazines, periodicals or other printed matter, or photographs, films, motion pictures, video cassettes, slides, video disks or other visual representations that are characterized by the depiction or description of specific sexual activities or specific anatomical areas.

Adult entertainment facility

All adult-oriented businesses including adult arcades, adult bookstores, adult novelty stores, adult video stores, similar adult uses and adult live entertainment facilities.

Adult live entertainment center

A cabaret or business having as part of its trade, live dancers or entertainers who depict specific sexual activities or display specific anatomical areas as defined in this Article, including, but not limited to topless dance centers, so-called exotic dance centers and body painting studios.

Business area

Any zoning district designated for office, government and institutional, commercial and industrial use.

Cabaret

An establishment that features topless dancers, go-go dancers, exotic dancers, strippers, male or female impersonators, or similar entertainers, distinguished or characterized by an emphasis on matter depicting, describing or relating to sexual activities or specified anatomical areas.

Commercial

Relating to the sale of goods or services.

Commercial vehicle

Any vehicle designed, maintained, or used primarily for the transportation of property or persons for hire.

Compensation

The receiving of goods, services, or money in exchange for or as a result of a service performed.

Day care operation:

1. **Day Care Home**

A home where not more than six (6) children are kept in addition to the caregiver's own children, subject to state licensing requirements.

2. **Day Care Group Home**

A home where not more than ten (10) children are kept in addition to the caregiver's own children, subject to state licensing requirements.

3. **Day Care Center**

A commercial business where eleven (11) or more children are kept, subject to state licensing requirements.

Entertainment

Any exhibition or dance of any type, removal of articles of clothing, pantomime, modeling or any other performance.

Establishment

An economic unit, generally at a single physical location, where business is conducted or service or industrial operations performed.

Member of the public

Any customer, patron or person, other than an employee, who is invited or admitted to an adult entertainment premise.

Non-business area

Any area within a residential Zoning District, including areas therein where legal non-residential uses are present.

Nude or state of nudity

Displays of less than completely and opaquely covered human genitals, pubic area, anus, buttocks, or female breast below the top of the areola.

Premise

Any tract of land. A premise may consist of one (1) or more lots, tracts, or units, under single or multiple ownership that operates as a functional unit. A **Shared Premise**, when developed, shall also possess one or more of the following criteria:

1. Shared parking;
2. Common management;
3. Common identification;
4. Common access; or
5. Shared circulation.

Principal use

The primary or predominant use of any lot.

Restaurant

An establishment where food and drink is prepared and served for consumption on or off the property. If alcoholic beverages are served, more than fifty (50) percent of gross income must be derived from the sale of food and non-alcoholic beverages, for consumption on the property, for the establishment to be classified as a restaurant.

Specific anatomical areas

1. Less than completely and opaquely covered human genitals, pubic region, buttocks and female breasts below a point immediately above the top of the areola;
2. Human male genitals in a discernibly turgid state, even if completely and opaquely covered.

Specific sexual activities

1. Human genitals in a state of sexual stimulation; and/or
2. Acts of human masturbation, sexual intercourse or sodomy; and/or
3. Fondling or other erotic touching of human genitals, pubic region, buttocks or the female breasts.

Stock in trade

The greater of:

1. The retail value of all prerecorded video tapes, books, magazines or similar material readily available for purchase, rental, viewing, or use by patrons of the establishment, excluding material located in any storeroom or other portion of the premise not regularly open to patrons; or
2. The total number of titles of all prerecorded video tapes, discs, books, magazines, or similar material readily available for purchase, rental, viewing or use by patrons of the establishment excluding material located in any storeroom or other portion of the premise not regularly open to patrons.

Tavern

An establishment where fifty (50) percent or more of the gross income is derived from the sale of alcoholic beverages by the drink, for the consumption on the property, and where the serving of food and non-alcoholic beverages, for consumption on the property, and the sale of package liquors may be accessory uses.

Tea Room

An establishment used primarily for the serving of non-alcoholic beverages by the drink for consumption on the premise with the sale of food for consumption on the premise is accessory to the primary use.

Wholesale Trade

An establishment or places of business primarily engaged in selling merchandise to retailers; to industrial, commercial, institutional, or professional business uses, or to other wholesalers; or acting as agents or brokers and buying merchandise for, or selling merchandise to, such individuals or companies.

Youth oriented facility

Facilities owned or operated by non-profit organizations for the purpose of providing recreational or educational opportunities for youth including, but not limited to, Boys and Girls Clubs, YMCAs, YWCAs, Little League, and other youth sports associations.

Section 3. Adult Entertainment Facilities Permitted in Certain Land Use Zones Subject to Certain Restrictions and Standards

- A. Adult arcades, adult live entertainment facilities, cabarets and any adult entertainment facility falling under the definitions of adult bookstores, adult novelty stores, adult video stores or other similar adult uses may be permitted in the following zones subject to the standards and requirements of Section 4 of this Article and spacing requirements identified below:
1. Land use zones permitted: C-2, M-1, or M-2 district.
 2. Spacing and buffering requirements.
 - a. No adult entertainment facility shall be located closer than one thousand (1,000) feet from another adult entertainment facility, whether such other facility is located within or outside the unincorporated area of Christian County.
 - b. No adult entertainment facility shall be located, operated or maintained within one thousand (1,500) feet of any sensitive land uses, which includes property used for:
 - (1) Public and private schools;
 - (2) Licensed day-care operations;
 - (2) Public parks;
 - (3) Public libraries;
 - (4) State-certified daycare;
 - (5) Public community centers;
 - (6) Churches, cemeteries or other religious facilities or institutions;
 - (7) Residential and lodging uses and property zoned primarily for residential uses, including A-R Agricultural Residence District, R-1 Suburban Residence District, R-2 One and Two-Family Residence District, R-3 Multi-Family Residence District, and R-4 Multi-Family Residence District zones;
 - (8) Any entertainment business that is oriented primarily toward children.
 - c. General Standards: All the standards of Section 4 of this Article shall apply.

- d. Measuring required distances: The distances between adult entertainment facilities and sensitive land uses identified in Section 3-A. (1.-b.) hereof or the spacing distances between adult entertainment facilities shall be measured by following a straight line, without regard to intervening structures or objects, from the nearest point of the property parcel upon which the proposed adult entertainment facility or use is to be located to the nearest point of the sensitive parcel of property or the Zoning District boundary line from which the proposed adult entertainment use is to be separated.

Section 4. General Standards for Adult Entertainment Facilities
Adult entertainment facilities shall conform to the following general standards:

- A. All on-site parking areas and premise entries of adult entertainment uses shall be illuminated from dusk until one (1) hour past closing with a lighting system that provides an average maintained horizontal illumination of one foot-candle of light on the parking strips and/or walkways. An on-premise exterior lighting plan shall be presented to and approved by the Planning & Zoning Department and the Building Inspections Department prior to the operation of any such use.
- B. All parking must be visible from the fronting street. Access to the exterior rear of the building shall be denied to any persons other than employees or public officials during the performance of their respective duties and tasks by means of fencing as approved by the Building Inspections Department.
- C. In addition to all on-premise sign requirements of Article 4, Section 5, and Article 13 the following signing provisions shall be followed:
1. There shall be no electronic reader boards or changing message center signs.
 2. All adult entertainment facilities shall have facades, exteriors, and exits which must be indistinguishable from surrounding buildings. Illustrations depicting partially or totally nude males and/or females shall not be posted or painted on any exterior wall of the building used for such business or on any door or apparatus attached to such building.
- D. No one under 21 years of age shall be admitted to any adult entertainment establishment. This minimum age limitation also applies to any employees, agents, servants or independent contractors working on the premise during hours when nude entertainment is being presented.
- E. Nude entertainment shall only be available at an adult entertainment establishment from the hours of 4:00 p.m. to the following 1:30 a.m., on Monday through Saturday of each week.

- F. Any adult entertainment facility operating at the effective date of this regulation in violation of Section 3 of this Article shall be allowed to continue operating without compliance herewithin for an amortization period of six (6) months. Six (6) months after this regulation becomes effective, all adult entertainment facilities must fully comply with this regulation, including Section 3 of this Article or be subject to the penalty provisions set forth herein.
- G. No landowner or lessee shall knowingly permit an adult entertainment establishment to be operated or maintained upon a premise, property, or structure under his, her, or its control, in violation of Section 3 of this Article.
- H. All standards of the underlying Zoning District must be met or complied with.
- I. All adult entertainment facilities shall be required to comply with the requirements of the Comprehensive Plan to promote compatibility with surrounding land uses in both commercial and manufacturing zones.
- J. Except for the amortization period set forth in subparagraph F above, each day of operation in violation of any provision of these Zoning Regulations shall constitute a separate violation.
- K. Any adult entertainment establishment that engages in repeated or continuing violations of these Zoning Regulations shall constitute a public nuisance. For purposes of these Zoning Regulations “repeated violations” means three (3) or more violations of any provision set out in these Zoning Regulations within a one (1) year period dating from the time of any violation, and a “continuing violation” means a violation of any provision set out in these Zoning Regulations lasting for three (3) or more consecutive days.
- L. If any provision of these Zoning Regulations is held invalid or unconstitutional by a court of competent jurisdiction, such decision shall not invalidate any regulation in its entirety, and to this end the provisions of these Zoning Regulations are declared to be severable.
- M. Any adult entertainment establishment operating before the effective date of this Regulation shall comply with every provision of this Regulation and all future amendments to this Regulation, except as set forth in item F above.

Section 5. Waiver of Distance Requirements

The following procedures and criteria shall be adhered to with regard to a request for waiver of distance requirements:

A. Distance Waiver Required.

Any party proposing to locate an adult facility within less than the required distances from uses or zones specified in this chapter may do so only after obtaining a waiver from the Board of Adjustment through a Conditional Use Permit process.

B. Waiver Notice Requirements.

In addition to the notice requirements for a Conditional Use Permit, first-class mailing notice shall be made to all parties within the distance set forth in Section 3 of this Article.

C. Criteria for Decision.

The final decision on the request for waiver of distance shall be made by the Board of Adjustment based on consideration of the following:

1. The extent to which the physical features would result in an effective separation in terms of visibility and access;
2. Compatibility with adjacent and surrounding land uses;
3. The availability or lack of alternative locations for the proposed use; and
4. The ability to avoid the adult facility by alternative vehicular and pedestrian routes.

Section 6. Intervening uses

Sensitive land uses specified in Section 3 of this Article shall not be allowed to locate within the specified distances to an adult entertainment facility. Any party proposing to locate such a use or zone within the specified distances of an adult entertainment facility is considered an intervening use and may do so only after obtaining a distance waiver pursuant to the provisions of Section 5 of this Article regarding waiver of distance requirements.

ARTICLE 29. CONCENTRATED ANIMAL FEEDING OPERATIONS (CAFO)

Section 1. Specifications

- A. Concentrated Animal Feeding Operations (CAFO) as defined by Article 2, Section 2 may be conditionally permitted in A-1, M-1, or M-2 districts with a conditional use permit approved by the Board of Adjustment.
- B. The Board of Adjustment is to defer to the standards set forth within Sections 640.700 to 640.755 of the Missouri Revised Statutes concerning the issuance of a conditional use permit.

ARTICLE 30. AGRICULTURAL RESERVE DISTRICT

Section 1. Specifications

- A. To help encourage the preservation of agricultural land and provide landowners protection from development pressures, any landowner who holds title to at least ten (10) acres may request that his/her property be designated by the Planning & Zoning Commission as an Agricultural Reserve Area.
- B. Said designation shall assure the landowner that property taxes shall be assessed at the rates set for agricultural use, even if the reserve area lies within an area designated for another land use.
- C. A reserve designation shall run with the property and shall be recorded in the County Recorder's Office, as well as the County Planning & Zoning Department.
- D. While an area is designated as a reserve area, there shall be no building permits issued other than for customary residential and accessory buildings directly related to agricultural uses.

ARTICLE 31. A-1 AGRICULTURE DISTRICT

Section 1. Statement of Intent:

- A. This Zoning District is intended to provide for agricultural and related uses in areas where non-farm residential development is not of a significant portion and is presently not anticipated.
- B. It is the intent of this Zoning District to allow accessory residential dwellings to the extent required for the safe and proper operation of a principal permitted use.
 - 1. Single-family detached dwelling
 - a. In the A-1 District to create tracts of less than twenty (20) acres requires an administrative subdivision. No more than two (2) tracts less than ten (10) acres may be created and the remaining tract must have a minimum of ten (10) acres.
 - b. All legal parcels of ground created prior this regulation will be considered legal tracts of land for permits and transfer of title.
 - c. A legal parcel of land less than fifteen (15) acres in size, created prior to the effective date of the Zoning Regulations (August 9, 2010) shall **not** be required, if subdivided, to have a remaining tract, consisting of a minimum of ten (10) acres.

Section 2. Principal Permitted Uses

- A. Agriculture, including any customary agricultural building and structure, orchards, the harvesting of wild crops, berries, tree fruits and seeds, grazing, nursery and greenhouses; provided that any greenhouse heating plants, or building or enclosure in which farm animals are kept shall comply with the distance requirements of one hundred (100) feet from any Residential District.
- B. Single-family detached dwelling.
- C. Churches and parish houses, schools, public buildings, structures and properties of recreational, cultural, administration or public service type all producing less than one thousand five hundred (1,500) gallons of wastewater per day.
- D. Private non-commercial recreational areas, uses and facilities including country clubs, swimming pools, forests and wildlife preserves.
- E. Road Right-of-Way and Road Crossing Procedures for Buried Lines and other public utility uses according to the provisions of Article 18.

- F. Private stables and dairies; provided that any building or enclosure in which fowl or animals are kept shall comply with the distance requirements of one hundred (100) feet from any Residential District.

Section 3. Accessory Uses

- A. Accessory uses, buildings and structures customarily incidental to any of the Permitted Uses set out above, including:
 1. Living quarters of persons employed on the premises; the keeping of roomers or boarders by a resident family.
 2. A private garage, parking area or stable.
 3. Customary incidental home occupations when conducted in a dwelling, provided that no stock in trade is kept or products sold, except such as are made on the premises.
 4. Roadside stands, offering for sale only agricultural products produced on the premises or in the vicinity.

Section 4. Conditional Uses Requiring Board of Adjustment Authorization

- A. Schools; cultural, administrative or public buildings; churches and other places of worship expected to exceed one thousand five hundred (1500) gallons of wastewater per day, including parish houses and Sunday Schools, but excluding overnight shelters and temporary outdoor revivals, on a minimum of five (5) acres of land, to provide sufficient land area for off-street parking; and buffer yards and proper site design to lessen possible adverse impacts on adjoining properties.
- B. The parking of one (1) mobile home in extreme hardship cases, as a second dwelling.
 1. Such as, but not limited to, relatives of the occupants of a principal dwelling unit on the premises, or
 2. In the case of the destruction or substantial damage to a dwelling by casualty, may be allowed for a time limit set by the Board of Adjustment, which may be renewed by the approval of the Board of Adjustment, for successive periods of time, with time limits set by the Board of Adjustment.
- C. The parking of one (1) mobile home as an additional dwelling may be permitted for temporary occupancy of a farmer, tenant farmer or hired help whose main occupation is farm work. Area, yard and setback requirements for the mobile home shall be the same as required for a single family dwelling.

- D. Temporary roadside stands for non-agricultural commercial sales.
- E. Concentrated Animal Feeding Operations (CAFOs) in conformance with Article 29.
- F. The following commercial activities: mining, oil drilling, quarries and gravel pits, temporary sawmill for cutting timber grown on the premises;
 - 1. provided that any lot or tract of land containing such use, other than a temporary sawmill, shall not be less than ten (10) acres in area, and
 - 2. That the location of any power-driven or power-producing machinery affixed to the real estate shall comply with a distance of five hundred (500) feet from any R District.
- G. Cemeteries, including mausoleums and crematories therein, provided that any mausoleum and crematory shall comply with the distance requirements of five hundred (500) feet from any Residential District, and provided that any new cemetery shall contain an area not less than twenty (20) acres.
- H. Religious and charitable institutions.
- I. Hospitals and sanitariums, including institutions for contagious disease and for the insane, liquor or drug addicts, and penal or correctional institutions,
 - 1. Provided that any tract or lot of land in such use shall be not less than ten (10) acres in area and
 - 2. Provided the location of any such establishment shall comply with the distance requirements of five hundred (500) feet from any Residential District.
- J. Airports and landing fields, subject to the provisions of the Missouri State Statutes.
- K. Disposal of garbage or refuse by the County, a township or municipality, or agent thereof, subject to the provision of the Missouri State Statutes.
- L. Radio and television transmitters, not to include class C or D (CB), but subject to FCC Regulations - towers only.
- M. Rifle, skeet, trap, and pistol ranges and similar uses provided that the physical layout of such uses (firing line, targets, range, *et cetera*) shall be located a minimum distance of five hundred (500) feet from an R District.
- N. Commercial kennels, animal hospitals or veterinary clinics

Christian County Zoning Regulations
Article 31 – A-1 Agriculture District

1. Provided that any tract of land in such use shall not be less than five (5) acres in area, and
 2. Any building or enclosure shall be a distance of one hundred (100) feet from a Residential District, and twenty-five (25) feet from any property line.
 3. All animals must be kept and provided for according to the provisions of United States Department of Agriculture guidelines for the humane treatment of animals.
- O. Golf courses.
- P. Riding academies and public stables;
1. provided that any lot or tract of land in such use shall be not less than twenty (20) acres in area and that
 2. any building or enclosure in which animals are kept shall be a minimum distance of two hundred (200) feet from an R District.
 3. The issuance of a conditional use permit for riding academies and public stables is intended to insure they remain primarily agricultural in nature.

Section 5. Area Requirements

- A. All tracts of property shall have a minimum road frontage of two hundred (200) feet.
- B. Lots that have no road frontage shall have a minimum dimension of two hundred (200) feet.
- C. Odd shaped tracts will be approved on a case by case basis by the Board of Adjustment.
- D. Tracts may include road rights-of-way.

Side Yard Widths

	Lot Area*	Minimum Frontage	Front Yard Depth	One Side Yard	Both Side Yards	Rear Yard Depth	Dwelling's 1 st Floor Minimum Area
Lot Area Customarily agricultural uses, as specified in Article 31	5 acres	-	50 feet	50 feet	100 feet	50 feet	-
Individual single-family dwelling with individual well and approved on-site sewage system	5 acres	200 feet	50 feet	25 feet	50 feet	50 feet	640 sq. ft. 1 st floor minimum
Recreational facilities, hospitals	5 acres	-	100 feet	75 feet	150 feet	100 feet	-

*Lot Area may include all road rights-of-way

Section 6. Road or Street Setback

Roadway

- Off major State and Federal Highways
- Off all subdivision roads
- Off all County roads

Required Setback

- 10 feet from adjoining right-of-way plus required yard setback
- 25 feet from right-of-way center line plus required yard setback
- 25 feet from right-of-way center line plus required yard setback

ARTICLE 32. A-R AGRICULTURAL - RESIDENCE DISTRICT

Section 1. Statement of Intent

- A. This Zoning District is intended to preserve the predominant rural character of the land while allowing certain non-agricultural uses.
- B. This Zoning District is to provide residential areas where property owners can maintain a limited number of farm animals and accessory buildings in a rural setting.
- C. This Zoning District imposes special regulations for areas which possess certain environmental and/or physical characteristics. These characteristics include but are not limited to:
 - 1. Recharge area for important springs,
 - 2. Faults and other areas of discrete groundwater recharge,
 - 3. Caves and sinkholes,
 - 4. Municipal watershed,
 - 5. Forest cover,
 - 6. Easily erodible soils,
 - 7. Proximity to streams or lakes.
- D. Only three (3) parcels may be created by Administrative (minor) Subdivision from the parent tract rezoned from another Zoning District. Other parcels may be created by platting as regulated by the Christian County Subdivision Regulations.

Section 2. Principal Permitted Uses

- A. Single family detached dwellings.
- B. Hunting and fishing, unless prohibited by other ordinances and laws.
- C. Residential Group Homes, if the maximum residential density does not exceed a total of ten (10) persons and located at least twenty-five (25) feet from all lot lines.
- D. Road Right-of-Way and Road Crossing Procedures for Buried Lines and other public utility uses according to the provisions of Article 18.
- E. Churches, schools, public buildings, structures, and properties of recreational, cultural, administration or public service type all producing less than one thousand five hundred (1500) gallons of wastewater per day.

- F. Private non-commercial recreational areas, including country clubs, swimming pools and golf courses, forest and wildlife preserves.
- G. Wineries.

Section 3. Accessory Uses

- A. Accessory uses, buildings and structures customarily incidental to the Permitted Uses set out above.
- B. Home occupations as defined in Article 10.
- C. Temporary real estate and small announcement signs.
- D. Temporary buildings for uses incidental to construction work, which shall be removed upon completion or abandonment of the construction work.
- E. Swimming pool incidental to a single family dwelling.
- F. Day care homes, if not more than six (6) children are kept.

Section 4. Conditional Uses Requiring Authorization by the Board of Adjustment

- A. Public utility structures or uses, subject to the provisions set by the Board of Adjustment.
- B. Schools; cultural, administrative, and public buildings; churches; and other places of worship expected to exceed one thousand five hundred (1500) gallons of wastewater per day, including parish houses and Sunday schools,
 - 1. on a minimum of three (3) acres of land, to provide sufficient land area for off-street parking; and buffer yards and proper site design to lessen possible adverse impacts on adjoining properties, but
 - 2. excluding overnight shelters and temporary outdoor revivals.
- C. Cemeteries adjacent to or in extension of existing cemeteries, subject to the provisions set by the Board of Adjustment.
- D. Day Care Group Homes, if not more than ten (10) children are kept.
- E. Bed-and-Breakfast facilities.

Section 5. Specific Prohibitions

- A. The filling or drainage of marsh or wetlands, removal of topsoil, stripping of natural vegetative cover, the creation of ponds or damming or relocating of any water course shall not be permitted unless allowed according to the provisions of federal, state and county regulations.

- B. Removal of forests, woods or other significant stands of foliage and cover unless by an approved plan.
- C. Quarrying, mining or other excavation except as incidental to the construction of buildings to house permitted uses listed above.
- D. Locating wastewater treatment systems closer than one hundred (100) feet from surface water or areas of discrete recharge to ground water sources.

Section 6. Special Provisions

- A. Location of wastewater treatment systems in those areas with environmental or physical constraints as described in the Statement of Intent of this Article shall only be installed after receiving approval from the Christian County Health Department.
- B. Stricter requirements may be imposed for water and wastewater systems if the Christian County Health Department finds it necessary for the protection of the public health, safety, and welfare. Alternate wastewater systems may be allowed in areas deemed inappropriate for conventional septic tank systems.
- C. Area requirements may be increased if the County Commission finds it necessary for the protection of the public health, safety and welfare.
- D. Private roads are allowed:
 - 1. provided that the private road shall be so described in deeds and legal descriptions.
 - 1. further stated that private roads will not be accepted or maintained by the County in any Zoning District,
 - 2. private roads shall have signs posted reading: "Christian County Maintenance Ends."
 - 3. private roads which serve (3) three or more parcels of land shall comply with the Road and Access Standards for Christian County, Missouri as they apply to road construction.

Section 7. Area and Height Requirements

Area and Height Measurements

	Area*	Frontage	Height	Front Yard	Side Yard	Rear Yard
Individual single-family dwelling with individual well and approved on-site sewage system	3 acres	150 feet	2½ stories (35 feet)	40 feet	25 feet	50 feet
All other permitted uses (Article 32)	3 acres	150 feet	50 feet	25 feet	50 feet	50 feet

*Lot Area may include all road rights-of-way

Section 8. Road or Street Setback

Roadway

- Off major State and Federal Highways
- Off all subdivision roads
- Off all County roads

Required Setback

- 10 feet from adjoining right-of-way plus required yard setback
- 25 feet from right-of-way center line plus required yard setback
- 25 feet from right-of-way center line plus required yard setback

ARTICLE 33. RR-1 RURAL RESIDENCE DISTRICT

Section 1. Statement of Intent

- A. This Zoning District is intended to accommodate low density residential development on tracts three acres or larger.
- B. This Zoning District provides a residential option between the lower density agriculture residential and the higher density urban residential.
- C. This Zoning District imposes special regulations for areas which possess certain environmental and/or physical characteristics. These characteristics include but are not limited to:
 - 1. Recharge area for important springs.
 - 2. Faults and other areas of discrete groundwater recharge.
 - 3. Caves and sinkholes.
 - 4. Municipal watershed.
 - 5. Forest cover.
 - 6. Easily erodible soils.
 - 7. Proximity to streams or lakes.
- D. Only three (3) parcels may be created by Administrative (Minor) Subdivision from the parent tract rezoned to this zoning classification. Other parcels may be created by platting as regulated by the Christian County Subdivision Regulations.

Section 2. Principal Permitted Uses

- A. Single family detached dwellings.
- B. Residential Group Homes, if the maximum residential density does not exceed a total of ten (10) persons and located at least twenty-five (25) feet from all lot lines.
- C. Road Right-of-Way and Road Crossing Procedures for Buried Lines and other public utility uses in accordance with Article 18.
- D. Churches, schools, public buildings, structures, and properties of recreational, cultural, administration or public service type all producing less than one thousand five hundred (1500) gallons of wastewater per day.

Section 3. Accessory Uses

- A. Accessory uses, buildings and structures customarily incidental to the Permitted Uses set out above.
- B. Residential home occupations as defined in Article 2, Section 2 and Article 10.
- C. Temporary real estate and small announcement signs.
- D. Temporary buildings for uses incidental to construction work, which buildings shall be removed upon completion or abandonment of the construction work.
- E. Swimming pool incidental to a single family dwelling.
- F. Day care homes, if not more than six (6) children are kept.

Section 4. Conditional Uses Requiring Authorization by the Board of Adjustment

- A. Public utility structures or uses, subject to the provisions set by the Board of Adjustment.
- B. Schools; cultural, administrative and public buildings; churches; and other places of worship expected to exceed one thousand five hundred (1500) gallons of wastewater per day, including parish houses and Sunday schools,
 - 1. on a minimum of three (3) acres of land, to provide sufficient land area for off-street parking; and buffer yards and proper site design to lessen possible adverse impacts on adjoining properties, but
 - 2. excluding overnight shelters and temporary outdoor revivals.
- C. Day Care Group Homes, if not more than ten (10) children are kept.

Section 5. Special Provisions

- A. Location of wastewater treatment systems in those areas with environmental or physical constraints as described in the Statement of Intent of this Article shall only be installed after receiving approval from the Christian County Health Department.
- B. Stricter requirements may be imposed for water and wastewater systems if the County Commission or the Christian County Health Department finds it necessary for the protection of the public health, safety, and welfare. Alternate wastewater systems may be required in areas deemed inappropriate for conventional septic tank systems by the Christian County Health Department.
- C. Area requirements may be increased if the County Commission finds it necessary for the protection of the public health, safety and welfare.
- D. Private roads.
 - 1. A private road shall be so described in deeds and legal descriptions.
 - 2. A private road will not be accepted or maintained by the County in any Zoning District,

Section 6. Specific Prohibitions

- A. The filling or drainage of marsh or wetlands, removal of topsoil, stripping of natural vegetative cover, the creation of ponds or damming or relocating of any water course shall not be permitted unless allowed according to the provisions of federal and state regulations.
- B. Removal of trees, forests, woods or other significant stands of foliage and cover unless by an approved plan.
- C. Quarrying, mining or other excavation except as incidental to the construction of buildings to house permitted uses listed above.
- D. Locating wastewater treatment systems closer than one hundred (100) feet from surface water or areas of discrete recharge to ground water sources.

Section 7. Area and Height Requirements

Area and Height Measurements

	Area*	Frontage	Height	Front Yard	Side Yard	Rear Yard
Individual single-family dwelling with individual well and approved on-site sewage system	3 acres	150 feet	2½ stories (35 feet)	40 feet	25 feet	50 feet
All other permitted uses (Article 33)	3 acres	150 feet	2½ stories (35 feet)	40 feet	25 feet	50 feet

*Lot Area may include all road rights-of-way

Section 8. Road or Street Setback

Roadway

Off major State and Federal Highways
 Off all subdivision roads
 Off all County roads

Required Setback

10 feet from adjoining right-of-way plus required yard setback
 25 feet from right-of-way center line plus required yard setback
 25 feet from right-of-way center line plus required yard setback

ARTICLE 34. MH-1 MANUFACTURED HOME (MOBILE HOME) PARK SUBDIVISION DISTRICT

Section 1. Statement of Intent

- A. This Zoning District is intended to provide for areas of quality affordable housing in Christian County.
- B. This Zoning District is intended to eliminate manufactured housing from commercial districts, and
- C. To require said housing to be located in areas where public sewer and water services are available.

Section 2. Principal Permitted Uses

- A. Manufactured home or mobile home parks.
- B. Manufactured home or mobile home subdivisions.
- C. Modular homes.
- D. Single-family detached dwellings, (subdivisions only)
- E. Neighborhood parks, swimming pools, playgrounds, recreational and community center buildings and grounds, public golf courses, tennis courts and similar recreational uses, all of a noncommercial nature.
- F. Residential group homes according to the provisions of Article 25.
- G. Road Right-of-Way and Road Crossing Procedures for Buried Lines and other public utility uses according to the provisions of Article 18.

Section 3. Accessory Uses - Distance Requirements -Reference General Provisions

- A. Accessory uses, buildings, and structures customarily incidental to any of the Permitted Uses set out above, including:
 - 1. Home occupations,
 - 2. Temporary real estate signs and small announcement signs,
 - 3. Temporary buildings for uses incidental to the permitted principal use of a single-family dwelling,
 - 4. Swimming pools, incidental to the permitted principal use of a single-family dwelling,
 - 5. Day care homes if not more than six (6) children are kept, subject to state licensing requirements,

6. Accessory Structures, awnings, storage cabinets and buildings, fences or windbreaks, carports, garages, porches, greenhouses, and other accessory structures.

Section 4. Conditional Uses Requiring Authorization by the Board of Adjustment

- A. Day care group homes if not more than ten (10) children are kept, subject to state licensing requirements.
- B. Public utility structures or uses subject to the provisions set by the Board of Zoning Adjustment.
- C. Churches and other places of worship, including parish houses and Sunday schools, but
 1. Excluding overnight shelters and temporary outdoor revivals,
 2. On a minimum of two (2) acres of land, to provide sufficient land area for off-street parking; and buffer yards and proper site design to lessen possible adverse impacts on adjoining properties.
- D. Bed-and-breakfast facilities.

Section 5. Special Provisions

- A. **Common Open Space.**
 1. All mobile home parks and subdivisions shall provide for common open space at the rate of three hundred (300) square feet per site or lot, or twenty thousand (20,000) square feet, whichever is greater.
 2. At least fifty (50) percent of the common open space shall be suitable for active recreation such as playgrounds, swimming pools, or ball fields.
 3. The common open space shall be landscaped, improved and maintained before the issuance of building permits.
 4. Perimeter buffer yards and streets shall not be used to satisfy the common open space requirements.
- B. **Perimeter Treatment.**
 1. All mobile home parks and subdivisions shall provide a completely landscaped and maintained setback
 - a. of at least twenty-five (25) feet from a public right of way, and

- b. a setback of at least ten (10) feet from any other abutting property line.
 - c. The setback areas may be included as parts of adjacent lots but shall not be included as part of the required minimum area.
 - d. No structure shall be allowed in the setback area.
2. Landscaping in the perimeter area shall consist of the following:
 - a. Deciduous and/or evergreen trees spaced not more than thirty-two (32) feet apart all of which grow to a height of five (5) feet or more after one full growing season.
 - b. At least one row of shrubs spaced not more than eight (8) feet apart.
 3. Where the adjoining land use is a street with a functional classification of arterial or higher, a six (6) foot solid wall or fence shall be provided to the aforementioned landscaping.
 4. The perimeter area may include other trees, shrubbery, benches, fences, *et cetera*.
- C. Parking.**
1. Each site or lot shall contain at least two (2) paved parking spaces.
- D. Streets and drainage.**
1. All streets and stormwater drainage structures, whether public or private, shall be constructed to Christian County Road and Access Standards. The street surface shall measure twenty (20) feet in width, with a 2 foot shoulder on each side.
 2. Each site or lot shall be directly accessible from an internal street with no direct access to any other street.
 3. All streets, drainage facilities and utilities must be constructed and approved before issuance of any permit to locate a manufactured home in any manufactured home park.
- E. Utilities.**
1. All units in all mobile home parks or subdivisions shall be connected to a municipal sewer system.
 2. All units in all mobile home parks or subdivisions shall be connected to a public water system or State approved well.

- a. Fire hydrants shall be provided at six hundred (600) foot intervals. The design is to be approved by the Planning and Zoning Department.

F. **Lighting** - Streets and sidewalks shall be lighted during hours of darkness.

Section 6. Design Requirements

- A. Minimum Park or Subdivision Size - 5 acres.
- B. Minimum Individual Site or Lot Size – 4,000 Square Feet.
- C. No mobile home may be occupied until having received an occupancy permit from the Christian County Building Inspections Department.

Area Measurements

	Lot Area*	Minimum Frontage	Front Yard Depth	Side Yard Width	Side Yard Width – Both Sides	Rear Yard Depth
Individual home site – Lot Size	4,000 sq. ft.	40 feet	25 feet	6 feet	Side yards may be reduced to zero lot lines, if the other side yard is not less than 12 feet, but two lots may not share the same zero lot line.	10 feet

*Lot Area may include all road rights-of-way

Section 7. Road or Street Setback

Roadway

- Off major State and Federal Highways
- Off all subdivision roads
- Off all County roads

Required Setback

- 10 feet from adjoining right-of-way plus required yard setback
- 25 feet from right-of-way center line plus required yard setback
- 25 feet from right-of-way center line plus required yard setback

ARTICLE 35. UR-1 URBAN RESIDENCE DISTRICT

Section 1. Statement of intent

This Zoning District is intended primarily for single-family-detached dwellings at lot densities of approximately seven (7) units per acre, in areas served by public sewage disposal and water supply. Certain other structures and uses necessary to serve governmental, educational, religious, recreational and other needs of neighborhood areas are allowed as permitted or conditional uses subject to restrictions intended to preserve and protect the single-family residential character of the Zoning District.

Section 2. Principal Permitted Uses

- A. Single-family-detached dwellings.
- B. Road Right-of-Way and Road Crossing Procedures for Buried Lines and other public utility uses according to the provisions of Article 18.
- C. Accessory apartments in owner-occupied-single-family detached dwellings.
- D. Residential group homes according to the provisions of Article 25.
- E. Police and fire stations.
- F. Temporary uses.
- G. Zero-lot-line construction.
- H. Noncommercial, not-for-profit residential neighborhood facilities, including indoor and outdoor recreational facilities, community centers, offices, and maintenance facilities operated by a neighborhood or community organization or a property owners association.

Section 3. Accessory uses - Distance Requirements - Reference General Provisions

- A. Accessory uses, buildings and structures customarily incidental to any of the aforesaid permitted uses, including:
- B. Living quarters of persons employed on the premises, not rented or otherwise used as a separate dwelling.
- C. Home occupations as defined in Article 2, Section 2 and Article 10.
- D. Temporary real estate signs and small announcement signs.
- E. Temporary buildings for uses incidental to construction work, which buildings shall be removed upon completion or abandonment of the construction work.

- F. Swimming pools, incidental to the permitted principal use of a single-family dwelling.
- G. Noncommercial nurseries, greenhouses and gardens
 - 1. but not including chicken farms, hog farms and other commercial animal farms or kennels.
- H. Day care homes, if not more than six (6) children in addition to the caregiver's own are kept, subject to state licensing requirements.

Section 4. Conditional Uses Requiring Board of Adjustment Authorization or Approval

The following Conditional Uses may be allowed, if the Board of Adjustment specifically authorizes or approves the use:

- A. Day care group homes if not more than ten (10) children are kept, subject to state licensing requirements.
- B. Churches and other places of worship, including parish houses and Sunday schools, but excluding emergency shelters and temporary outdoor revivals, with frontage on and primary access to an arterial or higher classification street and on a minimum of two (2) acres of land to provide sufficient land area for off-street parking, buffer yards, and property site design to lessen impact on adjoining residential neighborhoods.
- C. Churches and other places of worship on less than two (2) acres of land at the time the Zoning District is mapped shall be considered conforming uses.
- D. Schools, elementary and secondary, and schools or development centers for elementary and secondary-school-age children with handicaps or development disabilities, on a minimum of five (5) acres of land.
- E. Country clubs, public parks, public and private golf courses and other private noncommercial recreational areas and facilities, including swimming pools, but not including miniature golf courses and driving ranges;
 - 1. provided, that any principal building or swimming pool shall be located not less than one hundred (100) feet from any other lot in a Residential District.
- F. Public buildings and properties of a cultural, recreational, administrative or service type;
 - 1. Not including repair garages, storage or repair yards or warehouses;

2. Provided any such building shall be located not less than twenty-five (25) feet from any other lot in any Residential District.
- G. Road Right-of-Way and Road Crossing Procedures for Buried Lines subject to the provisions set by the Board of Adjustment.
- H. Cemeteries adjacent to or in extension of existing cemeteries, subject to the provision set by the Board of Adjustment.
- I. A manufactured home subdivision is subject to all requirements of a single-family R District. In addition, each manufactured home in the subdivision must also comply with the following provisions:
1. Each manufactured home's roof must be pitched at least three (3) in twelve (12) or greater.
 2. Each manufactured home's roof must be covered with roofing material similar to roofing material used on conventional residences.
 - (a) including, but not limited to, approved wood, asphalt composition, or fiberglass shingles, but
 - (b) excluding corrugated aluminum, corrugated fiberglass or metal roofing materials.
 3. Each manufactured home's roof overhang must be not less than one (1) foot or greater than thirty (30) inches.
 4. Each manufactured home's exterior siding must be similar to exterior siding used on conventional residences, including, but not limited to, clapboards, simulated clapboards such as conventional vinyl or metal siding, wood shingles, wood shakes, or similar material, but excluding high-gloss finish, smooth, ribbed or corrugated metal, or plastic panels.
 5. Each manufactured home shall have a garage or carport. The external roofing and siding material and design of the garage or carport must be the same as that of the dwelling unit.
 - (a) The requirement for a garage or carport may be waived by the Planning and Zoning Administrator or his/her designee, in cases where the deletion is consistent with the surrounding neighborhood.
 6. Each manufactured home must be placed on a permanent foundation that complies with the County's building code for residential structures.
 7. Each manufactured home must be at least twenty (20) feet wide.

8. The hitch axles or wheels must be removed from each manufactured home.
 9. Each manufactured home must be oriented on its lot such that its long axis is parallel with the street. A perpendicular or diagonal placement may be permitted if the manufactured home has a building addition so that the narrow dimension, facing the street, is not less than fifty (50) percent of the long dimension.
 10. The Board of Adjustment must determine that the manufactured home subdivision will be compatible with development in the surrounding area.
 11. The manufactured home subdivision must meet all requirements of Article 34, MH-1 Manufactured Home (Mobile Home) Park or Subdivision District.
- J. Bed-and-breakfast facilities.
- K. Public museums and libraries on a minimum of two (2) acres.

Section 5. Use Limitations

- A. All uses shall operate according to the provisions of the standards contained in Article 5.

Section 6. Lot Size Requirements

- A. Minimum lot area: seven thousand (7,000) square feet.
- B. Minimum lot width: Fifty (50) feet.
- C. Minimum lot depth: One-hundred (100) feet.

Section 7. Bulk and Open Space Requirements

A. Maximum structure height:

1. When side yards are less than fifteen (15) feet in width: Thirty-five (35) feet or two and one-half (2 ½) stories above the finished grade.
2. When side yards are fifteen (15) feet in width or greater: Forty-five (45) feet or three (3) stories above the finished grade.
3. Accessory structures: Sixteen (16) feet, except storage buildings, which shall not exceed ten (10) feet.

B. Minimum yard requirements:

1. Front yard: Twenty-five (25) feet.
2. Side yard: Five (5) feet.
3. Rear yard: Twenty (20) percent of the lot depth, but may not be less than ten (10) feet nor shall more than twenty-five (25) feet be required.

4. Road or Street Setback.

Roadway

Off major State and Federal Highways
Off all subdivision roads
Off all County roads

Required Setback

10 feet from adjoining right-of-way plus required yard setback
25 feet from right-of-way center line plus required yard setback
25 feet from right-of-way center line plus required yard setback

- ### C. Maximum building coverage (including accessory buildings) of the lot area shall not exceed forty (40) percent.

D. Minimum open space of the lot area.

1. Not less than thirty (30) percent of the total lot area shall be devoted to open space including required yards and buffer yards.
2. Open space shall not include areas covered by buildings, structures, parking areas, driveways and internal streets.
3. Open space shall contain living ground cover and other landscaping materials.

- ### E. Maximum Impervious Area: The combined area occupied by all main and accessory buildings or structures, parking areas, driveways and any other surfaces which reduce and prevent absorption of storm water shall not exceed seventy (70) percent of the total lot area.

Section 8. Density Requirements

- A. The maximum density shall be seven-thousand (7,000) square feet per dwelling unit provided that the required rights-of-way for adjacent streets as classified by the Major Thoroughfare Plan is dedicated during subdivision of any tract being developed.
- B. For tracts 20 acres or larger proposed to be subdivided into tracts smaller than 8,000 square feet, a left hand turn lane at all the entrances of the proposed subdivision shall be provided.
- C. If a proposed subdivision (with lots of less than 8,000 square feet) fronts a major transportation facility, then acceleration and deceleration lanes may be required.

Section 9. Other Requirements

- A. A site plan shall be submitted and approved for all uses except single-family-detached dwellings.
- B. A plot plan shall be submitted and approved for all single-family detached dwellings.
- C. A landscaping plan shall be submitted and approved for all uses except single-family-detached dwellings.
- D. All off-street parking lots and vehicular use areas for permitted non-residential uses shall be screened from all residential uses.
- E. Refuse storage areas for permitted non-residential uses shall be screened from view.
- F. Required front yards shall be landscaped with grass, ground cover, plants, shrubs or trees. Decorative landscaping materials such as rock, bark and mulch are also permitted. Impervious surfaces in required front yards shall be minimized and shall be limited to driveways leading to off-street parking areas located outside the required front yard and walkways necessary for access to structures on the property. Circular drives are permitted if sufficient room is available and if approved by the Christian County or applicable Special Road District.
- G. Storage of maintenance or other equipment incidental to any permitted use or a conditional use except a single-family-detached dwelling shall be screened from view.
- H. Mechanical and electrical equipment, including air conditioning units, shall be screened from view.

Section 10. Buffer Yard Requirements

Whenever any non-residential development in this Zoning District is located adjacent to a residential use in any Zoning District or a different Residential District, screening and a buffer yard shall be provided as follows:

- A. Required Plantings per 100 linear feet:
 - 1. Two (2) canopy trees;
 - 2. Two (2) understory trees;
 - 3. Two (2) evergreen trees;
 - 4. Fourteen (14) shrubs.
- B. Buffer yard depth requirements.
 - 1. 20 feet;
 - 2. 30 feet with a reduction of planting of 50 percent.
 - 3. 10 feet with a six (6) foot high fence, masonry wall, brick wall, or solid evergreen hedge.

ARTICLE 36. R-1 SUBURBAN RESIDENCE DISTRICT

Section 1. Statement of Intent

This Zoning District is intended to provide for detached single-family residential development in areas served by public sewage disposal and public water supply or tracts three acres or larger if not served by public sewage disposal and public water supply.

Section 2. Principal Permitted Uses

- A. One-family detached dwellings, limited to one driveway, unless on a corner lot and the street is classified as "local".
- B. Road Right-of-Way and Road Crossing Procedures for Buried Lines and other public utility uses according to the provisions of Article 18.
- C. Neighborhood parks, swimming pools, playground, recreational and community center buildings and grounds, public golf courses, tennis courts and similar recreational uses,
 - 1. all of a noncommercial nature; and
 - 2. provided that any such principal building or swimming pool shall be located not less than one hundred (100) feet from any other lot in any Residential District.
- D. Residential group homes according to the provisions of Article 25.

Section 3. Accessory Uses - Distance Requirements -Reference General Provisions

- A. Accessory uses, buildings, and structures customarily incidental to any of the aforesaid permitted uses, including:
- B. Living quarters of persons employed on the premises, not rented or otherwise used as a separate dwelling.
- C. Home occupation as defined in Article 2, Section 2 and Article 10.
- D. Temporary real estate signs and small announcement signs.
- E. Temporary buildings for uses incidental to construction work,
 - 1. Which buildings shall be removed upon completion or abandonment of the construction work.
- F. Swimming pool, incidental to the permitted principal use of a single-family dwelling.
- G. Noncommercial nurseries, greenhouses and gardens, but not including chicken farms, hog farms and other commercial animal farms and kennels.

- H. Day care homes if not more than six (6) children in addition to the caregiver's own are kept, subject to state licensing requirements.

Section 4. Conditional Uses Requiring Board of Adjustment Authorization

- A. Day care group homes if not more than ten (10) children are kept, subject to state licensing requirements.
- B. Churches and other places of worship, including parish houses and Sunday schools, schools, cultural, administrative and public buildings, but
 1. Excluding overnight shelters and temporary outdoor revivals;
 2. On a minimum of two (2) acres of land, to provide sufficient land area for off-street parking, buffer yards, and proper site design to lessen possible adverse impacts on adjoining residential neighborhoods.
- C. Country clubs, public parks, golf courses and other private noncommercial recreational areas and facilities including swimming pools; provided that any principal building or swimming pool shall be located not less than one hundred (100) feet from any other lot in any R District.
- D. Public buildings and properties of a cultural, recreational, administrative or service type,
 1. Not including repair garages, storage or repair yards or warehouses;
 2. provided any such building shall be located not less than twenty-five (25) feet from any other lot in any R District.
- E. Public utility structures or uses subject to conditions set by the Board of Adjustment.
- F. Cemeteries adjacent to or in extension of existing cemeteries, subject to conditions set by the Board of Adjustment.
- G. A manufactured home subdivision subject to all requirements of a single-family R District. In addition, each manufactured home in the subdivision must also comply with the following provisions:
 1. Each manufactured home's roof must be pitched at least three (3) in twelve (12) or greater
 2. Each manufactured home's roof must be covered with roofing material similar to roofing material used on conventional residences.

- (a) Including, but not limited to, approved wood, asphalt composition, or fiberglass shingles, but
 - (b) excluding corrugated aluminum, corrugated fiberglass or metal roofing materials.
3. Each manufactured home's roof overhang must be not less than one (1) foot or greater than thirty (30) inches.
 4. Each manufactured home's exterior siding that must be similar to exterior siding used on conventional residences, including, but not limited to, clapboards, simulated clapboards such as conventional vinyl or metal siding, wood shingles, wood shakes, or similar material, but excluding high-gloss finish, smooth, ribbed or corrugated metal, or plastic panels.
 5. Each manufactured home shall have a garage or carport. The external roofing and siding material and design of the garage or carport must be the same as that of the dwelling unit. The requirement for a garage or carport may be waived by the Board of Adjustment, in cases where the deletion is consistent with the surrounding neighborhood.
 6. Each manufactured home must be placed on a permanent foundation that complies with the County's building code for residential structures.
 7. Each manufactured home must be at least twenty (20) feet wide.
 8. The hitch axles or wheels must be removed from each manufactured home.
 9. Each manufactured home must be oriented on its lot such that its long axis is parallel with the street. A perpendicular or diagonal placement may be permitted if the manufactured home has a building addition so that the narrow dimension, facing the street, is not less than fifty (50) percent of the long dimension.
 10. The Board of Adjustment must determine that the manufactured home subdivision will be compatible with development in the surrounding area.
 11. The manufactured home subdivision must meet all requirements of Article 34, MH-1 Manufactured Home (Mobile Home) Park or Subdivision District.

H. Bed-and-breakfast facilities.

Section 5. Height Regulations

- A. The maximum height of buildings in an R-1 District shall not exceed two and one-half (2½) stories or thirty-five (35) feet above the average finished grade,
1. except the height may be increased by not more than ten (10) feet when each side yard is not less than fifteen (15) feet.
 2. Such dwelling, however, shall not exceed three (3) stories in height.

Area Measurements

	Lot Area	Minimum Frontage	Front Yard Depth	Side Yard Width	Side Yard Width – Both Sides	Rear Yard Depth
Single-family dwelling with public sewer and public water supply	10,000 sq. ft.	70 feet	30 feet	6 feet	12 feet	25 feet
Other permitted uses	-	100 feet	40 feet	20 feet	40 feet	50 feet
Single-family dwelling without public sewer and public water supply	3 acres	150 feet	40 feet	25 feet	50 feet	50 feet

Section 6. Road or Street Setback

Roadway

- Off major State and Federal Highways
- Off all subdivision roads
- Off all County roads

Required Setback

- 10 feet from adjoining right-of-way plus required yard setback
- 25 feet from right-of-way center line plus required yard setback
- 25 feet from right-of-way center line plus required yard setback

ARTICLE 37. R-2 ONE and TWO-FAMILY RESIDENCE DISTRICT

Section 1. Statement of Intent

This Zoning District is intended to provide for medium density residential development limited to one and two-family homes in areas served by public sewer and public water supply.

Section 2. Principal Permitted Uses

- A. Any use or structure permitted and as regulated in the R-1 District, except as is herein modified.
- B. Two-family dwelling.
- C. Cluster developments and townhouses comprised of buildings containing not more than two (2) families in any one (1) building, subject to the requirements of this Article.
- D. Residential group homes according to the provisions of Article 25.

Section 3. Accessory Uses, District Requirements, Reference General Provisions

- A. Any accessory use or structure permitted and as regulated in the R-1 District,
 - 1. Except that the raising or keeping of farm animals shall not be permitted on any lands used or platted for residential purposes, and
 - 2. Except as is modified in these Zoning Regulations.
- B. Home occupations as defined in Article 2, Section 2 and Article 10.
- C. The keeping of not more than three (3) roomers or boarders by a resident family.
- D. Any accessory use or structure customarily accessory and incidental to a permitted principal use.

Section 4. Conditional Uses Requiring Board of Adjustment Authorization

- A. Any conditional use permitted and as regulated in the R-1 District.

Section 5. Height Regulations

- A. The maximum height of buildings in an R-2 District shall not exceed two and one-half (2½) stories or thirty-five (35) feet above the average finished grade, except
1. The Board of Adjustment may allow the height to be increased by not more than fifteen (15) feet.
 2. Such dwelling, however, shall not exceed three (3) stories in height.

Area Measurements	Lot Area	Minimum Frontage	Front Yard Depth	Side Yard Width	Side Yard Width – Both Sides	Rear Yard Depth
Single-family dwelling	9,000 sq. ft.	70 feet	30 feet	6 feet	12 feet	25 feet
Two-family dwelling	10,000 sq. ft.	70 feet	30 feet	6 feet	12 feet	25 feet
Cluster development and townhouses	5,000 sq. ft.	40 feet each unit	30 feet each unit	Zero on common wall	12 feet per dwelling	25 feet
Other permitted uses	1 acre	100 feet	40 feet	15 feet	30 feet	50 feet

Section 6. Road or Street Setback

Roadway

- Off major State and Federal Highways
- Off all subdivision roads
- Off all County roads

Required Setback

- 10 feet from adjoining right-of-way plus required yard setback
- 25 feet from right-of-way center line plus required yard setback
- 25 feet from right-of-way center line plus required yard setback

ARTICLE 38. R-3 MULTI-FAMILY RESIDENCE DISTRICT

Section 1. Statement of Intent

This Zoning District is intended to provide for residential development of low-rise residential buildings housing two (2) or more families,

- A. where all dwelling units do not have ground level occupancy,
- B. or private entrance,
- C. in those areas where such development would be compatible with surrounding uses,
- D. where the density would not create service problems and
- E. here public sewer and public water supply are available.

Section 2. Principal Permitted Uses

- A. Any use or structure permitted and as regulated in the R-2 District.
- B. Condominium, multi-family dwellings for any number of families or housekeeping units.
- C. Churches and other places of worship, including parish houses and Sunday schools, schools, cultural, administrative and public buildings,
 - 1. but excluding overnight shelters and temporary outdoor revivals,
 - 2. On a minimum of two (2) acres of land, to provide sufficient land area for off-street parking, buffer yards, and proper site design to lessen possible adverse impacts on adjoining properties.
- D. Residential group homes according to the provisions of Article 25.

Section 3. Accessory Uses, District Requirements and Reference General Provisions

- A. Any accessory use or structure permitted and as regulated in the R-2 District.
- B. Any accessory use or structure customarily accessory and incidental to a permitted principal use.
- C. Daycare group homes if not more than ten (10) children are kept, subject to state licensing requirements.

Section 4. Conditional Uses Requiring Board of Adjustment Authorization

- A. The keeping of not more than six (6) roomers or boarders by a resident family in a multi-family dwelling unit.
- B. Any conditional use permitted and as regulated in the R-2 District.
- C. Clubs, fraternities, lodges and other meeting places of other organizations,
 - 1. Not including any use that is customarily conducted as a gainful business,
 - 2. Provided that buildings in which such meeting places are housed shall be located at least twenty (20) feet from any R or A District.
- D. Children's day care centers, rest homes, or nursing homes for convalescent patients, provided that any buildings for such use shall be distant no less than twenty (20) feet from any other lot in any R or A District.
- E. Non-Residential Group Homes according to the provisions of Article 26.
- F. Day care group homes if not more than ten (10) children are kept, subject to state licensing requirements.
- G. Bed-and-breakfast facilities.

Section 5. Height Regulations

- A. There shall be no maximum height for buildings in an R-3 Multi-Family District,
1. provided that the front, side and rear yards of any building exceeding forty-five (45) feet be increased one (1) foot for each foot which exceeds forty-five (45) feet up to a height of seventy-five (75) feet; and
 2. thereafter, no increase in front, side or rear yards shall be required for any height in excess of seventy-five (75) feet.

Area Measurements

	Lot Area	Minimum Frontage	Front Yard Depth	Side Yard Width	Side Yard Width – Both Sides	Rear Yard Depth
One-family dwelling	9,000 sq. ft.	70 feet	30 feet	6 feet	12 feet	25 feet
Two-family dwelling	9,000 sq. ft. 4,500 sq. ft. per double unit	70 feet	30 feet	6 feet	12 feet	25 feet
Multi-family dwelling	3,000 sq. ft. per unit	70 feet	30 feet	6 feet	12 feet	25 feet

- B. Other permitted uses, same as R-2 District.

Section 6. Road or Street Setback

Roadway

- Off major State and Federal Highways
- Off all subdivision roads
- Off all County roads

Required Setback

- 10 feet from adjoining right-of-way plus required yard setback
- 25 feet from right-of-way center line plus required yard setback
- 25 feet from right-of-way center line plus required yard setback

ARTICLE 39. R-4 MULTI-FAMILY RESIDENCE DISTRICT

Section 1. Statement of Intent

- A. This Zoning District is intended to provide for residential development of buildings housing two (2) or more families,
 - 1. where all dwellings do not have ground level occupancy
 - 2. or private entrances,
- B. in those areas where such development could be compatible with surrounding uses
- C. and where public sewer and public water supply are available.

Section 2. Principal Permitted Uses

- A. Any use or structure permitted and as regulated in the R-3 District.
- B. Apartment hotels, and short-term rentals for any number of guests,
 - 1. but not primarily for transients,
 - 2. including incidental accessory services,
 - a. such as restaurants, and news stands,
 - b. provided that there is no exterior display or advertising except for an indirectly illuminated announcement sign not exceeding six (6) square feet in area which if not attached to the building, shall be at least twelve (12) feet from all street lines.
- C. Hospital and clinics for human care.
- D. Residential group homes according to the provisions of Article 25.

Section 3. Accessory Uses, District Requirements and Reference General Provisions

- A. Any accessory use or structure permitted and as regulated in the R-3 District.
- B. Any other accessory use or structure, customarily accessory and incidental to a permitted principal use.

Section 4. Conditional Uses Requiring Board of Adjustment Authorization

- A. Any conditional use permitted and as regulated in the R-3 District.

Section 5. Height Regulations

- A. There shall be no maximum height for buildings in an R-4 Multi-family District,
 1. provided that the front, side and rear yards of any building exceeding forty-five (45) feet be increased one (1) foot for each foot that exceeds forty-five (45) feet up to a height of seventy-five (75) feet; and
 2. Thereafter, no increase in front, side or rear yards shall be required for any height in excess of seventy-five (75) feet.

Area Measurements

	Lot Area	Minimum Frontage	Front Yard Depth	Side Yard Width	Side Yard Width – Both Sides	Rear Yard Depth
Three-family dwelling	9,000 sq. ft.	70 feet	25 feet	6 feet	12 feet	25 feet
Four-family dwelling	10,000 sq. ft.	75 feet	25 feet	6 feet	12 feet	25 feet
Over four-family dwelling	2,000 sq. ft. per unit	100 feet	25 feet	6 feet	12 feet	25 feet

Section 6. Road or Street Setback

Roadway

- Off major State and Federal Highways
- Off all subdivision roads
- Off all County roads

Required Setback

- 10 feet from adjoining right-of-way plus required yard setback
- 25 feet from right-of-way center line plus required yard setback
- 25 feet from right-of-way center line plus required yard setback

ARTICLE 40. O-1 PROFESSIONAL OFFICE DISTRICT

Section 1. Statement of Intent

- A. This Zoning District is intended to provide for new construction of, and conversion of older dwellings into professional offices to act as a buffer between single-family residence districts and major thoroughfares without compromising the integrity of existing single-family neighborhoods.
- B. To qualify for this Zoning District, a property must abut both an R-1 Suburban Residence District and a street with a functional classification of "arterial" or higher.

Section 2. Principal Permitted Uses

- A. Any use or structure permitted and as regulated in the R-1 Suburban Residence District.
- B. Offices of professionals specifically listed below:
 - 1. Attorney-at-law
 - 2. Architect
 - 3. Certified Public Accountant
 - 4. Consultant
 - 5. Registered Engineer
 - 6. Land Planner
 - 7. Minister, Rabbi or Priest
 - 8. Registered Land Surveyor
- C. Any other use as determined by the Christian County Commission to be of the same general character as the above permitted uses.
 - 1. This does not include any use first allowed in the O-2 General Office District.

Section 3. Accessory Uses

- A. Exterior signs
 - 1. Each office structure may have one sign that pertains only to the permitted use on the premises and shall indicate only the name, insignia and/or address of the use.

2. Signs must be integral with or attached flat against the building, or project not more than four (4) feet beyond the building.
 - a. The sign may not project above the roof line and must face the major thoroughfare that the property abuts.
 3. Signs allowed under this Section may be a maximum of fifty (50) square feet, and
 - a. may only be indirectly illuminated with non-colored light, and
 - b. shall not have images or light that flashes or moves.
 4. One (1) free standing directional sign of no more than two (2) square feet may be hung at the office driveway entrance.
 - a. The sign may not overhang the street right-of-way nor otherwise obstruct or impair the safety of pedestrians or motorists.
 5. Portable signs and commercial vehicles serving as portable signs are prohibited.
- B. Any accessory use permitted in the R-1 Suburban Residence District.

Section 4. Conditional Uses Requiring Board of Adjustment Authorization

- A. Nonprofessional offices limited to those with administrative functions, not to include services available to the general public.
- B. Exterior alteration of any structure existing on the effective date of these Zoning Regulations that had already been, or was currently being converted into a professional office.
- C. Structural alteration of, or addition to, any structure existing on the effective date of these Zoning Regulations that had already been, or was currently being converted into a professional office. Interior structural alterations that do not change the exterior appearance of the structure are permitted.
- D. Construction of any new professional office structure.
- E. Location only, of a sign that does not conform to the requirements of Section 3 of this Article when the professional office is located more than one hundred (100) feet from the right-of-way of the major thoroughfare.
 1. Providing that the conditional use permit does not allow for more than one (1) non-directional sign.

- F. All conditional use permits must adhere to the standards of Sections 7, 8 and 9 of this Article.

Section 5. Prohibited Uses

- A. Any use not specifically listed as a principal permitted use or accessory use.
- B. Any use that produces more than one thousand five hundred (1500) gallons of wastewater per day without being connected to a public sewer system.

Section 6. Home Occupations.

- A. Any single-family home located in this Zoning District, that has not been converted into a professional office, may establish those home occupations which are permitted in the R-1 Suburban Residence District, as regulated in that Zoning District.

Section 7. Use Standards

- A. No more than thirty (30) percent of any lot may be occupied by the professional office and its accessory uses, including parking area.
- B. The conversion of a dwelling into a professional office may not result in an increase of more than fifty (50) percent of the floor area of the structure prior to the conversion,
 - 1. Except, when the structure is located on a lot of more than two (2) acres, the floor area of the structure before conversion, may be doubled.
 - 2. The construction of a new professional office may be no more than fifty (50) percent larger than the average floor area of the single-family dwellings within one thousand (1000) feet of the site.
 - A. unless the proposed site has an area of over two (2) acres, in which case an additional fifty (50) percent of the floor area will be allowed.
- C. All structural alterations to converted professional offices and new construction of professional offices must be in architectural harmony with the existing single-family homes in the area
 - 1. including exterior appearance, and
 - 2. exterior materials used.
- D. The conversion of a dwelling into a professional office and the new construction of a professional office must include the construction of a six (6) feet tall solid board fence of uniform color along any property line that abuts an R-1 Suburban Residence District. Evergreen trees must also be planted at ten (10) feet intervals along such property line.
- E. No more than fifty (50) percent of any side or front yard may be used for parking.
- F. No driveway, parking area or accessory structure may be located closer than twenty-five (25) feet from any R-1 Suburban Residence District.
- G. No new parcel may be created which does not have the required amount of road frontage on and direct access to the major thoroughfare.
 - 1. No access may be gained from residential or collector streets.
 - 2. Parking areas for corner lots shall be screened from the side street by evergreen trees planted at ten (10) foot intervals.

Section 8. Height and Area Regulations

- A. The maximum height for structures in the O-1 Office District shall be two and one-half (2 ½) stories or thirty-five (35) feet.

Area Measurements

Lot Area	Minimum Frontage	Front Yard Depth	Side Yard Depth	Rear Yard Depth
20,000 sq. ft. minimum	100 feet	50 feet	25 feet	50 feet

- B. Area and yard requirements may be waived for existing structures with the stipulation that the existing area and yards shall not be reduced when converting to a professional office.

Section 9. Road or Street Setback

Roadway

- Off major State and Federal Highways
- Off all subdivision roads
- Off all County roads

Required Setback

- 10 feet from adjoining right-of-way plus required yard setback
- 25 feet from right-of-way center line plus required yard setback
- 25 feet from right-of-way center line plus required yard setback

ARTICLE 41. O-2 GENERAL OFFICE DISTRICT

Section 1. Statement of Intent

- A. This Zoning District is intended to provide for professional, management and other office uses.
- B. Uses except for parking shall be conducted within an enclosed building.
- C. No use shall be permitted that involves manufacturing, wholesaling or retailing.

Section 2. Principal Permitted Uses

- A. Offices of any kind.
- B. Cultural facilities including art galleries, museums, and libraries.
- C. Any other use that is determined by the County Commission to be of the same general character as the above permitted uses.
- D. Any use permitted and as regulated in the R-4 Multi-Family Residence District.

Section 3. Accessory Uses

- A. Parking incidental to permitted uses.

Section 4. Conditional Uses Requiring Board of Adjustment Authorization

- A. Medical or dental laboratories.
- B. Barber or beauty shops.

Section 5. Prohibited Uses

- A. Any use first permitted in a C-1 District
- B. Any use which produces more than one thousand five hundred (1500) gallons of wastewater per day without being connected to a public sewer system.

Section 6. Height and Area Requirements

Area and Height Measurements

	Lot Area	Height	Lot Frontage	Front Yard Depth	Side Yard Width – Both Sides	Rear Yard Depth
Non-residential buildings	20,000 sq. ft.	2½ stories	100 feet	50 feet	None, except where adjoining R District, then not less than 15 feet each side	10 feet

Section 7. Road or Street Setback

Roadway

Off major State and Federal Highways
 Off all subdivision roads
 Off all County roads

Required Setback

10 feet from adjoining right-of-way plus required yard setback
 25 feet from right-of-way center line plus required yard setback
 25 feet from right-of-way center line plus required yard setback

ARTICLE 42. C-1 NEIGHBORHOOD COMMERCIAL DISTRICT

Section 1. Statement of Intent

- A. This Zoning District is intended to provide for individual or small groups of retail and customer service establishments benefitting local residential neighborhoods which
 - 1. do not create more than one thousand five hundred (1500) gallons per day of wastewater, unless connected to a public sewer system,
 - 2. do not require water suppression systems beyond what the site can supply
 - 3. and create no objectionable noise, glare, or odor hazards.
- B. It is intended that C-1 Districts be located along collectors or higher classification streets.
- C. Uses should be limited to those which do not generate substantially increased traffic in the neighborhood.

Section 2. Principal Permitted Uses

- A. Day care centers
- B. Any local retail business or personal service establishment including grocery, fruit or vegetable stores, pharmacies, beauty parlors, barber shops, dry cleaning and laundry pickup, shoe repair, self-service Laundromats.
- C. Restaurants, cafes, and soda fountains excluding dancing or those with drive-in, pick-up, or drive-thru facilities.
- D. Business and professional offices,
 - 1. Provided that they retain the character of the neighborhood in which they locate, and
 - 2. that the total impervious surface area does not exceed fifty (50) percent of the total lot area.
- E. Road Right-of-Way and Road Crossing Procedures for Buried Lines and other public utility uses according to the provisions of Article 18.
- F. On-premise outdoor advertising signs and structures,
 - 1. subject to the provisions of the laws of the State of Missouri, and
 - 2. all current Zoning Regulations.

- G. Billboards and other off-premise outdoor advertising signs and structures,
 - 1. Subject to the provisions of the laws of the State of Missouri, and
 - 2. All current Zoning Regulations.
- H. Other uses deemed by the County Commission to be of the same nature as outlined by the Statement of Intent so long as
 - 1. not requiring any pretreatment of waste water, and
 - 2. not creating more than one thousand five hundred (1500) gallons of waste water per day, unless connected to a public sewer system.

Section 3. Accessory Uses

- A. Exterior, directional and other incidental signs,
 - 1. Provided that such signs shall comply with existing sign regulations at the time any building or occupancy permits are received.
- B. A single-family residential unit, with the following conditions:
 - 1. The residence is occupied by the owner and operator or a full-time employee of the principal permitted use;
 - 2. the structures, if separate, must remain on the same property and may not be subdivided independent of each other.
- C. Any other accessory use or structure, not otherwise prohibited, customarily accessory and incidental to a principal permitted use.

Section 4. Conditional Uses Requiring Board of Adjustment Authorization

- A. The following uses will be allowed with the authorization of a conditional use permit by the Board of Adjustment.
 - 1. Banks and financial institutions, except those including automatic teller machines and drive-through facilities.
 - 2. Gas stations or service stations.
 - 3. Convenience stores with gas pumps.
 - 4. Mini-storage units.
 - 5. Retail establishments located within a completely enclosed building not specifically permitted but in conformance with the Statement of Intent.

6. Outdoor dining areas associated with restaurants, cafes, and soda fountains.
 7. Law enforcement and fire stations, and other emergency vehicle services.
 8. Public utility structures or uses subject to the provisions set by the Board of Adjustment.
 9. Any use permitted and as regulated in the C-2 General Commercial District.
- B.** Requirements and limitations regarding conditional use permits shall be based on the following considerations:
1. Size of the structure, amount of traffic generated and number of employees associated with the use.
 2. Impact of the use on the character of the surrounding neighborhood.
 3. Impact of the use on the surrounding natural environment.
 4. Operating hours of proposed use.
 5. Any other conditions deemed necessary by the Board of Adjustment.

Section 5. Use Limitations

- A.** All activities and permitted uses except off-street parking and loading facilities and those permitted with conditional use permits shall be conducted entirely within a completely enclosed building.
- B.** No permitted use shall have a floor area open to the public, including display, service and sales, greater than four thousand (4,000) square feet.
- C.** No accessory use shall have a floor area (excluding garage) exceeding four thousand (4,000) square feet.
- D.** No use shall be allowed which produces more than one thousand five hundred (1500) gallons of wastewater per day without being connected to a public sewer system.
- E.** No uses which require a water suppressions system greater than what the site can supply.
- F.** No construction of any type of dwelling unit shall be allowed as a principal permitted use.
 1. However, any dwelling unit legally existing in the C-1 District at the time of adoption of these Zoning Regulations, or any

amendment thereto, shall not be classified as a nonconforming use.

Section 6. Bulk and Intensity of Use Restrictions

A. Maximum structure height:

1. Principal building: Thirty (30) feet.
2. Accessory structure: Twenty-five (25) feet.

B. Minimum yard requirements:

1. Lot frontage: Seventy (70) feet.
2. Front yard: Thirty (30) feet.
3. Side yard: Six (6) feet.
4. Rear yard: Twenty-five (25) feet.
5. Lots without public water and sewer service must have 100 feet of road frontage.
6. Maximum structural coverage of lot (including accessory buildings): thirty-five (35) percent.

Area Measurements

	Minimum Frontage	Front Yard Setback	Side Yard	Both Side Yards	Rear Yard	Maximum Lot Coverage (all structures)
Principal structure served by public sewer and water	70 ft.	30 feet	6 feet	12 feet	25 feet	35 percent
Principal structure without public sewer and water	100 ft.	30 feet	6 feet	12 feet	25 feet	35 percent

Section 7. Road or Street Setbacks

Roadway

- Off major State and Federal Highways
- Off all subdivision roads
- Off all County roads

Required Setback

- 10 feet from adjoining right-of-way plus required yard setback
- 25 feet from right-of-way center line plus required yard setback
- 25 feet from right-of-way center line plus required yard setback

Section 8. Open Space Requirements

- A. Minimum open space:**
1. Not less than forty (40) percent of the total lot area shall be devoted to open space including required yards and buffer yards.
 2. Open space shall not include areas covered by structures, parking areas, driveways and internal streets.
- B. Maximum impervious surface:**
1. The combined area occupied by all permitted and accessory structures, paved parking areas and any other surfaces which reduce and prevent absorption shall not exceed sixty (60) percent of the total area.

Section 9. Design Requirements

- A.** A site plan, showing the overall concept of the proposed use must be submitted and approved by the Planning & Zoning Department. At a minimum, the site plan must include the following:
1. A legal description or a survey completed by a Registered Land Surveyor.
 2. The type of structure to be built
 3. The classification of the business
 4. All dimensions of proposed building, accessory uses, drives, and parking areas.
 5. The surrounding land use and zoning classification.
- B.** A landscaping plan, meeting all requirements in effect in the Zoning Regulations at the time of application for permits.
- C.** All structures in the C-1 Zoning District shall be constructed in a complementary nature of the most restrictive residential Zoning District abutting the property.
1. All materials, surface textures and colors should be compatible with the residential Zoning District it is intended to complement.
 2. If no residential development abuts the property, materials and colors shall be similar to the closest residential development to the proposed site.
 3. The following criteria will be considered in determining compatibility:

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- a. Roof lines;
 - b. Scale;
 - c. Orientation; and
 - d. Proportion of surrounding development.
4. Design review shall be performed as part of site plan review.
- D. Refuse disposal areas shall be landscaped and screened in accordance to landscape plans.
- E. Mechanical and electrical equipment, including air conditioning units, shall be designed, installed and operated to minimize noise impact on surrounding property. All such equipment shall be screened from public view.
- F. Lighting shall be designed to reflect away from adjacent residential areas.

ARTICLE 43. C-2 GENERAL COMMERCIAL DISTRICT

Section 1. Statement of Intent

- A. This Zoning District is intended to provide for the orderly and attractive grouping at appropriate locations of commercial activities of a more general retail and wholesale nature, and service facilities serving a larger community trade area.

Section 2. Principal Permitted Uses

- A. Any use permitted and as regulated in the C-1 Commercial District except as hereinafter modified.
- B. Automobile, truck, trailer, farm implement, boat sales and marine supply establishments for display, hire, sales and repair, including sales lots,
 - 1. provided all operations, other than display and sales, shall be conducted within a completely enclosed building, and
 - 2. buildings used for repair work shall be not less than one hundred (100) feet from any R District.
- C. Banks and finance companies, including drive-in type, department and variety stores, specialty shops, discount stores, studios, including commercial broadcasting schools.
- D. Bar, restaurant, cocktail lounge, liquor store, billiard parlor, pool hall, bowling alley and similar enterprises, provided that:
 - 1. Such use is conducted within a completely enclosed building(s), and
 - 2. such building(s) shall not be less than two hundred (200) feet from any R District.
- E. Travel trailer parks and Recreational Vehicle Parks
 - 1. Subject to the provisions of Article 8, and
 - 2. provided any travel trailer or recreational vehicle is distant at least one hundred (100) feet from any Residential District.
- F. Drive-in eating and drinking establishments, summer gardens and road houses, including entertaining and dancing, providing the principal building is distant at least two hundred (200) feet from any R District.
- G. Indoor theaters.
- H. Self-service laundry and dry cleaning shops, interior decorating and paper hanging shops.

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- I. Hotels and motels, subject to the provisions of these Zoning Regulations.
- J. Carpenter shops, electrical, plumbing and heating shops, printing, publishing, or lithographing shops, funeral homes or mortuaries, or furniture upholstering shops,
 - 1. Provided that any use shall be conducted within a completely enclosed building, and
 - 2. Shall be a distance of one hundred (100) feet of any Residential District.
- K. Pet shops, animal hospitals, veterinary clinics or kennels
 - 1. Provided any structure or premises used for such purposes shall be distant at least fifty (50) feet from any Residential District, and
 - 2. Provided further, that all animals shall be kept indoors.
- L. Skating rinks, dance halls, arcades, sheet metal and sign painting shops, bakeries, laundries, commercial greenhouses; but not within one hundred (100) feet of an R District.
- M. Bottlers of soft drinks and milk, or distribution stations, providing a building used for such processing and distribution shall be at least one hundred (100) feet from a Residential District.
- N. The following uses:
 - 1. when conducted wholly within a completely enclosed building, or
 - 2. when conducted within an area enclosed on all sides with a solid wall or uniformly painted solid board fence, not less than six (6) feet high.
 - 3. In any circumstance, such use may not take place within two hundred (200) feet of any R District or one hundred (100) feet of any dwelling unit.
 - a. Building material sales yards, not including concrete mixing.
 - b. Contractor's equipment storage yards or plants, or storage and rental of equipment commonly used by contractors.
 - c. Trucking and motor freight stations or terminals.
 - d. Warehousing and storage.
 - e. Retail lumber yards, including mill work only when incidental.

- f. Storage and sale of grain, livestock feed or fuel; provided dust is effectively controlled during all operations.
 - g. Carting, express or hauling establishments, including storage of vehicles.
 - h. Stone or monument works not employing power driven tools; or if employing such tools, then only within a completely enclosed building.
 - i. The storage of no more than five (5) vehicles involved in a wrecking or towing business.
- O. Any other use which is determined by the County Commission to be of the same general character as the above permitted uses, but not including any use which is first permitted in an M-1 District.
- P. Adult Entertainment Establishments and Uses as regulated in Article 28, Adult Entertainment Facilities.

Section 3. Accessory Uses

- A. Exterior, directional and other such signs incidental to the permitted use, provided that such signs comply with existing sign regulations at the time any building or occupancy permits are received.
- B. Any other accessory use or structure, not otherwise prohibited, customarily accessory and incidental to principal permitted use.

Section 4. Conditional Uses Requiring Board of Adjustment Authorization

- A. Drive-in theaters, commercial baseball fields, swimming pools, golf driving ranges, livery stables and riding academies, amusement parks, massage parlors, health care, night clubs, or recreational uses including water slides, race tracks or similar uses, companionship services.
- B. A single dwelling unit with the following conditions:
 - 1. The residence is occupied by the owner and operator or full-time employee of the principal permitted use.
 - 2. The structures, if separate, must remain on the same property and may not be subdivided independent of each other.
- C. Requirements and limitations regarding conditional use permits shall be based on the following conditions:
 - 1. Size of the structure, amount of traffic generated and number of employees associated with the use.
 - 2. Impact of the use on the character of the surrounding neighborhood.
 - 3. Impact of the use on the surrounding natural environment.
 - 4. Operating hours of proposed use.
 - 5. Any other conditions deemed necessary by the Board of Adjustment.

Section 5. Use Limitations

- A. No use shall be allowed which produces more than one thousand five hundred (1500) gallons of wastewater per day without being connected to a public sewer system.
- B. No uses shall be allowed which are objectionable by reason of odor, dust, smoke, cinders, gas, fumes, noise, glare, vibration, refuse matter or water-carried waste.
- C. No construction of any type of dwelling unit shall be allowed as a principal permitted use.
 - 1. However any dwelling unit legally existing in the C-2 District on the effective date of these Zoning Regulations shall not be classified as a nonconforming use.

Section 6. Bulk and Intensity of Use Restrictions

- A. Maximum structure height: According to the provisions of Article 21.
 - 1. Principal building: Forty-five (45) feet
 - 2. Accessory building: Twenty-five (25) feet
- B. Minimum Yard Requirements:
 - 1. Front yard: Fifty (50) feet,
 - 2. Side yard: none, unless adjacent to a more restrictive Zoning District; then twenty-five (25) feet.
 - 3. Rear yard: Ten (10) feet, unless adjacent to a more restrictive Zoning District, then twenty-five (25) feet.
 - 4. Lots without public water and sewer service must have one hundred (100) feet of road frontage.
 - 5. Maximum structural coverage of lot (including accessory buildings): Forty-five (45) percent.

Area Measurements

	Minimum Lot Width	Front Yard Setback	Side Yards	Rear Yard	Maximum Lot Coverage (all structures)
Structure(s) served by public sewer and public water	-	50 feet	None, unless adjacent to more restrictive Zoning District, then 25 feet	10 feet, unless adjacent to more restrictive Zoning District, then 25 feet	45 percent
Structure(s) without public sewer and public water	100 ft.	50 feet	None, unless adjacent to more restrictive Zoning District, then 25 feet	10 feet, unless adjacent to more restrictive Zoning District, then 25 feet	45 percent

Section 7. Road or Street Setback

Roadway

- Off major State and Federal Highways
- Off all subdivision roads
- Off all County roads

Required Setback

- 10 feet from adjoining right-of-way plus required yard setback
- 25 feet from right-of-way center line plus required yard setback
- 25 feet from right-of-way center line plus required yard setback

Section 8. Open Space Requirements

A. Minimum open space:

1. Not less than thirty (30) percent of the total lot area shall be devoted to open space, including required yards and buffer yards.
2. Open space shall not include areas covered by:
 - a. structures,
 - b. parking areas,
 - c. driveways and
 - d. internal streets.

B. Maximum impervious surface:

1. The combined area occupied by all permitted and accessory structures, paved parking areas and any other surfaces that reduce and prevent absorption,
2. shall not exceed seventy percent (70%) of the total area.

Section 9. Design Requirements

- A. A site plan, showing the overall concept of the proposed use must be submitted and approved by the Planning & Zoning Department. At a minimum, the site plan should include the following:
 1. A legal description or a survey completed by a Registered Land Surveyor.
 2. All dimensions of proposed building, accessory uses, drives, and parking areas.
 3. The surrounding land use and zoning classification.
- B. A landscaping plan, meeting all requirements in effect in the Zoning Regulations at the time of application for permits.
- C. Refuse disposal areas shall be landscaped and screened in accordance to landscape plans.
- D. Mechanical and electrical equipment, including air conditioning units, shall be designed, installed and operated to minimize noise impact on surrounding property. All such equipment shall be screened from public view.
- E. Lighting shall be designed to reflect away from adjacent residential areas.

ARTICLE 44. M-1 LIGHT MANUFACTURING or INDUSTRIAL DISTRICT

Section 1. Statement of Intent

This Zoning District is designed to accommodate those manufacturing establishments that are either:

- A. free of objectionable influences in their operation and appearance, or
- B. that can readily obviate or control any objectionable features that may otherwise result from the manufacturing processes by installation of appropriate abatement devices.

Section 2. Principal Permitted Uses

- A. Any use permitted and as regulated in the C-2 District, except as is modified in this Section.
- B. Except for uses and processes prohibited in these Zoning Regulations, the manufacturing, compounding, processing, packaging and assembling of products such as:
 - 1. Bakery goods, candy, cosmetics, pharmaceuticals, toiletries and food products; except fish or meat products, sauerkraut, vinegar, yeast and the rendering and refining of fats or oils.
 - 2. Products from the following previously prepared material: Bone, canvas, cellophane, cloth, cork, feathers, fiber, fur, glass, hair, horn, leather, paper, plastic, precious or semi-precious metals or stones, sheet metal yards (except where presses over twenty (20) tons rated capacity are employed).
 - 3. Pottery and figurines, using previously pulverized clay, and kilns fired only with gas or electricity.
 - 4. Musical instruments, toys, novelties, rubber or metal stamps and other small rubber products.
 - 5. Mechanical and electric appliances, instruments and devices, television sets, radios, phonographs.
 - 6. Electric and neon signs, billboards and other commercial advertising structures; light sheet metal products including heating and ventilating equipment, cornices, eaves and the like.
 - 7. Laboratories. Experimental, film, or testing laboratories, provided no operation shall be conducted or equipment used that would create hazards, noxious, or offensive conditions.

- C. The following uses, provided no part of a building occupied by such uses shall have any opening other than stationary windows or required fire exits, within five hundred (500) feet of any R residential District:
 - 1. Blacksmith, welding or other metal working shop, excluding punch presses over twenty (20) tons rated capacity, drop hammers and other noise producing machine operated tools.
 - 2. Foundry, casting lightweight, non-ferrous metal or electric foundry, not causing noxious fumes or odors.
 - 3. Carpet and rag cleaning, provided necessary equipment is installed and operated for the effective precipitation or recovery of dust and fumes.
 - 4. Ice manufacturing and cold storage plant; creamery and bottling plant.
- D. Road Right-of-Way and Road Crossing Procedures for Buried Lines and other public utility uses according to the provisions of Article 18.
- E. The following uses, when located not less than two hundred (200) feet from any Residential District:
 - 1. Inflammable liquids, underground storage only.
 - 2. Building materials sales yards, including concrete mixing, lumber yards, including mill work, open yards for storage and sale of feed and/or fuel.
- F. Any other use that is determined by the County Commission, to be of the same general character as the above permitted uses but not including any uses that are first permitted in an M-2 District, or that are prohibited in said Zoning District under Article 45.
- G. Adult entertainment establishments and uses as regulated in Article 28.

Section 3. Accessory Uses

- A. Any uses and structures customarily accessory and incidental to a principal permitted use, except for uses not otherwise permitted in an M-1 District.

Section 4. Conditional Uses Requiring Board of Adjustment Authorization

- A. Concentrated Animal Feeding Operations in conformance with Article 29.
- B. When authorized by the Board of Adjustment, subject to Article 45, any use permitted in the M-2 District as a principal use when necessary and incidental to a use permitted in an M-1 District, subject to such conditions

and requirements as may in the opinion of the Board of Adjustment, be necessary to protect adjacent property and prevent conditions of which may become objectionable or offensive.

Section 5. Required Conditions

- A. All uses, except for loading and unloading operations and parking, shall be conducted wholly within a completely enclosed building, provided that uses specified in Section 2 (E) (2) of this Article shall not be subject to this provision.
- B. No building customarily used for night operation, such as a bakery or milk bottling and distribution station, shall be within one hundred (100) feet of any Residential District, and any space used for loading or unloading commercial vehicles in connection with such operation shall not be within one hundred (100) feet of any Residential District.

Section 6. Prohibited Uses

- A. Any use that is first permitted in the M-2 District, or that is prohibited in said Zoning District under Article 45.
- B. No use shall be permitted or authorized to be established or maintained that, when conducted in compliance with the provisions of these Zoning Regulations and any additional conditions or requirements prescribed by the Board of Adjustment, is or may become hazardous, noxious or offensive due to the emission of odor, dust, smoke, cinders, gas, fumes, noise, vibration, refuse matter or waste.
- C. Dwellings and residences of any kind, including hotels, motels, mobile home parks, schools, hospitals, clinics and other institutions for human care, except where incidental to a permitted principal use; provided, however, that any of the aforesaid uses legally existing in the M-1 District on the effective date of these Zoning Regulations, or any amendment thereto, shall not be classified as a non-conforming use as defined in Article 2.
- D. Any use that produces more than one thousand five hundred (1,500) gallons of wastewater per day without being connected to a public sewer system.

Section 7. Area Requirements

- A. Dwellings or residential parts of non-residential buildings are not permitted in an M-1 District.
- B. Existing dwellings or residential parts of existing nonresidential buildings without connection to a public sewer services may not be subdivided on lot(s) less than three (3) acres.

C. The following minimum area measurements shall be observed:

Minimum Area Measurements

	Minimum Lot Area	Lot Frontage	Front Yard Depth	Side Yard Widths	Rear Yard Depth
Non-residential (not served by public sewer)	None	100 feet	50 feet	None, except where adjoining A or R districts, then not less than 100 feet each side	50 feet
Non-residential (served by public sewer)	None	50 feet	50 feet	None, except where adjoining A or R districts, then not less than 100 feet each side	50 feet
Residential dwelling (existing)	3 acres	150 feet	40 feet	25 feet each side	50 feet
Residential dwelling (new)	New residential construction not permitted	New residential construction not permitted			

Section 8. Road or Street Setback

Roadway

- Off major State and Federal Highways
- Off all subdivision roads
- Off all County roads

Required Setback

- 10 feet from adjoining right-of-way plus required yard setback
- 25 feet from right-of-way center line plus required yard setback
- 25 feet from right-of-way center line plus required yard setback

ARTICLE 45. M-2 GENERAL MANUFACTURING or INDUSTRIAL DISTRICT

Section 1. Statement of Intent

- A. This Zoning District is intended to provide for manufacturing and industrial development of a more general and less restrictive nature than in the M-1 District in those areas where the relationship to surrounding land use would create fewer problems of compatibility and would not necessitate as stringent regulatory controls.
- B. Certain offensive uses permitted in this Zoning District must observe greater setback and yard requirements when adjacent to residential areas.

Section 2. Principal Permitted Uses

- A. Any use permitted in an M-1 District or permitted in certain parts subject to Board of Adjustment authorization or this is not prohibited in the M-2 District by this Article or by any other law or order.
- B. Any of the following uses, when located not less than three hundred (300) feet from any R District, and not less than one hundred (100) feet from any other Zoning District, except an M-1 District.
 - 1. Acetylene manufacturing in excess of fifteen (15) pounds pressure per square inch.
 - 2. Automobile assembly.
 - 3. Bleaching, cleaning and dyeing of large scale production.
 - 4. Boiler shops, machine shops, structure steel fabricating shops, railway care or locomotive shops, including repair, metal working shops employing reciprocating hammers or presses over twenty (20) tons rated capacity.
 - 5. Brewing or distilling of liquors.
 - 6. Brick, pottery, tile and terra cotta manufacturing.
 - 7. Bulk station.
 - 8. Candle or sperm oil manufacturing.
 - 9. Coal yards.
 - 10. Cooperage works.
 - 11. Dextrine, starch or glucose manufacturing.
 - 12. Disinfectant, insecticide or poison manufacturing.

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13. Dye and dyestuff manufacturing.
14. Enameling, lacquering or japanning.
15. Emery cloth or sandpaper manufacturing.
16. Felt manufacturing.
17. Flour or grain mill.
18. Forge or foundry works.
19. Gas generation or storage for illumination or heating.
20. Grain drying or poultry feed manufacturing, from refuse, mash or grain.
21. Hair or hair products manufacturing.
22. Lime or lime products manufacturing.
23. Linoleum, oil cloth or oiled goods manufacturing.
24. Match manufacturing.
25. Meat packing; but not stockyards or slaughterhouses.
26. Oil, paint, shells, turpentine, varnish or enamel manufacturing, or the grinding of colors by machine.
27. Paper and pulp manufacturing.
28. Perfume manufacturing.
29. Pickle, sauerkraut or sausage manufacturing.
30. Plaster manufacturing.
31. Poultry slaughterhouse, including packing and storage for wholesale.
32. Printing ink manufacturing.
33. Radium extraction.
34. Sandblasting or cutting.
35. Sawmill, the manufacture of excelsior, wood fiber or sawdust products.
36. Shoe blacking or polish or stove polish manufacturing.
37. Soap manufacturing.

38. Steam power plant, except where necessary to a permitted principal use.
 39. Sugar refining.
 40. Tar distillation or manufacturing.
 41. Vinegar manufacturing.
 42. Wire or rod drawing-nut, screw or bolt manufacturing.
 43. Yeast manufacturing.
- C. Any other use that is determined by the County Commission to be of the same general character of the above permitted uses.
- D. Adult entertainment establishments and uses as regulated in Article 28.

Section 3. Conditional Uses Requiring Board of Adjustment Authorization.

- A. Concentrated Animal Feeding Operations in conformation with Article 29.
- B. Sewage disposal plants.
- C. Storage, drying, cleaning of iron, junk, rags, glass, cloth, paper or clippings, including sorting, refining, bailing, wood pulling and scouring.
- D. Commercial mines, quarries and gravel pits in conformation with Article 15.
- E. Any other use that in the opinion of the Board of Adjustment is of a similar character to these specified.
- F. Any of the following uses shall be prohibited, unless located not less than six hundred (600) feet from any Residential District, and not less than two hundred (200) feet from any other Zoning District except an M-1 District; and unless authorized by the Board of Adjustment as provided in Article 53 subject to such conditions and requirements as may in the opinion of the Board of Adjustment be necessary to protect adjacent property and prevent conditions that may become noxious or offensive.
1. Ammonia, chlorine, or bleaching powder manufacturing.
 2. Animal black, lamp black, bone black or graphite manufacturing.
 3. Celluloid or pyroxylin manufacturing, or explosive or inflammable cellulose or pyroxylin products manufacturing or storage.
 4. Cement, lime gypsum or plaster of paris manufacturing.
 5. Creosote manufacture or treatment.

6. Distillation of coal, petroleum, refuse, grain, wood or bones, except in the manufacturing of gas.
7. Explosives manufacture or storage for small arms ammunition.
8. Fertilizer, compost manufacture or storage.
9. Fish curing, smoking or packing, fish oil manufacturing or refining.
10. Garbage, offal, dead animals, refuse, rancid fats, incineration, reduction or storage, salvage yards.
11. Glue manufacture, size or gelatin manufacture where the processes include the refining or recovery of products from fish, animal or offal.
12. Petroleum or inflammable liquids production, refining and storage above ground.
13. Rubber, caoutchouc or gutta percha manufacture and treatment from crude or scrap material.
14. Slaughtering of animals or stockyards.
15. Smelting of ferrous or non-ferrous ores.
16. Storage, curing or tanning of raw, green or salted hides and skins.
17. Sulphurous, sulfuric, nitric, picric, carbolic or hydrochloric or other corrosive acid manufacture.
18. Any other use that in the opinion of the Board of Adjustment is of a similar character to those specified above.

Section 4. Accessory Uses

- A. Accessory uses and structures permitted and as regulated in the M-1 District except as is modified by this Section.
- B. Other uses and structures customarily accessory and incidental to a permitted principal use, except of a type that is permitted only subject to Board of Adjustment authorization.
- C. Any other use when an incidental and necessary accessory use to a permitted principal use, when authorized by the Board of Adjustment as provided by Article 53, subject to such conditions and requirements as may, in the opinion of the Board of Adjustment, be necessary to protect adjacent property and prevent conditions that may become noxious or offensive.

Section 5. Required Conditions

- A. The requirement that certain business, services or processing shall be conducted within a completely enclosed building shall not apply to any principal use permitted under Article 44 in the M-1 District.
 - 1. Any such use may be conducted in the M-2 District within or without a building or enclosure, subject to any applicable distance limitations set forth in Article 44.
- B. All junk or salvage yards shall be enclosed by a solid board fence or wall not less than ten (10) feet high of new material and well maintained.

Section 6. Prohibited Uses

- A. Dwellings and residences of any kind,
 - 1. Including hotels, motels, mobile home parks, schools, hospitals, clinics, and other institutions for human care, except where incidental to a permitted principal use;
 - 2. Provided, however, that any of the aforesaid uses legally existing in the M-2 District on the effective date of these Zoning Regulations, or any amendment thereto, shall not be classified as a non-conforming use as defined in Article 2, Section 2.
- B. No use shall be permitted or authorized to be established or maintained that, when conducted in compliance with the provisions of these Zoning Regulations and any additional conditions or requirements prescribed by the Board of Adjustment, is or may become hazardous, noxious or offensive due to the emission of odor, smoke, cinders, gas, fumes, noise, vibration, refuse matter or water carried waste.
- C. Any use that produces more than one thousand five hundred (1500) gallons of wastewater per day without being connected to a public sewer system.

Section 7. Area Requirements

- A. Dwellings or residential parts of non-residential buildings are not permitted in an M-2 District.
- B. Existing dwellings or residential parts of existing nonresidential buildings without public sewer service may not be subdivided on lot(s) less than three (3) acres.

C. The following minimum area measurements shall be observed:

	Minimum Lot Area	Lot Frontage	Front Yard Depth	Side Yard Widths	Rear Yard Depth
Non-residential (not served by public sewer)	None	100 feet	50 feet	None, except where adjoining A or R districts, then not less than 100 feet each side	50 feet except where adjoining A or R District, then 300 feet unless specified otherwise
Non-residential (served by public sewer)	None	50 feet	50 feet	None, except where adjoining A or R districts, then not less than 100 feet each side	50 feet except where adjoining A or R District, then 300 feet unless specified otherwise
Residential dwelling (existing)	3 acres	150 feet	40 feet	25 feet each side	50 feet
Residential dwelling (new)	New residential construction not permitted	New residential construction not permitted			

Section 8. Road or Street Setback

Roadway

Off major State and Federal Highways
 Off all subdivision roads
 Off all County roads

Required Setback

10 feet from adjoining right-of-way plus required yard setback
 25 feet from right-of-way center line plus required yard setback
 25 feet from right-of-way center line plus required yard setback

ARTICLE 46. PUD Planned Unit Development

Section 1. Statement of Intent

- A. This Zoning District is intended to provide for the establishment of particular plots of land having specific use assignments.
- B. The Planned Unit Development is calculated to promote flexibility and more inventive design than is generally possible under customary zoning regulations.
- C. It is hereby intended to permit Planned Unit Developments upon application and upon approval of site and use plans.
 - 1. Suitability of such tracts for a Planned Unit Development designation shall be determined by and shall be made according to the provisions of the Comprehensive Development Plan, and
 - 2. designed to lessen congestion in the streets, to secure safety from fire, panic, and other dangers,
 - 3. To promote health and the general welfare,
 - 4. To provide adequate light and air, to prevent the overcrowding of land,
 - 5. To avoid undue concentration of population,
 - 6. To preserve features of historical significance,
 - 7. To facilitate the adequate provision of transportation, water, sewerage, schools, parks, other public requirements,
 - 8. With a reasonable consideration being given to, among other things, the character of the Zoning District and its peculiar suitability for particular uses, and
 - 9. with a view to conserving the land throughout the County.
- D. In a Planned Unit Development, the regulations that are imposed are intended to accomplish the same purposes as do zoning regulations and other applicable regulations in zoning districts that are developed on a lot-by-lot basis, rather than on a unified basis.
- E. Nothing in this Section shall be construed to prevent an applicant from submitting, at his option, a subdivision plat or site plan for simultaneous review with the Planned Unit Development Plans.

Section 2. General Procedures

A. Pre-Application Conference.

1. A Pre-Application Conference is an informal procedure to assist the applicant in meeting various requirements of Christian County and to provide a preview of the proposed Planned Unit Development's conceptual layout.
2. To obtain further information in connection with the preparation of the Planned Unit Development application, each applicant shall confer with representatives from the Planning & Zoning Department and any other pertinent agency.

B. The Preliminary Plan shall be prepared in compliance with the directives stated herein:

1. The owners of a tract of land located in any Zoning District containing no less than five (5) acres may apply for a Planned Unit Development (PUD) and submit for the Planning & Zoning Commission's review, a preliminary plan for the use and development of such tract of land for a Planned Unit Development project.
2. In accepting such a plan for review, the Planning & Zoning Commission must be satisfied that the proponents of the Planned Unit Development (PUD) project intend to complete it within a reasonable time as determined by the Planning & Zoning Commission.
3. Such plan shall be prepared by a registered engineer or architect and shall contain, at a minimum, the following information:
 - a. A legal description of the proposed PUD project with total number of acres in the project and the number of acres allocated for each respective land use for the proposed PUD.
 - b. A written report describing the overall concept of the plan (including supporting graphics); at a minimum the plan shall include the following information:
 - (1) The total land area, expressed in acres and as a percentage of the total area at full development to be devoted to various land uses and intensities.
 - (2) The approximate total number of dwelling units proposed by type of structure and approximate number of bedrooms for multi-family units.

- (3) Square footage devoted to non-residential uses.
 - (4) The gross and net residential density within the project and within each component of the Zoning District. Flood area and open space ratios, and other data relating to intensity of development.
 - (5) The proposed number of off-street parking and loading spaces for each use.
 - (6) A generalized description of water service, sanitary sewerage, utilities, management of storm water runoff, maintenance of common areas, and other essential services.
- C. A PUD site plan illustrating the requested use allocations and their respective location within the Zoning District. The plan shall include, at a minimum, the following:
1. A general land use plan with a description of the type, location, and nature of each land use allocation within the Zoning District.
 2. A circulation plan which illustrates both external and internal traffic ways, including proposed and existing right-of-ways, pedestrian travel ways, and other transportation improvements.
 3. A generalized landscape plan including buffers, perimeter treatments, and berming, and screening of adjacent properties.
 4. A sign plan that coordinates the size, location, and illumination of signs proposed within the Zoning District.
 5. A PUD improvement plan including potential problems and proposed solutions to:
 - a. Wastewater disposal.
 - b. Storm water disposal and/or interior drainage.
 - c. Water supply and supplier.
 - d. Electrical supply and supplier.
 - e. Soils and geological conditions.
 - f. Topography.

6. A final PUD development plan will be required only if the County Commission or the Planning & Zoning Commission determines that a final and more detailed development plan is required to adequately safeguard the public interest.

Section 3. Permitted Uses

- A. A Planned Unit Development shall specify both for the project as a whole and/or for subareas within the project, as appropriate, those principal and accessory uses that are to be permitted, and may include or exclude uses from the Planned Unit Development or include uses with conditions as appropriate to achieve the intent of these provisions.
- B. In making its determination of the uses to be permitted within the Planned Unit Development, the County Commission may consider:
 1. The compatibility and relationship of permitted uses adjoining or in proximity to the Planned Unit Development,
 2. the appropriateness of permitted uses for the area in general,
 3. their overall impact on the community, and
 4. the consistency of the permitted uses with the Comprehensive Plan and other adopted plans and policies.

Section 4. Regulations

- A. The Development Plan shall contain provisions to regulate the intensity of development within the Planned Unit Development. Such provisions may apply to the project as a whole or to subareas within the project as appropriate.
- B. The following regulations shall apply to Planned Unit Developments:
 1. For non-residential development, the intensity of development may be regulated:
 - a. by specifying maximum square footage or gross leasable area,
 - b. by specifying setbacks, height and bulk restrictions, or
 - c. by a combination of such restrictions for the project as a whole or for components or subareas within the project.
 2. In addition, non-residential Development Plans may specify performance standards to be imposed on the project and restrictions regarding the location and nature of industrial, commercial and other non-residential activities.

3. The County Commission may impose such Standards and restrictions necessary to achieve the intent of this Article.
 4. In making its determination regarding the intensity of development and appropriate performance standards, the Planned Unit Development may consider:
 - a. the character and scale of similar developments,
 - b. the character and scale of surrounding development, and the area in general,
 - c. the real or anticipated impact on public facilities and services, and
 - d. consistency with the Comprehensive Plan and other adopted plans and policies.
- C. Maximum Number of Dwelling Units equals the entire area of the property (exclusive of all road right-of-ways to be utilized for residential purposes) divided by the maximum density permitted within the Zoning District(s) in effect for the property at the time of Planned Unit Development application, as shown by the table below:

<u>Zoning District</u>	<u>Maximum Residential Density</u>
A-1 Agriculture	1 dwelling unit/5 acres
A-R Agriculture Residence	1 dwelling unit/3 acres
R-1 Suburban Residence	4 dwelling units/acre
R-2 One-and Two-Family Residence	8 dwelling units/acre
R-3 Multi-family Residence	15 dwelling units/acre
R-4 Multi-family Residence	22 dwelling units/acre

1. The permitted number of dwelling units may be distributed in any manner over the residential portion of the project consistent with the intent and provisions of this Article.
2. The Development Plan shall specify distribution of residential density for the project as a whole or for subareas within the project as appropriate.

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- D. In making its determination regarding the distribution of residential densities, the County Commission may consider:
1. the compatibility of residential densities with other uses within the Zoning District as well as outside the Zoning District,
 2. the impact of residential densities on public facilities and services, and
 3. the consistency with the Comprehensive Plan and other adopted plans and policies.
- E. The Planned Unit Development design shall specify:
1. Conditions, restrictions and standards relating to the timely provisions of necessary public facilities as appropriate.
 2. The County Commission may impose conditions, restrictions and standards as appropriate to achieve the intent of these regulations.
 3. In making its determination regarding such conditions, restrictions and standards, the County Commission may consider
 - a. the adequacy of existing facilities,
 - b. the timely provision of adequate facilities,
 - c. the impact of the proposed development on existing and/or planned facilities and
 - d. the overall cost to the community.
 - e. Approved water and sewer systems shall be required.
- F. The Planned Unit Development design shall specify the location and general design of ingress and egress to the project along with access restrictions as appropriate.
1. The County Commission may impose such access standards and restrictions as necessary to protect the integrity and function of the County's thoroughfare system and to otherwise achieve the intent of these regulations.
 2. In making its determination regarding such access standards and restrictions, the County Commission may consider:
 - a. the classification and function of the thoroughfare system, existing and projected traffic volumes,
 - b. the condition and design of the affected thoroughfares,
 - c. the effect of the proposed development on traffic flow and circulation patterns and

- d. the consistency with the Comprehensive Plan and other adopted plans and policies.
- G. Unless specifically modified by the Planned Unit Development design, the off-street parking and loading requirements contained within the zoning regulations shall apply.
 - 1. Reductions in off-street parking and loading standards shall be approved only if it can be demonstrated that parking will be less due to:
 - a. Design and/or occupancy characteristics of the project, and/or
 - b. The availability of public transportation.
- H. Unless specifically modified by the Planned Unit Development design, the sign regulations contained within the zoning regulations shall apply.
 - 1. Modifications to the sign regulations shall be approved only if the general intent of the sign regulations regarding size, location, illumination, structural integrity and relation to surrounding uses is satisfied.
- I. The Planned Unit Development shall specify any special treatment of perimeter areas designed to mitigate the impact of the project upon adjoining properties and/or to achieve any appropriate transition between land uses and densities.
 - 1. The County Commission may impose such standards and requirements for perimeter treatment it deems necessary:
 - a. to protect adjoining properties from adverse effects, and
 - b. to achieve an appropriate transition of land uses and densities.

Section 5. Determination

- A. Upon determination by the Planning & Zoning Administrator that the proposed Planned Unit Development plan, as reviewed during the pre-application conference, appears to conform to the requirements of this Article and all other applicable requirements of these Zoning Regulations, the applicant shall prepare and submit a development plan which shall incorporate any changes or modifications required or suggested by the Planning & Zoning Commission, and, if necessary, an application for a change of zoning.
 - 1. The Planning & Zoning Commission shall hold a public hearing on the proposed Planned Unit Development. If the Planned Unit Development design is found to comply with the requirements set

forth in this Article and other applicable provisions of these Zoning Regulations, the Planning & Zoning Commission shall submit said plan with the required application by the proponents of the necessary change in classification of the site of the proposed Planned Unit Development together with its report and recommendation to the County Commission.

2. The County Commission may modify the plan consistent with the intent and meaning of these Zoning Regulations and may rezone the property to the classification permitting the proposed Planned Unit Development in substantial conformity with the final plan as approved by them.
3. After the Planned Unit Development design has been approved by the County Commission, and in the course of carrying out this plan, adjustments or rearrangements of buildings, parking areas, loading areas, entrances, heights or yards may be requested by the proponents and provided such requests conform to the standards established by the final Planned Unit Development design and these Zoning Regulations, such adjustments or rearrangements may be authorized by the County Commission upon recommendation by the Planning & Zoning Commission.
4. Minor adjustments to the final Planned Unit Development design shall be an administrative function of the Planning & Zoning Administrator. Preliminary and final plats will be required after Development Plan approval.
5. After the final Planned Unit Development design has been approved by the County Commission, and in the course of carrying out this plan, if the proponents deviate from the approved final Planned Unit Development design without proper authority, the project's development shall be stopped and the matter referred to the Christian County Commission for subsequent review.

ARTICLE 47. USA URBAN SERVICE AREAS OVERLAY DISTRICT

Section 1. Statement of Intent

- A. The Urban Service Areas Overlay District is intended to provide for increased coordination between the County and City Governments resulting in better management and control of land use and development.
 - 1. The intent of the Urban Service Areas is designating, maintaining, and enhancing areas for urban development in a thoughtful and deliberate way involving coordinated land use, transportation, and natural resource planning between governmental entities.
- B. This Overlay District will allow for the concentrating of urban land uses and densities in areas specifically designated for such development and affords for greater efficiency in the delivery of services such as:
 - 1. potable water
 - 2. stormwater management
 - 3. sanitary sewer
 - 4. street right-of-way maintenance
 - 5. design specifications
 - 6. and right-of-way maintenance and management.
- C. Coordinated planning efforts also present a measure of predictability to land owners and residents concerning the location of future public services and urban level land use densities which will be permitted.

Section 2. Recognition of Community Comprehensive Plans and Urban Service Areas

- A. The Christian County Commission recognizes the adopted Comprehensive Plans and Urban Services Areas (USA) Tier One, Two, and Three that have been approved by the incorporated communities within Christian County. Therefore, where the cooperation between Christian County and its incorporated communities is authorized by the constitution and laws of the State of Missouri, it is determined by the Christian County Commission that for the purposes of:
 - 1. Establishing effective coordination procedures between Christian County and it's municipalities regarding the urbanization of rural areas;
 - 2. Assuring that local and regional comprehensive plans are followed;

3. Assuring that urban development densities occur only as urban level facilities and services are able to be provided;
4. Assuring that urban development occurs only within and/or adjacent to the incorporated areas within the County;
5. Assuring that property owners serviced by municipal services agree to annex said properties into the corporate limits of the municipality once the property in question becomes compact and contiguous to said municipality for the purpose of assuring the affordable and effective maintenance of public improvements; and
6. Assuring that land use and development in the vicinity of an incorporated community does not negatively impact road and storm drainage systems and said public improvements follow the most recent design guidelines for such public improvements; and
7. Assuring that the standards, definitions, and procedures set forth in this Article shall promote increased coordination and result in better management of urban level development for the purpose of achieving a more healthy and sustainable Christian County.

Section 3. Definitions

Urban Service Area (USA)

An area outside, of an incorporated community's city limits in which a comprehensive land use and infrastructure master plan has been adopted for the purpose of effectively managing land use in a sustainable manner by applying sound planning principals to land use decisions and where each incorporated community considers to be that area where the greatest local level of public investment for installation and/or maintenance of capital improvements existing or is planned in the next 1-5 years. The USA boundary shall consist of planning "Tiers" One, Two, and Three based on adopted comprehensive master plans.

Tier One: Urban Service Area

An area where the incorporated community can, is willing, or intends to annex and offer access to public water and sewer infrastructure for property deemed appropriate for urban level development. (Generally a 1-5 year plan).

Tier Two: Rural/Low Density Planning Area

An area beyond Tier 1 that a city recognizes in their comprehensive land use plan but that is not within reasonable proximity to be serviced by public water and sewer infrastructure without significant off site private assistance. This area, although in advance of urban level development proposals shall require Christian County decision makers to refer to local and regional plans prior to approving development proposals.

Tier Three: Extended Planning Area (Agricultural)

An area beyond Tier One and Tier Two that is recognized in a community's comprehensive plan as a future urbanized area where public services will be provided at a later date. Generally, it is assumed that this area will not be developed within the immediate 10-years with urban level densities due to the lack of urban level public services such as water and sewer. The Christian County Commission shall evaluate development proposals within this Tier to ensure compliance with local, county, and regional comprehensive plans.

Irrevocable Consent Agreement to Annexation

An agreement between a property owner and a municipality which states that a particular parcel of property may connect to available public services as long as the developers of said property agree to follow all municipal development regulations and allow said property to be annexed into the municipality providing public services at such time it becomes contiguous to the corporate limits of that municipality.

Section 4. Establishment of USA Boundaries

- A. Any incorporated community wishing to create a USA shall meet the following requirements:
 - 1. Have an adopted Comprehensive Land Use and Infrastructure Master Plan.
 - 2. Submit a map identifying the geographic boundary of the proposed USA planning Tiers One, Two, and Three to the Christian County Commission.
 - 3. Seek approval of the USA boundary by the County Commission.

Section 5. General Guidelines for Subdivision & Development within the Urban Service Area Overlay District

- A. All new County and subdivision roads within the Adopted Urban Service Areas shall be comprised of hot mix asphalt, meeting the established minimum design standards set forth in the Christian County Road and Access Standards.

Section 6. Standards for Subdivision & Development within a Tier 1 USA

- A. For the purpose of simplifying the development processes Christian County agrees to forward all development proposals within this designated area to the appropriate municipality. Those properties not compact and contiguous which cannot be immediately annexed shall be required to enter into an irrevocable consent to annex agreement, as defined by this Article, with the appropriate municipality. All development guidelines,

processes, and fees of the municipality shall apply unless otherwise exempted by this section.

1. A request to develop property within this designated area shall be required to contact the appropriate municipality and follow all policies, procedures, zoning, subdivision, and public improvement design guidelines of said municipality's comprehensive plan, infrastructure design guidelines, and code of ordinances.
2. No subdivision application shall be allowed proposing lots of record less than ten (10) acres in size unless the exemptions stated in this section exist, or a written recommendation from the municipality has been provided. Once documentation is obtained, the county planning and zoning department shall proceed with their regular application process.
3. The Christian County Planning and Zoning Department agrees not to issue permits within this designated area unless the exemptions stated in this section exist, or a written recommendation from the municipality has been provided. Once documentation is obtained, the county planning and zoning department shall proceed with their regular application process.
4. Any property contiguous to a municipality's corporate limits requesting to develop, obtain permits or connect to public services from said municipality shall first be required to annex the property in question in accordance with State and Local annexation laws.
5. Commercial and Industrial development of property on which an irrevocable consent to annex agreement has been negotiated between the municipality and landowner shall require all structures having property lines within 1320 (a quarter of a mile) linear feet of public services to connect to said services. At such time the property becomes contiguous to a municipality's city limits the city, at its discretion, shall annex said property. The cost of extending public services shall be at the expense of the applicant unless a cost sharing agreement is negotiated with the municipality.
6. Where the USA boundaries of different adjacent municipalities overlap, the municipality willing and able to provide public infrastructure services shall be the jurisdiction to annex or consent to annex said property.
7. **Exemptions:** Building permits for single family residential dwellings that do not require subdivision of property and the proposed structure is not within 300 linear feet of an existing public utility shall obtain the applicable permits from the appropriate County Departments.

Section 7. Standards for Subdivision & Development within a Tier 2 & 3 USA

- A. If the subject property is within a defined Tier Two or Three planning area the Christian County Planning and Zoning Department shall follow standard County permitting procedures. Christian County staff shall inform, in writing, the nearest municipality of any application within these designated areas and include the municipality's comments, if any, in both the application for Planning and Zoning Commission and County Commission review.
- B. Proposed developments within these designated areas shall comply with the Ozark Transportation Organization (OTO) Major Thoroughfare Plan.
- C. Proposed developments within these designated areas shall comply, with local and regional comprehensive plans.
- D. Incorporated municipalities reserve the right to NOT annex any right-of-way of any County Road until such road is improved to the affected municipality's design standards, provided, however, if a municipality annexes property contiguous to and on both sides of a County Road then the Municipality shall annex said Road and right of way. Annexation on both sides of a County Road shall not constitute a transfer of right-of-way ownership and maintenance responsibility of said roadway from the County to the annexing municipality. Notwithstanding the foregoing, if a municipality shall annex property contiguous to and on both sides of a Special Road District road said annexation shall not constitute a transfer of right-of-way ownership or maintenance responsibility of said roadway from one governmental entity to another without the written consent of both governmental entities. Improvements to such County Roads may be made by Developer's of land adjacent to the right-of-way; joint projects with the County, City and Developer; or joint projects with the County and the City. This section does not supercede any Intergovernmental Governmental Agreement.
- E. Any amendments to this Section, including the USA map, shall be in accordance with established growth policies of both the City and County comprehensive plans.
- F. Any proposed amendment to this Article, including the USA map, shall require written notification from Christian County Staff to any City potentially affected by such amendment prior to the approval by both the Planning and Zoning Commission and the Christian County Commission.

ARTICLE 48. CONSERVATION DEVELOPMENT DISTRICT

Section 1. Statement of Intent

This Zoning District is intended to encourage residential development in the rural areas of Christian County to conserve open space and by doing so promote the following:

- A. Efficient use of the land while preserving agricultural land, significant stands of trees, open space, historical features, vistas, drainage systems, sinkhole watershed, and other significant environmental or cultural items on a case by case basis.
- B. Housing located and grouped to promote efficiency and viable open space, and reduce impervious surface area.
- C. Housing with access to parks, trails, greenways, and other open areas for recreation.
- D. Economic viability of farms and farmland.
- E. Open space for private or public use for recreation or agriculture production.
- F. Preservation of historic areas or landscapes as well as the rural image of the County.
- G. Diversity of housing sizes and styles in the County.
- H. Preservation of the County's cultural history.

Section 2. Principal Permitted Uses

- A. Single family detached dwelling on parcels of a minimum size of two (2) acres, as determined by a soils profile conducted by a registered soil scientist, that will have room for planned improvements, an on-site waste water disposal system and a replacement location for the soil absorption field, unless otherwise approved during platting.
- B. The open space portion of the development can be used for one or more of the following:
 - 1. Conservation of significant natural or cultural features and views.
 - 2. Agricultural uses that will support the conservation of open space.
 - 3. Common horse stables and associated trails.
 - 4. Recreational trails for non-motorized uses.

5. Recreational uses for the property owners, as regulated by the property owners' association.
 - a. Trails
 - b. Picnicking
 - c. Gardens
 - d. Passive areas for use
 - e. Ball fields
 - f. Playgrounds
 - g. Tennis, basketball and other courts
 - h. Swimming pools
 - i. Community building
 - j. Stables and equestrian trails and facilities
 - k. Rifle, skeet, trap, and pistol ranges, and similar uses.
6. Roadside stands, offering for sale only agricultural products produced on the premises or in the vicinity.

Section 3. Accessory Uses

Accessory uses may include buildings, and structures customarily incidental to any of the aforesaid permitted uses, including:

- A. Uses, buildings, and structures customarily incidental to any of the aforesaid permitted uses.
- B. Home occupations as listed in Article 10.
- C. Temporary real estate and small announcement signs.
- D. Temporary buildings for uses incidental to construction work, which building shall be removed upon completion or abandonment of the construction work.
- E. Swimming pool incidental to a single family dwelling, provided the pool will not hamper the use or location of the on-site waste water system.
- F. Day care homes, if not more than six (6) children are kept, in addition to the caregiver's own children.
- G. Accessory apartments.

Section 4. Development Standards

A. Density bonus

1. A density bonus will be considered for each conservation development. A set aside of forty (40) percent for open space will yield a bonus based upon approval during public hearing by the Board not to exceed fifty (50) percent over the allowable density in the Agricultural-Residence District.
2. With a significant cultural preservation area or public use area, the percent of required set aside may be reduced, but maximum density bonus will not exceed fifty (50) percent.

B. Residential requirements

1. Single family detached structures
2. The residential lot shall be a minimum of two (2) acres and shall be large enough to accommodate an onsite disposal system and a replacement system. The area requirements will be based on soils and size of the structure.
3. Setbacks and yard requirements will follow the R-1 Suburban Residence District guidelines.
4. Accessory buildings will follow location guidelines as shown in the R-1 residential regulations.
5. Maximum lot coverage will be thirty-five (35) percent and maximum height of all structures will be thirty-five (35) feet.
6. The property owners' association will provide for maintenance of the on-site waste water system within the context of their covenants. Covenants must receive the discretionary approval of the County Commission.

C. Minimum required acreage - 20 acres

D. Development considerations

1. Community commons
2. Residential and/or open space siting
 - a. Open space shall be arranged so that large contiguous areas of open space can be formed.
 - b. Impact on natural, environmental, and historical areas is to be minimized by the location of residential development.
3. Protection of scenic views.

4. Minimize the impact on mature stands of trees.
5. Protect historic buildings, views or landscapes.
6. Avoid prime farm land with residential development.
7. Roads will not be extended through open space; however, open space accessory parking and structures can be located in the open space.
8. Variance to design standards will be considered and may be approved as the Conservation Development is approved.

Section 5. Submittal Requirements

- A. A completed change of zoning application will be required for an open space development.
- B. In addition, a conservation development report and site plan shall be required and shall include the following items. (The development report and site plan must be prepared by a land development professional that is qualified by their education and experience to do site plan work.)
 1. Ten foot contour lines
 2. Rock outcrops
 3. Slopes of more than fifteen (15) percent
 4. Soil
 5. Water features and flood plains
 6. Sinkholes, caves and springs
 7. Land cover and sue
 8. Visual or historical resources
 9. Special environmental considerations
 10. Existing buildings or improvements
 11. Identify the maximum number of five (5) acre tracts that could be developed
 12. Site design to show the open space, lots, roads, and storm water facilities
 13. Phasing, if any
 14. Location map

15. Conservation easement

- C. No open space development will be considered approved until all hearings are complete and the conservation easements are recorded permanently preserving the open space. The requirement for a conservation easement may be waived by the County Commission if the development's property owners' association retains ownership of the open space.

ARTICLE 49. ZONING DISTRICT CHANGES and REGULATIONS

Section 1. Zoning District Changes

Whenever the public necessity, convenience, general welfare or good zoning practice requires, the County Commission may by order, after receiving a recommendation and report from the Planning & Zoning Commission, and subject to the procedure provided in this Article, amend, supplement, or change the Zoning District boundaries now or hereafter established by these Zoning Regulations.

- A. It shall be the duty of the Planning & Zoning Commission to submit its recommendations to the County Commission regarding all applications or proposals for district changes.
- B. A Zoning District change may be initiated by passing a resolution therefore by the Planning & Zoning Commission, on its own initiative, or by an application of one (1) or more of the owners or lessees of property within the area proposed to be changed or affected by said resolution.

Section 2. Procedure for Change of Zoning District Boundary or Change of Zoning Classification of Property

A. By Owner or Lessee of Property.

Applications for any change of zoning district boundary or change of zoning classification of property as shown on the zoning map shall be submitted to the Planning & Zoning Administrator upon such forms prescribed by the Planning & Zoning Administrator, and shall be accompanied by such data and information as may be prescribed for that purpose by the Planning & Zoning Commission or the Planning & Zoning Administrator, so as to assure the fullest practicable presentation of facts for the permanent record.

- 1. Each application shall be signed by at least one (1) of the owners or lessees of property within the area proposed to be reclassified, attesting to the truth and correctness of all facts and information presented with the application.
- 2. The application shall be submitted at least thirty (30) days before the public hearing date to be held by the Planning & Zoning Commission.
- 3. The applicant must provide names and addresses of the owners of all properties lying within the area sought to be changed and within one thousand (1,000) feet of any part of the premises the zoning classification of which is proposed to be changed.

B. By Planning & Zoning Commission.

The Planning & Zoning Commission may by motion or resolution propose a change of zoning district boundaries or change of zoning classification of property.

C. Before submitting its recommendations concerning a proposed zoning change to the County Commission, the Planning & Zoning Commission shall hold at least one (1) public hearing thereon, notice of which shall be given by at least one (1) publication in a newspaper of general circulation in the county at least fifteen (15) days before the hearing.

1. A notice of such hearing shall also be posted at least fifteen (15) days in advance thereof in at least two (2) conspicuous places on the premises the zoning classification of which is proposed to be changed.
2. The notice shall state the place or places and time at which the proposed change to the Zoning District, including text and maps, may be examined.

D. The Planning & Zoning Commission shall recommend to the County Commission the approval, denial, or modification of the proposed change of zoning district boundary or change of zoning classification of property within twenty-five days after the conclusion of the public hearing together with such application or resolution and the text and map pertaining thereto.

1. If the County Commission deems it desirable, an application or resolution may be tabled to the next meeting for one (1) additional hearing, in which case the recommendation shall be submitted within twenty-five (25) days after the second hearing.

E. In case of written protest against any proposed amendment, such amendment may not be passed except by the favorable vote of two-thirds of all the members of the County Commission when

1. signed and acknowledged by the owners of thirty (30) percent of the frontage within one thousand (1,000) feet of the right or left of the frontage proposed to be changed,
2. or by the owners of thirty (30) percent of the frontage directly opposite,
3. or directly in the rear of the frontage proposed to be altered,
4. or in cases where the land affected lies within one and one-half (1-1/2) miles of the corporate limits of a municipality having in effect ordinances zoning property within the corporate limits of the

municipality, made by resolution of the city council or board of trustees thereof, and filed with the county clerk.

- F. Any person adversely affected by an order of the County Commission adopting, amending or rescinding a zoning district change may appeal to the Circuit Court of Christian County on the grounds that said County Commission failed to comply with the law in adopting, amending, rescinding, publishing or distributing such zoning district change, or that the change, as adopted or amended by said County Commission is unreasonable or unlawful.
- G. Each application for zoning change, except those initiated by the Planning & Zoning Commission, shall be accompanied by a check payable to Christian County Planning and zoning, or a cash payment in an amount to be determined by the County Commission, to cover the cost of application review, publishing, posting and/or mailing the notices of the hearing or hearings required by the foregoing provisions.

Section 3. Zoning Regulation Amendments

Whenever the public necessity, convenience, general welfare or good zoning practice requires, the County Commission may by order, after receiving a recommendation and report from the County Planning & Zoning Commission, and subject to the procedure provided in this Article, amend, supplement or change the Zoning Regulations, now or hereafter established by the Regulations created under authority of Sections 64.510 through 64.695 of the Revised Statutes of Missouri.

- A. It shall be the duty of the Planning & Zoning Commission to submit its recommendations to the County Commission regarding all proposals for amendments to the zoning regulations.
- B. An amendment, supplement or change of the text of these Zoning Regulations may be initiated by:
 - 1. by the Planning & Zoning Commission, on its own initiative, through motion or resolution
 - 2. upon written petition to the County Commission by any citizen of Christian County.
- C. In any case, it shall be the duty of the Planning & Zoning Commission, in the interest of public necessity and good zoning practice, to conduct a review of the Zoning Regulations from time to time, and report its findings and recommendations to the County Commission.

Section 4. Procedure for Change

- A. Before submitting its recommendations on a proposed amendment to the County Commission, the Planning & Zoning Commission shall hold at least one (1) public hearing thereon.
 - 1. Notice of the hearing shall be given at least fifteen (15) days in advance thereof by at least one (1) publication in a newspaper of general circulation in the County.
 - 2. The notice shall state the place and time of the hearing and the place and time at which the proposed amendment to these Zoning Regulations may be examined.
- B. The County Planning & Zoning Commission, after consideration of the proposed amendment shall, within a reasonable time after the conclusion of such public hearing or hearings, recommend the approval or denial of the proposed amendment or the approval of some modification thereof to the County Commission.
- C. If the proposed amendment is adopted by the County Commission, an attested copy shall be certified to the County Clerk and a copy shall be recorded in the office of the Recorder of Deeds.
- D. Any person adversely affected by an order of the County Commission adopting, amending or rescinding a regulation, may appeal to the Circuit Court of Christian County.

Section 5. Limitation on Applications for Rezoning

No application for rezoning of any tract, lot or parcel of land within the unincorporated area of Christian County, other than an application initiated by the Planning & Zoning Commission as set forth in Section 1 of this Article

- A. shall be filed or allowed prior to the expiration of four (4) months from the time that the Christian County Commission shall have finally acted on any application for rezoning of all or any part of the same lot, tract or parcel of ground,
- B. unless the application previously acted upon was initiated by the Planning & Zoning Commission, or
- C. unless during said four (4) months interval property adjoining or abutting the lot, tract or parcel of land or within one thousand (1,000) feet, as provided in Section 2 (c) of this Article, of the lot, tract or parcel of land shall have been rezoned by the County Commission or by any other appropriate zoning authority.

ARTICLE 50. COMMON OPEN SPACE AND COMMON IMPROVEMENT REGULATIONS

Section 1. General Provisions

The provisions of this Article shall apply to all developments in which the following features are held in common ownership by a property owners' association or by persons or entities owning property within a development.

- A. All lands in common open space, not a part of individual lots, designed for the mutual benefit of a group of persons owning property within a development, where such lands are not dedicated to or conveyed for public use whether or not such lands are required by the provisions of this Article, and
- B. All private streets, driveways, parking facilities and buildings or portions thereof, as may be provided for the common use, benefit and/or enjoyment of the occupants of the development; whether or not such improvements are required by the provisions of this Article.

Section 2. Condominium Property Act

- A. All lands and improvements as set forth in Section 1 above shall be established and maintained according to the provisions of the Condominium Property Act, Chapter 448 of the Revised Statutes of Missouri, or subsequent amendments, except where the Board of Adjustment determines that the provisions of this Article can otherwise be satisfied.
- B. Should this Article conflict with the provisions of the Condominium Property Act, Chapter 448 of the Revised Statutes of Missouri, or subsequent amendments, the provisions of the Condominium Property Act shall prevail.

Section 3. Subdivision Approval Required

All subdivision of property containing common open space and common improvements shall originally be classified as a major subdivision and subject to review according to the provisions of the Subdivision Regulations. Amendments or revisions to an improved subdivision plat containing a common open space and common improvements may be classified as a minor subdivision according to the provisions of the County's Subdivision Regulations.

Section 4. Property Owner's Association

If common open space and common improvements are not dedicated to and accepted for public use, they shall be protected by legal arrangements, satisfactory to the County Commission sufficient to assure their maintenance and preservation for whatever purpose they are intended. Covenants or other legal arrangements shall specify:

- A. ownership of the common open space and common improvements;
- B. method of maintenance,
- C. responsibility for maintenance; maintenance taxes and insurance coverage;
- D. compulsory membership and compulsory assessment provisions;
- E. guarantees that any association formed to own and maintain common open space, and common improvements will not be dissolved without the consent of the County; and
- F. any other specifications deemed necessary by the Planning & Zoning Commission and the County Commission.

Section 5. Covenants, Rules and By-laws

The Planning and Zoning Administrator and the County Counselor shall review and discretionarily approve the restrictive covenants, rules and bylaws of the unit ownership, as prepared according to the provisions of this Article and the Condominium Property Act, Chapter 448 of the Revised Statutes of Missouri. This approval shall be obtained before any final plat is recorded or final site plan approved. Such documents, once approved, shall become part of the recorded subdivision plat or approved site plan.

Section 6. Maintenance of Common Open Space and Common Improvements

- A. If the Planning & Zoning Commission and County Commission determines that the public interest requires assurance concerning adequate maintenance of common open space areas and improvements, the County Commission may require that the restrictive covenants, rules and by-laws creating the unit ownership shall provide that if the unit owners establish and maintain such common open space, improvements, or any successor unit owners, shall at any time after establishment of the development fail to maintain the common open space/improvements in reasonable order and condition according to the provisions of the approved plans,
1. The County may serve notice in writing upon such unit owners.
 2. The notice shall describe how the unit ownership has failed to maintain the common open space/improvements in reasonable condition, and shall require that such deficiencies of maintenance be remedied within thirty (30) days thereof, and
 3. Hearing shall be held within twenty (20) days of notice.
- B. At such hearing the County Commission may modify the terms of the original notice concerning the deficiencies and may grant an extension of time to remedy these deficiencies.
- C. If said deficiencies are not corrected, the County may enter upon said common open space and maintain the same for one (1) year in order to preserve the taxable values of the properties within the development and to prevent the common open space/improvement from becoming a public nuisance.
- D. Said entry and maintenance shall not grant the public any rights to use the common open space/improvements unless the owners voluntarily dedicate the same to the public and such dedication is accepted by the County.
- E. Before the expiration of said one (1) year period and upon its initiative or upon the request of the unit owners theretofore responsible for the maintenance of the common open space/improvements, the County Commission shall call a public hearing upon notice in writing to such organization or to owners of the unit ownership. At said hearing, the unit owners shall show cause why such maintenance by the County shall not, at the election of the County Commission, continue for a succeeding one (1) year period.
- F. If the County Commission determines that said unit ownership is ready and able to maintain the common open space/improvements in reasonable condition, the County shall cease to maintain the common open space/improvements at the end of said one (1) year period or at any earlier

date prescribed by the County Commission.

- G. If the County Commission determines that such organization is not ready and able to maintain the common open space/improvements in a reasonable condition, the County Commission may, at its discretion, continue to maintain the common open space and/or improvements during the next succeeding year, subject to a similar hearing and determination in each year thereafter.
- H. The rules and bylaws creating the unit ownership shall further provide that the County's cost of maintenance, including cost of insurance, shall be assessed ratably against the individual properties within the development that have a right of enjoyment of the common open space and/or improvements. This assessment:
 - 1. Shall become a charge on said properties,
 - 2. The charges shall be due and payable by the owners of said properties within thirty (30) days after the receipt of same.
 - 3. The assessments shall constitute a lien against all properties within the unit ownership.

Section 7. Maintenance Responsibility

- A. Except as provided in Section 6, the County shall not be responsible for the maintenance of any common open space/improvements required by this Article.
- B. Initial maintenance of the common open space/improvements within a development shall be the responsibility of the developer.
 - 1. The restrictive covenants, rules and bylaws of the unit ownership may prescribe a method for transfer of maintenance responsibility to a duly constituted property owner's association.
 - 2. In the event no method for transfer or maintenance responsibility is prescribed, the developer shall retain this responsibility until fifty (50) percent of the development has been sold to the unit owners or other clients.
 - 3. When at least fifty (50) percent of the development has been sold, the established unit ownership, comprised of the development's unit owners shall be deeded the common open space/improvements and such owners shall become fully responsible for its maintenance and upkeep.
- C. The maintenance responsibilities of the developer listed in Section 4 shall be specifically indicated in a letter of agreement between the developer and the County. The developer shall submit said letter to the Planning & Zoning Commission at the time of final plat review.

ARTICLE 51. ENFORCEMENT

Section 1. Enforcement by Planning & Zoning Administrator

- A. The Planning & Zoning Administrator is charged with the enforcement of the Zoning Regulations and Subdivision Regulations.
- B. All departments, officials and public employees of Christian County, vested with the duty of authority to issue permits or licenses shall conform to the provisions of these Zoning Regulations and shall issue no permit or license for any use, building or purpose, in conflict with the provisions of these Zoning Regulations; any permit or license issued in conflict with the provisions of these Zoning Regulations shall be null and void.

Section 2. Filing Plans

- A. Every application for a zoning certificate or change shall be
 - 1. Accompanied by plans in such numbers as are specified by the Planning & Zoning Administrator,
 - 2. Drawn to scale in black line or blueprint, showing
 - a. the actual shape and dimensions of the lot to be changed in its use, in whole or in part;
 - b. the location, size and height of any building or structure to be erected or altered;
 - c. the existing and intended use of each building or structure or part thereof;
 - d. the number of families or housekeeping units the building is designed to accommodate; and,
 - e. when no buildings are involved,
 - (1) The location of the present use and proposed use to be made on the lot, and
 - (2) Such other information with regard to the lot and neighboring lots as may be necessary to determine and provide for the enforcement of these Zoning Regulations.
 - 3. One (1) copy of such plans may be returned to the owner when such plans have been approved by the Planning & Zoning Administrator, together with such Zoning Certificate as may be granted.

4. All dimensions shown on the plans relating to the location and size of the lot to be built upon shall be based on actual survey.
5. The lot and the location of the building thereon shall be staked out on the ground before construction is started.

B. In every case where the lot is not provided and is not proposed to be provided with public water supply and/or the disposal of sewerage by means of public sewers, the application shall be accompanied by a Certificate of Approval by the Health Department of Christian County of the proposed method of water supply and/or disposal of sanitary wastes.

Section 3. Zoning Certificate

A. It shall be unlawful for an owner to use or to permit the use of any structure, building or land, or part thereof, hereafter created, erected, changed, converted or enlarged, wholly or partly, until a zoning certificate shall have been issued by the Planning & Zoning Administrator.

1. Such zoning certificate shall show that such building or premises or part thereof, and the proposed use thereof, are in conformity with the provisions of these Zoning Regulations.
2. It shall be the duty of the Planning & Zoning Administrator to issue a zoning certificate, provided he or she is satisfied that the structure, building or premises, and the proposed use thereof, and the proposed methods of water supply and disposal of sanitary waste, conform to all the requirements of these Zoning Regulations.

B. No permit for excavation or construction shall be issued by the Planning & Zoning Administrator unless the plans, specifications and the intended use conform to the provisions of these Zoning Regulations.

C. The Planning & Zoning Administrator shall act upon each application on which he or she is authorized to act by the provisions of these Zoning regulations within thirty (30) days after the application is filed, in full compliance with the applicable requirements as specified under this Article.

1. Planning & Zoning Administrator shall either issue a Zoning Certificate within said thirty (30) day period or shall notify the applicant in writing of the refusal of such Certificate and the reasons therefor.
2. Failure to notify the applicant in case of such refusal within said thirty (30) days shall entitle the applicant to a zoning certificate unless the applicant consents to an extension of time.

- D. Under written request from the owner or tenant, the Planning & Zoning Administrator shall issue a zoning certificate for any building or premises existing at the time of enactment of these Zoning Regulations, certifying, after inspection, the extent and kind of use made of the building or premises, and whether such use conforms to the provisions of these Zoning Regulations.
- E. A zoning certificate shall not be required for platted subdivisions in the R-1 District.

Section 4. Fees

- A. No fees shall be charged for an original zoning certificate applied for coincident with the application for a building permit, where such permit is required and issued under the county building code.
- B. For all zoning certificates a fee shall be charged, as determined by the County Commission.

Section 5. Violations and Penalties

It shall be unlawful to locate, erect, construct, reconstruct, enlarge, change, maintain or use any building or land in violation of any of the provisions of these Zoning Regulations, or any amendment or supplement thereto, adopted by the County Commission of Christian County, Missouri.

Section 6. Procedures Upon Discovery of Violations

The Planning and Zoning Administrator shall have the power to cause any land, building, structure, place or premises to be inspected and examined and to order in writing the remedying of any condition found to exist therein or thereat in violation of the Zoning Regulations, Subdivision Regulations, Stormwater and Erosion Control Regulation or the Road and Access Standards.

- A. Any owner, lessee or tenant who, having been served with an order in writing signed by Planning and Zoning Administrator to correct or remove any such violation, shall fail to comply with the order within ten days after service, or who shall continue to violate any of the regulations or orders, shall be guilty of a misdemeanor.
- B. Any person or entity violating any of the provisions of these Zoning Regulations, or any amendment or supplement thereto, shall be deemed guilty of a misdemeanor and, upon conviction thereof, shall be fined not more than one thousand dollars (\$1000.00).
- C. Each and every day during which such illegal location, erection and/or construction may be deemed a separate offense.

Section 7. Violations – Remedies

In case any building is or is proposed to be located, erected, constructed, reconstructed, enlarged, changed, maintained, or used, or any land is or is proposed to be used in violation of these Zoning Regulations or any amendment or supplement thereto, the Planning & Zoning Administrator, or any adjacent or neighboring property owner who would be specially damaged by such violation, in addition to other remedies provided by law, may institute injunction, mandamus, abatement, or any other appropriate action, actions, proceeding or proceedings to prevent, enjoin, abate or remove such unlawful location, erection, construction, reconstruction, enlargement, change, maintenance or use.

ARTICLE 52. PLANNING and ZONING COMMISSION

Section 1. Members

- A. Upon the adoption of the county plan there is created in the county a county planning commission. The Christian County Planning and Zoning Commission shall consist of the county highway engineer or head of the highway department, and one resident of the county appointed by the county commission, from the unincorporated part of each township in the county, except that no such resident shall be appointed from a township in which there is no unincorporated area, as provided in sections 64.510 to 64.695. The township representatives are hereinafter referred to as appointed members.
1. The term of each appointed member shall be four years or until a successor takes office, except that the terms shall be overlapping and that the respective terms of the members first appointed may be less than four years.
 2. The term of the county highway engineer shall be only for the duration of the engineer's tenure of official position.
 3. Members shall be removable for cause by the County Commission upon written charges and after public hearings.
 4. **Officers**
At its first meeting in February of each year, the Planning and Zoning Commission shall, by majority vote of its membership (excluding vacant seats) elect one of its members to serve as chairperson, one member to serve as vice-chairperson, and one member to serve as secretary. The people so designated shall serve in these capacities for terms of one year. The Chairperson shall serve no more than two consecutive terms in that position. Vacancies in these offices may be filled for the unexpired terms only by majority vote of the Planning & Zoning Commission membership (excluding vacant seats). The chairman, vice-chairman, and secretary may take part in all deliberations and vote on all issues.
 5. **Quorum**
A quorum of the Planning and Zoning Commission shall consist of a majority of the membership (excluding vacant seats). A quorum is necessary for the Planning and Zoning Commission to take official action.

Section 2. Meetings

- A.** The Planning and Zoning Commission may create and adopt rules for the transaction of its business and shall keep a public record of its resolutions, transactions, findings and recommendations.
- B.** All members of the county planning commission shall serve as such without compensation, except that an attendance fee as reimbursement for expenses may be paid to the appointed members of the planning commission in an amount, as set by the county commission, not to exceed twenty-five dollars for each meeting.
- C.** Parliamentary procedure in Board meetings shall be governed by "Roberts Rules of Order, Newly Revised," except as specifically modified herein.
- D. Notice Letters**
Notice letters shall be mailed to the applicant and property owner, if different than the applicant and all property owners within one thousand (1,000) feet by certified mail at least fifteen (15) days prior to the public hearing. In sparsely populated areas, staff may require additional notification. The applicant shall provide the Planning Office with addressed, stamped notices for this purpose, as well as a list of property owners to whom notices are sent. Notices will be mailed by staff at the applicant's expense.
- E. Notice of Public Hearings**
Public hearings of applications shall be preceded by at least one (1) notice, published at least fifteen (15) days before the hearing in the official County newspaper (s). The applicant shall bear the costs of notice publication and shall submit an affidavit of publication as evidence that proper notice has been published.

ARTICLE 53. BOARD OF ADJUSTMENT

Section 1. Members

- A. The Christian County Commission which appointed a County Planning and Zoning Commission and which has adopted a comprehensive plan, as provided in sections 64.510 to 64.695, shall appoint a County Board of Adjustment.
1. The Board shall consist of five residents of the county, but not more than two shall be residents of the incorporated area of the county and not more than one may be a member of the county planning and zoning commission.
 2. The membership of the first board appointed shall serve respectively:
 - a. One for one year, one for two years, one for three years, and two for four years.
 - b. Thereafter members shall be appointed for terms of four years each.
 3. Members shall be removable for cause by the County Commission upon written charges and after public hearings.
 4. Vacancies shall be filled by the County Commission for the unexpired term of any member whose term becomes vacant.
 5. **Quorum**
Four members in attendance at any meeting shall constitute a quorum of the Board of Adjustment.
 - a. If at any meeting of the Board of Adjustment, a quorum shall fail to be present, or if at any meeting of the Board of Adjustment it should be suggested that a lack of quorum exists and the Board so finds, then the Chairperson or Acting Chairperson, shall adjourn such meeting to the earliest possible date in order to afford a full hearing upon such appeal or application pending.
 6. **Chairperson**
The Board of Adjustment shall elect its own Chairperson and Vice Chairperson, and shall adopt rules of procedure consistent with the provisions of the zoning regulations and the provisions of sections 64.510 to 64.695.
 - a. The chairperson, or in the chairperson's absence the acting chairperson, may administer oaths and compel the attendance of witnesses.

- (1) All interested witnesses wishing to speak will be sworn in before all the hearings are heard.
- (2) When the speaker approaches the podium they must state their name, address, and whether they have been sworn in previously.

7. Secretary

The person acting as Administrator of Planning and Zoning for Christian County shall act as Secretary for the Board of Adjustment and is hereby authorized and directed to publish, deliver, mail, and sign for on behalf of the Board of Adjustment on notices required.

- a. The Planning and Zoning Administrator shall not accept any applications for any meeting which are not filed at least thirty (30) days prior to said meeting.

8. Election

The Board shall, at its regular May meeting each year, elect by a majority of its membership, a Chairperson of the Board who shall serve until the successor has been elected and qualified, and in the same manner shall elect a Vice-Chairperson, who shall serve in the absence or inability of the Chairperson to act or perform the functions of his or her office.

Section 2. Meetings

- A. All meetings of the Board of Adjustment shall be open to the public and held at the call of the Chairperson and at such other times as the Board may determine, but unless otherwise specified, the regular meeting shall be the first Tuesday, or Wednesday as an alternate date, of each month at 9:00 a.m. on the second floor of the Historic Courthouse at 100 West Church Street, Room 208, Ozark, Missouri.
- B. Members of the board shall serve without compensation, but may be reimbursed for expenses incurred for attendance at not more than four meetings per year in an amount to be set by the county commission, not to exceed ten dollars per meeting.
- C. Parliamentary procedure in Board meetings shall be governed by "Roberts Rules of Order, Newly Revised," except as specifically modified herein.
- D. **Continued Meetings**
Motions for continuance in any case pending before the Board may be granted by the Board, within its discretion, and should for any reason a cause be continued, then such case will be automatically set for hearing on the next regularly scheduled meeting of the Board or at such sooner time appear for such hearing without further notice.

E. Tabled Meetings

An applicant to the Board may waive this provision by filing in writing, a request that this matter be tabled or by requesting in person or by legal representative, that this matter be tabled, which personal request shall be followed by an identical request in writing.

1. If the Board tables a matter upon such a request, the Board is required to take action upon such matter following bringing such matter off the table at the next regular meeting of the Board at which such matter may be considered.
2. All matters tabled for a period of 180 days without substantive amendment or final action shall be denied and removed from the agenda without further action by the Board.

F. Voting

The concurring vote of four-fifths of the regular board membership (excluding vacant seats) shall be necessary to reverse any order, requirement, decision, or determination of the administrative officer or body; or to decide in favor of the appellant / applicant any matter upon which it is required to pass under any ordinance, or to grant any variance.

1. If a motion to reverse or modify is not made then a motion to uphold the decision appealed from shall be in order.
2. This motion is adopted as the board's decision if supported by more than four-fifths of the board's membership (excluding vacant seats).

G. Records

All meetings of the Board of Adjustment shall be open to the public, and minutes shall be kept of all proceedings and official actions, which minutes shall be filed in the office of the board and shall be a public record.

Section 3. Appeals

- A. Appeals to the Board of Adjustment may be taken by any aggrieved owner, lessee or tenant of land, or by a public officer, department, board or bureau, affected by any decision of the administrative officer in administering a county zoning ordinance.
- B. Such appeals shall be taken within a period of not more than ninety days of the date of such decision, and in the manner provided by the rules of the board.

Section 4. Authority

- A. The Board of Adjustment shall have the following powers and it shall be its duty to hear and decide appeals where it is alleged there is error of law in any order, requirement, decision or determination made by an administrative official in the enforcement of the County Zoning Regulations:
1. To hear and decide all matters referred to it or which it is required to determine under the zoning regulations adopted by the County Commission as herein provided;
- B. In exercising the above powers, the Board may in conformity with the provisions of statute and the regulations reverse or affirm wholly or partly, or may modify the order, requirement, decision or determination appealed from and may make such order, requirement, decision or determination as ought to be made, and to that end shall have all the powers of the officer from whom the appeal is taken.
1. Any owners, lessees or tenants of buildings, structures or land jointly or severally aggrieved by any decision of the board of adjustment or of the county commission, respectively, under the provisions of sections 64.510 to 64.695, or board, commission or other public official, may present to the circuit court having jurisdiction in Christian County, a petition, duly verified, stating that the decision is illegal in whole or in part, specifying the grounds of the illegality and asking for relief there from.
 2. Upon the presentation of the petition the circuit court shall allow a writ of certiorari directed to the board of adjustment or the County Commission, respectively, of the action taken and data and records acted upon.
 3. The court may reverse or affirm or may modify the decision brought up for review.
 - a. After entry of judgment in the circuit court in the action under review, any party to the case may file an appeal to the appellate court having jurisdiction in the same manner now or hereafter provided by law.

Section 5. Stay of Proceedings

- A. An appeal shall stay all proceedings in furtherance of the action appealed from,
1. unless the officer from whom the appeal is taken shall certify to the board that by reason of facts stated in the certificate a stay would, in his / her opinion, cause imminent peril to life or property.

Section 6. Variances

- A. The County Commission shall provide for a Board of Adjustment with powers to modify or vary the regulations, in specific cases, in order that unwarranted hardships, which constitute an unreasonable deprivation of use as distinguished from the mere grant of a privilege, may be avoided, the intended purpose of the regulations being strictly observed and the public welfare and public safety protected.
 - 1. The county Board of Adjustment shall be appointed to serve as the board of adjustment for the building or setback line regulations.
- B. Where, by reason of exceptional narrowness, shallowness, shape of topography or other extraordinary or exceptional situation or condition of a specific piece of property, the strict application of any regulation adopted under sections 64.510 to 64.695 would result in peculiar and exceptional difficulties to or exceptional and demonstrable undue hardship upon the owner of the property as an unreasonable deprivation of use as distinguished from the mere grant of a privilege, the Board of Adjustment may authorize, upon an appeal relating to the property, a variance from the strict application so as to relieve the demonstrable difficulties or hardships, provided the relief can be granted without substantial detriment to the public good and without substantially impairing the intent, purpose, and integrity of the zone plan as embodied in the zoning regulations and map.
- C. In authorizing a variance, the Board of Adjustment may attach thereto such conditions regarding the location, character and other features of the proposed structure or use as it may deem necessary in the interest of the furtherance of the purposes of the regulations and in the public interest.
 - 1. In authorizing a variance, with guarantee or bond as it may deem to be necessary, that the conditions attached are being and will be complied with.
- D. No such variances in the provisions or requirements of the regulations shall be authorized by the Board of Adjustment unless the Board finds, beyond a reasonable doubt, that all the following facts and conditions exist:
 - 1. That there are exceptional or extraordinary circumstances or conditions applying to the property in question, or to the intended use of the property that do not apply generally to other properties or classes of uses in the same zoning districts.
 - 2. That such variance is necessary for the preservation and enjoyment of substantial property rights possessed by other properties in the same zoning district and in the same

vicinity.

3. That the authorizing of such variance will not be of substantial detriment to adjacent property and will not materially impair the purpose of the regulations or the public interest.

- E. No grant of a variance shall be authorized unless the Board of Adjustment specifically finds that the condition or situation of the specific piece of property, or the intended use of said property, for which variance is sought, one or the other in combination is not of so general or recurrent a nature as to make reasonable practicable the formulation of a general regulations for such conditions or situation.

Section 7. Application for Board of Adjustment Variance and Appeal Hearings

A. Public Notice

The applicant will provide public notice of the Board of Adjustment hearing by certified mail and newspaper notice. Notice of public hearings shall be posted on the property described in the application for the permit. The notice shall include the time, date and location of said hearing. The notice shall be supplied and posted by the staff at least fifteen (15) days prior to the hearing.

B. Application

Application shall be filed thirty (30) days before a scheduled hearing. All information to be discussed before the Board should in most cases to be submitted fifteen (15) days prior to the scheduled meeting. This will allow sufficient time for the staff to prepare the packets to the Board and give the Board a reasonable amount of time to review the information and to perform an on-site inspection, if needed. Substantial evidence submitted during the hearing may result in continuation or tabling the meeting to allow the Board sufficient time to review all evidence before a decision is made.

C. Application must be submitted with the following documents:

1. **Application Fee:** Fees must be paid to the department before a hearing can be held. Fees are non-refundable.
2. **Property Description:** Provide a copy of the recorded deed with the legal description attached.
3. **Property Owners:** Provide a list of property owners that was obtained from the Assessor's office.

4. **Reason:** Provide a typewritten description of the applicants reason for the appeal or variance requested.
5. **Plot Plan:** Provide a plot plan and/or a survey of the property. If a setback variance is requested, the survey must have the structure, easements, and property lines included.
6. **Evidence:** Provide any evidence 15 days prior to the scheduled hearing to be sent to the Board of Adjustment.

D. Notice Letters

Notice letters shall be mailed to the applicant and property owner, if different than the applicant and all property owners within one thousand (1,000) feet by certified mail at least fifteen (15) days prior to the Board of Adjustment hearing. In sparsely populated areas, staff may require additional notification. The applicant shall provide the Planning Office with addressed, stamped notices for this purpose, as well as a list of property owners to whom notices are sent. Notices will be mailed by staff at the applicant's expense.

E. Notice of Public Hearings

Public hearings of applications shall be preceded by at least one (1) notice, published at least fifteen (15) days before the hearing in the official County newspaper (s). The applicant shall bear the costs of notice publication and shall submit an affidavit of publication as evidence that proper notice has been published.

- F. Any party to any proceeding before the Board shall, insofar as it may be possible, prepare and submit in advance for hearing, six (6) copies of any exhibits proposed to be used in the proceeding, which said submission shall be made to the Board by filing the same in the office of the Planning and Zoning Department. The applicant and other proponents shall submit exhibits at least fifteen (15) days in advance of the hearing; the Planning and Zoning Department, other governmental agencies and departments, and opponents of the applicant's request shall submit exhibits at least ten (10) days in advance of the hearing. Each exhibit shall be identified as to the party who intends to sponsor the exhibit and shall be consecutively numbered or lettered. All material so submitted shall be deemed a public record and shall be open for inspection and copy by any person whomsoever. Any exhibit not so filed shall be admitted by the Board only upon a clear showing that such filing was not in good faith reasonably possible.

G. Proceedings

A proceeding before the Board consisting of an appeal by any aggrieved person from a decision of an administrative officer is a fact finding appeal made shorter than the Planning and Zoning Commission meetings on applications requesting a change of land use. Decisions will be based on any new information or evidence and based on incorrect or misleading information

presented in leading to the administrative decision. This is not a chance to rehear all the information presented in the planning and Zoning meeting. A copy of the file, letter of record, and minutes of the meeting will be submitted by the staff for evidence prior to the meeting.

Section 8. Board of Adjustment Hearing

A. Agenda

The Secretary shall prepare an agenda for such meeting and the order of business therein shall be as follows:

1. Roll Call
2. Approval of Minutes
3. Unfinished Business
4. Communication
5. Swearing in of All Witnesses
6. Hearings
7. Exceptions
8. Variances
9. Appeals
10. New Business
11. Closed meeting
12. Adjournment

B. All witnesses wishing to testify on any matter set for hearing by the Board of Adjustment shall be sworn before testifying.

C. Any witness may be cross-examined by any member of the Board.

D. Meeting Order

Each case coming before the Board shall be heard in the following order:

1. The presentation of the Planning and Zoning Department or any other public agency and cross-examination of their witness.
2. The presentation of the applicant (limited to 15 minutes for primary speaker, 5 minutes for each additional) and cross-examination.
3. Any public agency.
4. The presentation of parties in support to the applicant's position. (Limited to 5 minutes).
5. The presentation of parties opposed to the applicant's position (limited to 15 minutes for primary speaker, 5 minutes for each additional), not representing any governmental agency, and cross-examination of their witnesses.

6. The presentation of rebuttal testimony by the applicant and cross-examination of the rebuttal witnesses. Rebuttal testimony shall be limited to new matters made necessary in explanation of matters raised following the applicant's original presentation or in answer to matters so raised and shall not be for the purpose of merely resubmitting or restating matters previously submitted by the applicant in his original presentation. The applicants shall be given three additional minutes for rebuttal argument, if desired.
 7. Each person addressing the Board shall step up to the podium, state his name and address for the record, and whether they had been sworn in by the chairman. Unless further time is granted by the Board, the witness shall limit his address to five (5) minutes. All remarks shall be addressed to the Board as a body and not to any member thereof. No person, other than the Board and the person having the floor shall be permitted to enter into any discussion, either directly or through a member of the Board, without the permission of the Chairman. No question shall be asked of a member of the Board except through the presiding officer.
- E. Following presentation of all cases and requests at a meeting, the public session of the Board shall be declared at an end by the Chairman so that the Board may make its decisions.

Section 9. General Provisions

A. Burden of Proof

It shall be the burden of the applicant in any case before the Board to present sufficient facts and testimony that an affirmative decision by the Board in favor of the applicant will be based upon competent and substantial evidence upon the whole record of proceedings before the Board. Nothing shall prohibit any member of the Board inquiring of any witness or party at any time during the proceedings upon any fact or matter related to the proceedings, but it shall not be the duty of the Board to supply any deficiencies in or to seek to provide facts in any proceedings.

B. Presentation of Information or Evidence

If the applicant or the County staff provides the Board of Adjustment with information or evidence that was not included in the packet of information provided by the County staff to the Board approximately ten (10) days prior to the Board's scheduled meeting to consider the case, then said case may be tabled for one meeting.

C. Compel of Witnesses

The Chairman or Acting Chairman may compel the attendance of any witness so requested to be at such hearing for examination, cross-examination, or both. The office making such service of a subpoena shall

be entitled to receive therefore such fees as are allowed by law for similar service, to be paid by the County. The chairman shall have the power to administer oaths to witnesses.

D. Finding of Facts

Each member present at each meeting of the Board will make his separate findings in regard to each special exception and request for variance and taken together collectively, such findings will constitute the findings of the Board of Adjustment in each particular case. The staff shall be required to serve the Board's finding of facts and conclusions of law to the applicant by regular mail within five (5) days from the date of his notification of the Board's decision.

E. Request to Re-schedule Meeting

No affirmative relief will be granted to any applicant or appellant in any case unless the applicant, appellant, or his agent or attorney appear in person or by affidavit in writing duly verified which meets the required burden of proof, in any case in which the applicant, appellant or his agent or attorney fail to appear either in person or by written verified affidavit and no interested person appears protesting the granting of such relief, then such case will be dismissed by the Board without prejudice to the applicant to request another hearing in the time and manner necessary for the first hearing and upon

F. The Board of Adjustment shall adopt rules of procedure consistent with the provisions of the Zoning Regulations and the provisions of Sections 64.800 to 64.895 of the Revised Missouri Statutes.

Section 10. Powers of the Board of Adjustment

- A.** The Board of Adjustment shall have the power to hear and decide, in accordance with the provisions the Regulations, applications that are properly filed in the manner provided for:
1. Conditional uses,
 2. Special exceptions,
 3. Interpretation of the Zoning Map, or
 4. For decisions upon other special questions on which these Zoning Regulations provide that the Board of Adjustment shall decide.
- B.** In considering an application for a conditional use, a special exception or interpretation of the zoning map, the Board of Adjustment shall give due regard to the nature and conditions of all adjacent uses and structures;
- C.** In authorizing a conditional use or special exception, the Board of Adjustment may impose such requirements and conditions with respect to location, construction, maintenance and operation in addition to those

expressly stipulated in these Zoning Regulations for the particular conditional use or special exception as the Board of Adjustment may deem necessary for the protection of adjacent properties and the public interest.

Section 11. Conditional Uses and Special Exceptions

A. In addition to permitting the conditional uses and special exceptions specified in these Zoning Regulations, the Board of Adjustment shall have the power to permit the following conditional uses and special exceptions:

1. **Nonconforming Uses.** The substitution of a nonconforming use existing at the time of enactment of these Zoning Regulations by another nonconforming use, if no structural alterations, except those required by law or resolution, are made provided, however, that
 - a. in an Residential District, no change shall be authorized to any use that is not a permitted use or a conditional use in any Residential District and
 - b. in a Commercial District, no change shall be authorized to any use that is not a permitted use or a conditional use in any Commercial District.
2. The extension of a nonconforming building upon the lot occupied by such building, or on an adjoining lot, provided that:
 - a. such lot was under the same ownership as the lot in question at the time the use of such building became nonconforming, and
 - b. that such extension is necessary and incidental to such existing nonconforming use provided that
 - (1) The value of such extension shall not exceed in all one-third (1/3) of the assessed valuation for tax purposes of the existing building devoted to a nonconforming use,
 - (2) That such extension shall be within a distance of not more than fifty (50) feet of the existing building or premises, and
 - (3) Provided further that such extension shall in any case be undertaken within five (5) years of the enactment of these Zoning Regulations.
 - c. Provided, however, that the Board of Adjustment shall not authorize any extension or enlargement that would result in extending the useful life of a nonconforming building, or

that would result in violation of the provisions of these Zoning Regulations with respect to any adjoining premises.

Section 12. Extension of Use on Border of Zoning District

- A. The extension of a use or building into a more restricted Zoning District immediately adjacent thereto, but not more than twenty-five (25) feet beyond the dividing line of the two (2) Zoning Districts, under such conditions as will safeguard development in the more restricted Zoning District.

Section 13. Conditional Industrial Uses

- A. Permitting in such parts of any M-2 District as are more than six hundred (600) feet distant from any R District and more than two hundred (200) feet from every other Zoning District except an M-1 or F-1 District,
 - 1. Any of the industries or uses listed in Article 44 and permitted in any M-1 District as an accessory use,
 - 2. Any use permitted in an M-2 District as a principal use, as specified in Article 45.
- B. In doing so, the Board of Adjustment may require the installation, operation and maintenance in connection with the proposed use of such devices or such methods of operation as may, in the opinion of the Board of Adjustment, be reasonably required to prevent or reduce fumes, gas, dust, smoke, odor, water carried waste, noise, vibration or similar objectionable features, and
- C. May impose such conditions regarding the extent of open spaces between such industries or uses and surrounding properties as will tend to prevent or reduce the harm that might otherwise result from the proposed use of surrounding properties and neighborhoods.

Section 14. Temporary Structures and Uses

- A. Any use designated as temporary such as neighborhood block parties, fairs, and festivals, re-enactments, or outdoor concerts including seasonal uses such as fireworks stands, Christmas tree sales, roadside produce stands, not including those agricultural products grown on-site, but including other uses requiring retail sales must have a conditional use permit to be allowed in any Agricultural or Residential Zoning District.
 - 1. Activities conducted as fund raising events for non-profit organizations such as churches, libraries and museums do not require a conditional use permit so long as they do not exceed six (6) events per calendar year and each event shall not exceed a period of three (3) consecutive days.

2. The Board of Adjustment shall have the authority to allow any conditional use proposed, finding that such use is not inappropriate for neighborhood or for adjacent properties. The Board of Adjustment may make requirements, limitations or conditions with respect to the location, construction, maintenance and operation deemed reasonably necessary for the protection of the neighborhood or adjacent properties.
 3. No permit shall be granted for a period exceeding six (6) days except to promote seasonal sales or to allow a reasonable period in which to erect and take down temporary structures.
 4. A site plan must be submitted with all applications showing temporary structures, parking facilities and drives, emergency access easements and any applicable setbacks.
- B.** Outdoor events must include provisions for public safety, assurance of sanitary conditions, and adequate site design to accommodate vehicles, pedestrians, and temporary structures. At a minimum an applicant must include:
1. Provisions for adequate parking facilities,
 2. Estimates of the expected attendance for adequate restroom and wastewater disposal facilities,
 3. Access easements for ambulance and other emergency services to the entire festival area,
 4. A litter control plan showing location of all trash receptacles,
 5. Arrangements must be made for policing during and after the hours of the event, and
 6. Provisions must be made for any temporary street closure with the proper County office.

Section 15. Interpretation of Zoning Map

- A.** Where the street or lot layout actually on the ground, or as recorded, differs from the street and lot line as shown on the zoning map, the Board of Adjustment, after notice to the owners of the property and after public hearing, shall interpret the map in such a way as to carry out the intent and purposes of these Zoning Regulations.
- B.** In case of any question(s) as to the location of any boundary line between Zoning Districts, a request for interpretation of the zoning map may be made to the Board of Adjustment and a determination shall be made by said Board of Adjustment.

ARTICLE 54. VALIDITY AND EFFECTIVE DATE

Section 1. Validity

If any article, section, subsection, paragraph, sentence or phrase of these Regulations is for any reason held to be invalid by a Court of competent jurisdiction, such decision shall not affect the validity of the remaining portion of these Zoning Regulations.

Section 2. Effective Date

- A. These Zoning Regulations shall be given an effective date when enacted by the County Commission in the manner provided by Sections 64.510 through 64.695 of the Revised Statutes of Missouri.
- B. The subdivision regulations formerly known as Section 4-70 and 4-80 of the Unified Development Codes (UDC), the Road and Access Standards formerly known as Chapter Fifteen of the UDC and the Stormwater and Erosion Control Regulations formerly known as Chapter Nineteen of the UDC have been separated and removed from the UDC, resulting in the creation of three sets of regulations to be cited separately as the Christian County Subdivision Regulations, the Christian County Road and Access Standards and the Christian County Stormwater and Erosion Control Regulations;
 - 1. each to have the same effective date as the Zoning Regulations.
- C. The Zoning Regulations shall be in force and effect in all unincorporated portions of the County.

ORDER NO. 7-8-10-01

**ORDER of the
CHRISTIAN COUNTY COMMISSION
OZARK, MISSOURI**

DATE: July 8, 2010

SUBJECT: Adoption of Amendments to Zoning Regulations for Christian County, Missouri

WHEREAS, Christian County, Missouri desires to coordinate physical development in accordance with its present and future needs; so as to conserve the natural resources of the County, to insure efficient expenditure of public funds and to promote the health, safety, convenience, prosperity and general welfare of its inhabitants; and

WHEREAS, the Planning and Zoning Commission has held public hearings in order to obtain public input concerning the amendment of the Unified Development Codes (UDC) for Christian County, Missouri, which henceforth shall be known as the "Zoning Regulations for Christian County, Missouri", in accordance with the requirements of Section 64.670 of the Missouri Revised Statutes; and

WHEREAS, the Christian County Planning and Zoning Commission has recommended adoption of the "Zoning Regulations for Christian County, Missouri"; and

WHEREAS, the Christian County Planning and Zoning Commission has further recommended the removal and separation from the Zoning Regulations the subdivision regulations formerly know as Section 4-70, 4-75, 4-76, 4-77, 4-78 and 4-80 of the UDC, the Road and Access Standards formerly known as Chapter Fifteen of the UDC and the Stormwater and Erosion Control Regulations formerly known as Chapter Nineteen of the UDC, resulting in the creation of three sets of regulations to be cited separately as the "Christian County Subdivision Regulations", the "Christian County Road and Access Standards" and the "Christian County Stormwater and Erosion Control Regulations"; each to have the same effective date as the Zoning Regulations.

NOW, THEREFORE, on this 8th day of July, 2010, at a duly called meeting of the Christian County Commission, having received the report and recommendation of the Planning and Zoning Commission and, after public notice, and in open session, upon motion made by Commissioner Tom Huff, seconded by Commissioner Bill Barrett, and concurred by Presiding Commissioner Grubaugh, the Christian County Commission did vote unanimously to amend the Unified Development Codes for Christian County, Missouri, by adopting amended zoning regulations to be known as the "Zoning Regulations for Christian County, Missouri", for the purpose of regulating the use of land in the unincorporated areas of Christian County pursuant to the provisions of Chapter 64.510 through 64.695 of the Revised Statutes of Missouri to promote the orderly development of the County in accordance with the Comprehensive Development Plan of Christian County as adopted by the Planning Commission and approved by the County Commission, and to effectuate the use of other accepted purposes of zoning. Existing zoning regulations of the Unified Development Code of Christian County, Missouri, are repealed and superceded to the extent of their inconsistency with the Zoning Regulations of Christian County, Missouri adopted this date.

IT IS HEREBY ORDERED that the Unified Development Codes for Christian County, Missouri, are hereby amended and in lieu thereof zoning regulations to be known as the "Zoning Regulations for Christian County, Missouri" are hereby adopted and enacted as described in the Zoning Regulations which are attached hereto and incorporated herein by this reference and a copy shall be on file in their entirety at the Christian County Planning & Zoning office, 202 West Elm Street, Ozark, Missouri 65721.

IT IS FURTHER ORDERED that the Zoning Regulations for Christian County, Missouri adopted hereunder provide penalties for the violation thereof, and authorize said Regulations to be amended from time to time by Order of the Christian County Commission.

IT IS FURTHER ORDERED that the map portion of these regulations may be cited separately as the Christian County Zoning Map, a copy of which is incorporated into the Zoning Regulations for Christian County, Missouri. The zoning map shall be on file at the Christian County Planning and Zoning office.

IT IS FURTHER ORDERED that the following parcels numbers shall be amended upon the Christian County Zoning Map as specified below:

Parcel Number	Property Owner	Proposed Zoning Map Designation	Amended Zoning Designation
9-0.2-9-0-0-6	Journagan Construction	M-2	A-1
20-0.6-13-3-2-5	Christopher Snyder	R-1	C-2
20-0.6-23-0-0-14	Steven & Melissa Stewart	A-R	A-1
18-0.6-24-0-0-17	Rex & Phoebe Snapp	A-R	A-1
10-0.8-28-1-1-4	Ben & Cathryn Sayle	A-R	A-1
12-0.7-26-0-0-5	Roy & Connie Goins	A-R	A-1

IT IS FURTHER ORDERED that upon the recommendation of the Planning & Zoning Commission, the Christian County Commission may establish by Rule fees for any service the Planning and Zoning Department provides in order to pay for any costs incurred in carrying out the administration and enforcement of these Regulations in the unincorporated areas of Christian County, Missouri pursuant to Section 64.540, RSMo.

IT IS FURTHER ORDERED that the Zoning Regulations for Christian County, Missouri shall become effective on 9th day of August, 2010, and a copy of this Order shall be filed in the office of the County Clerk before 5:00 p.m. this date.

Christian County Zoning Regulations

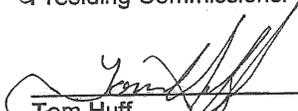
Done this 8th day of July, 2010, at 11:15 o'clock 9 .m.

CHRISTIAN COUNTY COMMISSION



John Grubaugh
Presiding Commissioner

Yes X
Dated: 7-8-10



Tom Huff
Commissioner, Eastern District

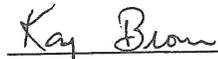
Yes X
Dated: 7-8-10



Bill Barnett
Commissioner, Western District

Yes X
Dated: 7-8-10

ATTEST:



Kay Brown
County Clerk

23385-000\ 383506.doc

The ZONING REGULATIONS FOR CHRISTIAN COUNTY, MISSOURI, were first adopted on July 8, 2010. Various amendments have been made to the original regulations. Those amendments to the original regulations are listed in the order that they were adopted by the Christian County Commission:

AMENDMENTS – Adopted December 9, 2010 (Effective January 1, 2011)

Article 2, Section 2

Amend the definition of **Guest House** to the following:

A living area in an accessory building of 1,000 square feet or less.

Add the following definitions:

Manufactured Home Park

See Mobile Home Park

Manufactured Home Subdivision

See Mobile Home Subdivision

Add the following language to the definition of **Mobile Home Park**:
mobile homes or

Add the following language to the definition of **Mobile Home Subdivision**:
manufactured homes

Article 3, Section 2

Add the following language to A-1 Quick Reference Guide:

Individual single-family dwelling with individual well and approved on-site sewage system.

Article 4, Section 10

Amend all of Article 4, Section 10, by replacing with a new Section 10,
Accessory Buildings and Uses.

Article 9, Section 1

Add the following language to Section 1:

Manufactured homes shall be constructed pursuant to the standards of the *National Manufactured Housing Construction and Safety Standards Act of 1974*, 42 United States Code §5401 *et seq.*; 24 CFR Part 3280 and Part 3282, that became effective June 15, 1976.

Article 9, Section 2

Add the following language to Section 2:

Manufactured home or

Article 9, Section 3

Delete the following language from Section 3:

No mobile home shall be placed in any district, other than in a MH-1 District or an A-1 Agriculture District, except in a previously approved or grandfathered mobile home park or mobile home subdivision.

Add the following language to Section 3:

Manufactured homes and mobile homes shall be allowed within a MH-1 District.

Article 9, Section 4

Amend all of Article 9, Section 4, by replacing with a new Section 4, Allowed in A-1 and A-R Districts with Provisions.

Article 9, Section 5

Rename the former Article 9, Section 4 as Article 9, Section 5.

Article 9, Section 6

Add a new Article 9, Section 6.

Article 31, Section 1

Add an new Article 31, Section 1 (B,1,c)

Article 31, Section 5

Add the following language to A-1 Chart:

Individual single-family dwelling with individual well and approved on-site sewage system.

Article 34, Section 2

Add the following language to Section 2 (A&B):
or mobile home

Article 51, Section 6

Add a new Article 51, Section 6.



STORMWATER & EROSION CONTROL REGULATIONS

for

CHRISTIAN COUNTY, MISSOURI



Originally Adopted as Chapter Nineteen
of the Unified Development Codes

Amendments Adopted July 8, 2010 to be Effective August 9, 2010 and
shall be henceforth known as the Stormwater & Erosion Control
Regulations of Christian County, Missouri

STORMWATER & EROSION CONTROL REGULATIONS

for

CHRISTIAN COUNTY, MISSOURI

Christian County Commission

Lou Lapaglia, Presiding Commissioner
Bill Barnett, Western District Commissioner
Tom Huff, Eastern District Commissioner

Christian County Planning and Zoning Commission

John View, Chairman
Allen Bishop, Secretary

Maryann Harter, Vice Chairman

Richard Alling
Donald Dishon
Gerald Griffin
John Hudgins
Louis Lapaglia
Charlie Rogers

Joe Rozell
Phil Short
Cameron Smith
John L. Smith
Robert Snook
John Uhrig

Christian County Planning and Zoning Staff

Todd M. Wiesehan
Planning & Zoning Administrator

Cathy Leming
Office Manager

Josh Bird
Code Enforcement
Environmental Inspector

Lena Cheney
Code Enforcement

Linda Failla
MSAG Coordinator
911 Mapping

STORMWATER & EROSION CONTROL REGULATIONS CHRISTIAN COUNTY, MISSOURI

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STORMWATER and EROSION CONTROL REGULATIONS CHRISTIAN COUNTY, MISSOURI

ARTICLE 1. GENERAL PROVISIONS

Section 1. Scope

These design criteria set forth the minimum standards for design of storm drainage facilities on public right-of-way and private property in the unincorporated areas of Christian County, Missouri.

Section 2. Authority

These design criteria and standards set forth herein have been adopted by the Christian County Commission, in accordance with the procedures and authority set forth in the Christian County Zoning Regulations and the Christian County Subdivision Regulations.

Any development or grading begun after the date of passage of these criteria and standards which does not comply with the requirements set forth herein shall be deemed to be in violation of the requirements established herein; and shall be subject to the following enforcement measures and penalties:

- A. Any person or entity violating any of the provisions of these Stormwater and Erosion Control Regulations, or any amendment or supplement thereto, shall be deemed guilty of a misdemeanor and, upon conviction thereof, shall be fined not more than one thousand dollars (\$1000.00).
- B. Each and every day during which such illegal location, erection and/or construction may be deemed a separate offense.

Section 3. Interpretations

Where any of the provisions contained herein may be unclear or ambiguous as they pertain to a particular site or situation, interpretations of the policies, criteria, and standards set forth herein shall be made in writing by the Christian County Engineer.

Such written interpretations shall be kept on file for future reference for use in similar situations, and shall be incorporated in subsequent revisions for the standards, if deemed necessary for general reference.

Section 4. Appeals

Where disagreements may arise over the interpretation of the requirements set forth herein, appeals may be made in accordance with procedures established by the Christian County Zoning Regulations, the Christian County Subdivision Regulations, or the Christian Building Regulations, as applicable.

Section 5. Stormwater Management Plan Requirements

A. General Requirements

1. The owner or operator of land development activities not exempted under Section 6 of this Article must submit a stormwater management plan.
2. The stormwater management plan shall include the specific required elements that are listed and/or described in the Christian County Stormwater and Erosion Control Regulations, as amended or provide sufficient analysis as detailed in Article 8 which demonstrates that the proposed development will not increase runoff levels beyond those deemed acceptable based on these regulations. Additional information shall be provided as necessary to allow an adequate review of the site conditions.
3. No approval for a building permit shall be issued until the required stormwater management plan is approved by the Planning Administrator in coordination with the County Engineer.
4. The developer/applicant is responsible for the review expenses of the County Engineer.

Section 6. Developments Exempt from a Stormwater Management Plan

It is acknowledged that any exemptions are reviewed by the Planning Administrator and should not be construed as an opportunity to circumvent the letter and spirit of the Christian County Stormwater and Erosion Control Regulations. It is also not the intent of Christian County Government to place undue and unreasonable hardships on individual business and property owners. A development shall be required to submit a Stormwater Management Plan unless it meets the criteria put forth in this Section.

A. Responsibilities of Exempt Developments

The exemptions listed in sub-section B shall not be construed as exempting these developments and redevelopments from onsite drainage improvements that may be required in accordance with building and construction codes, nor from compliance with any sections of Article 2, the County's Illicit Discharge ordinance, nor from providing adequate erosion prevention and sediment control measures to protect adjoining property owners and the public right-of-way.

B. Exemptions

The following developments and redevelopments are exempt from the requirements for a Soil and Erosion Control permit and for a Stormwater Management Plan:

1. Single to two-family individual residential dwellings in any given area that conform to all of the following criteria:
 - (a) do not alter a drainage channel; and,
 - (b) disturb less than one (1) acre of land; and,
 - (c) are not part of a larger common plan of development or sale that would disturb one (1) acre or more;
 - (d) do not alter the natural ground elevation by more than five (5) feet;
 - (e) is not located within a mapped sinkhole, or if located outside of the allowable building areas and not located within 30 feet of spring, sinkhole, wetland, or watercourse.
2. Commercial or industrial development that conform to all of the following criteria:
 - (a) disturbs less than one (1) acre of land; and,
 - (b) is not part of a larger common plan of development or sale that would disturb one (1) acre or more; or,
 - (c) adds less than five-thousand (5,000) square feet of impervious surface; and,
 - (d) does not alter the drainage channel; and,
 - (e) does not alter the natural ground elevation by more than five (5) feet;
 - (f) is not located within a mapped sinkhole, or if located outside of the allowable building areas and not located within 30 feet of spring, sinkhole, wetland, or watercourse.
3. Minor land disturbing activities such as home gardens and individual home repairs, landscaping, or maintenance work;
4. Individual utility service connections, unless such activity is carried-out in conjunction with the clearing, grading, excavating, transporting, or filling of a lot or lots for which a grading permit would otherwise be required by the regulation;
5. Installation, maintenance or repair of individual septic tank lines or drainage fields, unless such activity is carried out in conjunction with the clearing, grading, excavating, transporting, or filling of a lot or lots for which a grading permit would otherwise be required by the regulation;
6. Installation of posts or poles;
7. Farming activities;
8. Emergency work to protect life or property, and emergency repairs, provided that the land area disturbed shall be shaped and stabilized in accordance with the requirements of this regulation as soon as practicable.

ARTICLE 2. APPROVALS and PERMITS REQUIRED

Section 1. Procedure

- A. With application for a Soil Erosion & Control Permit, the County shall require the developer to post a performance bond, irrevocable letter of credit, escrow agreement, lender's agreement, cash bond, cash or certified check of not less than the value of all work to be done under the Permit. An itemized construction cost estimate of each portion of the work shall be submitted with the security.
- B. After approval of all drawings, specifications and security, the County shall issue a permit to the developer for the specified work.

Construction of detention/sedimentation basins shall be completed prior to any work on the site, including clearing & grubbing.
- C. Upon completion of the specified construction, a final inspection will be conducted by the County Engineer. A "punch-list" of unsatisfactory items will be provided to the developer within 1 week of the final inspection. Upon satisfactory completion of "punch-list" items and after As-Built Drawings are provided to the County, the County Engineer will issue a letter of approval to the developer along with a release of the security.
- D. The developer/applicant is responsible for the review expenses of the County Engineer.

Section 2. Soil Erosion & Control Permit

Storm drainage facilities may not be constructed or altered without review and approval of the plans by the County and issuance of a Soil Erosion & Control Permit by the County for subdivisions or for commercial or other sites.

- A. Soil removal from a pond or lake shall be limited to one (1) acre without a permit.
- B. Soil removed or disturbed over 1 acre shall require a Soil Erosion & Control Permit.

Section 3. National Pollutant Discharge Elimination System (NPDES) Stormwater Permit

- A. Provisions of the 1987 Clean Water Act require that certain stormwater discharges obtain an NPDES stormwater permit. In Missouri, these permits are administered by the Missouri Department of Natural Resources.
- B. Federal rules for NPDES stormwater discharges are contained in 40 CFR Parts 122, 123, and 124 of the Code of Federal Regulations.

Christian County Stormwater and Erosion Control Regulations
Article 2 – Approvals and Permits Required

- C. State NPDES stormwater regulations are contained in 10 CSR 20-6.200 of the Code of State Regulations.
- D. Per the State and Federal regulations cited above, a Storm Water Pollution Prevention Plan (SWPPP) must be prepared for all developments disturbing 1 acre or more. A copy of this plan shall be submitted to Christian County with the application for a Soil Erosion & Control Permit. The EPA resource “Developing Your Stormwater Pollution Prevention Plan” should be used as a guide in preparing the SWPPP.
- E. Additional provisions for NPDES stormwater permits for land disturbance activities and information regarding a Christian County Soil Erosion & Control Permit for land disturbance activities are contained in Article 3 of these Criteria.

Section 4. "404" Permit

- A. For certain activities which involve the discharge of dredged or fill materials into the waters of the United States a Department of the Army permit may be required as set forth in Section 404 of the Clean Water Act. Rules for 404 permits are contained in 33 CFR Parts 320 through 330 of the Code of Federal Regulations.
- B. Determination of applicability for Section 404 requirements are generally made by the Kansas City or Little Rock District office of the Corps of Engineers.
- C. A brochure regarding the Corps of Engineers regulatory program may be obtained from the Corps offices.

Section 5. Coordination With Other Jurisdictions

- A. Where proposed storm drainage facilities are located on property adjoining to other local government jurisdictions design of storm drainage facilities shall include provisions to receive or discharge storm water in accordance with the requirements of the adjoining jurisdiction, in addition to meeting County requirements
- B. In these cases 2 additional sets of plans shall be submitted and will be forwarded to the adjoining jurisdiction for review and comment.
- C. No grading or construction of storm drainage facilities may commence without prior notification of the Missouri One Call utility warning system at 1-800-DIG-RITE, as required by law.

ARTICLE 3. GRADING, SEDIMENT & EROSION CONTROL

Section 1. Goals & Objectives

The goal of this article is to effectively minimize erosion and discharge of sediment by application of relatively simple and cost effective Best Management Practices.

- A. This goal can be attained by meeting the following objectives:
 - 1. Minimize the area disturbed by construction at any given time.
 - 2. Stabilize disturbed areas as soon as possible by re-establishing sod, other forms of landscaping, and completing proposed structures, pavements and storm drainage systems.
 - 3. Provide for containment of sediment until areas are stabilized.
 - 4. Provide permanent erosion controls.

Section 2. General Design Guidelines

The following items must be considered in preparing a sediment and erosion control plan:

- A. **Temporary vs. Permanent Controls**

The greatest potential for soil erosion occurs during construction. Temporary controls are those that are provided for the purpose of controlling erosion and containing sediment until construction is complete.

Temporary controls include straw or hay bale dikes, silt fences, erosion control blankets etc., which are not needed after the area is stabilized.

Permanent controls consist of riprap, concrete trickle channels, sedimentation/detention basins, etc., which will remain in place through the life of the development.

It is possible for the same facility to serve both a temporary and permanent purpose. The difference between temporary and permanent erosion control should be clearly recognized in preparing a sediment and erosion control plan.

- B. **Sheet Flow vs. Concentrated Flow**

In areas where runoff occurs primarily as sheet flow, containment of sediment is relatively simple. In these areas straw or hay bales, silt fences and vegetative filter areas can be very effective.

Where concentrations of flow occur containment of sediment becomes more difficult as the rate and volume of flow increase. In these areas more sophisticated controls such as sedimentation basins must be provided.

- C. **Slope**

Control of erosion becomes progressively more difficult as the slope of the ground increases. Areas with steeply sloping topography, and cut and fill slopes must be given special consideration.

D. Soils and Geologic Setting

Area soils and the geologic setting must be considered in preparing the plan and any special considerations deemed necessary for a particular site provided.

E. Environmentally Sensitive Areas

Where construction occurs within the vicinity of permanent streams, springs, sinkholes, lakes or wetlands, special attention must be given to preventing discharge of sediment.

Section 3. Soil Erosion & Control Permits

A. Permit Exceptions

Soil Erosion & Control permits are required for all construction sites with the following exceptions:

1. Grading for single family or duplex residences constructed in subdivisions where approved sediment and erosion controls have been constructed.
2. Emergency construction required repairing or replacing roads, utilities, or other items affecting the general safety and well being of the public.

For emergency construction sites which would otherwise be required to obtain a permit, and for which remedial construction will take more than 14 calendar days, application for the permit must be made within 3 calendar days from the start of construction.

3. The following activities, provided that they are not located within 30 feet of a spring, sinkhole, wetland, or watercourse:
 - a. Gardening or landscaping normally associated with single-family residences that cover less than 1/2 acres.
 - b. Grading and repair of existing roads or driveways.
 - c. Cleaning and routine maintenance of roadside ditches or utilities.
 - d. Utility construction where the actual trench width is 2 feet or less.

B. Permit Procedure

An approved grading, sediment and erosion control plan must be received prior to issuance of a Soil Erosion & Control Permit:

The submittal and approval procedure is as follows for Subdivisions, Commercial and Other Sites.

The sediment and erosion control plan shall be submitted for review along with the plans for the proposed improvements.

Permits for commercial, multi-family or major subdivisions will be issued by the County after the project plans have been approved.

Section 4. Erosion & Sediment Control Plan

A. Professional Qualifications

Sediment and Erosion Control Plans must be prepared by and bear the seal of an engineer, land surveyor, architect, landscape architect or geologist registered to practice in the State of Missouri or by a Certified Professional in Erosion and Sediment Control (CPESC) who has attained certification by the Soil & Water Conservation Society

B. Plan Requirements

The sediment & erosion control plan must be drawn to scale and must include the following items:

1. Location map at a scale of 1" = 2000'.
2. Legal description of the property.
3. North arrow and scale.
4. One-Call utility notification symbol.
5. Title block.
6. Signature block for licensed professional.
7. Design professional's seal.
8. Existing topographic contours at five feet (5') maximum intervals.

NOTE: Contours can not be interpolated from U.S.G.S. maps. Each fifth (5th) contour (index contour) shall be labeled and shown in heavier line weight. Index contours must be labeled in a sufficient number of locations to allow the pan to be followed. Labels for existing and finish grade contour shall be distinguished by use of different symbols or fonts.

9. Proposed grades.
10. Existing and proposed utilities.
11. Existing ground covering (open areas, tree masses, etc.)
12. Existing buildings, drives and pavements.
13. Proposed buildings or other structures, drives and pavements.

14. Limits of area to be disturbed (shading preferred).
15. Location of erosion and sediment controls.
16. Details of non-standard erosion and sediment controls.
17. Seeding & mulching requirements.
18. Total site area, total disturbed area.
19. Location of stockpile areas, staging area, etc.
20. Location of temporary construction entrance.

C. Plan Exceptions

Plans will not be required in the following cases:

1. Grading associated solely with a single-family residence
2. Grading or filling of less than 1 acre if located outside of the allowable building areas and not located within 30 feet of spring, sinkhole, wetland, or watercourse.

These instances a grading permit can be issued, providing an inspection of the site by a representative of the County does not reveal conditions that would warrant preparation of a detailed plan.

D. Other Permits

1. NPDES Stormwater Permit

Construction sites where the area to be disturbed is 1 acre or more must apply for a stormwater discharge permit from the Missouri Department of Natural Resources.

Permit requirements are set forth in 10 CSR 20-6.200 of the Missouri Clean Water Laws.

A Stormwater Pollution Prevention Plan (SWPPP) must be prepared in accordance with Missouri Clean Water Laws. A copy of the SWPPP must be submitted with the application for a Soil Erosion & Control Permit.

2. "404" Permit

Grading activities in streams or wetlands may require a Department of the Army Permit under Section 404 of the Clean Water Act.

Section 5. Design Standards & Criteria

A. Grading

1. Maximum Grades

Cut or fill slopes shall not exceed 4:1.

2. Maximum Height

Cut or fill slopes shall not exceed 15 feet in vertical height unless a horizontal bench area at least 5 feet in width is provided for each 15 feet in vertical height.

3. Minimum Slope

Slope in grassed areas shall not be less than 1%.

4. Construction Specifications

Construction for streets must comply with specifications set forth in the Christian County Road and Access Standards.

For all other areas, construction specifications stating requirements for stripping, materials, subgrade compaction, placement of fills, moisture and density control, preparation and maintenance of subgrade must be included or referenced on the plans, or accompanying specifications submitted.

5. Spoil areas

Broken concrete, asphalt and other spoil materials may not be buried in fills within proposed building or pavement areas.

Outside of proposed building and pavement areas, broken concrete or stone may be buried in fills, provided it is covered by a minimum of 2 feet of earth.

Burying of other materials in fills is prohibited.

6. Stockpile Areas

Location of proposed stockpile areas shall be outlined on the plans, and specifications for proper drainage included.

7. Borrow Areas

The proposed limits of temporary borrow areas shall be outlined in the plans and a proposed operating plan described on the grading plan.

Temporary slopes in borrow areas may exceed the maximums set forth above. At the time that borrow operations are completed, the area shall be graded in accordance with the criteria set forth above, and reseeded.

B. Sediment Containment

1. Existing Vegetative Filter Area

Existing vegetative filter areas may be used where:

- a. unconcentrated sheet flow occurs,
- b. an area of existing vegetation a minimum of 30 feet in width can be maintained between the area to be graded and a property line, watercourse, sinkhole, spring, wetland or classified lake,
- c. existing ground slope is no greater than 5:1 (20%),
- d. the existing vegetative growth is of sufficient density and in sufficiently good condition to provide for filtration of sediment.

Vegetative filter areas are a temporary and permanent practice.

2. Hay/Straw Bale Dike, or Silt Fence

Containment areas constructed of hay or straw bales, or silt fence may be provided in areas where:

- a. unconcentrated sheet flow occurs,
- b. an area of existing vegetation a minimum of 25 feet in width cannot be maintained between the area to be graded and a property line, watercourse, sinkhole, spring, wetland or classified lake,
- c. existing ground slope is no greater than 5:1 (20%),
- d. concentrated flow from an area no greater than 1 acre occurs and a minimum volume of 1000 cubic feet per acre is contained behind the dike. Either cereal grain straw or hay may be used for bale dikes. Straw/hay bale dikes shall be constructed as shown in Drawing 4.

Straw/hale bale dikes and silt fences are temporary practices.

3. Temporary Containment Berms

Temporary containment berms may be provided for areas where concentrated flow from areas greater than 1 acre and less than 5 acres occurs. Temporary containment berms must contain a volume of 1000 cubic feet per acre of drainage area.

Temporary containment berms shall have a riprap outlet with a sediment filter as shown in Drawing 3, or a perforated pipe outlet as shown in Drawing 6.

Details for temporary containment berms are shown in Drawing 2.

Temporary containment berms and accumulated sediment may be completely removed after the tributary area is stabilized, and must be removed prior to final acceptance and release of escrow.

4. **Permanent Sedimentation/Water Quality Basin**

Permanent sediment/water quality basins shall be provided for all areas where concentrated flow occurs from an area of 5 or more acres or where 2 or more acres are stripped of vegetation. Sediment basins shall be designed to detain 125% of the runoff from 1" of rainfall from the development, for a period of between 24 and 48 hours. Runoff shall be calculated using the methods contained in Chapter 2 of TR-55 (Reference 11), using the recommended curve number for newly graded areas from Table 2-2a.

a. Sediment basins shall be provided with an outflow structure consisting of:

1. a flow restriction device which provides for the required detention time,
2. an outfall pipe sized to carry the maximum estimated outflow rate,
3. protective structures at the pipe outlet to prevent crushing or damage of the end of the pipe,
4. protective structures to prevent blockage of the pipe with debris,
5. erosion protection at the pipe outlet.
6. a typical outlet structure is shown in Drawing 2.
7. An overflow spillway capable of discharging the peak flow rate for the 4% annual probability (25-year) storm while maintaining a minimum freeboard of 1 foot.

Overflow spillways may be sodded where the depth of flow at the crest is limited to no greater than 6" and outlet channel velocities do not exceed 5 feet per second for the minor (25-year) storm.

Overflow spillways not meeting these restrictions must be constructed of riprap, concrete or other approved, non-erodible material.

C. Erosion Protection

1. Seeding and Mulching

a. Permanent Seeding

Permanent seeding fertilizer and mulch shall be applied at the rates set forth in Drawing 1 or according to other specifications, which are approved with the Grading Permit.

Permanent seeding seasons are from March 1 to May 15, and August 15 to October 15.

b. Mulching

Where slopes are less than 4:1, cereal grain mulch is required at the rate of 100 pounds per 1000 square feet (4500 pounds per acre). Cereal grain mulch shall meet the requirements of Section 802 of the State Specifications (Reference 17) for Type 1 mulch.

Where slopes are 4:1 or greater Type 3 mulch ("hydromulch") meeting the requirements of Section 802 of the State Specifications (Reference 17) shall be used.

c. Temporary Seeding

Whenever grading operations are suspended for more than 30 calendar days between permanent grass or seeding periods, all disturbed areas must be reseeded with temporary cover according to Drawing 1.

Temporary seeding season runs from May 15 to November 15.

d. Overseeding

During the winter season (November 15 to March 1) temporary seed and mulch shall be placed on all completed areas or areas where grading is suspended for more than 30 calendar days. During this period seed, mulch, and soil amendments shall be applied at the following rates:

Lime: 100% of specified quantity.*
Fertilizer: 75% of specified quantity.
Seed: 50% of specified quantity.
Mulch: 100% of specified quantity.

* Per Drawing 1.

Areas seeded during this period shall be reseeded and mulched during the next permanent seeding season according to seeding requirements.

e. **Maintenance**

Seeded areas must be maintained for one year following permanent seeding.

2. **Cut and Fill Slopes**

Cut and fill slopes shall be protected from erosion by construction of straw bale dikes, silt fences, diversion berms, or swales along the top of the slope.

Where drainage must be carried down the slopes, pipe drains, concrete flumes, riprap chutes, or other impervious areas must be provided. Suitable erosion control measures such as riprap stilling basins, must be provided at the bottom of the slope.

Diversions shall be maintained until permanent growth is firmly established on the slopes.

Typical diversion details are shown in Drawing 3.

Riprap chute details are shown in Drawing 5.

3. **Channels and Swales**

Permanent channels and swales shall be provided with a stabilized invert consisting of one of the following materials:

a. **Sod**

Where the average velocity of flow is 5 feet per second or less and there is no base flow, the channel shall be lined with sod.

For channels with a bottom width less than 15 feet, sod shall extend up the side slope to a minimum height of 6" above the toe. (Drawing 7).

Channels with a bottom width of 15 feet or greater, shall be graded as shown in Drawing 7 and contain a low flow area, 15 feet in width lined with sod.

The remainder of the channel slopes shall be seeded and mulched as provided above.

4. **Erosion Control Blanket**

Commercial erosion control blankets may be used in lieu of sod provided that samples are submitted and approved by the County. The guaranteed maintenance period shall be one year.

5. **Non-Erosive Lining**

In grass channels where base flow occurs, a non-erosive low-flow channel of riprap or concrete must be provided. Low flow channels shall have a minimum capacity of 5 cubic feet per second. Other suitable non-erosive materials may be specified with approval of the County.

For channels which have an average velocity of 5 feet per second or greater a non-erosive lining of riprap concrete or other approved material must be provided.

6. **Storm Sewer and Culvert Outlets**

Erosion protection shall be provided at storm sewer and culvert outlets. Minimum erosion protection shall consist of a concrete toe wall and non-erosive lining, meeting the County's specifications.

The required length of non-erosive lining will not be decreased where flared end sections or headwalls are provided unless calculations and data to support the decrease in length are submitted and approved.

Non-erosive lining shall consist of riprap, unless otherwise specified and approved. Field stone, gabions, or Riprap shall extend to the point at which average channel velocity for the peak flow rate from the minor (5-year) storm has decreased to 5 feet per second maximum.

The length of riprap to be provided shall be as follows:
(See Drawing 8.)

Average outlet velocity less than 5 feet per second:

$L = 3$ times the pipe diameter or culvert width.

Average outlet velocity less than 5-10 feet per second:

$L =$ length determined using Drawing 8.

Average outlet velocity greater than 10 feet per second:

Use MoDOT standard energy dissipater headwall.
(Reference 17.)

The height of erosion protection shall be as shown in Drawing 8.

Minimum toe wall dimensions are shown in Drawing 8. Where headwalls or flared end sections are specified, toe walls must be provided at the downstream end.

7. Curb Openings

Where drainage has been approved by the County to flow from paved areas to grass areas through curb openings erosion protection shall be provided as shown in Drawing 9.

8. Ditch Checks & Drop Structures

In grass channels grades and velocities may be controlled by use of ditch checks and drop structures.

Riprap ditch checks may be required in natural channels where average velocity for the peak flow rate from the 5-year storm exceeds 5 feet per second for post-development conditions.

9. Spillways

Erosion protection must be provided at spillways and outlet structures for detention ponds. Erosion protection shall extend to the point where flow has stabilized and average velocity in the outlet channel is 5 feet per second or less.

10. Temporary Construction Entrance

A minimum of one temporary construction entrance is required at each site. Additional temporary entrances may be provided if approved. The location of each construction entrance shall be shown on the plan.

Only construction entrances designated on the sediment and erosion control plan may be used. Barricades shall be maintained if necessary to prevent access at other points until construction is complete.

Construction entrances shall be constructed of crushed limestone meeting the following specifications:

Construction entrances shall be a minimum of 25 feet wide and 50 feet long.

Minimum thickness of crushed limestone surface shall be 6". Additional 2" lifts of crushed limestone shall be added at the discretion of the County if the surface of the initial drive deteriorates or becomes too muddy to be effective.

In locations where an existing drive or street extends at least 50 feet into the site, the existing drive may be designated as the construction entrance, and construction of a new gravel entrance is not required, unless job conditions warrant as set forth in the preceding paragraph.

11. Cleaning Streets

Streets both interior and adjacent to the site shall be completely cleaned of sediment at the end of construction and prior to release of security.

12. Dust Control

The contractor will be required to use water trucks to water all roads and construction areas to minimize dust leaving the site when conditions warrant.

13. Sequencing and Scheduling

Costs of sediment and erosion control can be minimized if proper consideration is given to sequencing and scheduling construction.

Any special sequencing and scheduling considerations should be noted in the grading plan.

Drawing 1 - Seed & Mulch Specifications

SEEDING RATES	BROADCAST	DRILLED SODDED
Tall Fescue	30 lbs/ac.	25 lbs/ac. solid
Kentucky Bluegrass	3 lbs/ac.	2 lbs/ac. solid
Red Fescue	10 lbs/ac.	7 lbs/ac.
Wheat or Rye	120 lbs/ac.	100 lbs/ac.
Annual Ryegrass	100 lbs/ac.	100 lbs/ac.

SEEDING DATES:

PERENNIAL GRASSES March 1 to May 15 or August 15 to October 15

TEMPORARY COVER May 15 to November 15

OVERSEEDING November 15 to March 1

MULCH RATES

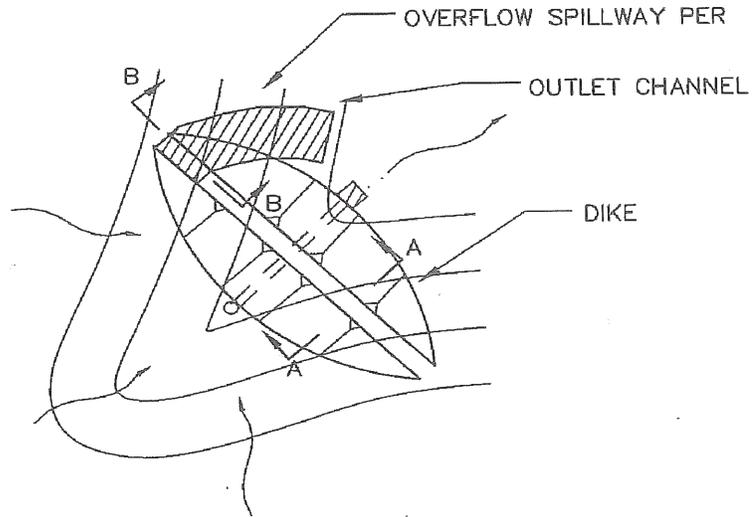
Wheat Straw 100 lbs per 1000 square feet (4,500 lbs/ac)

FERTILIZER RATES

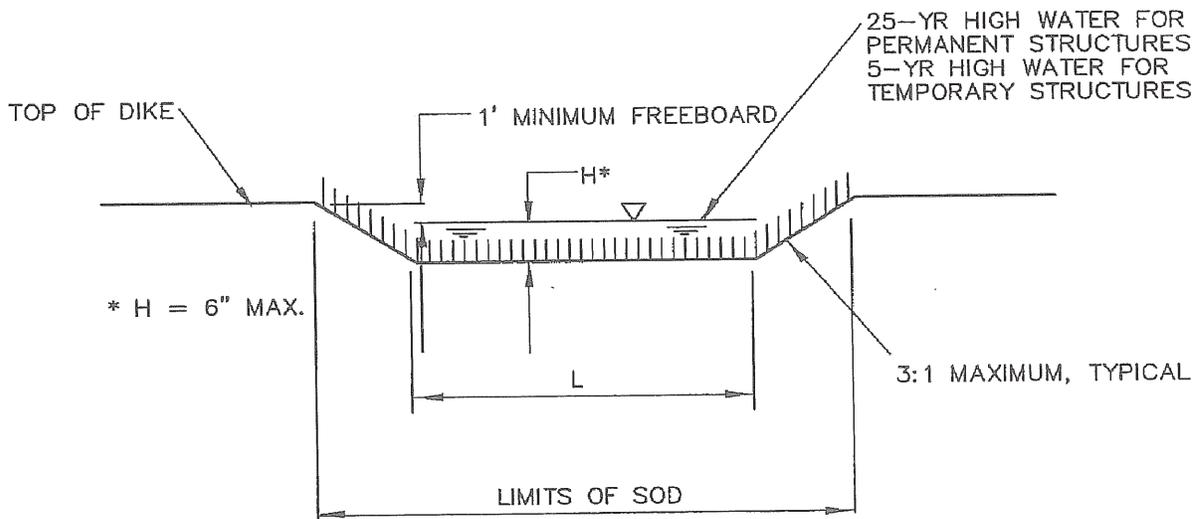
Nitrogen	90 lbs/ac.
Phosphate	90 lbs/ac.
Potassium	90 lbs/ac.
Lime	1500 lbs/ac. ENM*

ENM – effective neutralizing material as per State evaluation of quarried rock.

Drawing 2A - Sediment Basin

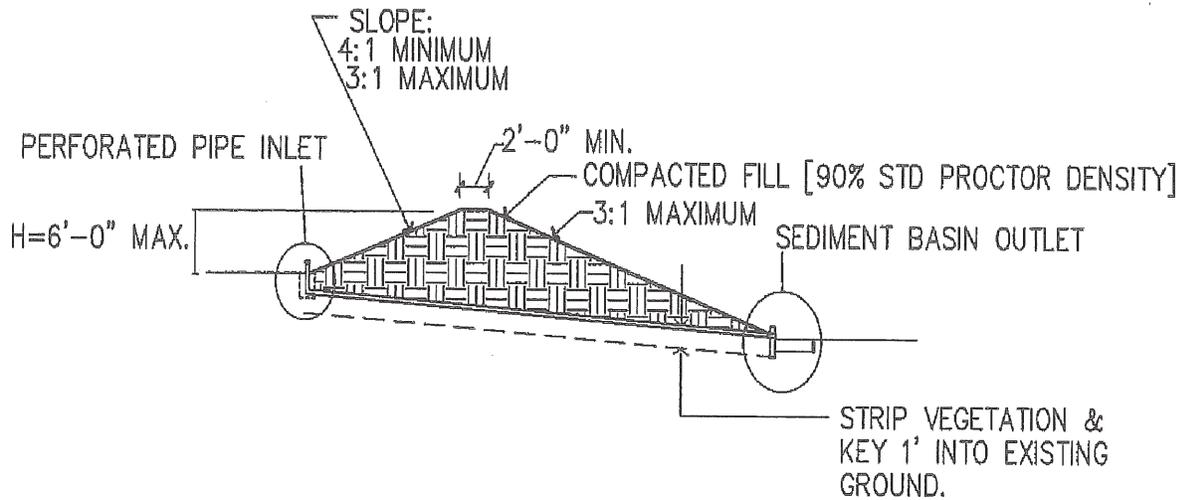


TYPICAL COMPONENTS OF SEDIMENT BASIN PLAN



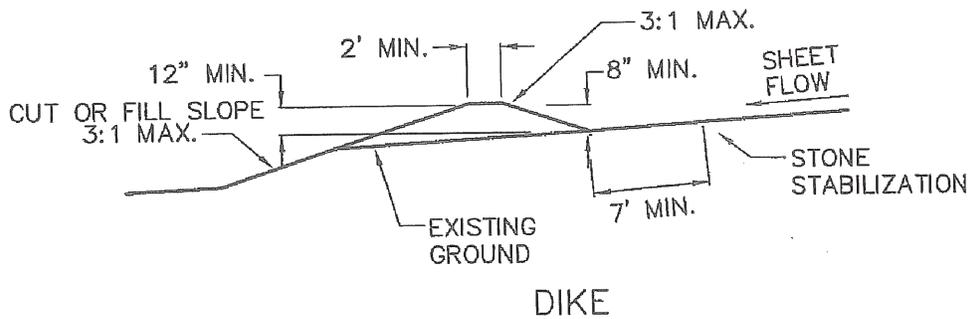
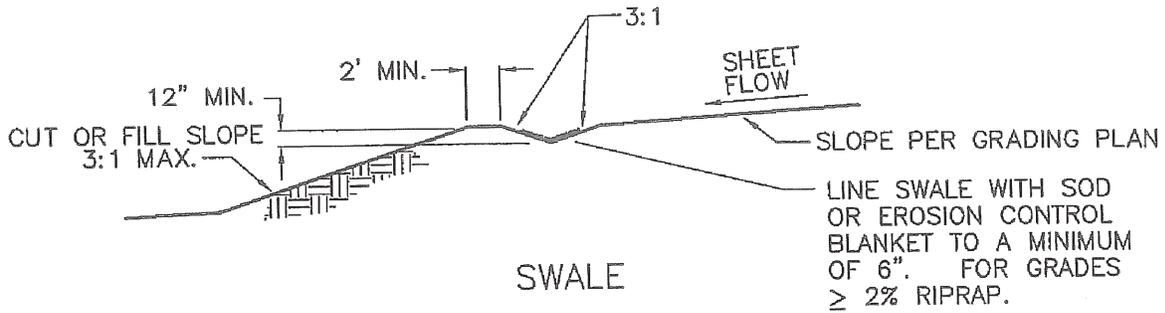
TYPICAL CROSS-SECTION – SODDED OVERFLOW SECTION B – B

Drawing 2B - Berm & Outlet Structures



SECTION A - A

Drawing 3A - Diversion Dike & Swale

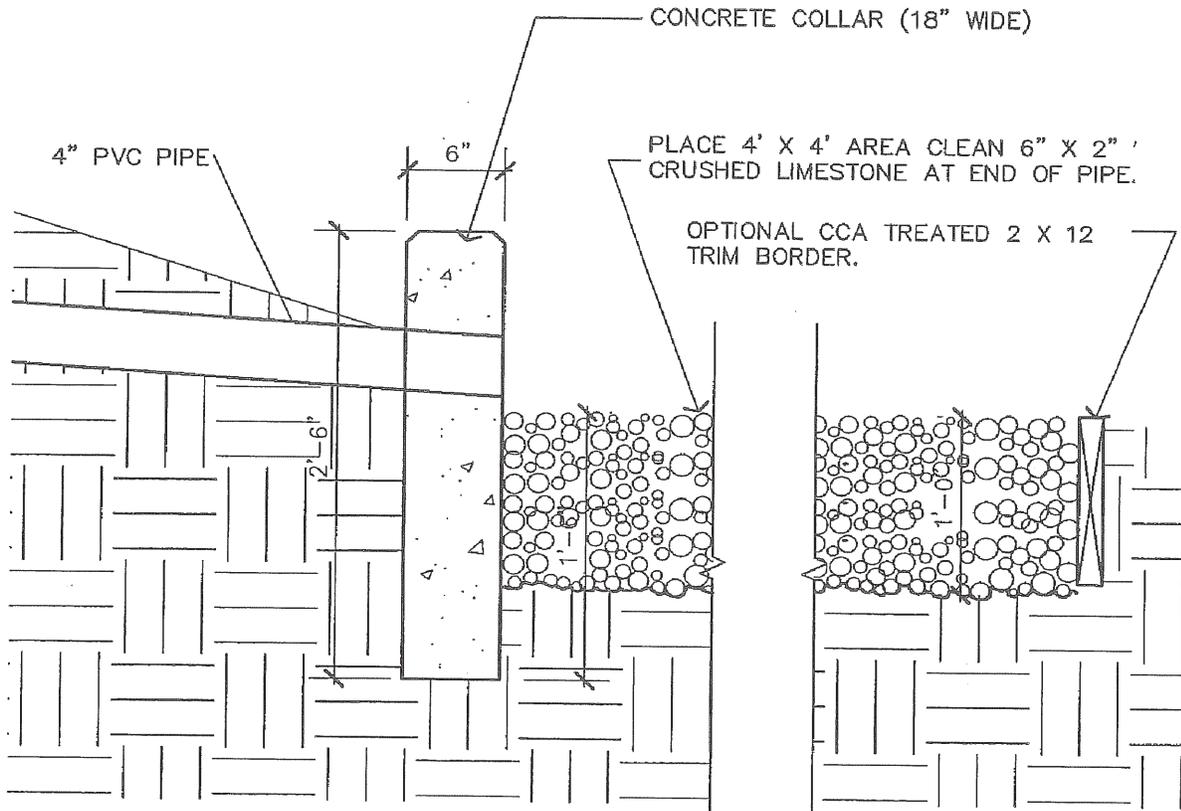


NOTES:

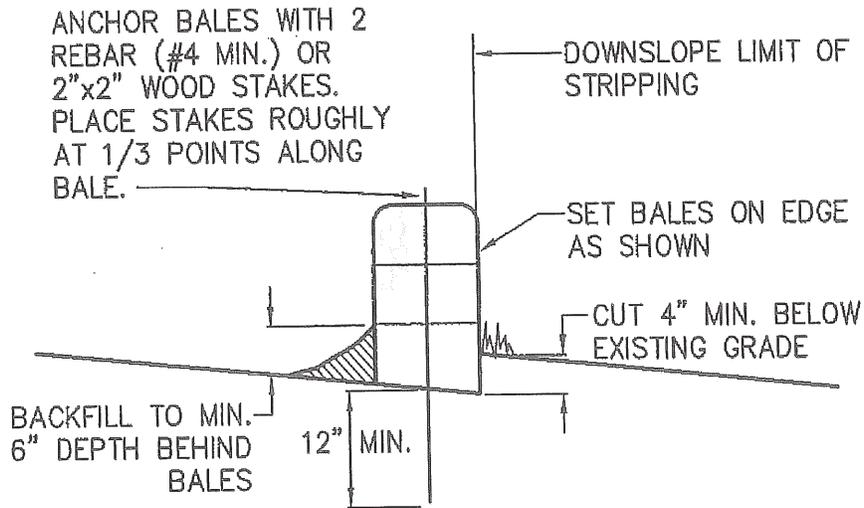
1. DIKE SHALL BE COMPACTED TO DENSITY EQUAL TO THAT SPECIFIED FOR ADJOINING AREA (90% STANDARD PROCTOR DENSITY, MINIMUM).
2. MINIMUM 1% GRADE MUST BE PROVIDED FOR SWALE OR ALONG UP SLOPE SIDE OF DIKE FOR PROPER DRAINAGE.

REFERENCE: ADAPTED FROM CITY OF AUSTIN & CITY OF TULSA EROSION AND SEDIMENTATION CONTROL MANUALS

Drawing 3B - Riprap Outlet Sediment Filter



Drawing 4A - Straw Bale Dike

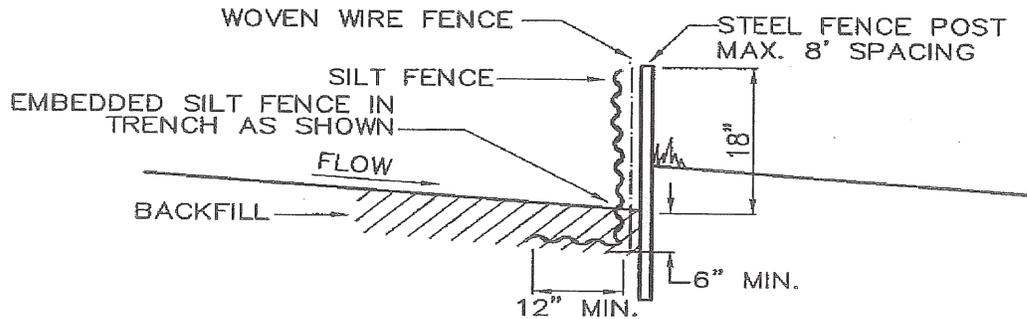


NOTES:

1. BALES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF FOUR INCHES, WHERE POSSIBLE.
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY STAKES OR RE-BARS DRIVEN THROUGH THE BALES. THE FIRST STAKE IN EACH BALE SHALL BE ANGLED TOWARD PREVIOUSLY LAID BALE TO FORCE BALES TOGETHER.
4. INSPECTION SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED BY CONTRACTOR.
5. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
6. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES.
7. AT EACH END OF DIKE, TURN DIKE UPSLOPE AND EXTEND UNTIL GROUND SURFACE RISES 18".

REFERENCE: ADAPTED FROM CITY OF AUSTIN & CITY OF TULSA
EROSION AND SEDIMENTATION CONTROL MANUALS

Drawing 4B - Silt Fence

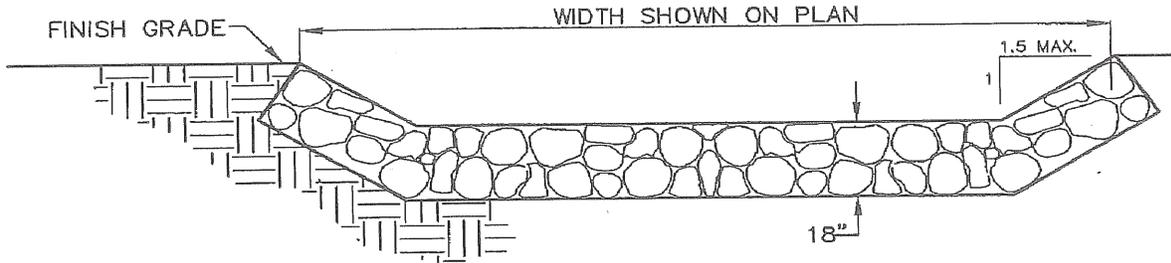


NOTES:

1. PLACE SILT FENCE AT DOWNSLOPE LIMIT OF AREA TO BE GRADED.
2. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POSTS.
3. INSPECTION SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
4. SILT FENCE SHALL BE REMOVED WHEN IT HAS SERVED ITS USEFULNESS, SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
5. SEDIMENT TRAPPED BY THIS PRACTICE SHALL BE DISPOSED OF IN AN APPROVED SITE IN A MANNER THAT WILL NOT CONTRIBUTE TO ADDITIONAL SILTATION.
6. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES AND DISPOSED OF IN AN APPROVED SPOIL SITE OR AS IN NO. 5 ABOVE.
7. AT EACH END OF SILT FENCE, TURN FENCE UPSLOPE AND EXTEND UNTIL GROUND SURFACE RISES 18".

REFERENCE: ADAPTED FROM CITY OF AUSTIN & CITY OF TULSA
EROSION AND SEDIMENTATION CONTROL MANUALS

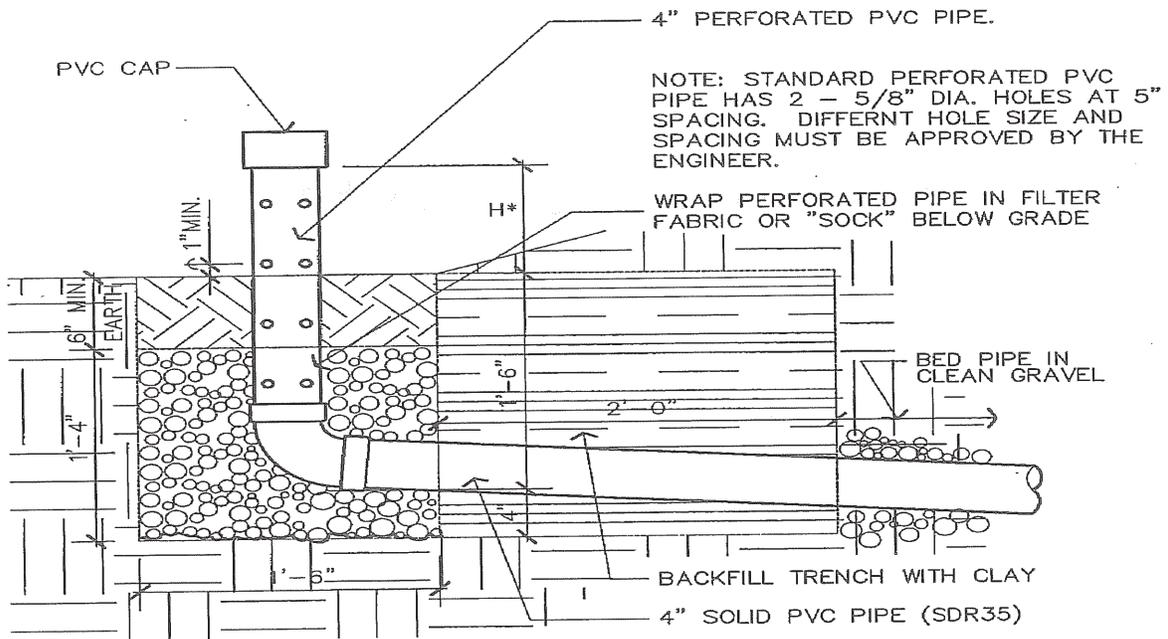
Drawing 5 - Riprap Chute



RIPRAP STONE SHALL BE GRADED AS FOLLOWS:

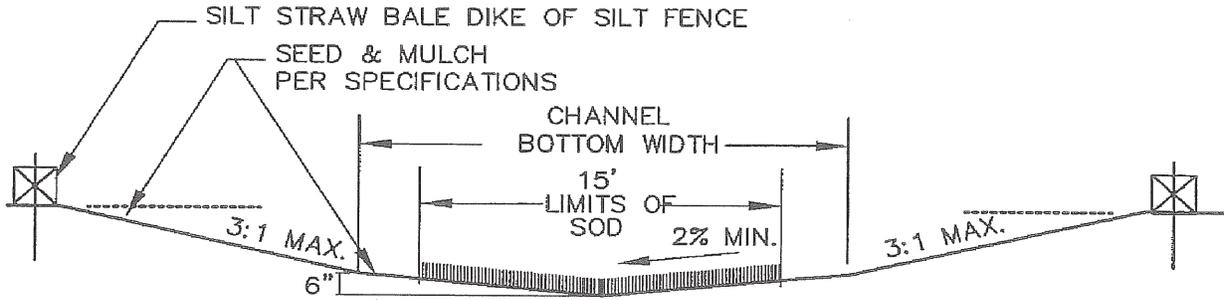
WEIGHT OF STONE (LBS.)	APPROXIMATE SIZE (LEAST DIMENSION)	% SMALLER BY WEIGHT
300	15.0"	100
200	13.0"	60-90
100	10.5"	30-50
50	8.5"	10-20
10	6.0"	<5

Drawing 6 - Perforated Pipe Outlet

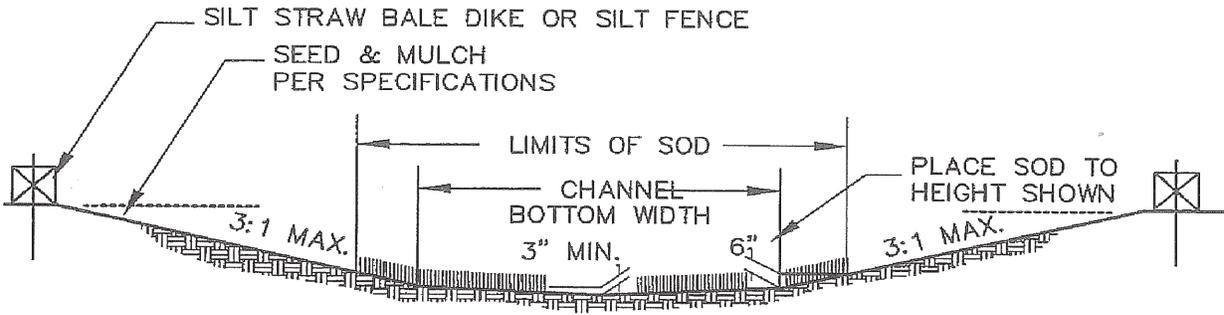


NOTE: PERFORATED RISER HEIGHT, H, TO BE SPECIFIED.

Drawing 7 - Sod Channel <15' & >15''

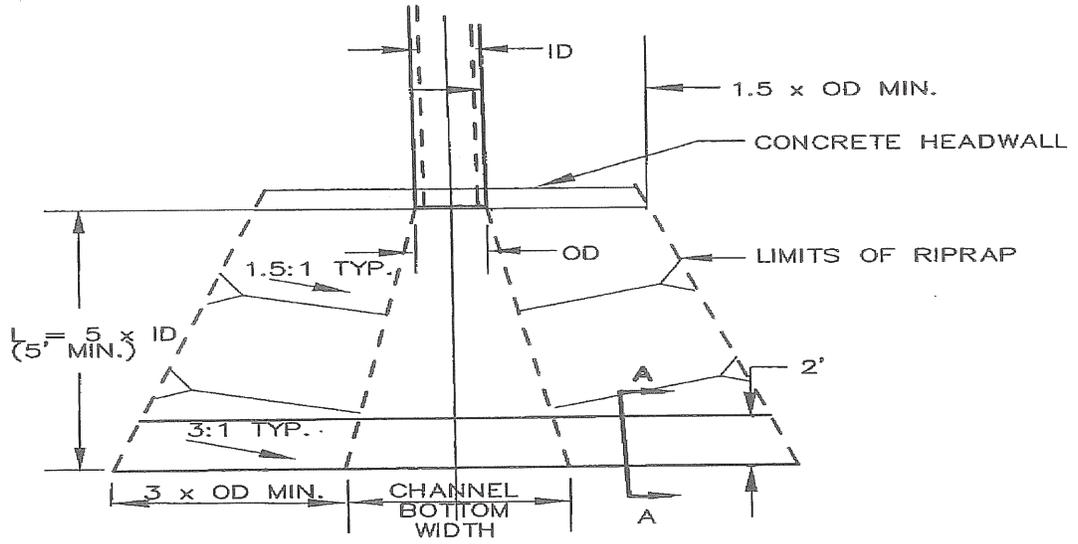


BOTTOM WIDTH > 15 FEET

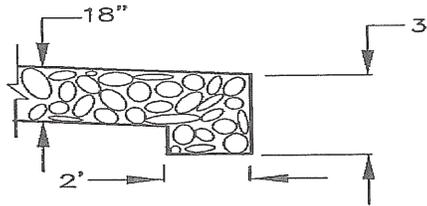


BOTTOM WIDTH < 15 FEET

Drawing 8 - Outlet Erosion Protection Culvert & Storm Sewer Outlets

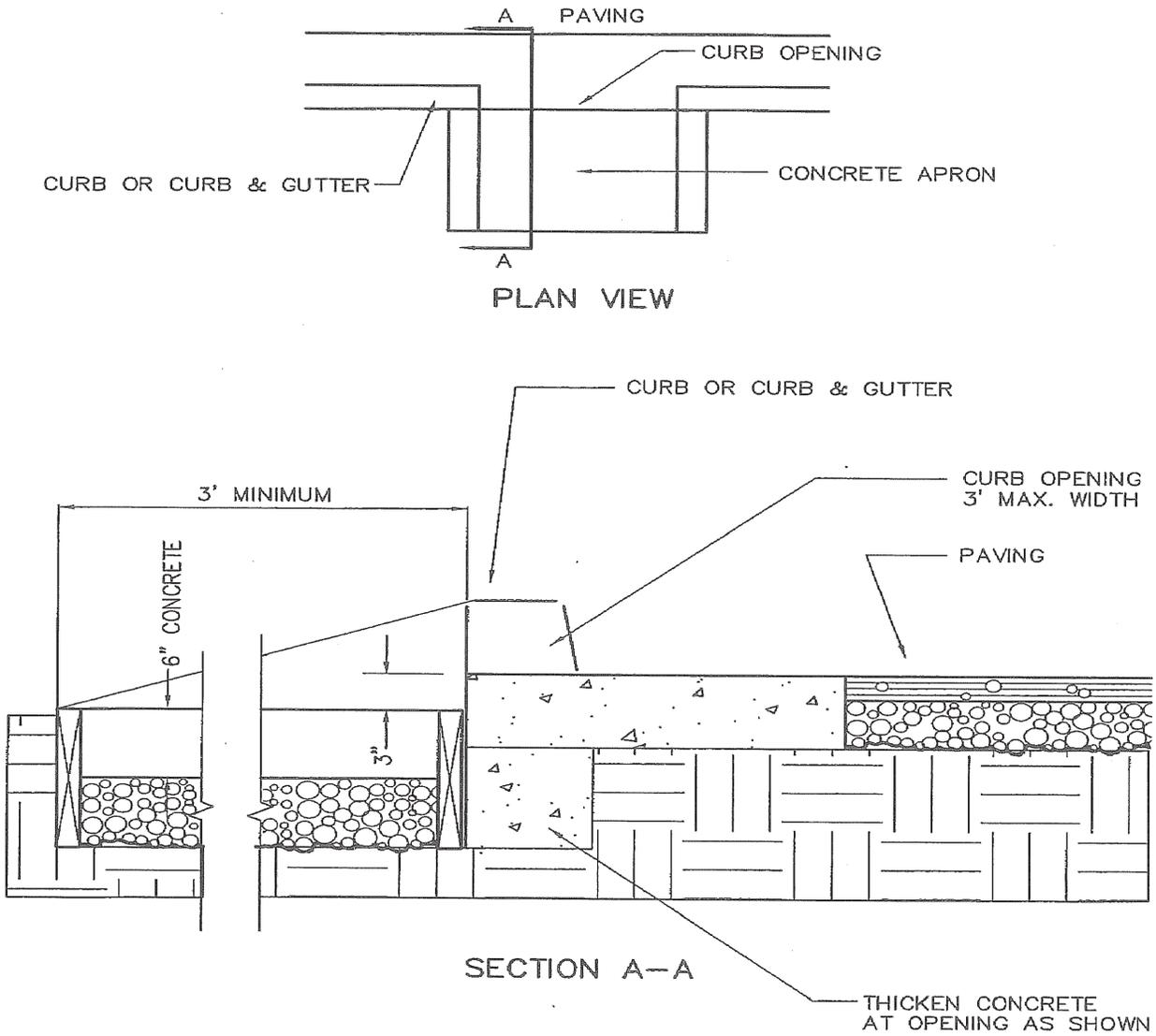


PIPE I.D. (INCHES)	L (FEET)
12	5.0
15	6.5
18	7.5
24	10.0
30	12.5
36	15.0
42	17.5
48	20.0
54	22.5
60	25.0



SECTION A - A
 TOE WALL

Drawing 9 - Curb Opening



ARTICLE 4. OWNERSHIP and MAINTENANCE

Section 1. Improvements on Public Road Right-of-Way

- A. Storm drainage improvements on public right-of-way shall become the property of; and shall be maintained by Christian County upon acceptance of the constructed improvements.
- B. As-built drawings of storm drainage improvements shall be provided after Final Inspection but before Final Approval from the County Engineer.

Section 2. Improvements on Private Property

- A. Storm drainage improvements on private property shall be maintained by the owner of the lot upon which the improvements are located or by the Homeowners' Association for improvements located in common areas.
- B. All such improvements which serve a drainage area shall be located in a drainage easement and the public shall have such rights of access to repair or maintain such facilities.

ARTICLE 5. STORMWATER PLANNING & DESIGN

Section 1. Stormwater Management Goals

In order to ensure protection of the general health and welfare of the citizens of Christian County, planning, and design of stormwater management measures shall meet the following goals:

- A. Prevent damage to residential dwellings, and other building structures from floodwaters.
- B. Maintain emergency vehicle access to all areas during periods of high water.
- C. Prevent damage to roads, bridges, utilities, and other valuable components of the community's infrastructure from damage due to flood waters and erosion.
- D. Prevent degradation of surface and groundwater quality from storm water runoff; preserve and protect quality of the environment; and promote conservation of the County's natural resources.
- E. Minimize flood water and erosion damage to lawns, recreational facilities, and other outdoor improvements.
- F. Minimize traffic hazards from runoff carried in streets and roads.
- G. Comply with applicable State and Federal laws and regulations.
- H. Meet the foregoing goals in a manner which is cost effective and which minimizes the cost of housing and development while encouraging sound development practices.
- I. Encourage innovative and cost effective planning and design of stormwater management facilities
- J. Encourage multiple purpose design of stormwater management facilities, to provide opportunities for recreational use, and other benefits to the community wherever possible.

The standards and criteria set forth herein provide the minimum standards for planning and design of stormwater facilities. Where a particular plan or design may be found to be in conflict with a specific standard, achievement of the goals set forth above will have precedence.

Section 2. General Planning and Design Principles

Christian County recognizes that stormwater management is an important component of overall land use planning.

Christian County further recognizes that proper stormwater planning significantly reduces the long term costs to the community both in terms of infrastructure cost and property losses due to flood damage. It is much more cost effective to prevent flood damage by proper design and construction, than to repair and remediate problems, which have occurred through poor planning and design.

The following general principles must be followed in preparing the grading and storm drainage plans for all development sites:

A. Recognize the Existing Drainage System

The storm drainage system differs from other utility systems in very important ways:

1. There is an existing natural drainage system.
2. It is only needed when runoff occurs.
3. The capacity of the system varies greatly depending upon how much it rains.
4. The system does not have to be constructed of man-made components in order to function.

Because of these characteristics there has been a historic inclination for fragmented planning and design of storm drainage facilities.

Proper planning of storm drainage facilities must begin with the recognition of the existing system, and include necessary provisions for preserving or altering the existing system to meet the needs of proposed development or construction.

Methods of delineating existing watercourses are outlined in Article 6.

B. Allow for Increase in Runoff Rates Due to Future Urbanization

As areas urbanize, peak rates of runoff increase significantly. Christian County may require temporary detention and storage of increased volumes of urban runoff in order to minimize increases in flow rates as urbanization occurs. However, the cumulative effects of on-site detention are difficult to predict and control, and development of comprehensive basin-wide runoff models to determine these effects does not appear likely in the foreseeable future.

For this reason, design of storm drainage improvements must be based upon the assumption of fully urbanized conditions in the area under consideration. No reduction in peak flow rates due to detention, unless an approved runoff model has been developed for the drainage basin under consideration. Any detention storage facilities whose effects are considered must be located within approved drainage easements.

C. Provide for Acceptance of Runoff from Upstream Drainage Areas

It is critical that provisions be made to receive runoff from upstream drainage areas. Drainage easements or public right-of-way must extend to a point where the upstream drainage area is 2 acres or less.

Drainage easements or public right-of-way must extend to the point where existing watercourses enter the site. Where the upstream drainage area is 2 acres or less, but does not discharge onto the site through a defined watercourse, the drainage easement shall extend to the point of lowest elevation.

D. Provide a Means to Convey Runoff Across the Site

Stormwater shall be conveyed across the site in a system of overland drainage ways and storm sewers. Overland drainage ways consists of natural waterways, streets, open channels, swales, and overland flow within drainage easements.

E. Discharge of Runoff to Downstream Properties

Concentrated runoff shall be discharged only into existing watercourses, drainage easements, or public road rights-of-way. Where none of these exist, a drainage easement which extends to the nearest watercourse, drainage easement or public road right-of-way must be obtained from the downstream property owner, and proper provisions made for conveyance of the peak flow from the 1% Annual Probability (100-year) storm within the drainage easement.

One of the typical results of urbanization is that diffuse surface flow or "sheet flow" is replaced with concentrated points of discharge. Where concentrated flows are discharged to downstream properties proper provisions must be made to:

1. Allow the flow to spread over the same area as would have occurred for the same rate of flow prior to the development, and
2. Reduce the rate of velocity to rates at least equal to the pre-development values at the same rate of flow.

F. Assess Potential Downstream Flooding Problems

It is important that a determination be made of conditions in the watershed downstream of each development site. Specifically it is important to determine whether there are existing structures, which are subject to an unacceptable flooding hazard.

If areas having an unacceptable flooding hazard occur downstream of a development site, either on-site detention for peak flow control, or mutually agreed off-site improvements will be required, as set forth in Article 7.

G. Assess Potential Water Quality Impacts on Receiving Waters

Sediment, erosion and other water quality controls are required as set forth in Article 3 and Article 9.

Section 3. Drainage Easements

All areas subject to inundation during the 100-year storm must be included in drainage easements. Specific standards for drainage easements to be provided for storm sewers, open channels, and detention facilities are set forth in Article 7.

ARTICLE 6. STORMWATER RUNOFF CALCULATIONS

This article outlines acceptable methods of determining stormwater runoff.

Section 1. General Guidelines

For watersheds with a total tributary area less than 200 acres and a one percent annual probability (100-year) fully developed discharge less than 300 cfs, the design storm runoff may be analyzed using the rational formula.

For watersheds with a total tributary area greater than 200 acres or with a one percent annual probability (100-year) fully developed discharge greater than 300 cfs, the design storm runoff shall be analyzed using an approved hydrograph method.

Section 2. Rational Formula

- A. The rational formula, when properly understood and applied, can produce satisfactory results for urban storm sewer design. The rational formula is as follows:

$$Q = CIA$$

Where, Q = Peak discharge in cubic feet per second.

C = Runoff coefficient which is the ratio of the maximum rate of runoff from the area to the average rate of rainfall intensity for the time of concentration.

I = Average rainfall intensity in inches per hour for a duration equal to the time of concentration.

A = Contributing watershed area in acres.

- B. The basic assumptions made when applying the rational formula are:
1. The rainfall intensity is uniform over the basin during the entire storm duration.
 2. The maximum runoff rate occurs when the rainfall lasts as long or longer than the basin time of concentration.
 3. Runoff response characteristics are relatively uniform over the entire basin.
 4. The time of concentration is the time required for the runoff from the most hydraulically remote part of the basin to reach the point of interest.
- C. The drainage basin should be divided into sub-basins of a size where all of the basic assumptions apply.

D. Time of Concentration

Time of concentration, etc., is calculated by:

$t_c = t_i + t_t$ (5 minutes, minimum); where

t_i = initial, inlet or overland flow time in minutes,

t_t = shallow channel and open channel flow time in minutes.

E. Overland Flow

Overland flow (sheet flow) time shall be calculated as:

$t_i = 0.83 * (N * L / S^{0.5})^{0.47}$ where

t_i = initial, inlet or overland flow time in minutes,

N = Coefficient of roughness (from the following table),

L = Overland flow length in feet, (maximum of 300 feet),

S = Overland slope in feet per foot.

**ROUGHNESS COEFFICIENTS FOR OVERLAND FLOW
 SURFACE DESCRIPTION**

Smooth surfaces (concrete, asphalt, gravel or bare soil)	0.05
Smooth bare packed soil, free of stones	0.10
Poor grass, row crops, or moderately rough bare surfaces	0.20
Pasture or average grass cover	0.40
Deciduous timberland	0.60
Conifer timberland, deciduous timberland with deep forest litter or dense grass cover	0.80

Open channel flow velocities may be estimated from Manning's equation. Open channel velocities are generally estimated under bank full conditions.

Drawing 10 - Rainfall Intensity

RAINFALL INTENSITIES FOR USE IN THE RATIONAL FORMULA SHALL BE DETERMINED BY THE FOLLOWING EQUATION:

$$i = \frac{A}{(B + t_c)^m}$$

WHERE,

t_c = TIME OF CONCENTRATION

A, B & m ARE TAKEN FROM THE FOLLOWING TABLE

<u>FREQUENCY</u>	<u>A</u>	<u>B</u>	<u>m</u>
2-YEAR	59.41	13.09	0.83
5-YEAR	64.18	12.84	0.80
10-YEAR	68.62	12.74	0.78
25-YEAR	81.41	13.16	0.78
50-YEAR	85.22	12.87	0.77
100-YEAR	84.29	12.18	0.74

Section 3. Hydrograph Methods

A. Methodologies

The most common hydrograph techniques are those developed by the Corps of Engineers and the Soil Conservation Service. These methods are preferred, however other proven techniques will be accepted.

The Corps of Engineers HEC-HMS, HEC-1 Flood Hydrograph Package, and Soil Conservation Service TR-55 computer models are the preferred runoff models. Other models may be used with approval from the County.

The runoff model must include the entire drainage basin upstream of the proposed development. The model shall be prepared in sufficient detail to ensure that peak runoff rates are reasonably accurate.

The runoff model shall be developed for the following cases:

- Case 1:** Existing conditions in the drainage basin prior to development of the applicant's property.
- Case 2:** Existing conditions in the drainage basin with developed conditions on the applicant's property.
- Case 3:** Fully developed conditions in the entire drainage basin.

B. Rainfall

Rainfall depth-duration-frequency and intensity-duration-frequency curves for the Christian County area are included in the standard drawings. The design rainfall intensities were developed from the U.S. Department of Commerce, National Weather Service, Technical Paper 40 (reference 19) and the National Oceanic and Atmospheric Administration publication "HYDRO-35" (reference 9).

Rainfall depths for use with hydrograph techniques shall be taken from "Rainfall Frequency atlas of the Midwest, Bulletin 71" (reference 23).

Rainfall shall be distributed in time using Huff's Distribution adapted to local rainfall data (references 20) as shown in the following table. Other distributions may be used upon approval from the County.

C. Storm Duration

A critical duration analysis of storm duration and corresponding rainfall depth shall be conducted to determine the storm duration producing the greatest peak flow from a particular watershed. The critical duration storm shall be used in all subsequent runoff calculations.

**Huff's Average Time Distribution
 Synthetic Rainfall Mass Curves**

Cumulative Fraction of Storm Duration	Cumulative Fraction of Depth			
<u>Duration</u>	<u>1st-Quartile</u>	<u>2nd-Quartile</u>	<u>3rd-Quartile</u>	<u>4th-Quartile</u>
.00	.00	.00	.00	.00
.05	.12	.04	.03	.02
.10	.26	.09	.06	.05
.15	.40	.14	.10	.08
.20	.51	.19	.13	.10
.25	.59	.25	.16	.13
.30	.65	.32	.20	.16
.35	.71	.40	.23	.18
.40	.75	.52	.27	.21
.45	.78	.61	.33	.24
.50	.82	.68	.39	.28
.55	.84	.73	.46	.32
.60	.87	.78	.56	.35
.65	.89	.82	.68	.40
.70	.91	.86	.79	.44
.75	.93	.89	.85	.50
.80	.95	.92	.89	.58
.85	.96	.94	.92	.68
.90	.97	.96	.95	.83
.95	.99	.98	.97	.93
1.00	1.00	1.00	1.00	1.00

ARTICLE 7. STORMWATER DRAINAGE STRUCTURES

Section 1. Inlets

A. Inlet Locations

Inlets shall be provided at locations and intervals, and shall have a minimum inflow capacity such that maximum flooding depths set below are not exceeded for the specified storm; at all sump locations where ponding of water is not desired, and where drainage cannot be released at the ground surface.

B. Inlet Interception Capacities

Inlet capacities shall be determined in accordance with the Federal Highway Administration HEC-12 & HEC-22 Manuals (reference 5).

Nomographs and methods presented in the Neenah Inlet Grate Capacities report (reference 12) may also be used where applicable.

The use of commercial software utilizing the methods of HEC-12 & HEC-22 is acceptable. It is recommended that software be pre-approved for use by the County.

C. Clogging Factors

The inlet capacities determined as required in this section must be reduced as follows, in order to account for partial blockage of the inlet with debris:

INLET TYPE & LOCATION	CLOGGING FACTOR
<i>Type SS Curb Opening Inlets</i>	
on grades	0.9
in sumps.	0.8
<i>Grated Inlets:</i>	
on grades	0.6
in sumps	0.5

Inlet lengths or areas shall be increased as required to account for clogging.

D. Interception and Bypass Flow

It is generally not practical for inlets on slopes to intercept 100% of the flow in gutters. Inlets must intercept sufficient flow to comply with street flooding depth requirements. Bypass flows shall be considered at each downstream inlet, until all flow has entered approved storm sewers or drainage ways.

E. Allowable Street Depth

Urban streets are a necessary part of the County drainage system. The design for the collection and conveyance of storm water runoff is based on a reasonable frequency and degree of traffic interference. Depending on the street classification, (ie: local, collector, etc.) portions of the street may be inundated during storm events. Drainage of streets are controlled by both minor (2-year) and major (25-year) storm events. The minor system is provided to intercept and convey nuisance flow. Flow depths are limited for the major storm to provide for access by emergency vehicles during most flood events. When the depths of flow exceed the criteria presented in this section a storm sewer or open channel system is required.

F. General Design Guidelines

Allowable Flow Depths: Flow in the street is permitted with maximum allowable depths as follows:

1. On Grades

- a. Local streets: crown of the street for the runoff from a 2 year rainfall, top of curb for runoff from a 25 year rainfall. Runoff from a 100-year rainfall should be contained within the right-of-way.
- b. Collector streets: the equivalent of one ten foot driving lane must remain clear of water during a 2 year rainfall, top of curb for runoff from a 25 year rainfall. Runoff from a 100-year rainfall should be contained within the right-of-way.
- c. Arterials and Parkways: two ten foot lanes must remain clear of water, one in each direction, during a 2 year rainfall. Top of curb for runoff from a 25-year rainfall. Runoff from a 100-year rainfall should be contained within the right-of-way.

2. In Sumps

- a. Local streets: top of curb from a 2-year rainfall. Runoff from a 25-year rainfall should be contained within the right-of-way. Maximum depth from a 100-year rainfall is 18” at the face of curb.
- b. Collector streets: top of curb from a 2-year rainfall. Runoff from a 25-year rainfall should be contained within the right-of-way. Maximum depth from a 100-year rainfall is 18” at the face of curb.
- c. Arterials and Parkways: Width of gutter from a 2-year rainfall. Runoff from a 25-year rainfall should be contained within the right-of-way. Maximum depth from a 100-year rainfall is 18” at the face of curb.

Where allowable depths are exceeded a storm sewer system must remove the excess water.

3. **Cross Flow**

Cross flow at intersections is permitted up to the following depth.

STREET CLASSIFICATION	2-YEAR STORM ALLOWABLE DEPTH	25-YEAR STORM ALLOWABLE DEPTH
LOCAL	6" in cross pan flow line	12" at gutter
COLLECTOR	No cross flow permitted	6" at gutter
ARTERIAL OR PARKWAY	No cross flow permitted	No cross flow permitted

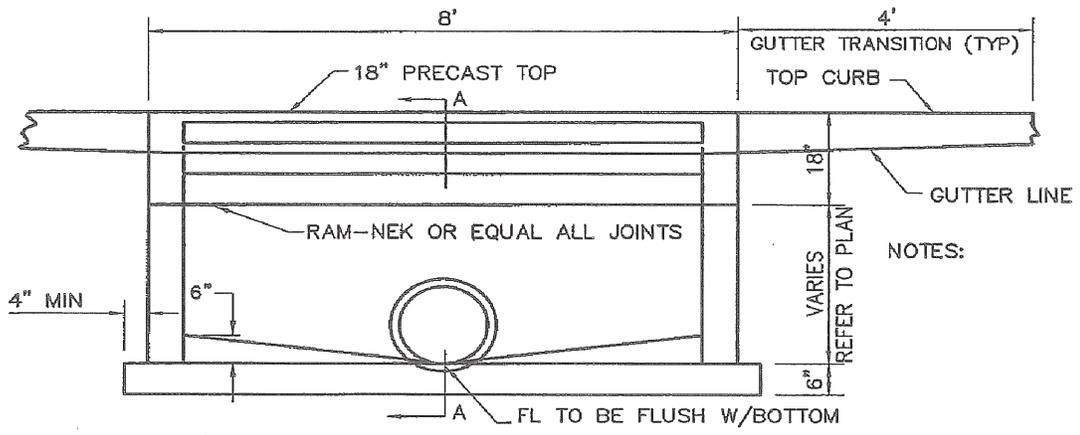
4. **Hydraulics**

The allowable storm capacity of each street section with curb and gutter is calculated using the modified Manning's formula for both the 2-year and 25-year storm event.

$$Q = 0.56(Z/n)S^{1/2}d^{8/3}$$

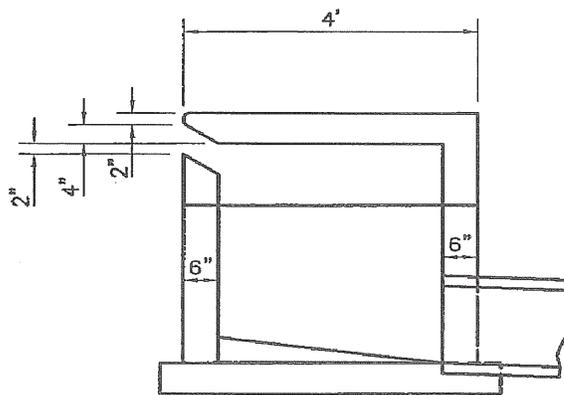
- Where,
- Q = discharge in cubic feet per second
 - Z = cross slope of the street in feet per foot
 - d = depth of flow at the gutter in feet
 - S = longitudinal slope of the street in feet per foot
 - n = Manning's roughness coefficient

Drawing 11 - Curb Inlet Detail



FRONT ELEVATION

1. BOTTOM SHALL BE CAST IN PLACE.
2. TYPE C RING AND COVER SHALL BE PROVIDED.
3. # 4 BARS @ 10" EA. WAY IN WALLS AND SLAB.



SECTION A-A

G. Types of Inlets Allowed

1. Public Streets

a. Curb Opening Inlets

Type "SS" standard curb opening inlets as shown in Drawing 11 shall be used for public streets with curb and gutter.

b. Grated Inlets

In general the use of grated inlets in streets, which require adjustment when streets are repaved, will not be permitted.

Where conditions are such that curb inlets cannot intercept the required rate of flow, necessary to control street flooding depth or to provide diversion of flow to detention, sedimentation, or infiltration basins, "trench inlets" with veined grates may be specified with approval of the County.

Other types of inlets will not be permitted unless approved by the County.

2. Outside of Public Right-of-Way

The type of inlets specified outside of public right-of-way is left to the discretion of the designer provided the following criteria are met:

- a. Maximum flooding depths for the major or minor storm as set forth above are not exceeded.
- b. General safety requirements set forth below are met.
- c. All inlets shall be depressed a minimum of 2" below the surrounding grade to allow proper drainage to the inlet and prevent inadvertent ponding in the area around the inlet.
- d. Inlets in pavements shall be provided with a concrete apron.

H. General Safety Requirements

All inlet openings shall:

1. provide for the safety of the public from being swept into the storm drainage system; the maximum allowable opening shall not exceed 6" in width.
2. be sufficiently small to prevent entry of debris which would clog the storm drainage system;
3. be sized and oriented to provide for safety of pedestrians, bicyclists, etc.

Section 2. Storm Sewers

A. Design Criteria

1. Design Storm Frequency

The storm sewer system, beginning at the upstream end with inlets, is required when the 5-year peak flow in the street exceeds 5 cfs or when allowable street depths are exceeded. Allowable street depths are specified above.

2. Construction Materials

Storm sewers may be constructed using reinforced concrete, corrugated metal (steel or aluminum) or plastic pipe. The materials, pipes, or appurtenances shall meet one or more of the following standards:

PIPE MATERIAL	STANDARD
Reinforced Concrete Pipe-Round	ASTM C-76 or AASHTO M-170
Reinforced Concrete Pipe-Elliptical	ASTM C-507 or AASHTO M-207
Reinforced concrete Pipe-Joints	ASTM C-443 or AASHTO M-198
Reinforced Concrete Pipe-Arch	ASTM C-506 or AASHTO M-206
Pre-cast Concrete Manholes	ASTM C-478 or AASHTO M-199
Pre-cast Concrete Box Pipe	ASTM C-789/C-850 or
Corrugated Steel Pipe-Metallic	AASHTO M-259/M-273
Coated for Sewers and Drains	AASHTO M-36
Corrugated Aluminum Alloy Pipe and Under drains	AASHTO M-196
Bituminous Coated Corrugated Metal Pipe and Pipe Arches	AASHTO M-190
Corrugated PVC Pipe	ASTM D-3034 and ASTM F-679
Corrugated Polyethylene Pipe	ASTM D-1248

3. Vertical Alignment

The sewer grade shall be such that a minimum cover is maintained to withstand AASHTO HS-20 loading on the pipe. The minimum cover depends upon the pipe size, type and class, and soil bedding condition, but shall not be less than 1 foot from the top of pipe to the finished grade at any point along the pipe. If the pipe encroaches on the street subgrade, approval is required. Manholes will be required whenever there is a change in size, direction, elevation grade and slope or where there is a junction of two or more sewers. The maximum spacing between manholes for storm sewers (cross sectional area less than 25 square feet) shall be 400 feet. For large storm sewers (cross sectional area greater than 25 square feet), manholes for maintenance access need only be placed a minimum of every 500 feet; access to the laterals can be obtained from within the larger storm sewer.

The minimum clearance between storm sewer and water main (for new construction), either above or below shall be 12 inches. Concrete encasement of the water line will be required for clearances of 12 inches or less when the clearance between existing water mains cannot be obtained.

The minimum clearance between storm sewer and sanitary sewer (for new construction), either above or below, shall be 18 inches. In addition, when an existing sanitary sewer main lies above a storm sewer, or within 18 inches below, the sanitary sewer shall have an impervious encasement or be constructed of structural sewer pipe for a minimum of 10-feet on each side of the storm sewer crossing.

Siphons or inverted siphons are not allowed in the storm sewer system.

4. **Horizontal Alignment**

Storm sewer alignment between manholes shall be straight except when approved by the County. Approved curvilinear storm sewers may be constructed by using radius pipe. The radius requirement for pipe bends is dependent upon the manufacturer's specifications.

A minimum horizontal clearance of 10 feet is required between sanitary and water utilities and the storm sewer.

The permitted locations for storm sewer within a street ROW are: (a) on centerline, (b) between centerline and curb and (c) behind the curb. Storm sewer shall not be placed on the area within the wheel lanes of the pavement.

5. **Pipe Size**

The minimum allowable pipe size for storm sewers is dependent upon a diameter practical from the maintenance standpoint. For storm sewers less than 50 feet in length the minimum allowable diameter is 15 inches. All other pipe shall have a minimum diameter of 18 inches.

6. **Storm Sewer Capacity and Velocity**

Storm sewers should be designed to convey the design storm (25-year) flood peaks without surcharging the storm sewer. The sewer may be surcharged during larger floods and under special conditions when approved by the County.

The use of storm sewers in areas without overland relief upon is discouraged. If this situation is unavoidable, 100-year capacity shall be provided in the storm sewer system.

The capacity and velocity shall be based on the Manning's n-values presented in Table I. The maximum full flow velocity shall be less than 15 fps. Higher velocities may be approved by the County if the design includes adequate provisions for uplift forces, dynamic impact forces, and abrasion. The minimum velocity in a pipe based on full flow shall be 2.5 fps; and the minimum slope shall be 0.50% to avoid excessive accumulations of sediment. The energy grade line (EGL) for the design flow shall be no more than six inches below the final grade at manholes, inlets, or other junctions. To insure that this objective is achieved, the hydraulic grade line (HGL) and the energy grade line (EGL) shall be calculated by accounting for pipe friction losses and pipe form losses. Total hydraulic losses will include friction, expansion, contraction, bend, manhole, and junction losses. The methods for estimating these losses are presented in the following sections.

7. Storm Sewer Outlets

All storm sewer outlets into open channels shall be constructed with a headwall and wingwalls or a flared-end-section. Riprap or other approved material shall be provided at all outlets.

8. Hydraulic Evaluation

Presented in this section are the general procedures for hydraulic design and evaluation of storm sewers. The user is assumed to possess a basic working knowledge of storm sewer hydraulics and is encouraged to review textbooks and other technical literature available on the subject.

9. Pipe Friction Losses

Pipe friction losses are estimated using Equation 1001 and Manning's formula (Equation 1002) which are expressed as follows:

	Hf	=	Sf x L	(1001)
Where,	Hf	=	head loss due to friction (feet)	
	Sf	=	friction slope from Manning's equation (feet per foot)	
	L	=	length of pipe segment (feet)	
and	V	=	$1.49 \times R^{2/3} \times Sf^{1/2} / n$	(1002)

Where,	V	=	velocity of flow (feet per second)
	R	=	hydraulic radius = A/WP (feet)
	Sf	=	friction slope (feet per foot)
	A	=	area of flow (square feet)
	WP	=	wetted perimeter (feet)

n = Manning's roughness coefficient (Table I)

10. Pipe Form Losses

Generally, between the inlet and outlet, the flow encounters, in the flow passageway, a variety of configuration such as changes in pipe size, branches, bends, junctions, expansions, and contractions. These shape variations impose losses in addition to those resulting from pipe friction. Form losses are the result of fully developed turbulence and can be expressed as follows:

Where,

HL	$=$	$K (V^2/2g)$	(1003)
HL	$=$	head loss (feet)	
K	$=$	loss coefficient	
$V^2/2g$	$=$	velocity head (feet)	
g	$=$	gravitational acceleration (32.2 ft/sec ²).	

The following is a discussion of a few of the common types of form losses encountered in storm design.

11. Expansion Losses

Expansion losses in a storm sewer will occur when the sewer outlets into a channel. The expansion will result in a shearing action between the incoming high velocity jet and the surrounding outlet boundary. As a result, much of the kinetic energy is dissipated by eddy currents and turbulence. The loss head can be expressed as:

Where,

HL	$=$	$K_x (V_1^2/2g)(1-(A_1/A_2))^2$,	(1004)
A	$=$	cross section area in square feet	
V_1	$=$	average upstream pipe flow velocity, feet per second	
K_x	$=$	expansion loss coefficient.	

Subscripts 1 and 2 denote the upstream and downstream sections respectively. The value of K_x is about 1.0 for a sudden expansion (such as an outlet to a channel) and about 0.2 for a well-designed expansion transition. Table II presents the expansion loss coefficient for various flow conditions.

12. Contraction Losses

The form loss due to contraction is:

$$HL = K_c(V_2^2/2g)(1-(A_2/A_1)^2)^2 \quad (1005)$$

Where, K_c = Contraction loss coefficient

K_c is equal to 0.5 for a sudden contraction and about 0.1 for a well-designed transition. Subscripts 1 and 2 denote the upstream and downstream sections respectively. Table II presents the contraction loss coefficient for various flow conditions.

13. Bend Losses

The head losses for bends in excess of that caused by an equivalent length of straight pipe may be expressed by the relation:

$$HL = K_b(V_2/2g) \quad (1006)$$

Where, K_b = Bend coefficient

The bend coefficient has been found to be a function of: (a) the ratio of the radius of curvature of the bend to the width of the conduit, (b) deflection angle of the conduit, (c) geometry of the cross section of flow, and (d) the Reynolds Number and relative roughness. Recommended bend loss coefficients for standard bends, radius pipe, and bends through manholes are presented in Table II.

14. Junction and Manhole Losses

A junction occurs where one or more branch sewers enter a main sewer, usually at manholes. The hydraulic design of a junction is in effect the design of two or more transitions, one for each flow path. Allowances should be made for head loss due to the impact at junctions. The head loss at a junction for each pipe entering the junction can be calculated from:

$$HL = (V_2^2/2g) = K_j(V_1^2/2g) \quad (1007)$$

Where, V_2 = the outfall flow velocity

V_1 = the inlet velocity

K_j = junction loss coefficient

Because of the difficulty in evaluating hydraulic losses at junctions (Reference 6) due to the many complex conditions involving pipe size, geometry of the junction and flow combinations, a simplified table of loss coefficients has been prepared. Table II presents the recommended energy loss coefficients for typical manhole or junction conditions encountered in the urban storm sewer system.

15. **Partially Full Pipe Flow**

When a storm sewer is not flowing full, the sewer acts like an open channel and the hydraulic properties can be calculated using open channel.

16. **Storm Sewer Outlets**

When the storm sewer system discharges into an open channel, additional losses, in the form of expansions losses, occur at the outlet. For a headwall and no wing walls, the loss coefficient K_e is 1.0. For a headwall with 45-degree wing walls, the loss coefficient is about 1.14. For a flared-end-section (which has a D_2/D_1 ratio of 2 and a theta angle of around 30 degrees) the loss coefficient is approximately 0.5.

17. **Connection Pipes**

Connector pipes are used to convey runoff from an inlet to the storm sewer. If, however, the storm sewer runs through the inlet, then a connector pipe is not needed. Connector pipes can connect a single inlet to the storm sewer or they can be connected in a series.

These bends, turns, and flows through the connector pipe give rise to three hydraulic losses: a change from static to kinetic energy to get the water moving through the connector pipe, an entrance loss from the inlet to the connector pipe, and a friction loss along the length of the connector pipe. The total head loss in the connector pipe can be calculated from the following equation:

Where,

$$H_{cp} = H_v + K_e \times H_v + S_f \times L \quad (1009)$$

H_{cp} = head loss in the connector pipe (feet)
 K_e = Entrance loss coefficient.
 H_v = velocity head in the pipe, assuming full pipe flow (feet)

and the other variables are as previously defined. The value of the entrance loss coefficient is determined from Table II.

If the connector pipes are connected in series, the head loss in each pipe is calculated from Equation 1009 and the total head loss is the summation of the individual head losses.

B. Easements

Easements shall be provided for all storm sewers constructed in Christian County that are not located within public rights of way. The minimum easement widths are as follows:

For pipes 48 inches or less in diameter or width the required easement width is 15 feet.

For pipes and boxes greater than 48 inches in width the required easement width is 15 feet plus half the width of the proposed storm sewer.

Storm sewers greater than 8 feet in depth to the flow line may require additional easement width.

All easements required for construction, which are not included on the final plat shall be recorded and filed with the County prior to approval of the construction drawings.

Section 3. Design Standards for Culverts

A. Structural Design

All culverts shall be designed to withstand an HS-20 loading in accordance with the design procedures of AASHTO "Standard Specifications for Highway Bridges". The designer shall also check the construction loads and utilize the most severe loading condition. The minimum allowable cover is one foot.

B. Design Capacity

For drainage areas less than 1 square mile in size, culverts shall be designed to pass the 25-year storm with one foot of freeboard prior to overtopping the road or driveway. For drainage areas greater than 1 square mile, culverts shall be designed to pass the 100-year storm with one foot of freeboard. In some instances, FEMA regulations may require greater than that specified above.

C. Headwater

The maximum headwater for the major storm design flow shall be 1.5 times the culvert diameter for round culverts or 1.5 times the culvert rise dimension for shapes other than round. In some instances, FEMA regulations may restrict headwater to less than that specified above.

D. Inlet and Outlet Protection

For road and driveway culverts larger than 15 inches, culverts are to be designed with protection at the inlet and outlet areas as provided in Article 3 of this criteria. Headwalls or end sections are to be located a sufficient distance from the edge of the shoulder or the back of walk to allow for a maximum slope of 3H:1V to the back of the structure. The type of outlet protection required is as follows:

$V < 7 \text{ FPS}$ $7 \text{ FPS} < V < 15 \text{ FPS}$ $V > 15 \text{ FPS}$

Minimum Riprap protection Energy Riprap protection
or Dissipater Energy dissipater

E. Velocity Limitations

The maximum allowable discharge velocity is 15 feet per second.

F. Culvert Hydraulics

It is recommended that the procedures outlined in the publication "Hydraulic Design of Highway Culverts" reference 4 be used for the hydraulic design of culverts. Backwater calculations demonstrating the backwater effects of the culvert may be required.

Section 4. Design Standards for Bridges

A. Structural Design

All bridges shall be designed to withstand an HS-20 loading in accordance with the design procedures of AASHTO "Standard Specifications for Highway Bridges" (reference 13). The designer shall also check the construction loads and utilize the most severe loading condition.

B. Design Capacity

Bridges shall be designed to pass the 100-year storm with one foot of freeboard between the water surface and the bridge low chord. Bridge capacity shall be designed such that all FEMA regulations are met.

C. Backwater

Backwater is defined as the rise in the water surface due to the constriction created by the bridge approach road fills. The maximum backwater for the 100-storm design flow shall be one foot. In some instances, FEMA regulations may restrict backwater to less than that specified above.

D. Velocity Limitations

Discharge velocities through bridge openings shall be limited to 15 feet per second. Abutment and channel scour protection shall be provided at all bridges.

E. Bridge Hydraulics

All bridge hydraulics shall be evaluated using the procedures presented in the publication "Hydraulics of Bridge Waterway" Reference 14. Backwater calculations demonstrating the effects of the bridge and approach fills compared to the existing flood stages shall be submitted for all bridges.

Section 5. Design Standards for Open Channels

A. General Design Guidelines

1. Natural Channels

The hydraulic properties of natural channels vary along the channel reach and can be either controlled to the extent desired or altered to meet the given requirements. Natural channels used as part of the drainage system must be evaluated for the effects of increased peak flow, flow duration and volume of runoff due to urbanization. A 25' setback is required for all natural waterways.

2. Grass Lined Channels

Grass lined channels are the most desirable of the artificial channels. The channel storage, lower velocities, and the greenbelt multiple use benefits obtained create significant advantages over other artificial channels. Unless existing development restricts the availability of right of way, channels lined with grass should be given preference over other artificial types. The minimum slope in a grass-lined channel shall be 1.0% unless a concrete low flow channel is installed.

3. Concrete Lined Channels

Concrete lined channels are sometimes required where right of way restrictions within existing development prohibit grass-lined channels. The lining must be designed to withstand the various forces and actions, which tend to overtop the bank, deteriorate the lining, erode the soil beneath the lining and erode unlined areas. The minimum slope in a concrete lined channel shall be 0.50%.

4. Rock Lined Channels

Rock lined channels are constructed from ordinary riprap or wire enclosed riprap (gabions etc.). The rock lining permits higher design velocity than for grass lined channels. Rock linings will normally be used only for erosion control at culvert/storm sewer outlets, at sharp channel bends, at channel confluences and at locally steepened channel sections.

5. Roadside Ditches

Ditches constructed alongside and in conjunction with roadways shall be of sufficient capacity to meet the allowable street flow depth limits as specified in this section.

6. Other Lining Types

The use of fabrics and other synthetic materials for channel linings has increased over the past several years. Proposed improvements of this type will be reviewed on an individual basis as for applicability and performance.

B. Hydraulics

An open channel is a conduit in which water flows with a free surface. The calculations for uniform and gradually varied flow are relatively straightforward and are based upon similar assumptions (e.g. parallel streamlines). The basic equations and computational procedures are presented in this subsection.

1. Uniform Flow

Open channel flow is said to be uniform if the depth of flow is the same at every section of the channel. For a given channel geometry, roughness, discharge and slope, there is only one possible depth, the normal depth. For a channel of uniform cross section the water surface will be parallel to the channel bottom for uniform flow.

The computation of normal depth for uniform flow shall be based upon Manning's formula as follows:

$$Q = (1.49/n)AR^{2/3} S^{1/2}$$

Where,

- Q = Discharge in cubic feet per second (cfs)
- n = Roughness coefficient (Table I)
- A = Cross sectional flow area in square feet
- R = Hydraulic radius, A/P, in feet
- P = Wetted perimeter in feet
- S = Slope of the energy grade line (EGL) in feet/foot

For channels with a uniform cross section the EGL slope and the bottom slope are assumed to be the same.

2. Critical Flow

The design of earth or rock channels in the critical flow regime (Froude numbers from 0.9 to 1.2) is not permitted. The Froude number is defined as follows:

$$F = V/(gD)^{0.5}$$

Where,

- F = Froude number
- V = Velocity in feet per second (fps)
- g = Acceleration of gravity, 32.2 ft/sec²
- D = Hydraulic depth in feet = A/T
- A = Cross sectional flow area in square feet
- T = Top width of flow area in feet

The Froude number shall be calculated for the design of all open channels.

3. Gradually Varied Flow

The most common occurrence of gradually varied flow in storm drainage is the backwater created by culverts, storm sewer inlets or channel constrictions. For these conditions the flow depth will be greater than normal depth in the channel and the water surface profile must be computed using backwater techniques.

Backwater computations can be made using the methods presented in Chow (reference 1). Many computer programs are available for computation of backwater curves. The most widely used program is HEC-RAS, Water Surface Profiles, developed by the U.S. Army Corps of Engineers (reference 2) and is the program recommended for backwater profile computations.

C. Design Standards

1. Flow Velocity

Maximum flow velocities shall not exceed the following:

Channel Type	Max. Velocity
Grass lined*	5 fps
Concrete	15 fps
Rock Lined	10 fps

*Refer to item 6. below

2. Maximum Depth

The maximum allowable channel depth of flow is three feet for the 25-year flow.

3. Freeboard Requirements

Freeboard is defined as the vertical distance between the computed water surface elevation for the design flow and the minimum top of bank elevation for a given cross section. For all channels one-foot minimum of freeboard is required. Freeboard shall be in addition to super elevation.

4. Curvature

The minimum channel centerline radius shall be three times the top width of the design flow.

5. Super Elevation

Super elevation shall be calculated for all curves. An approximation of the super elevation h , may be calculated from the following formula:

Where,

$$H = V^2T/(gr)$$

h = Super elevation in feet
 V = Velocity in fps
 T = Top width of flow area in feet
 G = Acceleration of gravity, 32.2 ft/sec²
 r = radius of curvature in feet.

Freeboard shall be measured above the super elevated water surface.

6. Grass Channels

Side slopes shall be 3 (horizontal) to 1 (vertical) or flatter. Steeper slopes may be used subject to additional erosion protection and approval from the County.

For design discharges greater than 50 cfs, grade checks shall be provided at a maximum of 200' horizontal spacing.

The variation of Manning's n with the retardance, and the product of mean velocity and hydraulic radius as shown in Figure 7.23 in reference 17 shall be used in the capacity calculations. Retardance curve C shall be used to determine the channel capacity and retardance curve D shall be used to determine the velocity.

D. Easements

Easements shall be provided for all open channels constructed in Christian County that are not located within public rights of way. The minimum easement width for open channels is the flow width inundated by a 100-year event plus 15 feet.

All easements required for construction, which are not included on the final plat shall be recorded and filed with the County prior to approval of the construction drawings.

TABLE I - MANNING'S n-VALUES

Closed Conduit	
Concrete pipe	.013
Corrugated steel pipe	.024
Open Channels	
gabions	.035
concrete	.015
riprap	$.0395 d_{50}^{0.17}$
grouted riprap	.027
gunite	.028
earth lined	.020 to .040
grass lined	.029 to .100
natural streams	.025 to .100

TABLE II - LOSS COEFFICIENTS

A. EXPANSION LOSS COEFFICIENTS

EXPANSION ANGLE	COEFFICIENT, K_x	
	D2/D1=3	D2/D1=1.5
10	.17	.17
20	.40	.40
45	.86	1.06
60	1.02	1.21
90	1.06	1.14
120	1.04	1.07
180	1.00	1.00

Where, D2 = downstream diameter and D1 = upstream diameter.

B. CONTRACTION LOSS COEFFICIENTS

ENTRANCE	COEFFICIENT, K_c
Bell-mouthed	.04
Square-edged	.50
Groove-edged	.20

D2/D1	COEFFICIENT, K_c
<.4	.5
.4	.4
.6	.3
.8	.1

C. BEND LOSS COEFFICIENTS, PIPE BENDS

DEFLECTION ANGLE	COEFFICIENT, K_b
90	.50
60	.43
45	.35
22.5	.20

TABLE II - LOSS COEFFICIENTS

BENDS AT MANHOLES (no special shaping)

DEFLECTION ANGLE	COEFFICIENT, Kb
90	1.30
60	0.68
45	0.44
22.5	0.14

BENDS AT MANHOLES (Curved or deflector)

DEFLECTION ANGLE	COEFFICIENT, Kb
90	1.04
60	0.48
45	0.32
22.5	0.10

ARTICLE 8. STORMWATER DETENTION DESIGN

Section 1. Purpose

Detention facilities are used to reduce storm water runoff rates by storing excess runoff. The usual function of a detention facility is to provide sufficient storage such that peak runoff rates are not increased when development occurs.

Section 2. Policy

The primary goal of the Christian County storm water management program is the prevention of flood damage to residential, commercial and public property.

A. In adopting this policy, Christian County recognizes that:

- there are areas in the County where flooding occurs because of inadequately sized drainage ways,
- flooding depths and frequency will increase as development occurs upstream of these areas,
- detention basins are the only effective "on-site" means which can be used to control peak runoff storm water rates as areas develop.

B. Christian County further recognizes that:

- the best means to assure effective performance of a detention basin is perform reservoir routing calculations using hydrographs,
- use of the Simplified Volume Formula frequently does not result in adequately sized detention facilities,
- the inaccuracy of the Rational Method, upon which the Simplified Volume Formula is based, increases as the area under consideration increases,
- even though the Simplified Volume Formula has severe limitations, requirement of detailed analytical methods may not be justified in all cases,
- detention basins designed using the Simplified Volume Formula do provide a minimal amount of flooding protection and potential water quality benefits by functioning as sediment basins.

Therefore, in order to provide a reasonable level of flood protection to homes and businesses, while maintaining a climate favorable for development and economic growth, Christian County has established the following policy for design of detention facilities:

Section 3. Methods of Analysis

The method of analysis to be required for the design of detention facilities will be determined as follows:

A. Detailed Analysis will be Required in the Following Cases:

1. In areas where residences or other structures located downstream of a development can be shown to have an imminent flooding hazard a detailed analysis using hydrographs and reservoir routing techniques will be required.

Residences or other structures will be defined as having an imminent flooding hazard when the lowest point, at which surface runoff may gain entry, is located at, or below, the estimated flooding level which would result from a storm with an annual probability of 1% or greater under conditions existing in the basin prior to development of the applicant's property. (i.e. affected by the "100-year" storm)

Consideration of downstream flooding problems will be limited to the area which may reasonably be expected to be significantly affected by runoff from the applicant's property.

2. Detailed analysis will be required for all detention facilities where the peak runoff rate from the area upstream of the detention facility (off site and on site) exceeds 50 cfs (cubic feet per second) for a storm with an annual probability of 1% (the "100-year" storm) under fully developed conditions. (Note : This would be the rate of flow from approximately 12 acres for residential areas or 5 acres for fully paved commercial areas.)

B. Simplified Analysis will be Permitted in the Following Cases:

For areas where there are no imminent downstream flooding problems, and where the peak runoff rate from the drainage area (off site and on site) upstream of the detention facility does not exceed 50 cfs for the 1% annual probability ("100-year") storm under fully developed conditions, the Simplified Volume Formula may be used.

Section 4. Alternatives to Detention

A. Criteria for Approving an Alternative to Detention

The County will evaluate each request for an alternative design or fee in lieu of detention based on the following criteria. Christian County reserves the right to set precedent with each case considered depending upon the unique circumstances surrounding each request.

1. Size of site in relation to the stormwater generated.*
2. Size of the site in relation to the drainage area.*
3. Impact on properties downstream of site.*
4. Location of the site with respect to floodplains, streams or other large watercourses.
5. Location of the site with respect to environmentally sensitive areas.
6. Approval of previous requests.

* Downstream impacts shall generally be considered insignificant when the added upstream impervious area is less than 10% of the total contributing watershed area. Exceptions to this rule include development where downstream areas are known to have an imminent flooding hazard as defined in Article 8.

B. Residential Subdivisions

Unless otherwise approved by the County, through review of stormwater calculations, and criteria referenced herein, detention shall be required in all major residential subdivisions. Upon request by a developer, the County may consider alternative in cases where it can be proven that the absence of detention will not adversely affect downstream property owners. Each request will be evaluated on a case-by-case basis.

C. Justified Exceptions

The County may consider, upon request, a waiver of detention for sites, in which the alteration of the site is inconsequential and will not substantially increase the runoff. A justified exception will be granted for sites based on the following criteria:

- a. Existing sites in which the addition of impervious surface will not increase more than 5,000 square feet.
- b. Sites in which existing gravel, chat or stone parking lots or driveways are paved with asphalt cement or concrete surfaces. This shall not apply to parking areas or circulation routes in which vegetation has consumed the site and altered the ability to shed or absorb runoff. The County shall exercise strict discretion with respect to approving exceptions based on these criteria.

- c. Sites in which a change in use has occurred, that does not increase the impervious area of the site.
- d. Subdivisions meeting the definition of a minor subdivision or the development of individual single-family-residential homes on individual lots in existing subdivisions.

D. Procedure

A request for approval of an alternative to detention must begin with the applicant providing the County with stormwater calculations for the increased runoff from the development. In addition to providing calculations, the applicant must submit a request for alternative design based on the criteria established above. The County Engineer will coordinate review of the request with County staff. If the County Engineer and staff determines that the request is justified the Planning & Zoning staff will notify the applicant or his representative of the approval.

Section 5. Innovation in Design

It is the desire of the County that detention facilities be designed and constructed in a manner to enhance aesthetic and environmental quality of the County as much as possible.

Christian County therefore encourages designs, which utilize and enhance natural settings, and minimize disturbance and destruction of wooded areas, natural channels, and wetlands.

Section 6. Interpretation

Interpretations of the detention policy will be made by the County Engineer in writing. Where disagreements may arise over the interpretation of the requirements set forth herein, appeals may be made in accordance with procedures established by the Christian County Zoning Regulations, the Christian County Subdivision Regulations, or the Christian Building Regulations, as applicable.

Section 7. Design Criteria

A. General

- 1. Detention facilities shall discharge into a drainage easement or public right of way.
- 2. One foot of freeboard shall be provided between the maximum water surface elevation (maximum stage for a 1% annual probability event) and the minimum top of berm or wall elevation.
- 3. Embankment slopes steeper than three horizontal to one vertical (3H:1V) are not permitted.
- 4. In certain instances, such as when the existing development conditions runoff from a watershed would exceed the capacity of the existing downstream facilities, retention basins (i.e., no outlet

or with a release rate at the capacity of the downstream facilities) for the storm runoff may be required by the County.

5. Dry detention basins shall maintain a minimum bottom slope of two feet per hundred feet (2%).
6. Trickle channels shall have a minimum slope of one half foot per hundred feet (0.5%).
7. The maximum allowable depth of ponding for parking lot detention is 12 inches.
8. Parking lot detention may not inundate more than 10% of the total parking area.
9. All parking lot detention areas shall have a minimum of two signs posted identifying the detention pond area. The signs shall have a minimum area of 1.5 square feet and contain the following message:

WARNING:

This area is a storm water detention pond and is subject to periodic flooding to a depth of 12 inches.

10. The sign shall be reflective and have a minimum height of forty-eight (48) inches from the bottom of the sign to the parking space finished grade. Any suitable materials and geometry of the sign are permissible, subject to approval by the County.

B. Detailed Analysis

1. Detailed analysis shall be performed using hydrograph methodologies and reservoir routing techniques.
2. The most common techniques are those developed by the Corps of Engineers and the Soil Conservation Service. These methods are preferred, however other proven techniques will be accepted.
3. Detention basins designed by detailed methods shall be designed on the basis of multiple storm recurrence frequencies to ensure that they function properly for both frequent storms and large infrequent storms.
4. A minimum of three recurrence frequencies, the 50%, 10% and 1% annual probability storms (the "2-year, 10-year and 100-year" storms) must be considered.
5. The runoff model must include the entire drainage basin upstream of the proposed detention pond. The model shall be prepared in sufficient detail to ensure that peak runoff rates are reasonably accurate.
6. The runoff model shall be developed for the following cases:

Case 1: Existing conditions in the drainage basin prior to development of the applicant's property.

Case 2: Existing conditions in the drainage basin with developed conditions on the applicant's property.

Case 3: Fully developed conditions in the entire drainage basin.

Cases 1 & 2 are utilized to determine the required detention volume and the type of outlet structure to be provided, and shall be analyzed for the three storm recurrence frequencies required above.

7. The detention facility shall be designed such that peak outflow rates from the facility for Case 2 are no greater than the rates determined in Case 1 for each of the three storm recurrence frequencies required.
8. The storage volume provided shall not be less than the difference in total runoff volume between Case 1 and Case 2.
Case 3 is used determine the size of the overflow spillway. Case 3 need only be analyzed for the 1% annual probability ("100-year").
9. The overflow spillway will, in most cases, be combined with the outlet structure.

C. Submittals

The following information must be submitted for detention ponds designed by detailed methods:

1. Information regarding analytical methods and software to be used, including:
 - Name of software to be used.
 - Type and distribution of precipitation input.
 - Method for determining precipitation losses.
 - Type of synthetic hydrograph.
 - Method for routing hydrographs.
 - Method used for reservoir routing.
2. Map(s) showing sub-basin delineation, topography, presumed flow routes, and pertinent points of interest; soil types; existing basin development conditions used in the model; fully developed conditions used in the model.
3. Routing diagram for the runoff model.
4. A summary of sub-basin characteristics used for program input.
5. Stage-area or stage-storage characteristics for the basin in tabular or graphic form.

6. Stage-discharge characteristics for the outlet structure and overflow spillway in tabular or graphic form; hydraulic data for weirs, orifices, and other components of the control structure.
7. A printout of the input data file.
8. A summary printout of program output, including plots of hydrographs. (These are intended to be the printer plots generated by the software.)

D. Simplified Analysis

1. Method of Evaluation

Differential runoff rates shall be evaluated by equation:

$$R = (C_d \times I_{100}) - (C_u \times I_{100})$$

Where, R = Differential Runoff Factor
 Cd = Runoff Coefficient for developed conditions
 Cu = Runoff Coefficient for undeveloped conditions
 I₁₀₀ = Intensity for 100 year storm

"C" values shall be determined from the following table:

SUGGESTED RUNOFF COEFFICIENTS

"C" Value	Surface Conditions
.10 - .15	- Tall grass, brush
.15 - .20	- Parks, golf courses, farms, and one acre single family residences
.35	- Single family residences on lots of not less than 15,000 sq. ft.
.45	- Single family residences on lots of not less than 10,000 sq. ft.
.47	- Single family residences on lots of not less than 7,500 sq. ft.
.51	- Single family residences on lots of not less than 6,000 sq. ft.
.90	- Gravel surfaces.
.95	- Asphalt and concrete surfaces.
1.00	- Buildings and other structures

E. Volume of Detention

Volume of detention shall be determined according to the "Simplified Volume Formula", as follows:

$$V = R \times A \times tc \text{ (min.)} \times 60 \text{ (sec./min.)}$$

V = Total volume of detention (cu. ft.)

R = Differential Runoff Factor

A = Area of project in acres

tc = Time of concentration (30 minutes, minimum, for volume calculation only)

F. Time of Concentration

SCS Method

The preferred method for determining time of concentration shall be the method set forth in Chapter 3 of the Soil Conservation Service Technical Release No. 55, "Urban Hydrology for Small Watersheds", 2nd Edition, 1986.

Other Methods

Time of concentration may also be calculated by other accepted methods providing reasonable results.

The time of concentration used in the formula shall be determined based upon existing conditions.

G. Rainfall Intensity

Rainfall intensity shall be determined from Drawing 10.

H. Required Volume

The required volume of detention shall be determined from the following Table:

Calculated Volume	Required Volume
1 cu. ft. thru 500 cu. ft.	500 cu. ft.
501 cu. ft. thru 5,999 cu. ft.	Round up to nearest 500 cu. ft.
5,000 cu. ft. thru 9,999 cu. ft.	Round up to nearest 1,000 cu. ft.
10,000 cu. ft. thru 49,999 cu. ft.	Round up to nearest 5,000 cu. ft.
Above 50,000 cu. ft.	Round up to nearest 10,000 cu. ft.

I. Control Structures – Simplified Analysis

1. Detention facilities designed by the simplified analysis shall be provided with obvious and effective outlet control structures. These outlet structures may include v-notch weirs or rectangular weirs, as well as pipe. Plan view and sections of the structure with adequate detail shall be included in plans.
2. The design discharge (Q) for the low-flow outlet shall not exceed the existing runoff for the one-year storm. The maximum discharge shall be designed to take place under total anticipated design-head conditions. The design-head storage volume is not to be considered a part of the volume of detention required.
3. Sizing of a low-flow pipe shall be by inlet control.
4. Low-flow pipes shall not be smaller than four (4) inches in diameter to minimize maintenance and operating problems, except in parking lot and roof detention where minimum size and configuration of opening shall be designed specifically for each condition.
5. Overflow spillways will be required on all detention facilities, which have storage volumes of 1,000 or more cubic feet.
6. The overflow opening or spillway shall be designed so that the combination flow of the low flow outlet and the flow over the spillway will not exceed the total peak runoff for the improved area. The total peak runoff is to be determined from a 100 year storm event.

ARTICLE 9. SINKHOLES AND KARST FEATURES

Section 1. General

Christian County is located on or near the Springfield Plateau of the Ozark physiographic region. This area is underlain by Mississippian Age limestone, which is highly susceptible to solutional weathering. As a result, sinkholes, springs and caves are common.

In many areas of the County special consideration must be given to flood hazards and potential for groundwater contamination due to the presence of sinkholes, caves, losing streams, springs, and other features associated with karst geology.

The requirements set forth herein, are intended to provide specific criteria for design and construction for any site upon which sinkholes or other karst features are located.

Interpretations of these requirements shall be made and appeals may be made according to the procedures set forth in these Design Criteria.

Section 2. Policy

In keeping with the intent of the Christian County stormwater management plan the following policy is set forth for development in areas containing sinkholes:

- A. Development in sinkhole areas will be based upon the following axioms:**
 - 1. Avoidance
 - 2. Minimization
 - 3. Mitigation
- B. Construction in sinkholes shall be avoided. Exceptions will be made only in situations where it can be conclusively demonstrated that there are no practical alternatives to such construction. These situations are mostly likely to arise where:**
 - 1. An underground cavity has caused a collapsed sinkhole to form, after subdivision approval or building construction.
 - 2. A sinkhole has been altered or filled either unknowingly or prior to passage of these regulations.
 - 3. Maintenance and operation is required for existing roads and utilities.
 - 4. Location of existing streets or utilities would render access or utility service to a property impractical or cost prohibitive.

In these types of cases, measures which will have minimal impact on the sinkhole or receiving water may be proposed. Plans for minimal alteration can be approved provided it is conclusively demonstrated that the proposed plan is the minimum practical alternative.

In these cases potential impacts of construction on the sinkhole and receiving waters must be studied and assessed, and recommendations made for mitigation of potential impacts upon surface flooding and groundwater quality before the plans can be approved. The degree and sophistication of study required will increase in proportion to the potential impacts.

Section 3. Definitions

Sinkhole

Any depression in the surface of the ground, with or without collapse of adjacent rock that provides a means through which surface water can come into contact with subsurface water.

Sinkhole depressions may be gradual or abrupt; they may or may not have a well defined eye. While most sinkholes can be defined as the area within a "closed contour", some sinkholes such as those located on the sides of hills may not.

All sinkholes provide discreet points of recharge to groundwater.

Sinkhole Watershed

The ground surface area that provides drainage to the sinkhole. This area extends beyond the sinkhole depression, and generally crosses property boundaries.

Unaltered Sinkhole

A sinkhole that has never been altered or disturbed.

Altered Sinkhole

A sinkhole that has been filled, excavated, or otherwise disturbed.

Collapsed Sinkhole

A subsidence or cave-in of the ground surface caused when soil overburden can no longer be supported by underlying strata due to the presence of subsurface solution cavities.

Sinkhole Eye

Generally, a visible opening, cavity, or cave in the bottom of a sinkhole, sometimes referred to as a swallow hole.

Sinkhole Rim

The perimeter of the sinkhole depression. The sinkhole rim will generally vary in elevation.

Sinkhole Cluster Area

An area containing 2 or more sinkholes located in close proximity, generally interconnected by groundwater conduits.

Terminal Sinkhole

The lowest sinkhole in a sinkhole cluster to which any surface water overflowing from other sinkholes in the cluster will flow.

Sinkhole Flooding Area

The area inundated by runoff from a storm with an annual exceedance probability of 1% and a duration of 24 hours.

Qualified Geologist

A person who has met or exceeded the minimum geological educational requirement and who can interpret and apply geologic data principles, and concepts and who can conduct field or laboratory geologic investigations (per RSMo); and who by reason of experience and education, has an understanding of local karst geology.

Qualified Professional Engineer

A person registered to practice engineering according to the laws of the State of Missouri, and who by reason of technical education and experience has a background in the fundamentals of storm drainage and karst geology.

Heavy Equipment

Motorized equipment having a gross weight of more than 6 tons.

Light Equipment

Motorized equipment weighing 6 tons or less.

Section 4. Permits Required

A. Soil Erosion & Control Permit

A grading permit must be obtained prior to any alteration of sinkholes associated with new subdivision construction in accordance with County regulations.

Procedures and requirements for grading permits are set forth in Article 3.

B. Other permits

Other permits from State or federal agencies may be required, as outlined in Article 1 of these Design Criteria, depending upon the size and nature of the proposed activity.

Section 5. General Plan Requirements

General requirements for grading and drainage plans are set forth in Article 3, Article 6 and Article 7 of these Design Criteria.

Section 6. Sinkhole Evaluation

An evaluation including the following information shall be made for all sites upon which sinkholes are fully or partially located:

- A. The site plan for the proposed development must show the following items with respect to location of proposed construction, proposed or existing property lines, and existing structures:
 1. **Sinkholes**
 - a. Location and limits of the area of the sinkhole depression as determined by field surveys or other reliable sources as may be approved.

Location of sinkholes based solely upon USGS 7-1/2 Minute Series Quadrangle Maps will not be considered sufficient unless field verified.
 - b. Location and elevation of the sinkhole eye where visible or known.
 - c. Topographic contours at maximum intervals of 2 feet, and spot elevations sufficient to determine the low point on the sinkhole rim and the profile of the potential overflow area.
 - d. Minimum entry elevations of any existing structures located within the sinkhole rim.
 - e. Elevation of any roadway located within or adjacent to the sinkhole.

2. Water Supply Sources

- a. The approximate location of public or private water supply sources such as springs or wells, as determined from information available from the County and Missouri Department of Natural Resources that are located within a 500' radius of the sinkhole.
- b. Boundaries of any known recharge areas to wells or springs as determined from information available from the County and Missouri Department of Natural Resources.

3. Other Geologic Features

Location of caves, springs, faults and fracture trends, geologic mapping units based upon information from the County or other reliable sources.

B. Flooding Limits for the Sinkholes Determined as Set Below:

- 1. A drainage area map showing the sinkhole watershed area.
Where the site is located in a sinkhole cluster area, this map shall be extended to include the watershed area any sinkholes located downstream of the site which may receive overflow drainage from the site.

- C. Assessment of potential impacts on groundwater quality and proposed water quality management measures as set forth below.

Section 7. Flooding Considerations

A. Minimum Flooding Analysis

Maximum estimated flooding elevations shall be determined for each sinkhole for both pre-development and post development conditions, assuming no subsurface outflow from the sinkhole.

Where the estimated volume of runoff exceeds the volume of the sinkhole depression, the depth, spread and path of overflow shall be estimated and shown on the map.

The overflow volume shall be included determining the maximum estimated flooding elevations in the next downstream sinkhole. This analysis shall continue downstream until the lowest sinkhole of the sinkhole cluster is reached or overflow reaches a surface watercourse.

The volume of runoff considered shall be that which results from a rainstorm with an annual probability of 1% (100-year storm) and a duration of 24 hours (8.2 inches).

The runoff volume shall be determined by the method set forth in Chapter 2 of the SCS TR-55 Manual (Reference).

No Further Flooding Analysis will be Required Provided That:

1. The post-development flooding area of any sinkhole which receives drainage from the site is located entirely on the site.
 - a. A drainage easement covering the post-development flooding area is provided for any off-site sinkhole or portion of a sinkhole which receives increased peak rates of runoff from the site. If the receiving sinkhole is not contiguous to the site, an easement must also be provided for the waterway that connects the site to the sinkhole.
2. The minimum entry elevation of any existing structure is at least 5 feet higher than the estimated flooding elevation from the 1% annual probability 24-hour storm.
3. The flooding depth on any existing public road does not exceed the maximum depths set forth in Article 7.

B. Detailed Flooding Analysis

In cases where the conditions set forth above cannot be met, a detailed flooding analysis will be required if any increase in runoff volume is proposed. For detailed flooding analysis a runoff model must be made for the sinkhole watershed and reservoir routing analysis performed using hydrograph techniques as set forth in Article 8

The following alternative methods may be used singly or in combination to keep flooding levels at pre-development levels:

1. Diversion of excess runoff to surface watercourses.

Where feasible, increased post-development runoff may be diverted to a surface watercourse, provided that

 - a. Any increase in peak runoff rate in the receiving watercourse does not create or worsen existing flooding problems downstream; and
 - b. The diverted storm water remains in the same surface watershed.

Storm sewers, open channels and other appurtenances provided for diversions shall be designed in accordance with applicable sections of these Design Criteria.

The effect of diverted water on downstream watercourses and developments, and requirements for additional detention facilities prior to release of runoff to the surface water course shall be determined as set forth in Article 8, Detention Facilities.

Effects of the diversion shall be shown by reservoir routing analysis. Routing of excess runoff shall be considered satisfactory when it can be demonstrated that the post-

development flooding elevation in the sinkhole does not exceed the pre-development flooding elevation within reasonable tolerance (generally 0.1 ft.).

2. Storage of Excess Runoff Within the Sinkhole Watershed

Where feasible, detention facilities may be constructed within the sinkhole watershed or in perimeter areas of the sinkhole. These detention facilities must be located outside the sinkhole flooding area determined for post-development conditions.

The flooding considerations set forth in this Section will be met if it can be demonstrated that:

- a. Inflow rates to the sinkhole can be reduced to a degree that, in conjunction with the observed outflow rate, the post-development flooding elevation in the sinkhole does not exceed the pre-development flooding elevation within reasonable tolerance (generally 0.1 ft.).

- 3. Sediment & erosion control and water quality considerations as set forth elsewhere in this section can be satisfied.

Section 8. Water Quality Considerations

Sinkholes provide direct recharge routes to groundwater. As a result water quality in wells, caves and springs may be affected by discharge of runoff from developed areas. The Sinkhole Evaluation must consider potential impacts of the proposed construction on receiving groundwater and propose measures to mitigate such impacts.

Four Primary Factors Must be Considered in the Sinkhole Evaluation:

- 1. Receiving groundwater use.
- 2. Relative groundwater contamination hazard associated with the proposed development.
- 3. Ability to capture pollutants.
- 4. Management measures to be provided to reduce pollutant levels.

A. Receiving Groundwater Use

The Sinkhole Evaluation Report shall identify whether the site lies within a critical area based upon information available from the County.

Where disagreements may arise over whether a site is located within a particular recharge area dye tracing may be required for confirmation of the destination of water discharges through a sinkhole.

1. Critical Areas

The following areas are classified as critically sensitive to contamination from urban runoff:

- a. Recharge areas of domestic water supply wells.

- b. Recharge areas of springs used for public or private water supply.
- c. Recharge areas of caves providing habitat to rare or endangered species such as the Ozark cave fish.

2. **Sensitive Areas**

All other sinkhole areas will be classified as sensitive to contamination from urban runoff.

B. Groundwater Contamination Hazard

The relative potential for groundwater contamination will be classified as moderate, high, or very high depending upon the type of land use, development density and amount of directly connected impervious area. The Sinkhole Evaluation shall identify whether the proposed development poses a moderate, high or very high hazard to groundwater uses, as defined below:

1. **Moderate Hazard**

The following land uses are classified as posing a relatively low hazard to groundwater contamination:

- a. Wooded areas and lawns.
- b. Parks and recreation areas.
- c. Residential developments on sewer, provided directly connected impervious areas discharging to the sinkhole is less than 1 acre.
- d. Low density commercial and office developments provided directly connected impervious areas discharging to the sinkhole is less than 1 acre.
- e. Discharge from graded areas less than 1 acre having required sediment controls per Article 3.

2. **High Hazard**

- a. Concentrated discharge from streets and parking lots and roofs and other directly connected impervious areas having an area greater than 1 Acre and less than 5 acres.
- b. Multifamily residential developments and higher intensity office developments provided the directly connected impervious areas discharging to the sinkhole is less than 5 acres.
- c. Discharge from graded areas greater than 1 acre and less than 5 acres having required sediment controls per Article 3.

3. Very High Hazard

- a. Collector and arterial streets and highways used for commercial transport of toxic materials.
- b. Railroads.
- c. Concentrated discharge from streets and parking lots and roofs and other directly connected impervious areas having an area greater than 5 acres.
- d. Commercial, industrial and manufacturing areas.
- e. Individual wastewater treatment systems.
- f. Commercial feedlots or poultry operations.
- g. Discharge from graded areas greater than 5 acres having required sediment controls per Article 3.

C. Capturing and Filtering Pollutants

The majority of sinkholes drain a limited watershed area. For sinkholes where the surrounding drainage area is small enough that the area draining to the sinkhole flows predominantly as "sheet flow", potential impacts on water quality can be addressed by erecting silt control barriers around the sinkhole during construction and providing a vegetative buffer area around the sinkhole to filter out potential contaminants.

When the volume of runoff into the sinkhole increases to the point where flow becomes concentrated, the degree of effort required capturing and filtering out contaminants increases significantly.

Concentrated inflow occurs naturally when the sinkhole watershed area reaches a sufficient size for watercourses leading into the sinkhole to form. Concentrated surface flows result as urbanization occurs due to construction of roads, storm sewers, drainage channels. Subsurface flows can become concentrated through utility trenches.

The Sinkhole Evaluation shall include maps showing any existing watercourse which flows into the sinkhole and location of any proposed concentrated storm water discharges into the sinkhole.

D. Water Quality Management Measures

1. Sediment and Erosion Control

a. Non-Concentrated Flow (Sheet Flow)

In critical areas, existing ground cover shall not be removed within 30 feet of the sinkhole rim and a silt barrier shall be provided around the outer perimeter of the buffer area.

b. Concentrated Flow

A sediment basin will be required at each point where concentrated flows are discharged into the sinkhole.

Sediment basins shall be designed according to the procedures set forth in Article 3.

2. **Minimizing Directly Connected Impervious Area**

The groundwater contamination hazard category for impervious areas may be reduced by reducing the amount of Directly Connected Impervious Area. This is the area of roofs, drives, streets, parking lots, etc. which are connected via paved gutters, channels, or storm sewers.

Directly Connected Impervious Areas can be reduced by providing properly sized grass swales, vegetative filter strips, or other Best Management Practices to separate paved areas.

3. **Diversion of Runoff**

Concentrated discharges to sinkholes can be reduced to manageable levels or avoided by diverting runoff from impervious areas away from sinkholes where possible.

Diversions shall be done in a manner that does not increase flooding hazards on downstream properties and, generally, shall not be directed out of the surface watershed in which the sinkhole is located.

4. **Filtration Areas**

For areas having a moderate or high groundwater contamination hazard and where flow into the sinkhole occurs as sheet flow, water quality requirements can be satisfied by maintaining a permanent vegetative buffer area with a minimum width of 30 feet around the sinkhole.

Use of pesticides and fertilizers will not be permitted within the buffer area. Animal wastes will not be permitted to accumulate in the buffer area.

5. **Grassed Swales and Channels**

For areas having a moderate groundwater contamination hazard concentrated flows from directly connected impervious areas of less than one acre may be discharged into the sinkhole through grassed swales and channels.

Swales and channels shall be designed for non-erosive velocities and appropriate temporary erosion control measures such as sodding or erosion control blankets provided.

6. Storage and Infiltration

Storage and infiltration will be required in the following cases:

- a. All areas having a **very high** groundwater contamination hazard.
- b. Areas having a **high** groundwater contamination hazard where concentrated inflow occurs.

Storage and infiltration basins shall be designed to capture the runoff from storms up to 1 inch and release runoff over a minimum period of 24 hours and maximum period of 48 hrs.

Standards outlet structures for sedimentation and infiltration basins are shown in the standard drawings.

E. Development Requirements.

1. Stormwater Detention in Sinkholes

Where flooding considerations and water quality considerations, as set forth in Article 3, can be met, the volume of runoff storage in sinkholes can be counted toward storm water detention requirements, provided that proper sediment and erosion control measures are provided as set forth in Article 3.

The volume of required detention storage shall be determined as set forth in Article 8.

Excavation within the sinkhole flooding area to provide additional detention storage will not be allowed.

2. Modification of Sinkholes to Increase Outflow Rates

Increasing outflow rates in sinkholes by excavating the sinkhole eye or installing disposal wells for diverting surface runoff to the groundwater system is prohibited, unless clear and imminent danger to the public health and safety can be demonstrated.

3. Setbacks and Use Restrictions

- a. No new construction of any of the following shall be permitted within 30 feet horizontally of the sinkhole rim:
 1. Residential, commercial or industrial structures.
 2. Swimming pools.
 3. Streets, highways, or parking lots.
 4. Storage yards for materials, vehicles, and equipment.
 5. Sanitary sewer lines.

- b. The finished floor elevation of all structures constructed within a sinkhole rim shall have the finished floor set a minimum of 5 feet above the 100-year water surface elevation as determined in Section G above.
- c. Use of pesticides and fertilizers within 30 feet of the sinkhole rim is prohibited.
- d. Use of heavy construction equipment in unaltered sinkholes is prohibited.
- e. Construction of underground utilities is prohibited within the sinkhole rim.
- f. Recreational facilities such as hiking, jogging, and bicycling trails, playgrounds, exercise courses, and grass playing fields are permitted within the sinkhole area provided they are not located within the eye of the sinkhole.
- g. Golf courses are permitted subject to approval of a Management Plan for use of pesticides and fertilizers.
- h. Clearing and pruning of trees and undergrowth, and limited grubbing of roots is permitted.
- i. Landscaping and minor gardening is permitted outside of the sinkhole eye provided erosion and sediment discharge is limited through use of minimum tillage and mulches.
- j. Construction of light incidental landscaping and recreational structures such as gazebos, playground equipment, etc. is permitted except in the sinkhole eye.

4. **Collapsed Sinkholes**

Collapsed sinkholes may be stabilized and filled using approved techniques. A Soil Erosion & Control Permit must be issued prior to performing any construction.

The probable cause of the collapse and potential adverse impacts of filling the collapse shall be investigated and information submitted with the permit application.

5. **Altered Sinkholes**

Filling or altering of sinkholes without a Soil Erosion & Control Permit constitutes a violation of these regulations. In such cases corrective measures must be proposed within the time period specified in the Zoning Regulations for enforcement of such violations. No corrective or remedial measures shall be undertaken until the proposed remediation plan has been reviewed by the County and a Permit issued.

Christian County Stormwater and Erosion Control Regulations
Article 9 – Sinkholes and Karst Features

No Building Permits will be issued, or zoning or subdivision approvals granted, until the remedial measures specified in the Soil Erosion & Control Permit have been completed and approved.

ARTICLE 10. FLOODPLAIN DEVELOPMENT

Section 1. Purpose

As a participant in the National Flood Insurance Program, Christian County adheres to the requirements of the 1968 Flood Insurance Act and the 1994 Flood Insurance Reform Act. The National Flood Insurance Program (NFIP) is administered by FEMA.

The purpose of the NFIP is to:

- A. Significantly limit the number of new structures built below the 100-year flood elevation
- B. Provide affordable flood insurance to existing flood prone structures
- C. Provide programs to remove or elevate substantially damaged structures and repetitive loss structures

Section 2. Policy

Christian County, through the Floodplain Manager, is responsible for reviewing and ensuring that all development in the floodplain and floodway meets the requirements of the NFIP.

Section 3. Definitions

Flood

Temporary condition of partial or complete inundation of normally dry areas from overflow of inland or tidal waters, rapid accumulation or runoff of surface waters from any source.

SFHA (Special Flood Hazard Area)

Areas subject to a 1% or greater annual chance of flooding in a given year.

BFE (Base Flood Elevation)

The flood elevation from a flood having a 1% probability of being equaled or exceeded in any given year.

FIRM (Flood Insurance Rate Map)

Official map of a community on which FEMA has delineated the flood hazard areas.

FIS (Flood Insurance Study)

An engineering study performed under contract to FEMA to identify floodprone areas and to determine BFEs.

Structure

A walled and roofed building, including a gas or liquid storage tank, that is principally above ground.

Floodway

The critical area of the SFHA that must be preserved to allow passage of floods.

Surcharge

The difference in the elevation of the base flood and the floodway water surface elevation at a given point. This value is never more than 1.0 foot.

Fringe

The area of the SFHA between the floodway and the 100-year flooding limits.

Encroachment

Any fill, structures or other obstructions that infringe upon the floodway or floodplain and cause an increase in the BFE.

Section 4. Permits

A floodplain development permit is required for all development or fill activities within the limits of the 100-year floodplain as shown on the FIRM.

Section 5. FEMA

Prior to approval of any development plan, all lots or structures to be located within the floodplain or floodway must meet all NFIP requirements.

A. Approximate Zone A

1. Establishment of BFEs in an approximate Zone A floodplain must conform to the requirements of, The Zone A Manual: Managing Floodplain Development in Approximate Zone A Areas.
2. Based upon the computed BFE, a Letter of Map Amendment or Letter of Map Revision Based upon Fill must be obtained from FEMA for the property and/or structure in question.
3. Encroachment in an approximate Zone A floodplain must produce no more than 1.0 foot of rise in the BFE.

B. Zone AE

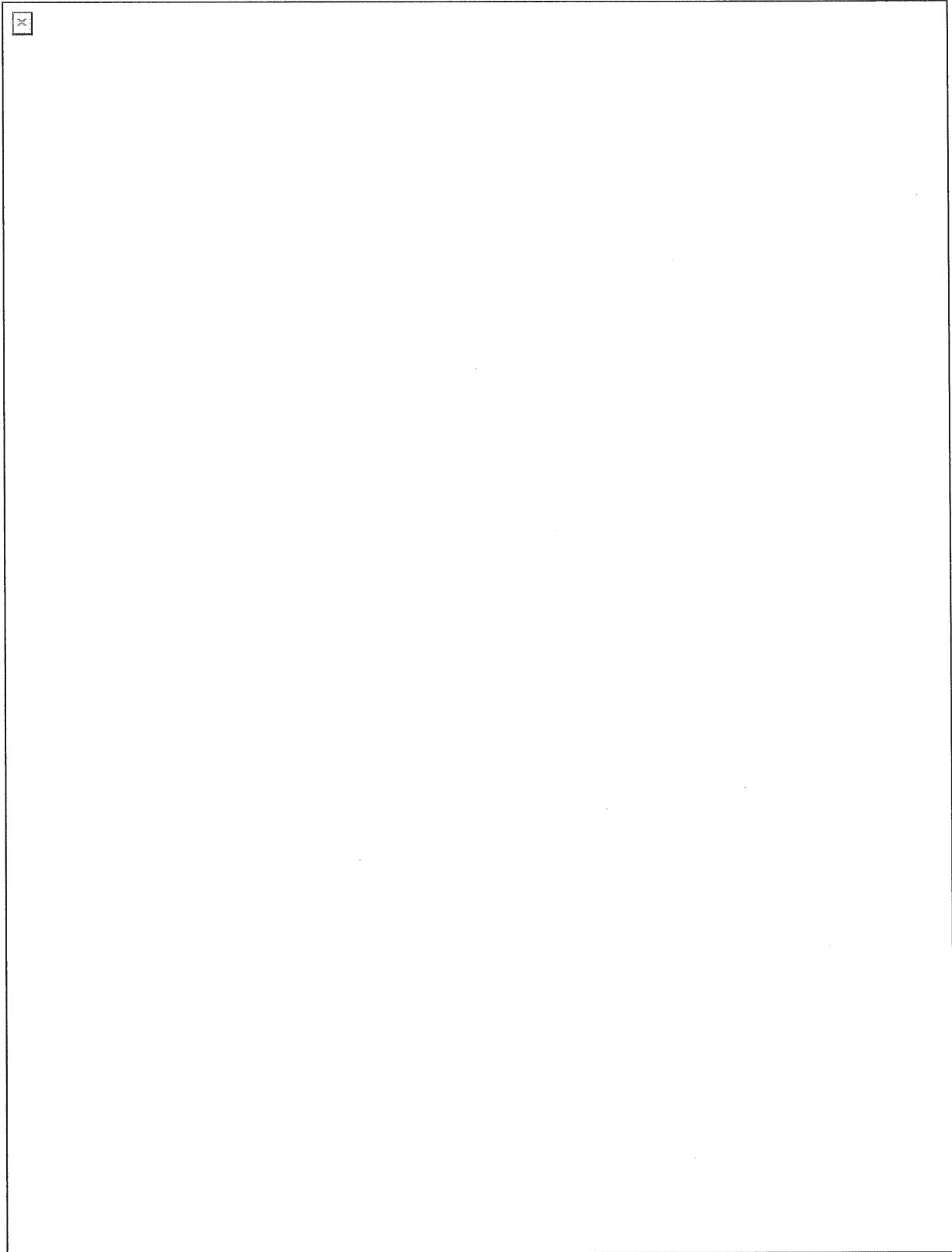
1. Based upon the BFEs from the FIRM, a Letter of Map Amendment or a Letter of Map Revision Based upon Fill must be obtained from FEMA for the property and/or structure in question.

2. If mapping errors are found or changes to BFEs are proposed, a Letter of Map Revision must be obtained from FEMA for the floodplain reach impacted.

C. Floodway Development

1. Development causing any obstruction to flow is not allowed within the effective floodway.
2. A No-Rise Certification must be made for all roadway crossings of the floodway.
3. If changes to the floodway are desired, a Letter of Map Revision must be obtained from FEMA for the floodway reach impacted.

**APPENDIX A ADOPTED FLOODPLAIN MANAGEMENT
ORDINANCE**



ARTICLE 2 GENERAL PROVISIONS

SECTION A. LANDS TO WHICH ORDINANCE APPLIES

This ordinance shall apply to all lands within the jurisdiction of Christian County (local unit) identified as unnumbered A zones, on the Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map (FHBM) dated April 19, 1983 as amended, and any future revisions thereto. In all areas covered by this ordinance, no development shall be permitted except through the issuance of a floodplain development permit, granted by the County Commission (governing body) or its duly designated representative under such safeguards and restrictions as the County Commission (governing body) or the designated representative may reasonably impose for the promotion and maintenance of the general welfare, health of the inhabitants of the community, and as specifically noted in Article 4.

SECTION B. FLOODPLAIN ADMINISTRATOR

The Planing and Zoning Administrator (community official (title/office)) is hereby designated as the Floodplain Administrator under this ordinance.

SECTION C. COMPLIANCE

No development located within the special flood hazard areas of this community shall be located, extended, converted, or structurally altered without full compliance with the terms of this ordinance and other applicable regulations.

SECTION D. ABROGATION AND GREATER RESTRICTIONS

It is not intended by this ordinance to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this ordinance imposes greater restrictions, the provisions of this ordinance shall prevail. All other ordinances inconsistent with this ordinance are hereby repealed to the extent of the inconsistency only.

SECTION E. INTERPRETATION

In their interpretation and application, the provisions of this ordinance shall be held to be minimum requirements, shall be liberally construed in favor of the governing body, and shall not be deemed a limitation or repeal of any other powers granted by State statutes.

SECTION F. WARNING AND DISCLAIMER OF LIABILITY

The degree of flood protection required by this ordinance is considered reasonable for regulatory purposes and is based on engineering and scientific methods of study. Larger floods may occur on rare occasions or the flood heights may be increased by man-made or natural causes, such as ice jams and bridge openings restricted by debris. This ordinance does not imply that areas outside unnumbered A zones or land uses permitted within such areas will be free from flooding or flood damage. This ordinance shall not create a liability on the part of Christian County (name of local unit), any officer or employee thereof, for any flood damages that may result from reliance on this ordinance or any administrative decision lawfully made thereunder.

SECTION G. SEVERABILITY

If any section, clause, provision, or portion of this ordinance is adjudged unconstitutional or invalid by a court of appropriate jurisdiction, the remainder of this ordinance shall not be affected thereby.

ARTICLE 3 ADMINISTRATION

SECTION A. FLOODPLAIN DEVELOPMENT PERMIT (REQUIRED)

A floodplain development permit shall be required for all proposed construction or other development, including the placement of manufactured homes, in the areas described in Article 2, Section A. No person, firm, corporation, or unit of government shall initiate any development or substantial-improvement or cause the same to be done without first obtaining a separate floodplain development permit for each structure or other development.

SECTION B. DESIGNATION OF FLOODPLAIN ADMINISTRATOR

The Planning and Zoning Administrator (designed official (title/office)) is hereby appointed to administer and implement the provisions of this ordinance.

SECTION C. DUTIES AND RESPONSIBILITIES OF FLOODPLAIN ADMINISTRATOR

Duties of the Planning and Zoning Administrator (floodplain administrator (title/office)) shall include, but not be limited to:

1. review of all applications for floodplain development permits to assure that sites are reasonably safe from flooding and that the floodplain development permit requirements of this ordinance have been satisfied;
2. review of all applications for floodplain development permits for proposed development to assure that all necessary permits have been obtained from Federal, State, or local governmental agencies from which prior approval is required by Federal, State, or local law;
3. review all subdivision proposals and other proposed new development, including manufactured home parks or subdivisions, to determine whether such proposals will be reasonably safe from flooding;
4. issue floodplain development permits for all approved applications;
5. notify adjacent communities and the State Emergency Management Agency (state coordinating agency) prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Emergency Management Agency (FEMA);
6. assure that maintenance is provided within the altered or relocated portion of any watercourse so that the flood-carrying capacity is not diminished; and

[Article 3, Section C]

7. where base flood elevation from other sources is utilized within unnumbered A zones:
 - a. verify and maintain a record of the actual elevation (in relation to mean sea level) of the lowest floor (including basement) of all new or substantially improved structures;
 - b. verify and maintain a record of the actual elevation (in relation to mean sea level) that the new or substantially improved non-residential structures have been flood proofed;
 - c. when flood proofing techniques are utilized for a particular non-residential structure, the Planning and Zoning Administrator (floodplain administrator) shall require certification from a registered professional engineer or architect.

SECTION D. APPLICATION FOR FLOODPLAIN DEVELOPMENT PERMIT

To obtain a floodplain development permit, the applicant shall first file an application in writing on a form furnished for that purpose. Every floodplain development permit application shall:

1. describe the land on which the proposed work is to be done by lot, block and tract, house and street address, or similar description that will readily identify and specifically locate the proposed building or work;
2. identify and describe the work to be covered by the floodplain development permit;
3. indicate the use or occupancy for which the proposed work is intended;
4. indicate the assessed value of the structure and the fair market value of the improvement;
5. identify the existing base flood elevation and the elevation of the proposed development;
6. give such other information as reasonably may be required by the Planning and Zoning Administrator (floodplain administrator);
7. be accompanied by plans and specifications for proposed construction; and
8. be signed by the permittee or his authorized agent who may be required to submit evidence to indicate such authority.

ARTICLE 4 PROVISIONS FOR FLOOD HAZARD REDUCTION

SECTION A. GENERAL STANDARDS

1. No permit for floodplain development shall be granted for new construction, substantial-improvements, and other improvements, including the placement of manufactured homes, within any unnumbered A zone unless the conditions of this section are satisfied.

[Article 4, Section A]

2. All areas identified as unnumbered A zones on the FIRM are subject to inundation of the 100-year flood; however, the base flood elevation is not provided. Development within unnumbered A zones is subject to all provisions of this ordinance. If Flood Insurance Study data is not available, the community shall obtain, review, and reasonably utilize any base flood elevation or floodway data currently available from Federal, State, or other sources.
3. All new construction, subdivision proposals, substantial-improvements, prefabricated buildings, placement of manufactured homes, and other developments shall require:
 - a. design or adequate anchorage to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy;
 - b. construction with materials resistant to flood damage;
 - c. utilization of methods and practices that minimize flood damages;
 - d. all electrical, heating, ventilation, plumbing, air-conditioning equipment, and other service facilities be designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding;
 - e. new or replacement water supply systems and/or sanitary sewage systems be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters, and on-site waste disposal systems be located so as to avoid impairment or contamination; and
 - f. subdivision proposals and other proposed new development, including manufactured home parks or subdivisions, located within special flood hazard areas are required to assure that:
 - (1) all such proposals are consistent with the need to minimize flood damage;
 - (2) all public utilities and facilities, such as sewer, gas, electrical, and water systems are located and constructed to minimize or eliminate flood damage;
 - (3) adequate drainage is provided so as to reduce exposure to flood hazards; and
 - (4) all proposals for development, including proposals for manufactured home parks and subdivisions, of five (5) acres or fifty (50) lots, whichever is lesser, include within such proposals base flood elevation data.
4. *Agricultural Structures*

Structures used solely for agricultural purposes in connection with the production, harvesting, storage, drying, or raising of agricultural commodities, including the raising of livestock, may be constructed at-grade and wet-flood proofed provided there is no human habitation or occupancy of the structure; the structure is of single-wall design; there is no permanent retail, wholesale, or manufacturing use included in the structure; a variance has been granted from the floodplain management requirements of this ordinance; and a floodplain development permit has been issued.

[Article 4, Section A]

5. *Storage, material, and equipment*

- a. The storage or processing of materials within the special flood hazard area that are in time of flooding buoyant, flammable, explosive, or could be injurious to human, animal, or plant life is prohibited.
- b. Storage of other material or equipment may be allowed if not subject to major damage by floods, if firmly anchored to prevent flotation, or if readily removable from the area within the time available after a flood warning.

6. *Accessory Structures*

Structures used solely for parking and limited storage purposes, not attached to any other structure on the site, of limited investment value, and not larger than 400 square feet, may be constructed at-grade and wet-flood proofed provided there is no human habitation or occupancy of the structure; the structure is of single-wall design; a variance has been granted from the standard floodplain management requirements of this ordinance; and a floodplain development permit has been issued.

SECTION B. SPECIFIC STANDARDS

1. In all areas of special flood hazard, once base flood elevation data is obtained, as set forth in Article 4, Section A(2), the following provisions are required:

a. *Residential Construction*

New construction or substantial-improvement of any residential structure, including manufactured homes, shall have the lowest floor, including basement, elevated to One (1) *(feet/foot) above base flood level.

*[*The FEMA, Region VII office recommends elevating to one foot above the base flood elevation to accommodate floodway conditions when the floodplain is fully developed.]*

b. *Non-Residential Construction*

New construction or substantial-improvement of any commercial, industrial, or other non-residential structure, including manufactured homes, shall have the lowest floor, including basement, elevated to One (1) *(feet/foot) above the base flood level or, together with attendant utility and sanitary facilities, be flood proofed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. A registered professional engineer or architect shall certify that the standards of this subsection are satisfied. Such certification shall be provided to the Floodplain Administrator as set forth in Article 3, Section C(7)(c).

*[*The FEMA, Region VII office recommends elevating to one foot above the base flood elevation to qualify for flood insurance rates based upon flood proofing.]*

[Article 4, Section B]

- c. Require, for all new construction and substantial-improvements, that fully enclosed areas below lowest floor used solely for parking of vehicles, building access, or storage in an area other than a basement and that are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or meet or exceed the following minimum criteria:
 - (1) A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided; and
 - (2) the bottom of all opening shall be no higher than one foot above grade. Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.
2. In all areas of special flood hazard, once floodway data is obtained, as set forth in Article 4, Section A(2), the following provisions are required:
 - a. The designated floodway shall be based on the standard that the area chosen for the floodway must be designed to carry the waters of the base flood, without increasing the water surface elevation more than one foot at any point; and
 - b. the community shall prohibit any encroachments, including fill, new construction, substantial- improvements, and other development within the designated regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge.

SECTION C. MANUFACTURED HOMES

1. All manufactured homes to be placed within special flood hazard areas shall be required to be installed using methods and practices that minimize flood damage. For the purposes of this requirement, manufactured homes must be elevated and anchored to resist flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors.
2. Require manufactured homes that are placed or substantially improved within unnumbered A zones on the community's FIRM on sites:
 - a. outside of manufactured home park or subdivision;
 - b. in a new manufactured home park or subdivision;
 - c. in an expansion to and existing manufactured home park or subdivision; or

[Article 4, Section C]

- d. in an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial-damage" as the result of a flood,

be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated to one (1) *(feet/foot) above the base flood level and be securely attached to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.

3. Require that manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or subdivision within unnumbered A zones on the community's FIRM, that are not subject to the provisions of Article 4, Section C(2) of this ordinance, be elevated so that either:

- a. the lowest floor of the manufactured home is at one (1) *(feet/foot) above the base flood level; or

- b. the manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than thirty-six (36) inches in height above grade and be securely attached to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.

*[*The FEMA, Region VII office recommends elevating to one foot above the base flood elevation to accommodate floodway conditions when the floodplain is fully developed.]*

SECTION D. RECREATIONAL VEHICLES

1. Require that recreational vehicles placed on sites within unnumbered A zones on the community's FIRM either:

- a. be on the site for fewer than 180 consecutive days, and be fully licensed and ready for highway use*; or
- b. meet the permitting, elevating, and the anchoring requirements for manufactured homes of this ordinance.

*A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick-disconnect type utilities and security devices, and has no permanently attached additions.

ARTICLE 5 FLOODPLAIN MANAGEMENT VARIANCE PROCEDURES

SECTION A. ESTABLISHMENT OF APPEAL BOARD

The Christian County Commission (appeal board) as established by Christian County (local unit) shall hear and decide appeals and requests for variances from the floodplain management requirements of this ordinance.

SECTION B. RESPONSIBILITY OF APPEAL BOARD

Where an application for a floodplain development permit or request for a variance from the floodplain management regulations is denied by the Planning and Zoning Administrator (floodplain administrator), the applicant may apply for such floodplain development permit or variance directly to the Appeal Board, as defined in Article 5, Section A.

The Christian County Commission (appeal board) shall hear and decide appeals when it is alleged that there is an error in any requirement, decision, or determination made by the Planning and Zoning Administrator (floodplain administrator) in the enforcement or administration of this ordinance.

SECTION C. FURTHER APPEALS

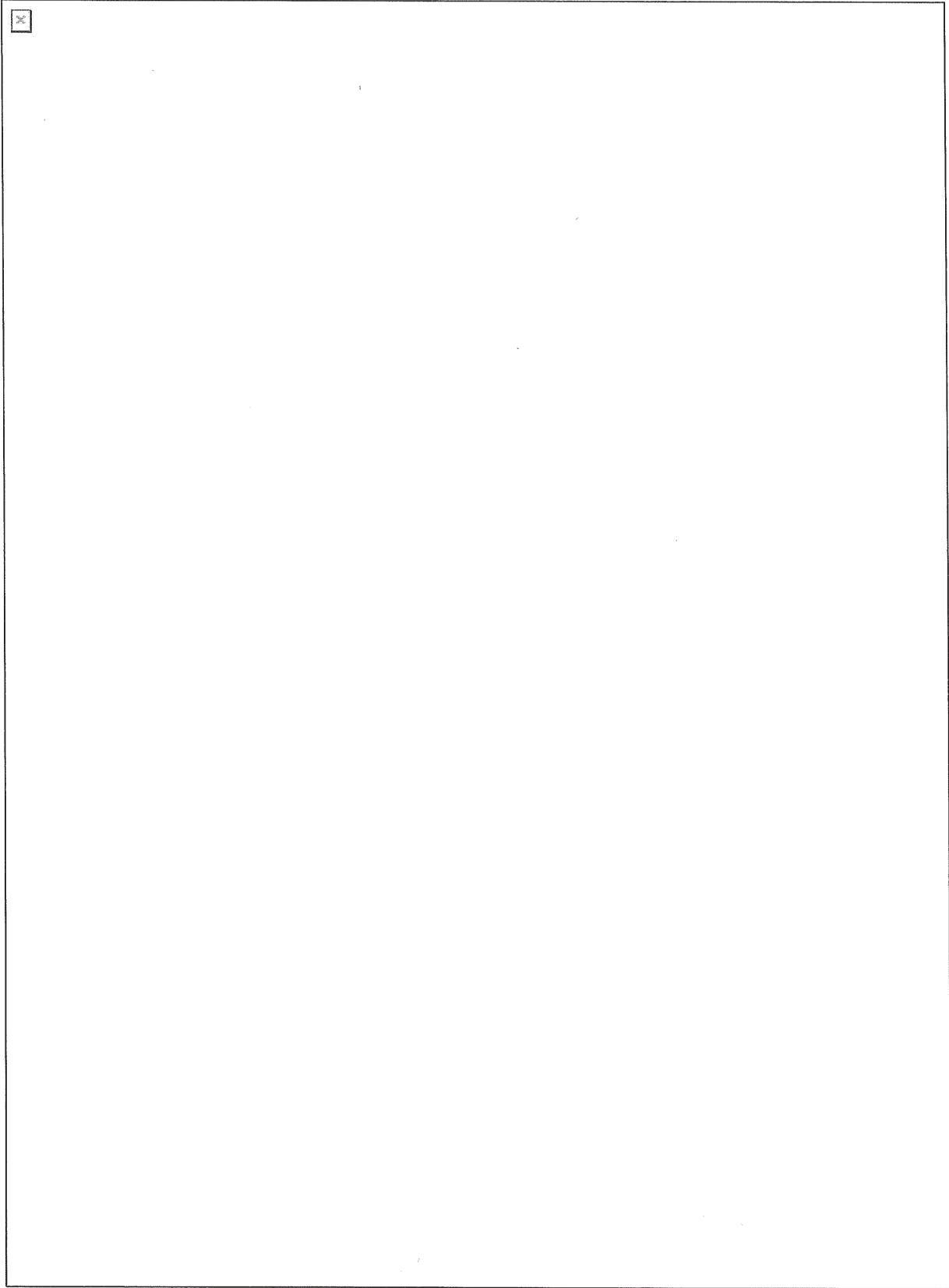
Any person aggrieved by the decision of the Christian County Commission (appeal board) or any taxpayer may appeal such decision to the Circuit Court (name of appropriate appeal board) as provided in 64.660 RSMo (statute).

SECTION D. FLOODPLAIN MANAGEMENT VARIANCE CRITERIA

In passing upon such applications for variances, the Christian County Commission (appeal board) shall consider all technical data and evaluations, all relevant factors, standards specified in other sections of this ordinance, and the following criteria:

1. the danger to life and property due to flood damage;
2. the danger that materials may be swept onto other lands to the injury of others;
3. the susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
4. the importance of the services provided by the proposed facility to the community;
5. the necessity to the facility of a waterfront location, where applicable;
6. the availability of alternative locations, not subject to flood damage, for the proposed use;
7. the compatibility of the proposed use with existing and anticipated development;

Christian County Stormwater and Erosion Control Regulations
Appendix A – Adopted Floodplain Management Ordinance



[Article 5, Section F]

SECTION F. CONDITIONS FOR APPROVING VARIANCES FOR AGRICULTURAL STRUCTURES

Any variance granted for an agricultural structure shall be decided individually based on a case by case analysis of the building's unique circumstances. Variances granted shall meet the following conditions as well as those criteria and conditions set forth in Article 5, Sections D and E of this ordinance.

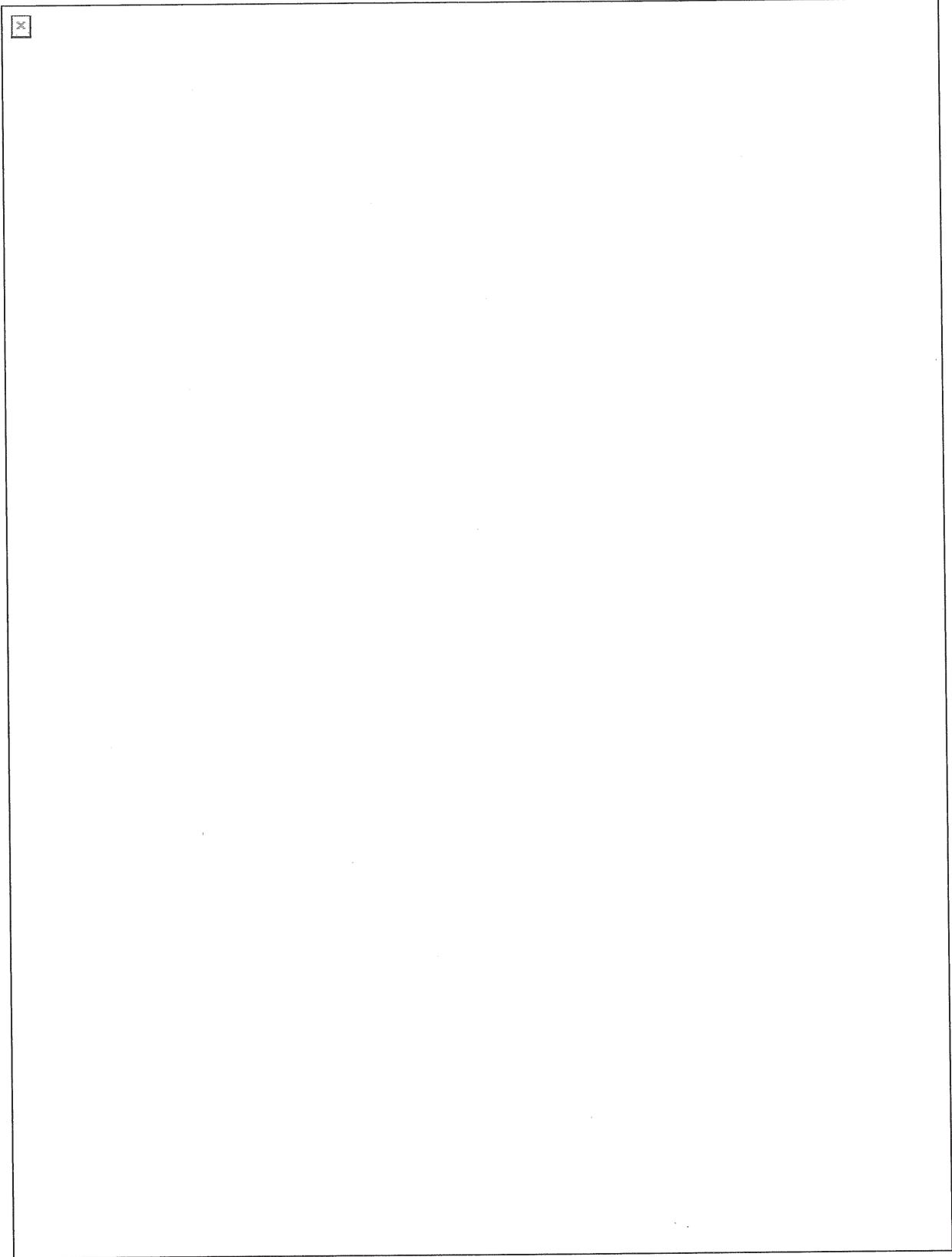
In order to minimize flood damages during the 100-year flood and the threat to public health and safety, the following conditions shall be included for any variance issued for agricultural structures that are constructed at-grade and wet-flood proofed.

1. All agricultural structures considered for a variance from the floodplain management regulations of this ordinance shall demonstrate that the varied structure is located in wide, expansive floodplain areas and no other alternate location outside of the special flood hazard area exists for the agricultural structure. Residential structures, such as farm houses, cannot be considered agricultural structures.
2. Use of the varied structures must be limited to agricultural purposes in zone A only as identified on the community's Flood Insurance Rate Map (FIRM).
3. For any new or substantially damaged agricultural structures, the exterior and interior building components and elements (i.e., foundation, wall framing, exterior and interior finishes, flooring, etc.) below the base flood elevation, must be built with flood-resistant materials in accordance with Article 4, Section A (3)(b) of this ordinance.
4. The agricultural structures must be adequately anchored to prevent flotation, collapse, or lateral movement of the structures in accordance with Article 4, Section A (3)(a) of this ordinance. All of the building's structural components must be capable of resisting specific flood-related forces including hydrostatic, buoyancy, and hydrodynamic and debris impact forces.
5. Any mechanical, electrical, or other utility equipment must be located above the base flood elevation or flood proofed so that they are contained within a watertight, flood proofed enclosure that is capable of resisting damage during flood conditions in accordance with Article 4, Section A (3)(d) of this ordinance.
6. The agricultural structures must meet all National Flood Insurance Program (NFIP) opening requirements. The NFIP requires that enclosure or foundation walls, subject to the 100-year flood, contain openings that will permit the automatic entry and exit of floodwater in accordance with Article 4, Section B (1)(c) of this ordinance.
7. The agricultural structures must comply with the floodplain management floodway encroachment provisions of Article 4, Section B(2) (b) of this ordinance. No variances may be issued for agricultural structures within any designated floodway, if any increase in flood levels would result during the 100-year flood.
8. Major equipment, machinery, or other contents must be protected from any flood damage.

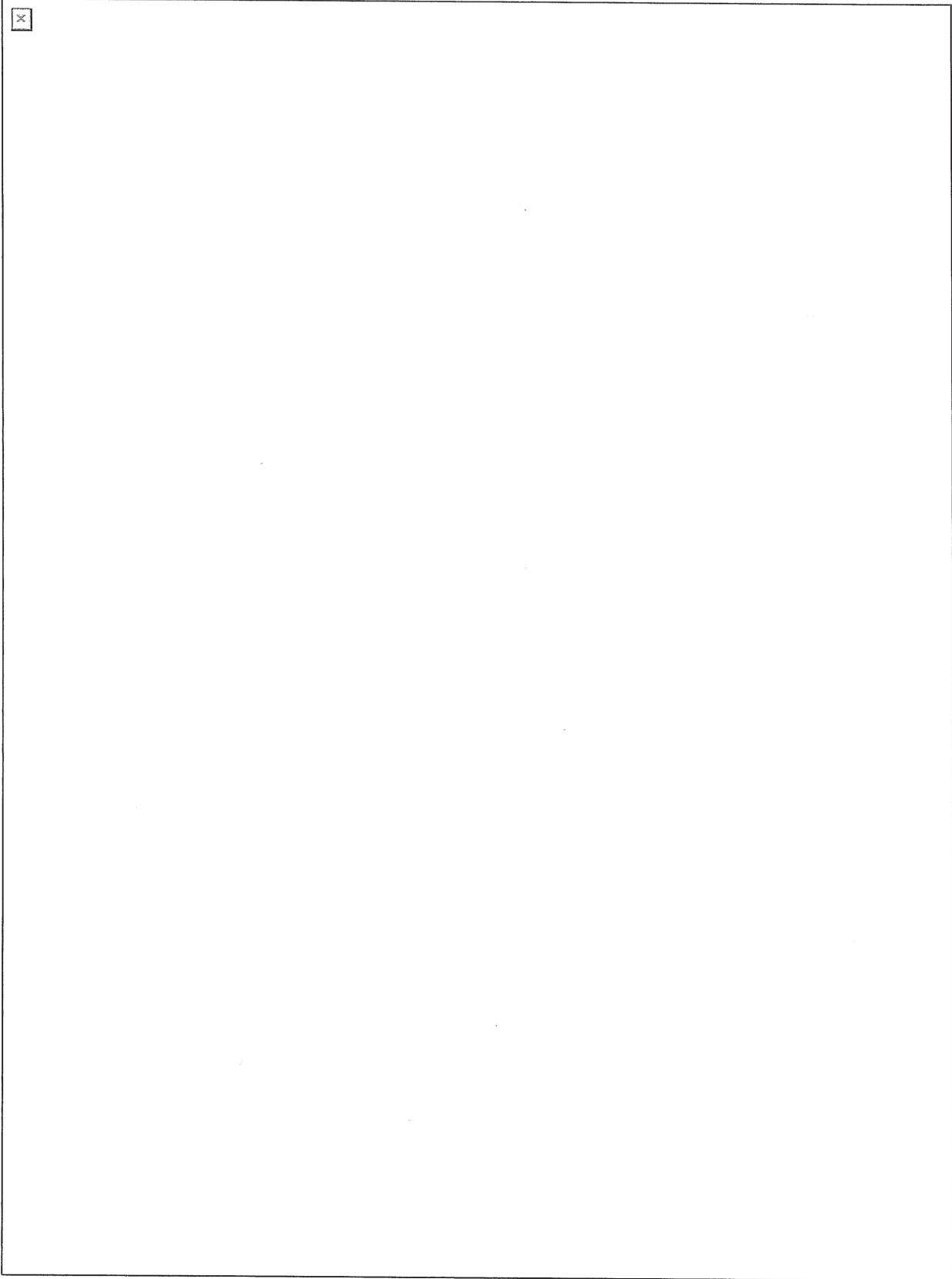
Christian County Stormwater and Erosion Control Regulations
Appendix A – Adopted Floodplain Management Ordinance



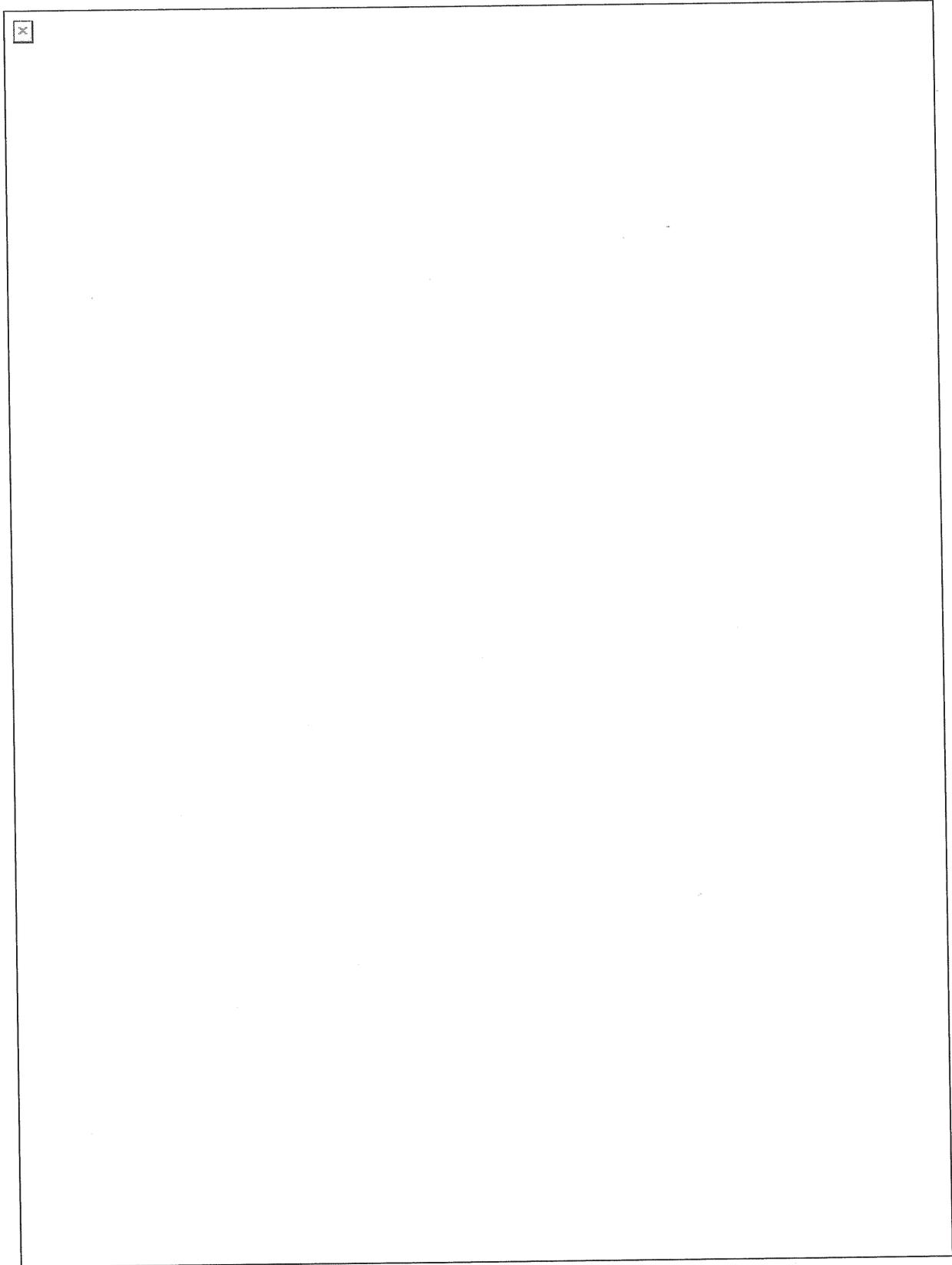
Christian County Stormwater and Erosion Control Regulations
Appendix A – Adopted Floodplain Management Ordinance



Christian County Stormwater and Erosion Control Regulations
Appendix A – Adopted Floodplain Management Ordinance



Christian County Stormwater and Erosion Control Regulations
Appendix A – Adopted Floodplain Management Ordinance



"**Flood proofing**" means any combination of structural and nonstructural additions, changes, or adjustments to structures that reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, or structures and their contents.

"**Functionally Dependent Use**" means a use that cannot perform its intended purpose unless it is located or carried out in close proximity to water. This term includes only docking facilities and facilities that are necessary for the loading and unloading of cargo or passengers, but does not include long-term storage or related manufacturing facilities.

"**Historic Structure**" means any structure that is (a) listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register; (b) certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district; (c) individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of the Interior; or (d) individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either (1) by an approved state program as determined by the Secretary of the Interior or (2) directly by the Secretary of the Interior in states without approved programs.

"**Lowest Floor**" means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access, or storage, in an area other than a basement area, is not considered a building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable flood proofing design requirements of this ordinance.

"**Manufactured Home**" means a structure, transportable in one or more sections, that is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "*manufactured home*" does not include a "*recreational vehicle*."

"**Manufactured Home Park or Subdivision**" means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

"**Map**" means the Flood Hazard Boundary Map (FHBM) or the Flood Insurance Rate Map (FIRM) for a community issued by the Federal Emergency Management Agency (FEMA).

"**Market Value**" or "**Fair Market Value**" means an estimate of what is fair, economic, just and equitable value under normal local market conditions.

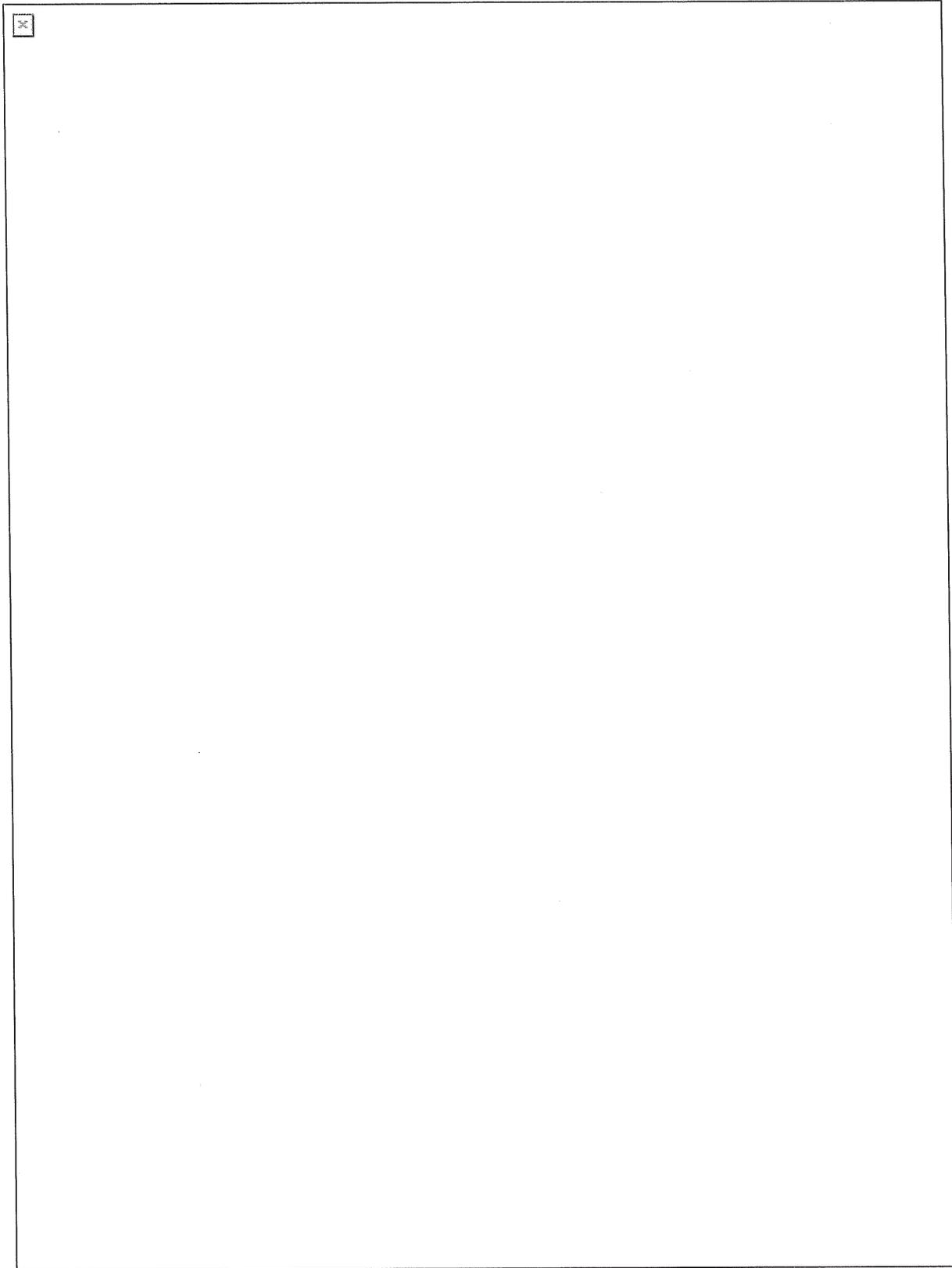
"**Mean Sea Level**" means, for purposes of the National Flood Insurance Program (NFIP), the National Geodetic Vertical Datum (NGVD) of 1929 or other datum, to which base flood elevations shown on a community's Flood Insurance Rate Map (FIRM) are referenced.

"**New Construction**" means, for the purposes of determining insurance rates, structures for which the "*start of construction*" commenced on or after the effective date of an initial FIRM or after December 31, 1974, whichever is later, and includes any subsequent improvements to such structures. For floodplain management purposes, "*new construction*" means structures for which the "*start of*

Christian County Stormwater and Erosion Control Regulations
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construction" commenced on or after the effective date of the floodplain management regulations adopted by a community and includes any subsequent improvements to such structures.

Christian County Stormwater and Erosion Control Regulations
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alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

"State Coordinating Agency" means that agency of the state government, or other office designated by the governor of the state or by state statute at the request of the Administrator to assist in the implementation of the National Flood Insurance Program (NFIP) in that state.

"Structure" means, for floodplain management purposes, a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home. "Structure" for insurance purposes, means a walled and roofed building, other than a gas or liquid storage tank, that is principally above ground and affixed to a permanent site, as well as a manufactured home on a permanent foundation. For the latter purpose, the term includes a building while in the course of construction, alteration or repair, but does not include building materials or supplies intended for use in such construction, alteration or repair, unless such materials or supplies are within an enclosed building on the premises.

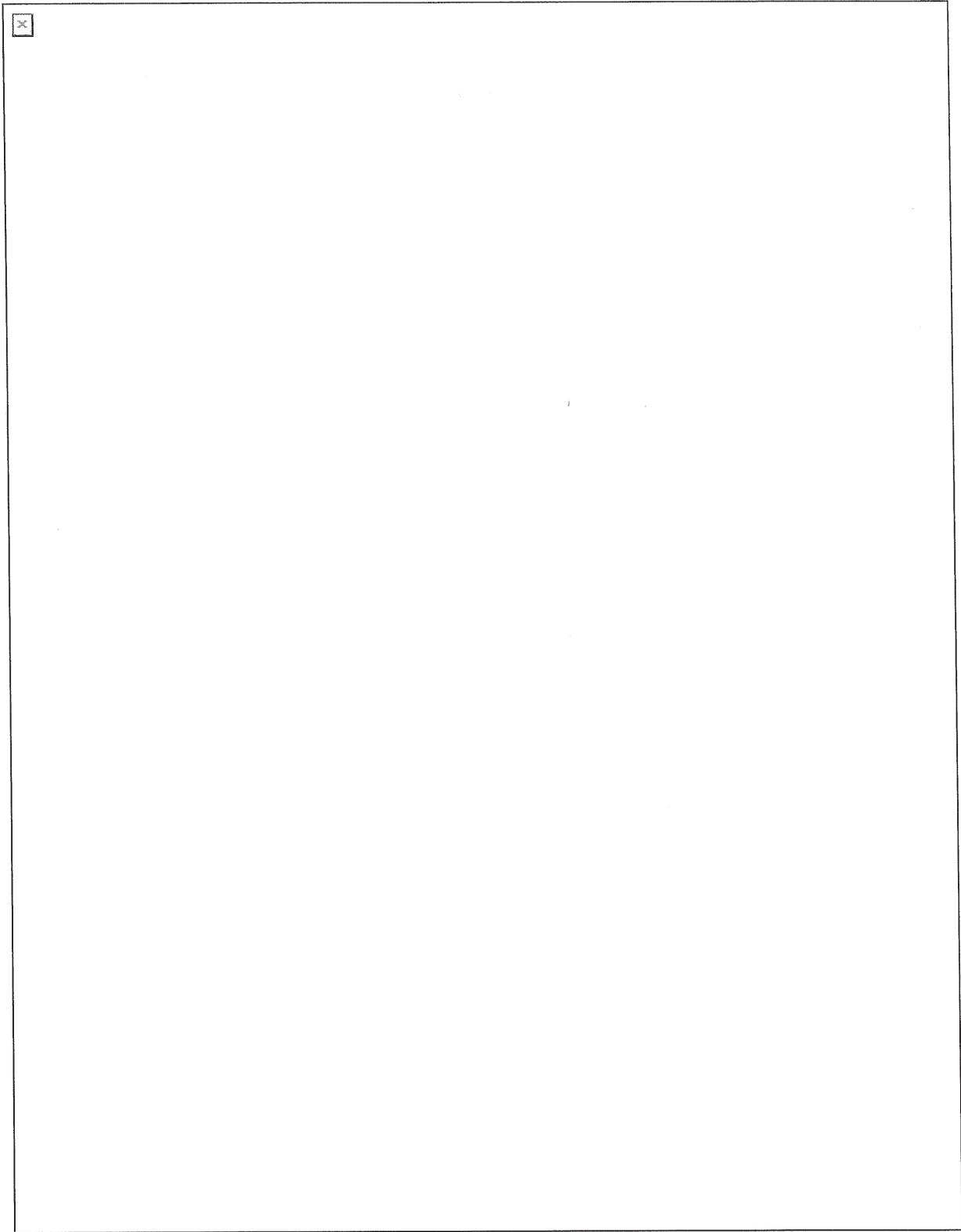
"Substantial-Damage" means damage of any origin sustained by a structure whereby the cost of restoring the structure to pre-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

"Substantial-Improvement" means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before "start of construction" of the improvement. This term includes structures which have incurred "substantial-damage," regardless of the actual repair work performed. The term does not, however, include either (1) any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications that have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions, or (2) any alteration of a "historic structure," provided that the alteration will not preclude the structure's continued designation as a "historic structure."

"Variance" means a grant of relief by the community from the terms of a floodplain management regulation. Flood insurance requirements remain in place for any varied use or structure and cannot be varied by the community.

"Violation" means the failure of a structure or other development to be fully compliant with the community's floodplain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required by this ordinance is presumed to be in violation until such time as that documentation is provided.

Christian County Stormwater and Erosion Control Regulations
Appendix A – Adopted Floodplain Management Ordinance



**CHRISTIAN COUNTY COMMISSION
AN ORDER REGULATING
ILLICIT DISCHARGE AND ILLEGAL CONNECTION TO STORM DRAINAGE
SYSTEMS AND PROVIDING PENALTIES**

Authority: Section 192.300. The county commissions and the county health center boards of the several counties may make and promulgate orders, ordinances, rules or regulations, respectively as will tend to enhance the public health and prevent the entrance of infectious, contagious, communicable or dangerous diseases into such county, but any orders, ordinances, rules or regulations shall not be in conflict with any rules or regulations authorized and made by the department of health and senior services in accordance with this chapter or by the department of social services under chapter 198. The county commissions and the county health center boards of the several counties may establish reasonable fees to pay for any costs incurred in carrying out such orders, ordinances, rules or regulations, however, the establishment of such fees shall not deny personal health services to those individuals who are unable to pay such fees or impede the prevention or control of communicable disease.

Section 1: Purpose and Intent

The purpose of this chapter is to protect the public health, safety, environment, and general welfare through the regulation of Non-Stormwater Discharges to the County's Separate Storm Sewer System or into any Waters of the United States to the maximum extent practicable as required by federal law. This chapter establishes methods for controlling the introduction of Pollutants into the County's Separate Storm Sewer System in order to comply with requirement of the National Pollutant Discharge Elimination System (NPDES) permit process. The objectives of this chapter are to:

- a. Regulate the contribution of Pollutants to the County's Separate Storm Sewer System or into any Waters of the United States by any Person;
- b. Prohibit Illicit Discharges and Illegal Connections to the County's Separate Storm Sewer System or into any Waters of the United States;
- c. Prevent Non-Stormwater Discharges, generated as a result of spills, inappropriate dumping, or disposal, into the County's Separate Storm Sewer System or into any Waters of the United States;
- d. To establish legal authority to carry out all inspection, surveillance, monitoring and enforcement procedures necessary to ensure compliance with this ordinance.

Section 2: Applicability

The provisions of this chapter shall apply throughout the unincorporated area of Christian County.

Section 3: Compatibility with Other Regulations

This chapter is not intended to modify or repeal any other ordinance, rule, regulation, or other provision of law. The requirements of this chapter are in addition to the requirements of any other ordinance, rule, regulation, or other provision of law, and where any provision of this chapter imposes restrictions different from those imposed by any other chapter, rule, regulation, or other provision of law, whichever provision is more restrictive or imposes higher protective standards for human health or the environment shall control.

Section 4: Responsibility for Administration

The County's Director of Planning and Development or designee shall administer, implement, and enforce the provisions of this chapter.

Section 5: Definitions

As used in this chapter the following words and phrases having the meanings indicated:

Accidental Discharge means a discharge prohibited by this chapter which occurs by chance and without planning or thought prior to occurrence.

Clean Water Act means the Federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.), and any subsequent amendments thereto.

Construction Activity means activities subject to the Christian County Erosion and Sedimentation Control Ordinance or NPDES General Construction Permits. These include construction projects resulting in land disturbance. Such activities include but are not limited to clearing and grubbing, grading, excavating, and demolition.

County means Christian County, Missouri.

Director means the Director of Planning and Development or his/her designated agent.

Illicit Discharge means any direct or indirect Non-Stormwater Discharge to the County's Separate Storm Sewer System, except as exempted by this chapter.

Illegal Connection means either of the following: a) any pipe, open channel, drain, or conveyance, whether on the surface or subsurface, which allows an Illicit Discharge to enter the storm drain system including, but not limited to, any conveyance which allows any Non-Stormwater Discharge, including sewage, processed wastewater, and wash water, to enter the storm drain system, regardless of whether such pipe, open channel, drain, or conveyance has been previously allowed, permitted, or approved by an authorized enforcement agency; or b) any pipe, open channel, drain, or conveyance connected to the County's Separate Storm Sewer System which has not been documented in plans, maps, or equivalent records and approved by an authorized enforcement agency.

Industrial Activity means activities subject to NPDES Industrial Permits as defined in 40 CFR, Section 122.26 (b) (14).

County's Separate Storm Sewer System means any facility in unincorporated Christian County, Missouri, designed or used for collecting and/or conveying Stormwater, including but not limited to any roads with drainage systems, highways, streets, curbs, gutters, inlets, catch basins, piped storm drains, pumping facilities, Structural Stormwater Controls, ditches, swales, natural and man-made or altered drainage channels, reservoirs, and other drainage structures, and which are: a) owned or maintained by Christian County; b) not a combined sewer; and c) not part of a publicly-owned treatment works.

National Pollutant Discharge Elimination System (NPDES) Stormwater Discharge Permit means a permit issued by the Missouri Department of Natural Resources under authority delegated pursuant to 33 USC § 1342 (b) that authorizes the discharge of Pollutants into Waters of the United States, whether the permit is applicable on an individual, group, or general area-wide basis.

Non-Stormwater Discharge means any discharge to the storm drain system that is not composed entirely of Stormwater.

Person means, except to the extent exempted from this chapter, any individual, partnership, firm, association, joint venture, public or private corporation, trust, estate, commission, board, public or private institution, utility, cooperative, city, county, or other political subdivision of the State of Missouri, any interstate body, or any other legal entity.

Pollutant means anything which causes or contributes to Pollution. Pollutants may include, but are not limited to: paints, varnishes, and solvents; petroleum hydrocarbons; automotive fluids; cooking grease; detergents (biodegradable or otherwise); degreasers; cleaning chemicals; non-hazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects and accumulations, so that same may cause or contribute to Pollution; floatables; pesticides, herbicides, and fertilizers; liquid and solid wastes; wastes and residues that result from constructing a building or structure; concrete and cement; and noxious or offensive matter of any kind.

Pollution means the contamination or other alteration of any water's physical, chemical, or biological properties by the addition of any constituent and includes, but is not limited to, a change in temperature, taste, color, turbidity, or odor of such waters, or the discharge of any liquid, gaseous, solid, radioactive, or other substance into any such waters as will or is likely to create a nuisance or render such waters harmful, detrimental, or injurious to the public health, safety, welfare, or environment, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, or fish or other aquatic life.

Premises means any building, lot, parcel of land, or portion of land, whether improved or unimproved, including adjacent sidewalks and parking strips.

Stormwater Runoff or Stormwater means any surface flow, runoff, or drainage consisting entirely of water from any form of natural precipitation, and resulting from such precipitation.

Structural Stormwater Control means a structural Stormwater management facility or device that controls Stormwater Runoff and changes the characteristics of that runoff including, but not limited to, the quantity and quality, the period of release, or the velocity of flow.

Waters of the United States means any and all rivers, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs, wells, and other bodies of surface and subsurface water, natural or artificial, lying within or forming a part of the boundaries of the State of Missouri which are not entirely confined and retained completely upon the property of a single person.

Section 6: Prohibition of Illicit Discharges

No Person shall throw, drain, or otherwise discharge, cause, or allow others under that Person's control to throw, drain, or otherwise discharge into the County's Separate Storm Sewer System or into any Waters of the United States, any Pollutants or waters containing any Pollutants, other than Stormwater.

Section 7: Exemption

The following discharges are exempt from the prohibition contained in this section:

- a. Water line flushing performed by a government agency, other potable water sources, landscape irrigation or lawn watering non-commercial or fundraising car washing, powerwashing on private property, discharges from swimming pools, diverted stream flows, rising groundwater, groundwater infiltration to storm drains, uncontaminated pumped groundwater, foundation or footing drains (not including active groundwater dewatering systems), crawl space pumps, air conditioning condensation, springs, natural riparian habitat or wetland flows, and any other water source not containing Pollutants;
- b. Discharges for agricultural use, to include crop planting and cultivation, vegetative renewal, and flushing of animal wastes.
- c. Discharges or flows from firefighting, and other discharges specified in writing by the Director or designee as being necessary to protect public health and safety; and,
- d. Any Non-Stormwater Discharges permitted under an NPDES Permit or order issued to dischargee and administered under the authority of the State of Missouri, or the Federal Environmental Protection Agency, provided that the dischargee is in full compliance with all requirements of the permit, waiver, or order, and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the County's Separate Storm Sewer System or into any Waters of the United States.

Section 8: Prohibition of Illegal Connections

It shall be unlawful for any Person to construct, use, or maintain any connection to the County's Separate Storm Sewer System or into any Waters of the United States, except in strict compliance with this ordinance.

Section 9: Includes Post Connection

The prohibition of this section expressly includes, without limitation, Illegal Connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.

Section 10: Sewage Lines

A Person violates this chapter if that Person connects a line conveying sewage to the County's Separate Storm Sewer System or into any Waters of the United States, or allows such a connection to continue.

Section 11: Disconnection Required

Illegal Connections in violation of this chapter must be disconnected and redirected, if necessary, to an approved onsite wastewater management system or the sanitary sewer system as approved by the Director.

Section 12: Drains

Any drain or conveyance that has not been documented in plans, maps, or the equivalent, and which may be connected to the Storm Sewer System, shall be located by the owner or occupant of the Premise in question upon receipt of written notice of violation from the Director or designee requiring that such locating be completed. Such notice will specify a reasonable time period within which the location of the drain or conveyance is to be completed, that the drain or conveyance be identified as storm sewer, sanitary sewer, or other, and that the outfall location or point of connection to the Storm Sewer System, sanitary sewer system, or other discharge point be identified. Results of these investigations are to be documented and provided to the Director.

Section 13: Industrial or Construction Activity Discharges

Each Person subject to an industrial or construction activity NPDES Stormwater Discharge permit shall comply with all provisions of such permit. Proof of compliance with said Permit may be required in a form acceptable to the Director or designee prior to allowing discharges to the County's Separate Storm Sewer System or into any Waters of the United States.

Section 14: Access and Inspection of Premises and Facilities

The Director or designee may enter and inspect Premises and facilities at reasonable times as may be necessary to determine compliance with this ordinance.

Section 15: Allow Access

The owner or operator of a Premise shall allow the Director or designee ready access to all parts of the Premises for the purposes of inspection, sampling, photography, videotaping, examination

or copying of any records that are required under the conditions of an NPDES Permit to discharge Stormwater.

Section 16: Monitoring Services, Director

The Director or designee shall have the right to set up on any Premises or facility such devices as are necessary in the opinion of the Director or designee to conduct monitoring and/or sampling of flow discharges.

Section 17: Maintaining Equipment, Owner's Responsibility

The Director or designee may require the owners or operator of a Premise to install monitoring equipment and perform monitoring as necessary, and make the monitoring data available to the Director or designee. This sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the owner or operator at his/her own expense. All devices used to measure flow and utility shall be calibrated to ensure their accuracy.

Section 18: Search Warrant

If the Director or designee has been refused access to any part of the premises from which stormwater is discharged, and the Director or designee is able to demonstrate probable cause to believe that there may be a violation of this chapter, or that there is a need to inspect and/or sample as part of a routine inspection and sampling program designed to verify compliance with this chapter or any order issued hereunder, or to protect the overall public health, safety, environment, and welfare of the community, then the Director or designee may seek issuance of a search warrant from the appropriate court.

Section 19: Notification of Accidental Discharges and Spills

Notwithstanding other requirement of law, as soon as any Person responsible for a facility, activity, or operation, or responsible for emergency response for a facility, activity or operation has information of any known or suspected release of Pollutants or Non-Stormwater Discharges from that facility or operation which are resulting or may result in Illicit Discharges or Pollutants discharging into Stormwater, the County's Separate Storm Sewer System, state waters, or Waters of the United States, said Person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release so as to minimize the effects of the discharge. Said Person shall notify the Public Works Department in person, by phone or by facsimile no later than twenty-four hours after the incident of the nature, quantity, and time of occurrence of the discharge. Notifications in person or by phone shall be confirmed by written notice addressed and mailed to the Director or designee within three business days of the phone call or by personal notification. If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an onsite written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years. Said Person shall also take immediate steps to ensure no recurrence of the discharge or spill. In the event of a release of hazardous materials, the responsible Person shall immediately notify emergency response agencies and/or other

appropriate agencies. Failure to provide notification of a release as provided above is a violation of this ordinance.

Section 20: Violations

It shall be unlawful for any Person to violate any provision or fail to comply with any of the requirements of this chapter. Any Person who has violated or continues to violate any provision of this chapter, may be subject to the enforcement actions outlined in this chapter or may be restrained by injunction or otherwise abated in a manner provided by law. In the event the violation constitutes an immediate danger to public health or safety, the Director or designee is authorized to enter upon the subject Premises, without giving prior notice, to take any and all measures necessary to abate the violation and/or restore the Premises. The Director or designee is authorized to seek costs of the abatement.

Section 21: Notice of Violation

Whenever the Director or designee finds that a violation of this ordinance has occurred, the Director or designee may order compliance by written notice of violation.

Section 22: Delivery, Contents

The notice of violation shall be sent via regular U.S. mail or via hand delivery to the owner of the Premises as shown by Christian County official records, and shall contain:

- a. The name and address of the parties listed above;
- b. The address, when available, or a description of the building, structure, or land upon which the violation is occurring, or has occurred;
- c. A statement specifying the nature of the violation;
- d. A description of the remedial measures necessary to restore compliance with this ordinance and a time schedule for the completion of such remedial action;
- e. A statement of the penalty or penalties that shall or may be assessed against the Person or Persons to whom the notice of violation is directed; and,
- f. A statement that the determination of violation may be appealed to the Director or designee by filing a written notice of appeal within thirty (30) days of service of the notice of violation.

Section 23: Notice, Additional Requirements

Such notice may require without limitation:

- a. The performance of monitoring, analyses, and reporting;
- b. The elimination of Illicit Discharges and Illegal Connections;

- c. That violation discharges, practices, or operations cease and desist;
- d. The abatement or remediation of Stormwater Pollution or contamination hazards and the restoration of any affected Premises;
- e. Payment of costs to cover administrative and abatement expenses; and,
- f. The implementation of Pollution prevention practices.

Section 24: Appeal of Notice of Violation

Any person receiving a notice of violation may appeal the determination of the Director or designee. The notice of appeal must be received within thirty (30) days from the date of the notice of violation. A hearing on the appeal before the Director or designee, shall take place within fifteen days from the date of receipt of the notice of appeal. The decision of the Director or designee shall be final.

Section 25: Enforcement Measures After Appeal

If the violation has not been corrected pursuant to the requirements set forth in the notice of violation, or in the event of an appeal, within fifteen (15) days of the decision of the Director or designee, then the Director or designee may enter upon the subject's Premises and is authorized to take any and all measures necessary to abate the violation and/or restore the Premises. The Director may further issue to the property owner a General Ordinance Summons. It shall be unlawful for any Person, owner, agent, or Person in possession of any Premises to refuse to allow the County or designated County contractor to enter upon the Premises for the purposes set forth above.

Section 26: Costs of Abatement of the Violation

Within thirty (30) days after abatement of a violation by the County the Director or designee will bill the owner of the Premises for the cost of abatement, including administrative costs. If within thirty (30) days after receiving the payment request, the owner has not made payment, the charges shall become a special assessment against the Premises and shall constitute a lien on the Premises for the amount of the assessment.

Section 27: Criminal Penalties

For violation of this chapter, the Director or designee may issue a citation to the alleged violator requiring such Person to appear in the County Court to answer charges for such violation. Upon conviction, such Person shall be punished by a fine not to exceed \$1,000.00. Each act of violation and each day upon which any violation shall occur shall constitute a separate offense.

Section 28: Violation Deemed a Public Nuisance

In addition to the enforcement processes and penalties provided, any condition caused or permitted to exist in violation of any of the provisions of this chapter is a threat to the public health, safety, welfare, and environment and is declared and deemed a nuisance, and may be abated by injunctive or other equitable relief as provided by law.

Section 29: Remedies Not Exclusive

The remedies listed in this chapter are not exclusive of any other remedies available under any applicable Federal, State or local law and the Director or designee may seek cumulative remedies. The Director or designee may recover attorney's fees, court costs, and other expenses associated with enforcement of this ordinance, including sampling and monitoring expenses.

Section 30: Variances from Requirements

The Director may grant a variance from requirements of this chapter if exceptional circumstances exist, such that strict adherence to the provisions of this ordinance will not fulfill the intent of this ordinance.

Section 31: Written Application Required

A written application for a variance shall be required and shall state the specific variance sought and the reasons, with supporting data, why a variance should be granted. The request shall include all information necessary to evaluate the proposed variance.

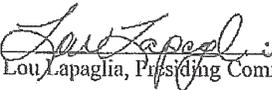
Section 32: Review

The Director will conduct a review of the request for a variance and may approve, deny, or request additional information concerning the variance request.

Christian County Stormwater and Erosion Control Regulations
Appendix B – Adopted Illicit Discharge Management Ordinance

CHRISTIAN COUNTY, MISSOURI

DATED: 10-31-11


Lou Lapaglia, Presiding Commissioner

DATED: 10-31-11


Bill Barnett, Western Commissioner

DATED: _____

ABSENT
Tom Huff, Eastern Commissioner

COUNTY CLERK:


Kay Brown

APPROVED AS TO FORM:


John W. Housley, County Counselor

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Christian County Stormwater and Erosion Control Regulations
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Christian County Stormwater and Erosion Control Regulations

IT IS FURTHER ORDERED that the Stormwater and Erosion Control Regulations for Christian County, Missouri provide penalties for the violation of the requirements established within said Regulations.

IT IS FURTHER ORDERED that the Stormwater and Erosion Control Regulations for Christian County are authorized to be amended from time to time by Order of the Christian County Commission.

IT IS FURTHER ORDERED that the Stormwater and Erosion Control Regulations for Christian County, Missouri shall become effective on 9th day of Aug., 2010, the same effective date as the Zoning Regulations for Christian County, Missouri and a copy of this Order shall be filed in the office of the County Clerk before 5:00 p.m. this date.

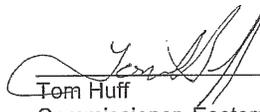
Done this 8th day of July, 2010, at 11:16 o'clock a.m.

CHRISTIAN COUNTY COMMISSION



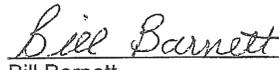
John Grubbaugh
Presiding Commissioner

Yes
Dated: 7-8-10



Tom Huff
Commissioner, Eastern District

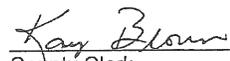
Yes
Dated: 7-8-10



Bill Barnett
Commissioner, Western District

Yes
Dated: 7-8-10

ATTEST:



County Clerk

23385-000\383506.doc

COMPREHENSIVE PLAN
for
CHRISTIAN COUNTY, MISSOURI



Originally Adopted December 7, 1992
Revisions and Updates Adopted September 21, 2009

Prepared By

Center for Resource Planning and Management

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INTRODUCTION

Planning for the future of Christian County

Historically, Christian County has been a rural area of Southwest Missouri, characterized by small communities, scattered low density residential development and agricultural/animal husbandry activities. In the 1980's, however, Christian County began to experience rapid urbanization and development pressures that quickly began to change the rural landscape and had notable impacts on the quality of the County's natural resources, the existing infrastructure system and traditional land use activities and development patterns.

In response to the issues that attend rapid urbanization, including land use conflicts, maintenance of groundwater quality and proper disposal of sewage and solid waste, voters approved planning and zoning authority for Christian County in April of 1990. With the formation of the County's first Planning and Zoning Commission, the Commission was charged with the task of preparing the Comprehensive Plan and related land development regulatory controls for the County. In 1991, the Center for Resource Planning and Management and the Christian County Planning and Zoning Commission initiated a series of information meetings throughout the County to explain the planning process ahead, the purposes of the comprehensive plan and to obtain citizen input on area issues, needs and desires for the future. The result was a Comprehensive Plan intended to serve as a guide for the future development of the County that is responsive to public desires to maintain a high quality of life and protect the County's natural resources while allowing for balanced growth and development. As a result of its continued growth Christian County will be moving from a second class to a first class status which presents several issues the County must prepare to address. This document is intended to act as an assessment of

the County's current condition and to offer continued guidance as Christian County continues to develop.

This current updated version of the comprehensive plan was prepared at the request of the Planning and Zoning Commission. The department staff along with assistance from other planning professionals and interns from the area assembled the information contained herein which is intended to present a current representation of Christian County and to help understand the needs the County faces and how the two translate into the goals and objectives we hope to achieve. A major part of this process was gathering public input. The Planning and Zoning Department held a series of seven public meetings throughout the county in order to gain insight as to what the residents of the County envision for the future.



Purpose of the Plan

The primary purpose of the Comprehensive Plan is to provide a series of goals, objectives and strategies that will serve to guide the daily decision-making process on development and resource management issues. The plan provides the basis for elected officials, advisory boards and citizens to make informed decisions about the County's future growth and development. Decisions

that are made based on the Plan are therefore better able to withstand legal challenges. The Comprehensive Plan is a statement of future desires for Christian County and actions to be undertaken to achieve these desires.

Contents of the Comprehensive Plan

The Christian County Comprehensive Plan is organized in three general sections that include (1) existing conditions and needs, (2) future development strategies and policies, and (3) appendices and support material. Chapters 1-12 provide a summary of existing conditions and development trends in the County, covering topics such as land use patterns, physical characteristics, population and economy, community facilities and existing transportation networks and their relationship to current and projected development. The result of collecting and updating this information has been a greater awareness of the various assets Christian County currently possesses as well as a revelation that there are significant needs and opportunities the County must address. With this information as a reference the developers of this plan have sought to establish goals and objectives for the County which can be used as a guide in preparing recommendations, policies and guidelines for future development.

Chapters 13-17 outline goals and objectives, land development standards and policies, and resource management recommendations on issues of concern to the County, including the transportation plan and future land use. Also outlined are recommended priority actions and implementation strategies.

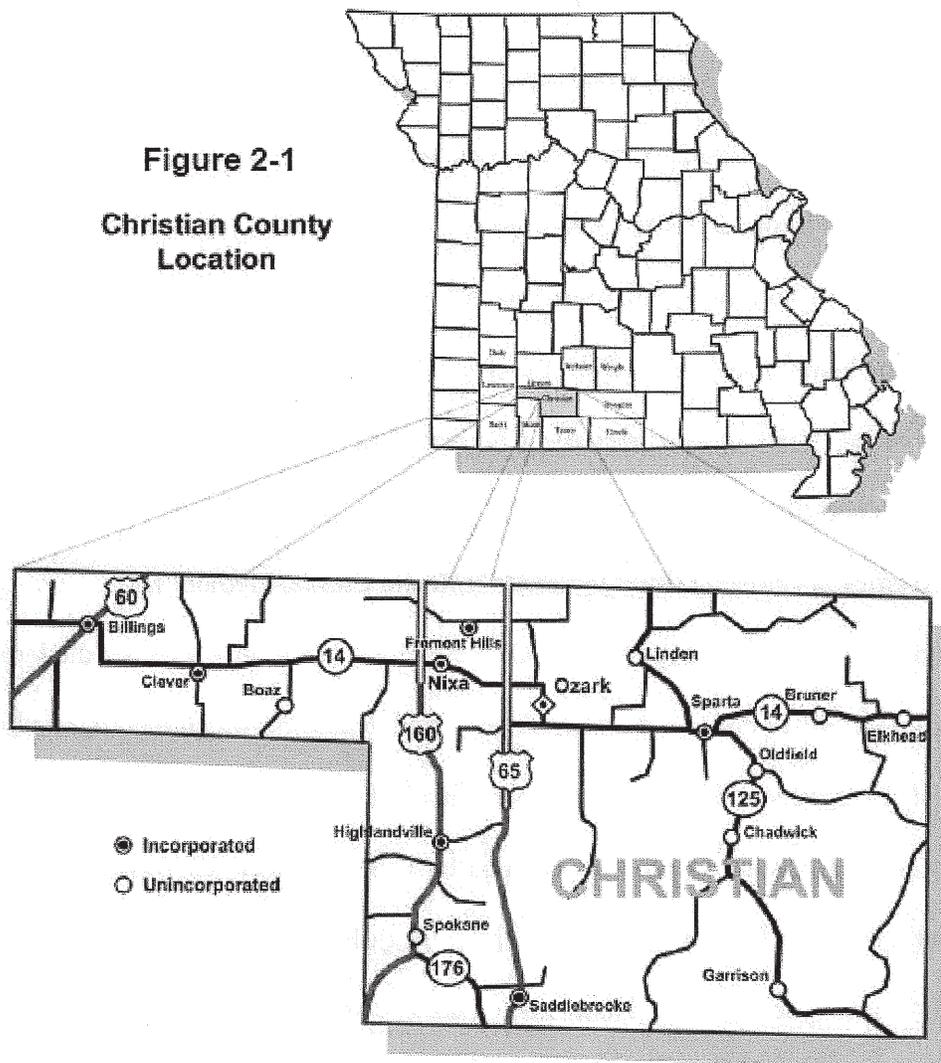
The appendices section of the Plan contains more detailed data, reference materials and standards utilized in the analysis of existing conditions and preparation of policy recommendations for Christian County. Appendices materials are noted throughout the document for reference by persons interested in methodologies employed or specific information.

STUDY AREA

Christian County covers approximately 564 square miles in Southwest Missouri and is bordered by Greene, Lawrence, Stone, Taney, Douglas and Webster Counties (see Figure 2-1). Christian County's northern boundary is situated approximately one mile south of Springfield, the major metropolitan center in Southwest Missouri. Although Christian County is one of the fastest growing counties in the State of Missouri and is considered part of the Springfield Metropolitan Statistical Area (Greene, Christian and Webster Counties), the southern part of the County is predominantly rural in character.

Incorporated cities in Christian County include Billings, Clever, Fremont Hills, Nixa, Highlandville, Ozark, and Sparta (see Figure 2-2). Of these cities, Nixa and Ozark are the largest with 2004 populations of 14,617 and 14,457, respectively. Saddlebrooke, which incorporated in 2002, is the smallest community with an estimated population of 20.

Primary access to Christian County is provided by U.S. Highway 65, U.S. Highway 160, U.S. Highway 60 and MO. Highway 14 (see Figure 2-1). Both Highways 160 and 65 serve as the major north-south routes connecting Nixa and Ozark to Springfield and the growing tourism/recreation centers in the Branson and Table Rock Lake areas to the south. MO. Highways 14 and CC provide the major east-west access route across the northern third of Christian County, linking the County's various cities and villages.



Form of Government

Missouri is divided into 114 counties and the City of St. Louis by the Revised Statutes of Missouri (RSMo) §46.040. Counties are political subdivisions of the State “for governmental, political, and public purposes” (Freyermuth, n.d.) and have a wide range of governmental responsibilities. The Missouri legislature has established four classes of counties, based on the assessed valuation of real and personal property (Freyermuth,

n.d.; RSMo §48.820). Christian County is classified as a second class county and is governed by a three-member Commission. Under the provisions of RSMo §49.010, counties are divided into two districts of nearly equal population. Each district elects one commissioner and the presiding commissioner is elected by the county as a whole. Commissioners serve four-year terms.

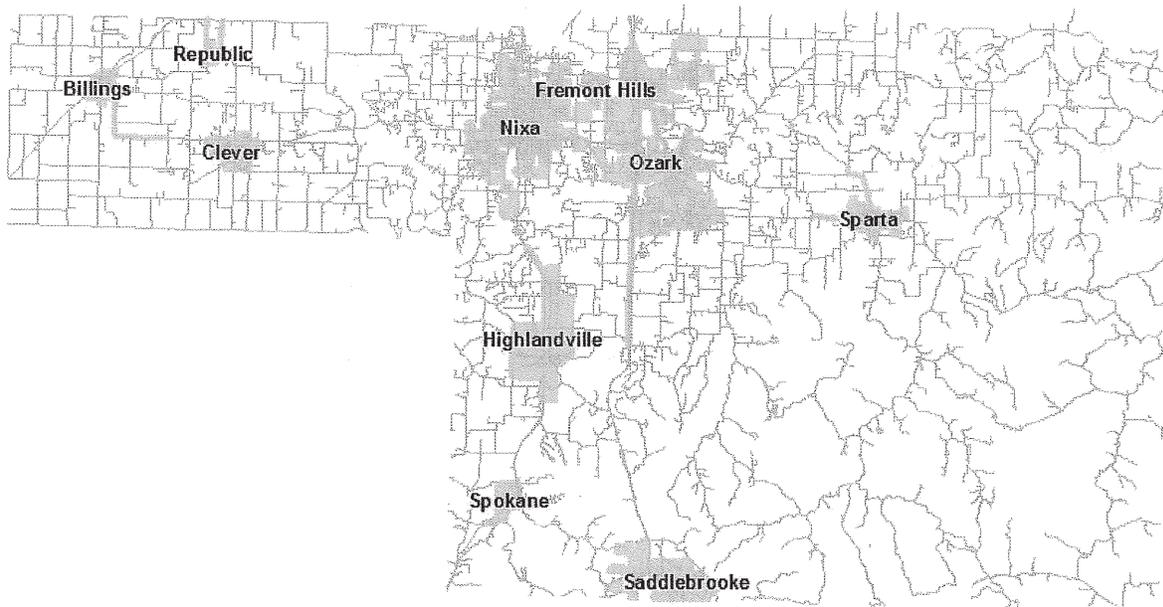
There are currently two classes of cities in Missouri--third and fourth class cities, as well as villages and home rule charter cities (Freyermuth, n.d.). Fourth class cities are those with populations greater than 500 but less than 3,000 inhabitants. Villages/towns are incorporations with less than 500 inhabitants (RSMo §72.050). There are eight municipal subdivisions within Christian County, including the recently incorporated Village of Saddlebrooke and the cities of Billings, Clever, Fremont Hills, Highlandville, Nixa, Ozark, and Sparta. (see Figure 2-2) All of the cities are incorporated as fourth-class cities. Villages are regulated under RSMo §80 and are governed by a board of trustees. The board elects a presiding officer (chair) and a clerk, and appoints the village's officers. Fourth class cities are regulated by RSMo §79. Such cities may have the mayor/board of aldermen or mayor/city administrator/board of aldermen form of government. The mayor presides over the board but may vote only to break a tie. Table 2-1 lists the incorporated communities in Christian County, government form, and meeting dates. The settlement of Spokane is classified by the U.S. Bureau of the Census as a Census-Designated Place (CDP) for statistical reporting purposes. CDPs are delineated to provide data for concentrations of population in identifiable areas that are not incorporated under the laws of the state. Statistical information is provided in this plan for Spokane; however, Spokane is under the governance of Christian County.

Table 2-1 Christian County Local Governments

Local Government	Form of Government	Meeting Dates
Christian County	Commission	Mon and Thurs
Billings	Mayor/Aldermen	2nd Thurs, 7 p.m.
Clever	Mayor/Aldermen	2nd Mon, 6:30 p.m.
Fremont Hills	Mayor/Aldermen	3rd Mon, 6:00 p.m.
Highlandville	Mayor/Aldermen	3rd Tues, 7:00 p.m.
Nixa	Mayor/City Administrator/Aldermen	2nd Mon, 7:00 p.m.
Ozark	Mayor/City Administrator/Aldermen	1st and 3rd Mon, 7:00 p.m.
Saddlebrooke	Chairman/Trustees	As Needed
Sparta	Mayor/Aldermen	2nd Tues, 6:30 p.m.

FIGURE 2-2

INCORPORATED CITIES IN CHRISTIAN COUNTY



HISTORICAL BACKGROUND

The Christian County area has a varied pre-European settlement history. The area was intermittently visited and occupied by several Indian groups, including Paleo-Indians, Archaic peoples, Woodland Indians and Mississippian peoples. When the first hunters and trappers entered the region in the early 1800s, the Christian County area was occupied by the Osage Indians. Control of the Christian County area passed from the Indians to the Spanish and French until it became a territory of the United States through the Louisiana Purchase of 1803 (Christian County Centennial, Inc., 1959, 1).

The rivers of the Ozarks region were the main avenues of exploration. Rivers, such as the White, the James and the Finley, provided early trappers and hunters with food and income as well as transportation through the region. Henry Rowe Schoolcraft explored the area in 1819 and the first permanent settlers followed within two years. The Pettyjohns, Wells and Pattersons were among the first families to move into the area in 1822, settling near the present day communities of Ozark and Nixa. Christian County was formally organized as a county by an act of the Missouri Legislature on March 8, 1859 (Christian County Centennial, Inc., 1959, 2). Because of its central location and accessibility, Ozark was selected as the county seat.

Although settlers arrived in Christian County in a steady but slow stream in the early 1800's, the rate of settlement increased in 1838 with the opening of a United States Land Office in Springfield and the offering of Christian County lands for homesteading. The Land Office made it possible for residents to obtain title to already settled lands and insured ownership titles for future settlers (Christian County Centennial, 1959, 4).

The area's rivers also served as a focal point for the development of permanent communities in Christian County. Early settlers who farmed the rivers' fertile bottomlands also depended on the

rivers for grain milling. The town of Ozark developed around Hoover's Mill, which was built in 1833 on the Finley River. John Hoover constructed another mill at the site of present Lindenlure in 1840, which was then a small settlement replete with a general store and a distillery. The settlement of Riverdale also developed around a mill, with Nixa area residents utilizing its' services.

The City of Billings developed in a fertile agricultural area in the northwestern section of the County. First settled in 1835, this community's population required a post office by 1860. The growth of Billings was spurred by the extension of the St. Louis and San Francisco railroad through the area in 1871. Billings was officially incorporated in 1884.

The advent of the railroads brought new settlement patterns and economic growth to Christian County. Chadwick, which was already a small village by 1842, was transformed into a boomtown by the location of the Springfield and Southern Railroad in 1882. The railroad utilized the area's timber reserves for tie production and industry.

While Chadwick and Ozark became shipping centers for agricultural products to and from southern Missouri and northern Arkansas, Sparta became a center for shipping railroad ties and timber. The rail line between Chadwick and Ozark did a thriving business into the 1920s; however, the line was eventually abandoned in 1934 due to a decline in the timber industry and an increase in automobile and truck transportation.

Nixa and Clever also developed along primary transportation routes. The City of Nixa developed at the intersection of two thoroughfares, the Wilderness Road leading south from Springfield and a route (current MO. Highway 14) leading west from the agricultural areas around Ozark. Nixa was incorporated as a village in 1902. Clever began as a trading post along the Old Wire Road, a principal road west of the Mississippi running from St. Louis to the southwest United States. Incorporated in 1909, Clever's growth was also spurred by its proximity to the railroad.

Settlement in Christian County was not limited to just the river bottom lands and along major transportation routes. Many settled in the less fertile and heavily forested areas of eastern and southern Christian County, dependent on a lumbering and cattle raising economy transplanted from the rugged hills of Tennessee and Kentucky.

Christian County has experienced many changes in its economy since the mid-1800s. Grain crops, fruits, vegetables, dairy and beef cattle dominated the County's early agricultural economy. Through the late 1800s to early 1900s the area's agricultural base also spurred related agricultural businesses, ranging from grist milling to cheese production to vegetable canning. Many of these early industries are no longer in existence. A decreasing demand for the area's grain, fruit and vegetable produce resulted in a shift from field crops to beef and dairy cattle after the Great Depression. While grain production is still found in many areas of the County, dairy and beef cattle production continue to dominate the agricultural sector.

Since WWII, Christian County has experienced steady growth with a more diversified economy. The primary impetus to the County's growth has been proximity and improved road linkages with Springfield to the north. Rapid industrial growth in the Springfield area during the 1960s and 1970s provided employment opportunities within commuting distance for Christian County residents. During the 1980s, the County continued to attract new residents, many who desired to live in a more rural atmosphere but within close proximity to the amenities of the Springfield metropolitan area.

A second major impetus to rapid growth in Christian County over the past several years has been the growing tourism and recreation economy to the south in Branson and along Table Rock Lake and Lake Taneycomo. Christian County has benefited from the tourist flow and the development of recreation related manufacturing and service industries.

Christian County today exhibits a unique pattern of development with a diversifying economic base. Continued growth in southern Springfield is leading to increased residential development and service/convenience commercial development in the northern part of Christian County. While much of southern Christian County retains a more pristine and undeveloped character, due to the Mark Twain National Forest acreage, continued urbanization would undoubtedly signal changing economic growth and land development patterns in these more rural areas as well.

DEMOGRAPHIC TRENDS

Demography refers to the study of population. Demographers are concerned with the size and distribution of the population, the age and gender of the population, social and economic characteristics of the population and the way these components change over time (Shyrock, 1973, 2).

An understanding of local demographic patterns is an important part of the planning process for Christian County. Changes in the population have a direct influence on physical growth and development of the County. The size and composition of the population play a large role in determining how much land is necessary for housing, retail business, industry, streets and community facilities.

This chapter discusses historical population trends and characteristics of the population in Christian County. This demographic information has also been used to develop population projections for the County to the year 2030. Population projections serve as a primary basis for many of the future land development, community services and utility service recommendations noted in later chapters of the Plan.

Components of Population Change in Christian County

Three factors affect population change in any political subdivision, including Christian County. These factors include birth rates, death rates and migration. While a declining birth rate has been the primary component of population change for the State of Missouri over the past decade, migration is the dominant factor affecting Christian County's rate of population growth. The County's growth rate since the 1970s has far outpaced that of both Missouri and the United States. Between 1990 and 2000, the County's population increased by 21,641 persons. Only 16.1% of this number, or 3,501 persons, are attributed to natural increase (number of births less the

number of deaths). From 2000 through 2007 the population has further increased by 18,781 and 17.9% of that total being attributed to natural increase. While in-migration has accounted for the overwhelming majority of new population in Christian County over the past decade, the percentage of natural increase has remained fairly constant. Table 4-1 lists the vital statistics for Christian County between 1990 and 2007.

TABLE 4-1
VITAL STATISTICS, 1990-2007

<u>Year</u>	<u>Births</u>	<u>Deaths</u>	<u>Natural Increase</u>
1990	508	221	287
1991	485	239	246
1992	540	240	300
1993	535	295	240
1994	575	298	277
1995	650	288	362
1996	653	362	291
1997	682	371	311
1998	701	373	328
1999	807	393	414
2000	858	413	445
2001	815	393	422
2002	805	452	353
2003	861	475	386
2004	953	466	487
2005	1094	481	613
2006	1020	479	541
2007	1062	503	559
Totals	13604	6742	6862

Source: Missouri Department of Health, Center for Health Statistics.

Several national and regional trends have contributed to the rate of migration into Christian County. The past few decades have seen a national migration trend to the "sunbelt". Christian County has been on the receiving end of this national migration. In addition to the pattern of migration to the "sunbelt", the County's rapid growth since the 1980's also reflects a second national phenomenon--migration from larger urban areas to small communities and rural areas. This phenomenon is evidenced by the rapid population increases in several of the County's incorporated communities, such as Nixa and Ozark.

A third factor contributing to the County's rapid growth during the 1980s was industrial expansion and increased employment opportunities in nearby Springfield during the same time period. Improvements to major transportation routes that link Christian County with the Springfield metropolitan area, such as U.S. Highway 160, spurred continued population growth during the 1980s and 1990s.

Table 4-2 notes the actual total population for Christian County and its political subdivisions since 1970. Table 4-3 indicates the percentage increases in population from decade to decade. As shown in Table 4-2, Christian County's total population has increased from 15,124 in 1970 to 54,285 in 2000 and then to 73,066 in 2007. The fastest rate of growth, 66.3%, occurred between 1990 and 2000. While overall growth has slowed since 2000, it continues to be strong.

Urban/Rural Growth Trends

Tables 4-2 and 4-3 provide not only a record of population growth for Christian County as a whole, but also a comparison breakdown of rural and urban population in the County. As shown, both the urban and rural populations in Christian County have steadily increased since the 1970s.

Figure 4-1 graphically displays the urban/rural growth trends of Christian County since 1970. Up until 1990 the proportion of rural population to urban had held steady at a roughly 2:1 ratio. Since then the gap has closed steadily. Population data from 2007 now indicates that 56% of the County's residents live within the incorporated areas. In this respect Christian County must be looked upon as more urban than it is rural. From the years 2000 -2007 urban growth outpaced rural at a ratio of better than 2:1 and based upon the fact that as the incorporated areas expand through annexation, the gross acreage remaining in unincorporated areas will decrease and therefore perpetuate and likely accelerate this trend.

Christian County is expected to experience continued rapid growth during the 2000s and into the next decade, with the focus of growth occurring in the northern and central sections of the County, in and around the cities of Nixa and Ozark. This portion of the County is expected to receive the greatest growth over the next decade for two primary reasons:

1. Both Nixa and Ozark are in the path of growth from the Springfield metropolitan area and are connected to the Springfield area by four-lane highways.
2. Approximately 142 square miles of southern and eastern Christian County are within the Mark Twain National Forest. Development of this land area, which is controlled by the National Park Service, is restricted. As such, limited development is anticipated in these areas.

TABLE 4-2
POPULATION GROWTH AND CHANGE

Census Year	1970	1980	1990	2000	2007	% of Total
Christian County	15,124	22,402	32,644	54,285	73,066	100 %
Rural Population	9,534	14,665	21,173	27,782	32,188	44 %
Urban Population	5,590	7,747	11,471	26,503	40,878	56 %
Billings	760	911	989	1,091	1,111	1.5%
Clever	430	551	580	1,010	1,414	1.9%
Fremont Hills *	-----	-----	201	597	850	1.2%
Highlandville **	-----	-----	-----	872	908	1.2%
Nixa	1,636	2,662	4,707	12,124	18,202	24.9%
Ozark	2,384	2,980	4,243	9,665	17,177	23.5%
Sparta	380	643	751	1,144	1,144	1.6%
Saddlebrooke***	-----	-----	-----	-----	72	.01%

Source: U.S. Bureau of the Census, *General Social and Economic Characteristics, Missouri, 1900-1980; Fourteenth Census of the U.S., 1920 vol. 1, Population Composition and Characteristics by States; Census of Population, 1990; STF 1 Profile Report for State of Missouri and Selected Counties, 1990; Summary File 1, 2000 Decennial Census, American Fact Finder; 2007 Population Estimates 2009.*

* Fremont Hills incorporated in 1986.

** Highlandville incorporated in 1995.

*** Saddlebrooke incorporated in 2001.

FIGURE 4-1

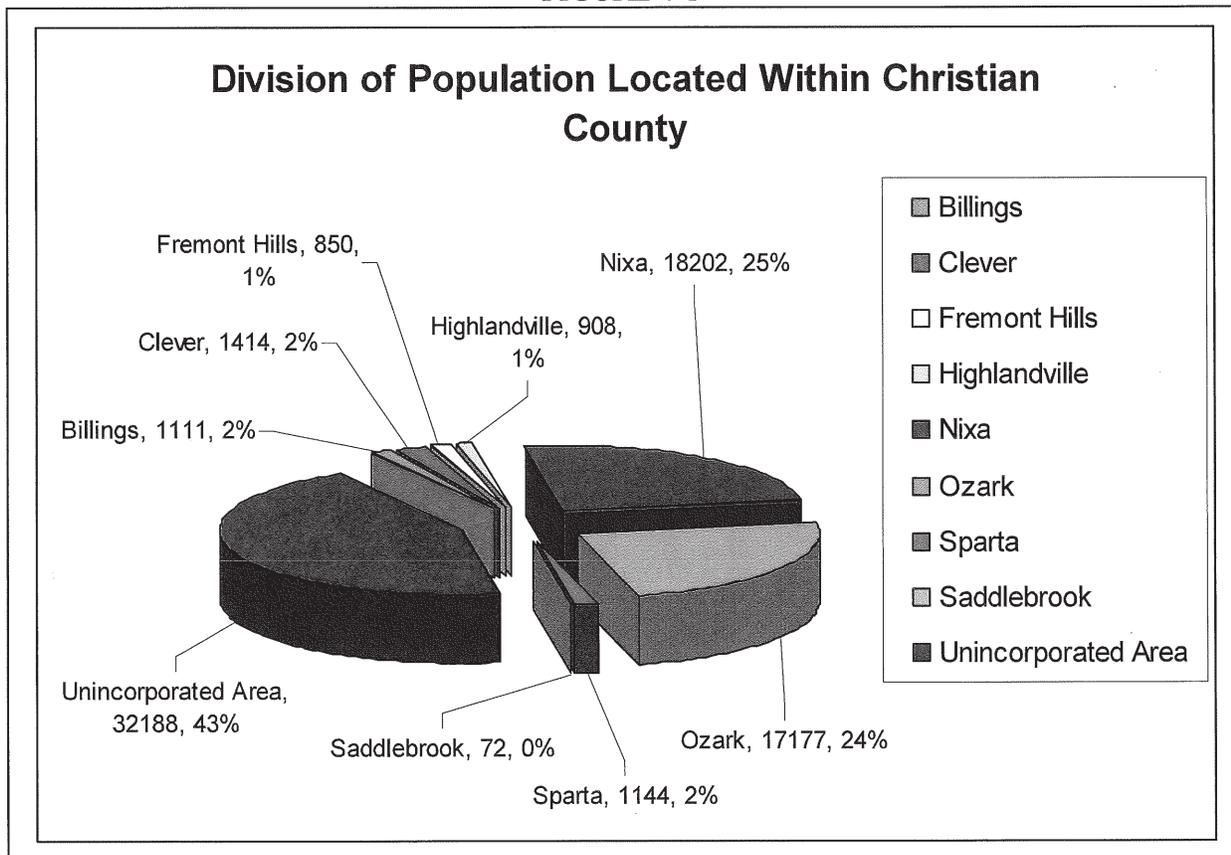


TABLE 4-3
POPULATION PERCENT OF CHANGE

	1970-1980	1980-1990	1990-2000	2000-2007
Christian County	48.1%	45.7%	66.3%	34.6%
Rural Population	53.7	44.5	31.2	15.9
Urban Population	38.6	48.1	131.0	54.2
Billings	19.9	8.6	10.3	1.8
Clever	28.1	5.3	74.1	40
Fremont Hills	-----	-----	197.0	42.4
Highlandville	-----	-----	-----	4.1
Nixa	62.7	76.8	157.6	50.1
Ozark	25.0	42.4	127.8	77.7
Sparta	69.2	16.8	52.3	0

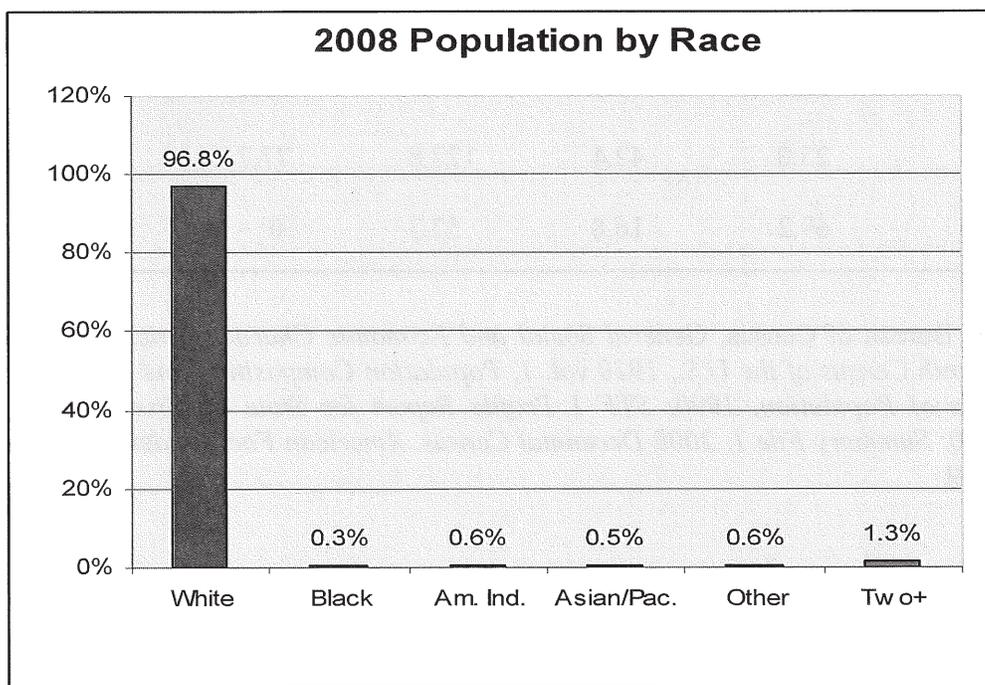
Source: U.S. Bureau of Census, *General Social and Economic Characteristics, Missouri, 1900-1980; Fourteenth Census of the U.S., 1920 vol. 1, Population Composition and Characteristics by States; Census of Population, 1990; STF 1 Profile Report for State of Missouri and Selected Counties, 1990; Summary File 1, 2000 Decennial Census. American Fact Finder, 2007 Population Estimates 2009.*

Racial Composition

The 2005 - 2007 American Community Survey from the U.S. Census Bureau indicates that Christian County's racial composition is overwhelmingly white, accounting for approximately 97.4% of the total population. As noted in Table 4-4, the Census Bureau shows the second largest

racial group in the County as Black or African American persons making up 0.7% of the total population. The Hispanic or Latino population is accounted for separately by the Census Bureau and their numbers were estimated at 1420 persons which actually places them as the second largest racial component in Christian County’s population mix.

TABLE 4-4
RACIAL COMPOSITION



Source: U.S. Bureau of the Census, 2000 Census of Population and Housing. ESRI forecasts for 2008 and 2013.

The age structure of a population is important to a demographic analysis because it reflects changes in behavior at various stages in the life cycle as well as potential needs of various age groups within the population. Different age groups have their own social and economic needs (Bogue, 1969) which should be taken into consideration in the planning process. For example, age structure of a population influences planning for potential school enrollments, work force and economic development potential, housing needs and elderly services.

Table 4-5 provides a breakdown of Christian County's 2007 population by age cohort (age group). As shown, 28.4% of the County's total population is included in the youth age cohorts 0-19. The County's percentage of youth-aged population is slightly higher than that of the State (27.2%).

Over one-third of the County's population (37.4%) is in the age group 25-44, a proportion only slightly higher than that of the State (26.9%). In addition to validating the County's mean age being comparatively low, the large percentage of individuals in these age groups reflects two phenomena: (1) the maturing of the baby boom generation--those born between 1946 and the early 1960s, and (2) in-migration of younger population in the family-forming years, attracted by employment opportunities in the County and nearby Springfield and other quality of life factors such as land and housing costs and quality of schools.

TABLE 4-5
AGE SPECIFIC POPULATION, 2007

Christian County			
Age Specific Population			
Subject	<u>Total</u>	<u>Male</u>	<u>Female</u>
Total population	69,761	34,290	35,471
AGE			
Under 5 years	7.5%	8.3%	6.8%
5 to 9 years	7.6%	7.8%	7.4%
10 to 14 years	6.9%	7.0%	6.7%
15 to 19 years	6.4%	6.9%	5.9%
20 to 24 years	6.7%	6.6%	6.7%
25 to 29 years	8.9%	8.5%	9.3%
30 to 34 years	7.5%	7.7%	7.2%
35 to 39 years	6.8%	6.4%	7.1%
40 to 44 years	7.5%	7.5%	7.5%
45 to 49 years	7.8%	8.1%	7.5%
50 to 54 years	6.1%	6.0%	6.2%
55 to 59 years	5.5%	5.8%	5.2%
60 to 64 years	4.1%	3.8%	4.4%
65 to 69 years	3.6%	3.5%	3.7%
70 to 74 years	2.3%	2.1%	2.4%
75 to 79 years	2.1%	2.2%	2.0%
80 to 84 years	1.4%	1.0%	1.8%
85 years and over	1.5%	0.6%	2.3%

Source: U.S. Bureau of the Census, 2005 - 2007 American Community Survey 3 - Year Estimates

Of interest is the population group aged 65+ (10.9%), which represents a greater percentage of the total population than the age cohort 55-64 (9.6%). This increase in the retirement-aged population indicates not only increased life spans but also in-migration. The Ozarks region in general is attracting retirees due to mild climate, recreational opportunities, lower costs of living and easy access to regional medical facilities.

Although in-migration of retirement-aged population is evident, the County has a lower percentage of retirees aged 65 and over than the State (13.4%). Today, children and baby boom generation adults primarily dominate Christian County's population. Over the next decade, the County will continue to experience an increased demand for educational services and housing to meet the needs of these specific age groups. However, as the baby boom generation continues to move into retirement within the next 20 years, the County will likely see increased demands for housing and social services for the elderly population.

Median Age

An index of age composition is the median age of a population. Median age, which is determined by dividing the population into groups of equal size, can be compared to state and national statistics to determine any significant variances from larger geographic area patterns. For comparison purposes, Table 4-6 shows the median age for Christian County, the State of Missouri, the United States and surrounding Stone, Taney and Greene Counties.

As shown, the median age of Christian County's population has increased from 30.6 years in 1980 to 34 years in 2007. Although an increasing median age is a national trend, due to lower birth rates and the natural aging of the population, Christian County's median age is lower than that of the State, the nation and surrounding counties. This supports the previous observation that the County is primarily attracting younger-aged individuals and families. In contrast, the significantly higher median age figures for Stone and Taney Counties reflects the importance of the Table Rock and Taneycomo Lakes areas as retirement centers.

TABLE 4-6

MEDIAN AGE TRENDS

Area	1980	1990	2000	2007
Christian County	30.6 yrs.	32.6 yrs.	34.5 yrs.	34 yrs.
Greene County	29.2	32.5	35.1	35.5
Stone County	41.2	42.9	44.1	44.5
Taney County	40.5	40.2	38.8	38
Missouri	30.9	33.5	36.1	37.3
United States	30.1	32.9	35.3	36.4

Source: U.S. Bureau of the Census, *General Population Characteristics, Missouri, 1980-2000; Census of Population and Housing, 1980-2000, and 2005 - 2007 American Community Survey 3 - Year Estimates*

Age Dependency Ratio

The age dependency ratio is used to measure the impact of age structure on the productive or income earning portion of the population. The ratio of the "dependent" population to the "productive" population is an approximate measure of the number of dependents each productive member of the population must support. For calculation purposes, the "dependent" population is all those persons between the ages 0-14 and over 64. This is an approximate measure, since not all persons between 15 and 64 are actually producing income and some teen-agers and adults over 64 are wage earners.

Table 4-7 notes the trend changes in Christian County's age dependency ratios since 1970. Christian County's age dependency ratio in 2000 was 51.2, which means that for every 100 persons in the income earning age group there were 51.2 dependents.

The County's total age dependency ratio in 2000 was slightly less than the Missouri ratio of 52.9. However, the County's youth dependency ratio of 35.2 was slightly greater than Missouri's youth dependency ratio (32.3). The youth age group is the principal component of the dependent population in Christian County.

Census data from 2007 suggested a continuation in these trends with the exception of the elderly ratio holding steady and showing a very slight increase.

TABLE 4-7
AGE DEPENDENCY RATIOS

Age Group	1970	1980	1990	2000	2007
Youth (0-14)	46.9	39.4	36.7	35.2	32.8
Elderly (65+)	22.0	18.6	17.2	16.0	16.2
Total Population	68.9	58.0	53.9	51.2	49

Source: U.S. Bureau of the Census, *General Social and Economic Characteristics, Missouri 1900-1980; Fourteenth Census of the U.S., 1920. Vol. 1, Population Composition and Characteristics by States; Census of Population, 1990; STF 1 Profile Report for State of Missouri and Selected Counties, 1990; Census 2000 Summary File (SF 1, and 2005 - 2007 American Community Survey 3 - Year Estimates*

From a historical perspective, the County's age dependency ratio has decreased significantly since the 1960s. This can be attributed to the maturation of the later baby boomers and mini-baby boomers (those born in the 1960s and early 1970s) and movement into the working years. Due to the natural aging process and continued decreases in birth rates, it was expected that Christian County would see a significant increase in its age dependency ratio through the 1990's and 2000's as the baby boomers moved into the retirement years. This however, has not been the case which is largely attributable to the influx of working age people from surrounding counties.

This has created and will continue to provide demand for single-family housing, education and other community services to meet the needs of the youth dependents and working age population. The economic downturn in 2008 has slowed this demand substantially which is reflected in decreased numbers of residential land use permits issued but this must be seen as temporary. As the national economy rebounds in the coming years, Christian County will remain

one of the most relatively attractive places for new development. As previously noted, however, planning for gerontology health care and alternative housing to meet the needs of the elderly will become increasingly warranted over the coming decades.

Sex Composition

The sex composition of a population is an important criteria in many areas of planning-- health services, military planning, sales programs and community services (Shyrock, 1973). Defined as the number of males per 100 females in a population, the sex ratio is a common statistical measure of sex composition. A sex ratio greater than 100 indicates an excess of males, while a ratio less than 100 reflects an excess of females in the population. In general, sex ratios tend to fall between 95 and 102 (Shyrock, 1973, 191).

Table 4-8 shows Christian County's sex ratios for the years 1970 through 2000. Since 1970, the County has had a slight excess of females in the population, but this is well within the normal range.

Evaluation of Christian County's sex composition by age group indicates that all groups have experienced an increase in total numbers between 1990 and 2000. Table 4-9 shows the changes in sex ratios for the various age cohorts in the County over the past decade. In general, the trends in the County's sex ratios do not show any significant variances from national norms.

TABLE 4-8
SEX RATIOS

	1970	1980	1990	2000	2007
MALES	7,389	10,986	15,946	26,402	34,290
FEMALES	7,735	11,416	16,698	27,883	35,471
SEX RATIOS	95.53	96.23	95.49	94.69	96.67

Source: U.S. Bureau of the Census, *General Social and Economic Characteristics, Missouri 1900-1980*; *Census of Population, 1990*; *STF 1 Profile Report for State of Missouri and Selected Counties, 1990*; *Census 2000 Summary File 1 (SF 1)*, and *2005 - 2007 American Community Survey 3 - Year Estimate*

The higher sex ratios in the early youth age cohorts (0-4) reflect the tendency of male births to exceed female births. Also, the lower sex ratios in the elderly age groups reflect the greater life span of the female population. There has been, however, a significant increase in the total numbers of both elderly males and females since 1980, supporting the observation of in-migration of retirement-aged population.

Population Pyramids

A graphic technique used to display the age-sex composition of a population is the population pyramid. The classic population pyramid that shows high birth rates and high death rates typically represents pre-industrial and developing societies. Today, however, the national trend of declining birth rates and increased life spans is evidenced in the smaller base of the classic population pyramid.

Figure 4-2 represents the population pyramids for Christian County's 2000 and 2030 populations. These graphics display the impacts of the natural aging of the population as well as the decline in birth and death rates on the County's population. The bulge in the middle age years represents the baby boom population and in-migration. The most significant inference that can be typically drawn from these graphic representations is the dominance of the youth and younger, working-aged populations and in-migration of retirement population.

Population Projections

In order to develop a plan that will be responsive to the needs of Christian County's population, both now and in the future, it is essential to know what the future population will be. Population projections are necessary in order to provide guidance for the timely planning of community services, such as schools, law enforcement and social services and for necessary public infrastructure, including roads, water, sewer and utilities. Population projections are not the same as predictions. Projections are based on historical and current demographic trends and what the future population may be if these trends continue (Missouri Office of Administration, 1988). Projections are also based on a set of assumptions on how demographic patterns may change in the future. The assumptions used in this report include the following:

- 1 Birth rates will remain relatively stable, but low during the coming decade in keeping with national and state trends.
- 2 Death rates will remain stable through the 2000s, with a slight increase in the period 2010-2020. Life expectancy will continue to increase during the 2010s, accounting for the relatively stable death rate.
- 3 While changing fertility rates (births) have traditionally been the primary factor affecting population change in the State of Missouri, in-migration has become and will continue to be the dominant component of population change in Christian County during the foreseeable future.
- 4 The current negative changes in economic conditions and employment opportunities are not regional but nationwide. This means there will be no significant regional negative impact on current migration patterns but may instead only serve to reinforce many of the qualities such as cost of living that tend to draw people to this area.

Household Characteristics

Household statistics are used in the planning process as indicators of probable demand for various types of housing and related community facilities and services. In 2007, the U.S. Bureau of the Census defined a household as all persons living in a housing unit. This definition does not make a distinction between a single person and more than one related or unrelated persons living together. One person per household is considered the householder (head of household).

The data in Table 4-10 shows that the majority of the County's households in 2007 were family households (76.9%), a rate higher than that of the State (66.1%). The most striking variances in the County's family household composition and that of the State are the percentages of married couple families and female-headed households. In total, 63.0% of the County's family households are married couple households in comparison to only 50.0% of married couple households for Missouri. Within this category, Christian County has a higher percentage of both married couple households with and without children (see Table 4-10).

The County also has a lower percentage of female-headed households (9.5%) than does the State (11.9%). The numbers of female-headed households with children is a particularly important housing and community services planning indicator as females tend to earn lower wages than their male counterparts and have less disposable income for housing. In addition, such households are often more dependent on public-supported social service programs.

TABLE 4-10
HOUSEHOLDS BY TYPE, 2007

	Christian County		Missouri
	Number	Percent	Percent
Total Households	26,380	100.0%	100.0%
Family Households	20,286	76.9%	66.1%
with Children under 18 yrs	9,919	37.6%	30.3%
Married Couple Family	16,657	63.1%	50.0%
with Children under 18 yrs	7,529	28.5%	20.7%
Male Households, no wife present	1,132	4.3%	4.1%
with Children under 18 yrs	708	2.7%	2.2%
Female Households, no husband present	2,497	9.5%	11.9%
with Children under 18 yrs	1,682	6.4%	7.4%
Non-Family Households	6,094	23.1%	33.9%
Householder living alone	4,831	18.3%	28.4%
65 yrs and over	1,783	6.8%	9.8%
Households with one or more persons under 18 yrs	10,719	40.6%	33.3%
Households with one or more persons 65 yrs or over	5,042	19.1%	23.5%
Average Household Size	2.62		2.46
Average Family Size	2.98		3.03

Source: U.S. Bureau of the Census, *2005 - 2007 American Community Survey 3 - Year Estimates*

Although Christian County has a lower percentage of female-headed households than the State, it should be noted that there has been a regional, state and national trend of increasing numbers of female-headed households over the past two decades and that this trend will most likely continue during the 2010s.

Christian County's greater percentage of family households in comparison to the State also means that the County has a lower percentage of non-family households. In 2007, the County's

non-family households were estimated to be 23.1%, as compared to 33.9% for Missouri as a whole. The number of female headed households more than doubles that of males, supporting the overall national trends of delaying marriage due to career opportunities and changing social attitudes. Also contributing to the greater numbers of single female non-family households is the fact that females tend to have a longer life span.

Average Household Size

Also of interest for housing planning purposes, is the average size of households. As indicated, the average size of Christian County households in 2007 was 2.62 persons, as compared to 2.46 persons for all Missouri households. Household size has been decreasing since the 1970s, due to declining birth rates and an increase in single person households. While single family dwelling units will continue to be the dominant type of housing needed into the 2010s, there will most likely be an increasing demand for alternative housing types to meet the changing lifestyles of smaller family households, single person households and the growing segment of retirement age baby boomers.

ECONOMY

Christian County's physical development pattern and potential for future growth are dependent in part on the structure and pattern of its economic base. This section of the

Comprehensive Plan discusses the components and pattern of economic activity in Christian County, along with related labor force and income characteristics.

The Regional Economy

The economy of Christian County is closely intertwined with that of the City of Springfield and the larger metropolitan area. Linked to the Springfield area by Highways 160, 65 and 60, Christian County residents are within easy commuting distance of Springfield for employment, shopping and services. However, the future prospect of increasing fuel prices could become a deterrent for those wanting to move to Christian County while remaining employed outside the county. The 2005 - 2007 American Community Survey indicates that the estimated average travel time to work for Christian County residents is 23.8 minutes. Creating jobs in Christian County would allow residents to reduce commuting time and support the local economy.

The close relationship between the economies of Christian County and greater Springfield is evidenced by the employment patterns and places of employment of the Christian County labor force. The 2000 Census indicates that 17,272 persons, or 61.5% of the employed residents of Christian County, work outside of the County. As shown in Table 5-1, 50.7% of all employed work in Springfield. Overall, 92.1% of the County's employed labor force works in the Springfield Metropolitan Statistical Area (MSA), which includes Greene, Christian and Webster Counties. Christian County's economic future will continue to be influenced by larger regional economic trends, including not only the Springfield area but also the rapidly growing tourism and recreation economy in the Branson area to the south.

TABLE 5-1

PLACE OF EMPLOYMENT

Christian County Employed	Number	Percent of Total
Work in County of Residence	9,777	35.7%
Work Outside County of Residence	17,272	62.9%
Work Outside of State	372	1.4%
Work in MSA of Residence	25,267	92.1%
Work in Central City (Springfield)	13,921	55.1%
Work in Remainder of MSA	11,346	44.9%
Work Outside MSA of Residence	449	1.7%
Work in Central City	269	1.0%
Work in Remainder of MSA	180	0.7%
Work Outside of Any MSA	1,705	6.2%
Total Workers	27,770	100.0%

Source: U.S. Bureau of the Census, *2000 Census of Population and Housing, STF 3 Selected Characteristics*.

Business Sector Analysis

Christian County has experienced significant growth in the number of business establishments over the past 25 years, increasing from 163 businesses in 1965 to 703 establishments in 1999 (County Business Pattern Report, 1999). Since 1999, the number of businesses in Christian County has increased further reaching a total of 2,595 in 2008 (Business Study prepared by Springfield Area Chamber of Commerce, 2008). Since 1980, the greatest

growth has occurred in the Construction sectors. The cities of Nixa and Ozark account for over half of the County's economic activity.

As noted in Table 5-2, the greatest number of businesses is in the service, retail and construction sectors. The largest number of businesses is in the service sector, with health and business services accounting for the majority of payroll dollars. The service and retail sectors together account for over 54.2% of all business establishments in the County. The service sector employs the greatest number of people (5,574 employees).

TABLE 5-2
NUMBER OF BUSINESSES AND EMPLOYEES, 2008

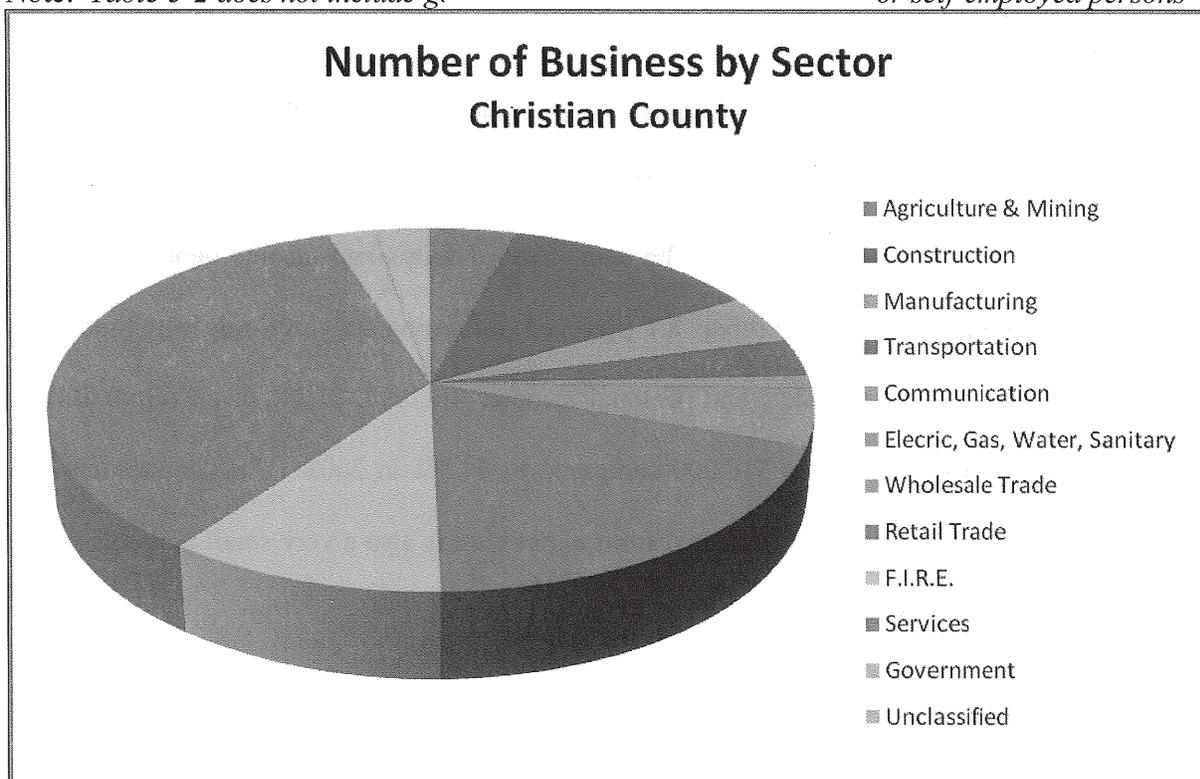
Sector	No. of Businesses	% of Total	No. of Employees	% of Total
Agriculture & Mining	108	4.2%	264	1.6%
Construction	323	12.4%	1,630	9.8%
Manufacturing	112	4.3%	1,702	10.2%
Transportation	88	3.4%	404	2.4%

Communication	16	0.6%	46	0.3%
Electric, Gas, Water, Sanitary	12	0.5%	89	0.5%
Wholesale Trade	131	5.0%	691	4.1%
Retail Trade	499	19.2%	4,584	27.5%
F.I.R.E.	268	10.3%	1,149	6.9%
Services	908	35.0%	5,574	33.4%
Government	61	2.4%	539	3.2%
Unclassified	69	2.7%	3	0.0%
Total	2,595	100.0%	16,675	100.0%

Source: Business data provided by InfoUSA, Omaha NE Copyright 2008, all rights reserved. ESRI forecasts for 2008.

FIGURE 5-1

Note: Table 5-2 does not include government or self-employed persons



Source: Business data provided by InfoUSA, Omaha NE Copyright 2008, all rights reserved. ESRI forecasts for 2008.

Agricultural Sector

Christian County's most basic economic activity is agriculture and is home to 48 century farms. Historically the mainstay of the County's economy, the agricultural sector is in decline, in terms of both numbers of working farms and percentage of total personal income generated. The decline in the number of farms follows national and state trends. The number of Christian County farms decreased from 1386 in 1997 to 1,294 in 2002, a 6.6% decrease. This percentage decrease is more than that experienced by the State of Missouri during the same time period (-3.8%), but is also more than five times the national trend (-3.9%).

The average farm size in Christian County is increasing. The average farm is approximately 165 acres, that's up from 156 acres in 2002. There has also been a decrease since 1997 in the number of farms over 1,000 acres in size. The small size of farms and income generated from commodities sales suggest that many farmers are involved in farming activities only part-time and may have other sources of employment and personal income. In 1997, 71.7% of all farms in the County had annual sales of less than \$10,000 compared to 64.5% in 2002. (U.S. Department of Agriculture, 1997). Personal income generated from agriculture is also a very small percentage of total personal income in the County.

Retail Sector

Retail trade plays an important role in a local community's economic well-being. It fosters the creation of jobs, income, and tax revenues. It serves as a support industry to the area's industrial base by providing inputs for these enterprises and meeting the consumer needs of its workers. Furthermore, if the local retail trade sector provides goods and services, which are not available in other locations, it attracts dollars from out-of-town shoppers. From a regional perspective, one

community's ability to increase retail sales may come at the expense of a reduction in another community's retail sales. An analysis of the local retail pull factor for each major retail sales category has been evaluated. The retail pull factor provides a precise measure of sales activity in a locality. A pull factor of above 1.00 indicates that a community is attracting business, while one that is below 1.00 indicates that the community is losing businesses to other retail markets. For purposes of this assessment and given that Christian County is Ozark's primary trade area, an assessment of sales leakage for Christian County by major retail reporting category identifies where immediate growth opportunities may be achieved.

An analysis of eight major retail sales reporting categories compared Christian County's pull factors to the other major competing counties for retail activity, Greene and Taney Counties. Both neighboring counties have very strong retail pull factors, as Springfield serves as a regional trade center for the metropolitan area and Branson is a major visitor destination. Not surprisingly, Greene and Taney Counties have very strong pull factors. This comparative data presented in Table 5 - 3 provides insight about the major retail opportunities in the area. Retail pull factor data reveals that sales in Christian County are strongest for building materials, general merchandise and food stores, and sales leakage occurs among motor vehicle and auto parts dealers, furniture and home furnishings, eating and drinking places and miscellaneous retail stores (which includes gift stores, office supplies, art galleries, florists, pet stores, used merchandise stores and others). Clothing and apparel data is not available but it is reasonable to conclude that leakage is also occurring in this area because of the strength of Greene and Taney County's pull factor in this category. Therefore, in addition to serving future population growth, in order to further expand the area's retail base, it is appropriate for the County and its incorporated municipalities to target those retail categories where the trade area is experiencing the most sales leakage.

TABLE 5 - 3
Area County's Retail Pull Factors by Sales Category

Sales Category	Christian	Greene	Taney
Building Material & Garden Supply Stores	2.98	1.99	1.33
General Merchandise Stores	1.30	2.04	1.69
Food Stores	1.01	1.20	2.37
Motor Vehicle, Gasoline & Parts Dealers	0.70	1.40	0.87
Clothing & Clothing Accessories Stores	N/A	1.94	9.22
Furniture & Home Furnishings Stores	0.47	2.21	3.35
Eating & Drinking Places	0.95	1.44	5.02
Miscellaneous Store Retailers	0.70	1.94	2.50
TOTAL RETAIL TRADE PULL FACTOR	0.98	1.76	2.85

Source: MERIC

Labor Force Characteristics

Christian County's labor force is defined as those persons 16 years of age and older who are employed or who are available for employment. The County's labor force has increased greatly over the past 30 years, from 6,800 persons in 1970 to 28,763 persons in 2000. Between 1990 and 2000 the labor force increased by 12,077 persons, a 72.4% increase. This compares to an 11% increase in the labor force for the State of Missouri during the same time period. Between 2000 and 2007 the labor force increased by 10,871 persons, a 37.8% increase. This is a considerable drop compared to the increase between 1990 and 2000 but still considerably higher than the 5.7% increase in the State of Missouri between 2000 and 2007

Labor force participation rates for Christian County and the State of Missouri between 1980 and 2000 are noted in Table 5-4. While participation rates for males have remained relatively constant since 1970, there has been a significant increase in the female participation rate for both Christian County and the State. The substantial increase in the female participation rate follows national trends and supports the observation of increases in two-income households.

TABLE 5-4

LABOR FORCE PARTICIPATION RATES

Area	1970	1980	1990	2000	2007
Christian County					
Male	74.7%	74.9%	78.0%	78.7%	
Female	35.7%	46.8%	60.2%	62.8%	
Missouri					

Male	71.7%	74.2%	73.6%	71.6%
Female	39.3%	49.9%	56.4%	59.2%

Source: U.S. Bureau of the Census, *Missouri Statistical Abstract, 1970, 1980; STF 3 Profile, Selected Characteristics, Christian County and Missouri, 1990, 2000.*

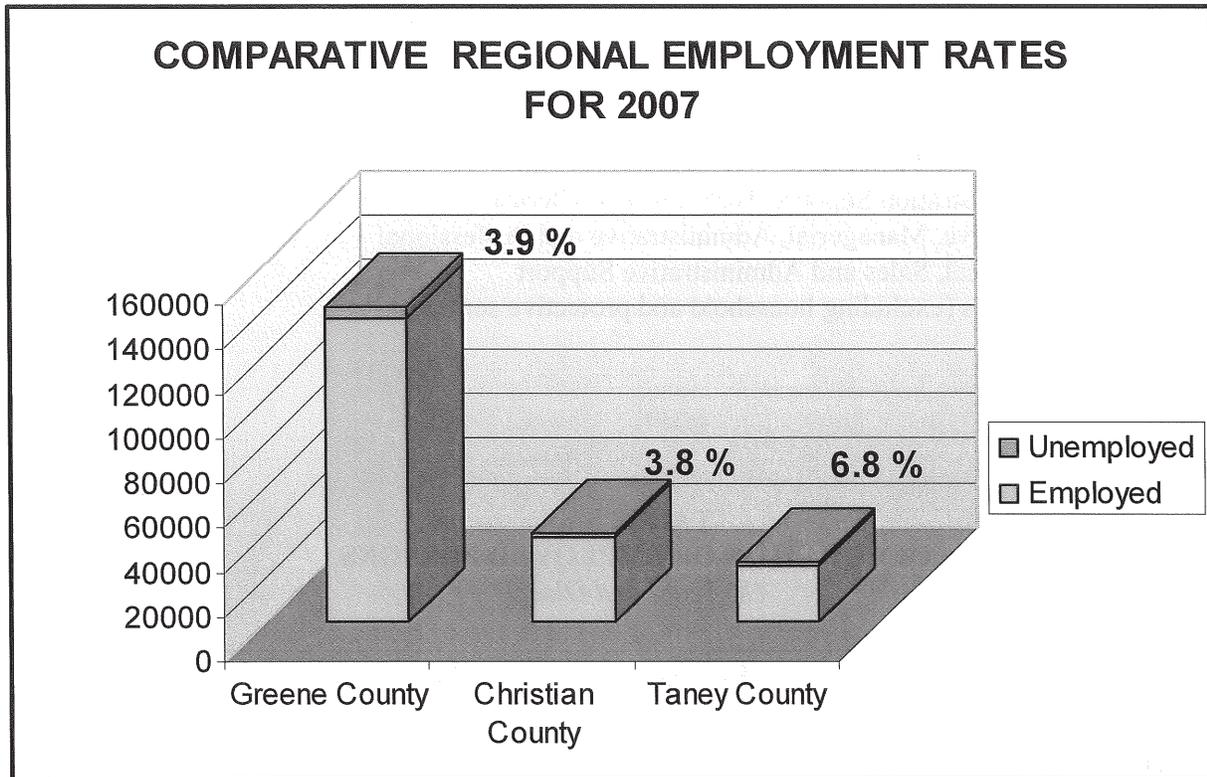
Employment rate trends in Christian County since 1970 have remained fairly consistent with larger state and national trends and have traditionally been comparatively strong within our region as well as the state. As shown in Table 5-5, the County's highest unemployment rate during recent census periods occurred in 1980 when the unemployment rate was 5.5%. Although the County's employment rates have followed state and national trends, the County's economy has been expanding at a faster pace. Overall, the region has maintained an expanding employment market. For example, Christian County's labor force increased by over 72.4% between 1990 and 2000. During this same period, there was only a 15% increase in the number of unemployed persons.

The County's 2007 unemployment rate was 3.8%, an increase over the low water mark of 2.3% established in 2000. It should be noted, however, that these figures represent unemployment levels at moments in time in 2000 and 2007. They do not represent current employment rates being affected by recent economic developments.

TABLE 5-5
HISTORICAL LABOR FORCE EMPLOYMENT RATES

Year	Labor Force	Number Employed	Number Unemployed	Rate
1970				
Christian Co.	6,800	6,710	90	3.2%
Missouri	1,927,000	1,864,000	63,000	3.3
1980				
Christian Co.	10,680	10,090	590	5.5%
Missouri	2,295,000	2,134,000	161,000	7.0
1990				
Christian Co.	16,686	15,889	766	5.3%
Missouri	2,511,000	2,348,000	163,000	6.1
2000				
Christian Co.	28,763	27,770	921	2.3%
Missouri	2,822,010	2,657,924	148,794	3.4%
2007				
Christian Co.	39,634	38,121	1513	3.8%
Missouri	2,981,717	2,774,004	191,505	4.2%

Source: U.S. Bureau of the Census, *Statistical Abstract of United States, 1961*; *Missouri Statistical Abstract, 1970, 1980, 1990*; *STF 3 Profile Report, Selected Characteristics, Christian County, 1990, 2000.*, *2005-2007 American Community Survey 3-Year Estimates*



Labor Force by Occupation and Industry

The characteristics of Christian County's labor force may be evaluated by both type of occupation and type of industry. Note that the following census information provided is based on place of residence (Christian County), not place of employment.

The County has experienced significant changes in the occupational structure of its labor force since 1960. All occupations have grown tremendously between 1960 and 1990 with the exception of Farming, Fishing, and Forestry occupations. Farming in particular has experienced significant decline. In 1960, farming was the most common occupation, accounting for 31.4% of employed persons. By 2000, farming had dwindled to the smallest occupation, accounting for only 0.6% of the employed labor force and by 2007 it was 0.3%.

Table 5-6 lists the breakdown in occupation structure between 2000 and 2007. For reference, the top five occupations of employed persons in the County in 2000 by rank order were:

1. Professional Specialty
2. Administration Support, Technical and Clerical
3. Executive, Managerial, Administrative and Professional
4. Technical, Sales and Administrative Support
5. Services (excluding household and protective services)

TABLE 5-6
OCCUPATION OF EMPLOYED PERSONS
(16 Years and Older)

Occupation	Estimate	Percentage
Management, professional & related	11,482	31.9%
Service occupations	5,311	14.8%
Sales & office occupations	10,188	28.3%
Farming, fishing & forestry operations	91	0.3%
Construction, extraction, maint. & repair	4,080	11.3%
Production, transportation & materials moving operations	4807	13.4%

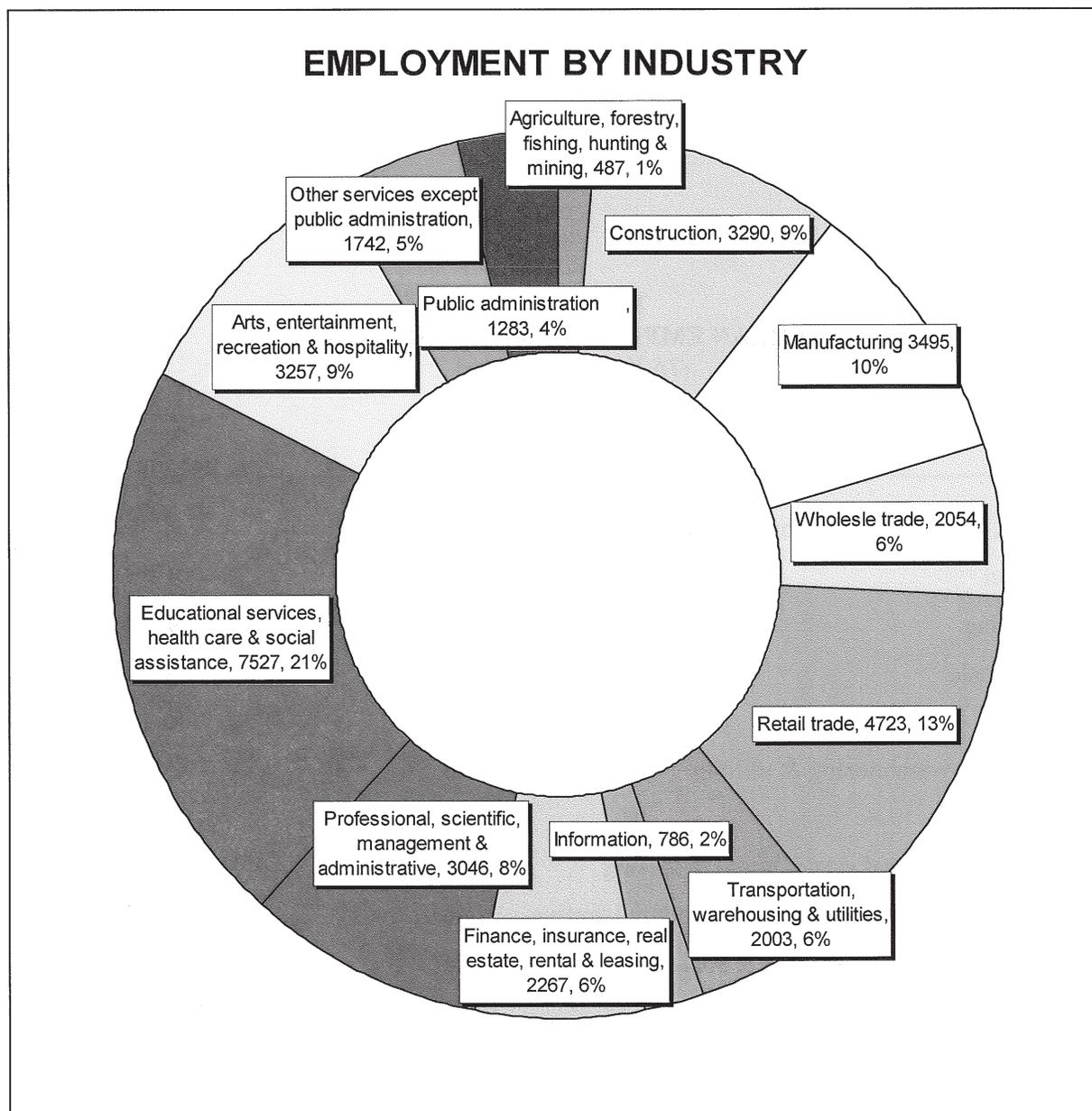
Source: *U.S. Bureau of the Census, 2005 - 2007 American Community Survey 3 - Year Estimates*

Table 5-7 depicts employment patterns by industrial sector in 2007. As shown, over 20% of employed persons work in the Educational Services, Health Care & Social Assistance sector (7,526 persons or 20.9%). As shown in Figure 5 -3, other top employment sectors include Retail Trade (13.1%) and Arts, Entertainment, Recreation & Hospitality. Over the last 10 - 15 years the construction and manufacturing sectors have shown significant decline in their percentage of employment which reflects a growing diversity in employment sectors and also indicates a growing reliance on service related jobs not thought to be “basic” to a healthy local economy.

TABLE 5 - 7
CIVILIAN EMPLOYMENT BY INDUSTRY
(16 Years and Older)

Industry	Estimate	Percent
Agriculture, forestry, fishing, hunting & mining	487	1.4%
Construction	3,290	9.1%
Manufacturing	3,495	9.7%
Wholesale trade	2,054	5.7%
Retail trade	4,723	13.1%
Transportation, warehousing & utilities	2,003	5.6%
Information	786	2.2%
Finance, insurance, real estate, rental & leasing	2,267	6.3%
Professional, scientific, management & administrative	3,046	8.5%
Educational services, health care & social assistance	7,526	20.9%
Arts, entertainment, recreation & hospitality	3,257	9.1%
Other services except public administration	1,742	4.8%
Public administration	1,283	3.6%

FIGURE 5 - 3



Source: U.S. Bureau of the Census, 2005 - 2007 American Community Survey 3 - Year

Income Characteristics

In 2007, the median household income in Christian County was \$46,542, increasing from \$38,085 in 1999. The County's median household income is slightly higher than that of the State of Missouri (\$44,545) but is lower than the United States (\$50,007). The 2007 per capita income for Christian County (\$21,650) is lower than state and national figures (U.S Bureau of the Census, 2005-2007 American Community Survey 3-year estimates).

Table 5-8 categorizes 2007 household income levels for the County. Over 20% of the County's households reported annual income falls within \$50,000-\$74,999. This is a large increase in income compared to 1989 when the highest percent, 21%, reported an annual income between \$15,000 and \$24,999.

The economic well being of Christian County, along with the potential need for various public assistance programs, is reflected in part by the number of people with incomes below the poverty level. In 1999, 4,869 persons in the County had incomes below the poverty level. This represents 9.1% of all persons for whom poverty status was determined, a decrease from 10.1% in 1989. Of those persons below the poverty level in 1999, 1,562 or 34.6% had incomes less than 50% of poverty level.

TABLE 5-8

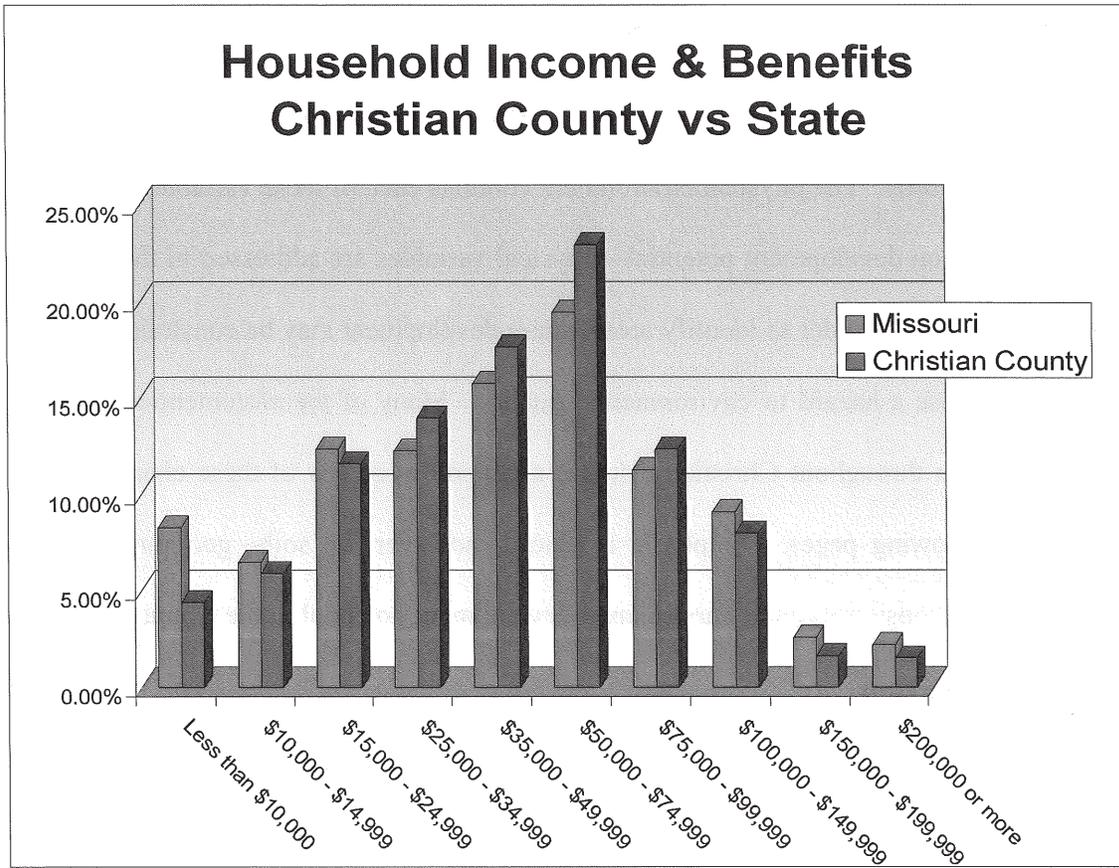
HOUSEHOLD INCOME AND BENEFITS (In 2007 Inflation Adjusted Dollars)

Income	Number Households	Percent of Total
Less than \$10,000	1,149	4.4%
\$ 10,000 – 14,999	1,560	5.9
\$ 15,000 – 24,999	3,071	11.6
\$ 25,000 – 34,999	3,682	14
\$ 35,000 – 49,999	4,664	17.7
\$ 50,000 – 74,999	6,064	23
\$ 75,000 – 99,999	3,277	12.4
\$100,000 – 149,999	2,105	8
\$150,000 – 199,999	419	1.6
\$200, 000 or more	389	1.5
Total	26,380	100%

Source: U.S. Bureau of the Census, *2005 - 2007 American Community Survey 3 - Year Estimates*

Over 42% of persons below the poverty level are under the age of 18. Also, 8.6% of persons below the poverty level are retirement-aged (65 years and older). It was previously noted that females tend to have lower incomes than their male counterparts. This observation is supported in the percentage of female-headed households below the poverty level. Of 5,206 persons in households headed by females, 1,684 or 32.3% are below the poverty level. Clearly, poverty status is most acute for persons in the dependent age years, including both children and retirees.

FIGURE 5-4



PHYSICAL CHARACTERISTICS

Physical variables refer to topography, geology, hydrology, weather and climate, geomorphology, and soils. The physical environment contains each of these variables, all of which may have an impact on development potential. Physical variables are addressed in this chapter of the Comprehensive Plan in order to identify areas where development may be constrained or where development may pose a hazard to environmental quality. Many of the aforementioned physical variables are uniform throughout Christian County; a general overview of these characteristics is provided in the following pages. Emphasis is placed, however, on soils, geomorphology and hydrology due to the constraints each impose upon development potential in the County.

Topography-Elevation

Christian County is situated on three landforms--the Springfield Plateau, the Salem Plateau, and the Eureka Springs Escarpment (see Figure 6-1). Most of the northern portion of Christian County is on the Springfield Plateau. The Salem Plateau is located mainly in the southeastern portion of the County with a small area in the south central region. The Eureka Springs Escarpment crosses the County from the northeast to the southwest, thus dividing the Springfield and Salem Plateaus.

The County exhibits many different topographic features ranging from gently rolling hills to rugged bluffs and valleys. The highest point in the County is located in the northeast portion of the Springfield Plateau with an elevation of 1590 feet. The lowest point of elevation, 830 feet, is located on the Salem Plateau where Swan Creek enters Taney County. With these great variances in elevation throughout Christian County, steep slopes do pose some constraints and hazards to development as well as potential soil erosion from removal of vegetative ground cover.

The entire County is marked with sinkholes and karst, indicating that the surface topography is connected with underground geological features. Sinkholes represent a potentially serious hazard to development in several areas of Christian County; sinkholes are discussed further in the section on hydrology and drainage.

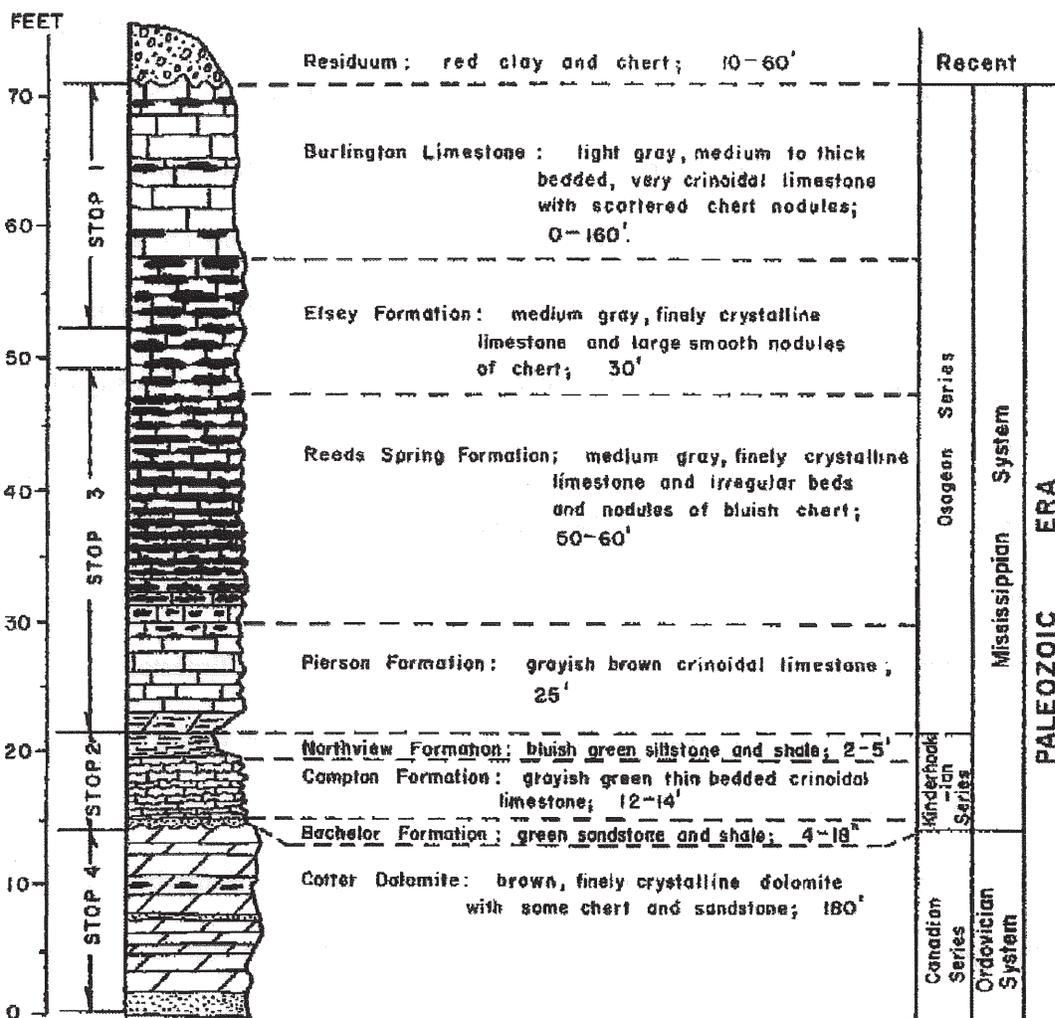
Geology

The term geology refers to the earth's crust and the development of its various layers. Christian County is underlain by eight rock units and one unconsolidated unit (see Figure 6-2). Each of these rock formations outcrops in different parts of the County. The depth of the soil and residuum (unconsolidated materials) throughout the County ranges from 10' to 60'. The remaining rock formations range from 0' to 180' below the surface. The most prominent rock formations in Christian County are the Cotter, Northview, Reeds Spring/Elsey, and Burlington/Keokuk Formations.

The Cotter Formation is the oldest and most deeply buried rock unit. It outcrops at the surface in the rugged hills and valleys in the southwestern and south-central portion of the County. There is a sandstone unit within the formation, which furnishes small amounts of groundwater that recharge many springs in the valleys of southern Christian County. This poses some hazard to well construction due to the direct access to surface waters and potential contaminants.

The Northview Formation is a thin but important rock layer ranging in thickness from 5 - 20 feet. The formation consists of siltstone and shale. The shale portion of the formation acts as a barrier against the downward percolation of groundwater. Many springs appear at the top of the Northview Formation;

FIGURE 6-2
GENERALIZED COLUMNAR SECTION OF ROCK UNITS
FOR CHRISTIAN COUNTY



Source: Jerry D. Vineyard and Larry D. Fellows, *Missouri Geological Survey and Water Resources*, R1 37, 1969.

the groundwater percolates downward to the shale and then moves laterally until reaching a gully or valley and resurfacing as a spring. The Northview Formation can be thought of as a divider between shallow and deep groundwater in Christian County. Due to the shallow percolation of

waters, well water from aquifers in the Northview Formation are much more prone to contamination from surface pollutants.

The Reeds Spring and Elsey rock units are difficult to separate from each other, and so are often identified collectively as the Reeds Spring/Elsey Formation. This formation is composed of alternating layers of limestone and chert, ranging from 80' - 150' feet in thickness. The formation appears in all parts of the County, but occurs mainly on the hillsides bordering the James River and Finley Creek. This formation is important in the development of soils. The soils are very cherty and gravelly, with depths ranging from less than 1 foot to more than 15 feet. Development of on-site sewage disposal systems should be carefully monitored in these areas due to the porosity of the soils and potential for groundwater contamination.

The Burlington/Keokuk Formations are also separate rock units, but because they are difficult to distinguish from one another, are considered a single unit. The formation represents the uppermost layers of bedrock in much of Christian County, and is comprised of limestone ranging from 100 - 150 feet in thickness. The formation crops out in the central portion of the County and in northern stream valleys.

The weathering process that takes place in this formation causes a sharp but irregular boundary with the above-lying residual soil material, resulting in pinnacles and cutters. Pinnacles and cutters are peak-and-valley-like variations in the bedrock surface with as much as 12 feet of relief. The pinnacles are hard limestone bedrock, while the cutters are comparatively soft residual materials. Pinnacles and cutters create problems for development because of their irregularity, difficulty of detection prior to excavation and increased costs during construction (Porter and Thomson, 1975).

Structural features are those geologic features formed through the deformation of bedrock, principally by uplifting, faulting, and volcanic activity. Structural features may include uplifts and basins, folds, faults, and joints.

There are four main structural features within Christian County, including the Chesapeake, Sac River, Ponce de Leon, and Highlandville Faults. The Chesapeake Fault is located in the extreme western region of the County. The portion of the fault lying in Christian County runs from the Lawrence-Christian County line west of the town of Billings and extends in a southeasterly direction (McCracken, 1971). Although not a significant threat to development, construction should try to avoid the fault line.

The Sac River Fault parallels the Chesapeake Fault and runs from just north of the City of Nixa to where the James River crosses the Greene-Christian County line. Where exposed at the surface, the displacement is up to 60 feet and is downthrown to the northeast side of the fault. It is common to have brecciated areas along this fault. Breccia is very porous rock composed of coarse angular fragments. Surface water and pollutants can easily pass downward through the brecciated material, thus creating potential for groundwater contamination.

The Ponce de Leon Fault is located principally in Stone County, but extends east-southeasterly into the extreme southwest corner of Christian County, just south of Spokane. This fault area does not pose a great threat to development. However, as with any fault, construction should try to avoid the fault line.

The Highlandville Fault runs from the Stone-Christian County line, northwest of Highlandville, in a southeasterly direction to approximately U.S. Highway 65. This fault area does not pose a significant threat to development.

Hydrology and Drainage

Christian County lies within the Osage River Basin, the Upper White River Basin, and the Spring River Basin. A small portion of the western panhandle of Christian County, including the City of Billings, lies within the Sac River watershed which drains northwest to the Osage River. Also, a small portion of the panhandle area west of MO Highway 13 and south of the City of Billings lies within the Spring River Basin. The Spring River drains in a northwesterly direction to east of the City of Asbury in Jasper County then southwest into Kansas and to the Grand Lake of the Cherokees in Oklahoma. Most of Christian County lies within the James River Basin and the Bull Shoals Lake Basin, sub-basins of the Upper White River Basin (Figure 6-3).

The northern third of the county is located in the James River Basin. From its headwaters in Webster County, the James traverses nearly ninety-nine miles through southern Greene County and Christian County, flowing in a southerly direction to where it is impounded in Table Rock Lake in Stone County. Major tributaries to the James flowing in Christian County include Finley Creek, Flat Creek, Terrell Creek, and Wilson's Creek.

There are four intermittent streams with permanent pools located in the Christian County portion of the James River Basin. "Intermittent" refers to a stream that has intervals of flow interspersed with intervals of no flow. These streams include Stewart Creek, Terrell Creek, and two unnamed laterals to Finley Creek. There are also 62 losing stream reaches. Losing stream reaches, a feature of karst topography, means the surface water goes underground (Kiner and Vitello, n.d.).

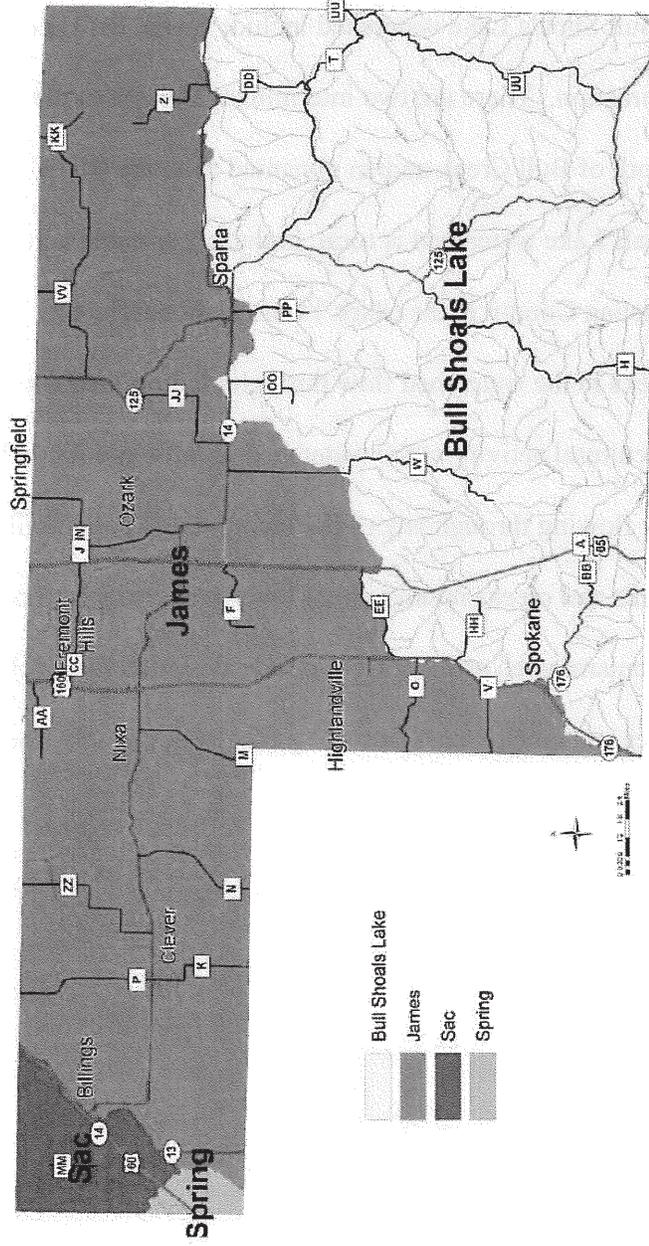
The cities of Fremont Hills, Highlandville, Nixa, and Ozark are located in the James River Basin. Finley Creek flows through the center of the City of Ozark and has caused major flooding in past high water events. Rapid urbanization is occurring in the James River Basin area between the City of Springfield in Greene County and Nixa and Ozark in Christian County.

The southern and eastern half of the County lies within the Bull Shoals Lake watershed, which is a subdivision of the Upper White River Basin. The watershed lies on the Salem Plateau, with a small portion of the northwestern edge of the watershed on the Springfield Plateau. Major Christian County tributaries in the Bull Shoals Lake watershed include Swan, Bull and Bear Creeks, which flow in a southerly direction. There are two intermittent streams in the watershed, an unnamed tributary to the West Fork of Bull Creek and an unnamed tributary to the Woods Fork of Bull Creek. Most of the Bull Shoals Lake watershed is rural, including sizeable acreage in the southern and eastern portion of Christian County in the Mark Twain National Forest.

None of the streams and creeks in the watershed flow through incorporated communities in Christian County. Predominant agricultural activity in the watershed is cattle production. Finley Creek is the only stream or tributary flowing through any of the incorporated communities in Christian County. The smaller streams and creeks mainly affect low water bridges on county roads and low-lying agricultural lands. Contaminated effluent from poorly designed livestock facilities, landfills, or sewage disposal facilities can quickly pass into the groundwater supply, thereby resulting in groundwater pollution.

FIGURE 6-3

Christian County Watersheds

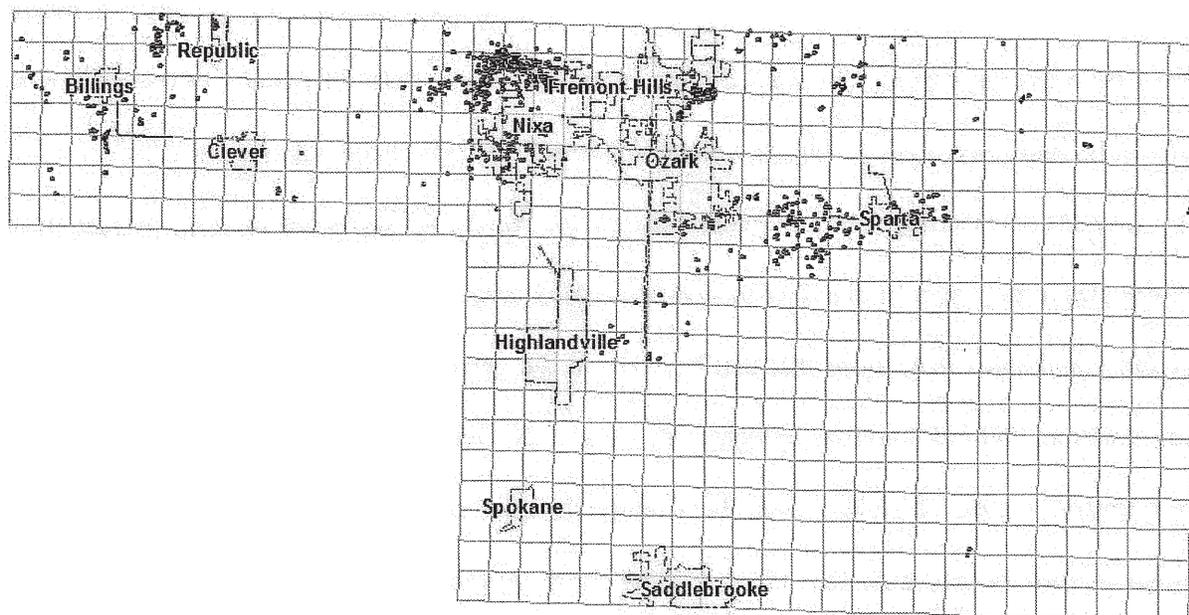


Much of Christian County is considered a sensitive karst region. The northcentral and northwestern parts of the County have been classified by the Missouri Department of Natural Resources (DNR) as a sensitive area for well construction due to the karst topography. A recent study of 60 wells throughout Christian County found that water from 50 percent of the wells was unsafe for human consumption. Of the wells found unsafe, 13.3% tested positive for E. coli.

Overall, the County has hundreds, perhaps thousands, of sinkholes ranging in size from small dimples a few yards in diameter to several acres in area. (see Figure 6-4) There are probably many more sinkholes than those that can be seen on the ground, but they are covered with chert and/or residuum and are therefore hidden from view (U.S. Department of Agriculture, 1985). The most extensive region of sinkholes in the County lies just north and west of the City of Nixa, although it must be assumed that there are many more un-mapped sinkholes which exist in less populated areas which have not yet been identified. The largest sinkholes in this area are the Aven and Deffenderfer Sinks.

Field surveys have indicated that many of the sinkholes in the County are used as trash dumps or serve as conduits for movement of feedlot wastes into the groundwater system. Trash dumping in sinkholes has negative consequences for groundwater quality as pollutants can enter the groundwater with little filtration. Further study to identify the locations of sinkholes as well as direction of subsurface water flow is recommended.

FIGURE 6-4
Mapped Sinkholes in Christian County



Another karst feature common to Christian County is caves. There are some 140 caves that have been identified and documented in the County. These caves are found in limestones and dolomites, with most being located in the Mississippian-aged Burlington and Pierson limestone (260-285 million years), and a few in the Ordovician-aged, Cotter Formation dolomites. Other geologic formations in the County are not conducive to cave formation (Thomson and Martin, 1975).

Climate and Weather

The Christian County area has a continental climate characterized by mild winters and hot summers. Weather data for the area, which have been collected since 1900, are derived from the

nearby Springfield Weather Station. The average annual temperature for the Christian County area has been in the fifties during the data collection period (1900-1990). For agricultural purposes, the area has an average growing season of 192 days. The first killing frost occurs around October 23rd and the last killing frost of spring on approximately April 14th.

Prevailing winds are generally from the south-southwest with an average velocity of eight to ten miles per hour. During the winter months, however, cold northwesterly winds from Canada do sweep across the region. The region has experienced numerous destructive tornadoes, with over 980 tornadoes touching down within a 125-mile radius of Springfield since 1950.

Total precipitation for years of record during the reporting period, including melted snow, varies from a low of 25.21 inches in 1953 to a high of 63.19 inches in 1990. Between 1900 and 1990, the Springfield Weather Station reported seven years with precipitation less than 30 inches and nine years with precipitation in excess of 50 inches. Average annual precipitation is approximately 39.47 inches.

Geomorphology refers to the study of landforms. Landform, or the shape of the land, is affected more by precipitation extremes than average precipitation patterns. The energy available to alter the landscape by running water is maximized during periods of excess precipitation. Dry periods are also important in that the protective ground cover provided by vegetation is reduced during dry years. If these dry years are followed by wet years, increased rates of soil erosion will occur. Erosion from running water is an active geomorphic process in the Christian County area and is most common during the fall and winter seasons.

Soils

The Christian County study area contains 17 individual soil series, which are divided into 23 mappable soil units (see Figure 6-6). There are two major differences between these soils in

terms of formation. In general, the soils of Christian County were formed in either loess (wind blown silts) or in residual materials from the underlying limestone or dolomite bedrock. The loessal soils tend to be of finer texture, consisting of sandy loam to silty clay. Several of the residuum deposited soil series (i.e. Captina, Creldon, Needleeye, and Wilderness) have a fragipan, which is a brittle, cement-like subsurface layer. The presence of fragipan limits the penetration of plant roots, greatly reduces downward water movement and limits operation of construction equipment.

Permanent development in low lying areas with a soil fragipan are susceptible to standing water and potential foundation damage during wet periods as downward percolation of water is restricted. Soils with fragipan also have severe limitations for installation of septic tank systems. Substantial land areas along Highway 14, around the cities of Nixa and Ozark have fragipan conditions; standing water during the wet season is common in these areas.

Prime farmland soils are those soils that are best suited for producing feed and crops and which have properties favorable for the sustained high yield of crops. Approximately 28,000 acres (8%) of Christian County are considered prime farmland. These areas are mostly in the northern portion of the County and are used for hay and pasture, with some used for row crops. Many of the County's prime farmland soils lie in the path of urban development. The soil associations that are considered prime farmland include Tonti-Wilderness, Bolivar, Creldon and Peridge-Huntington (see Figure 6-6).

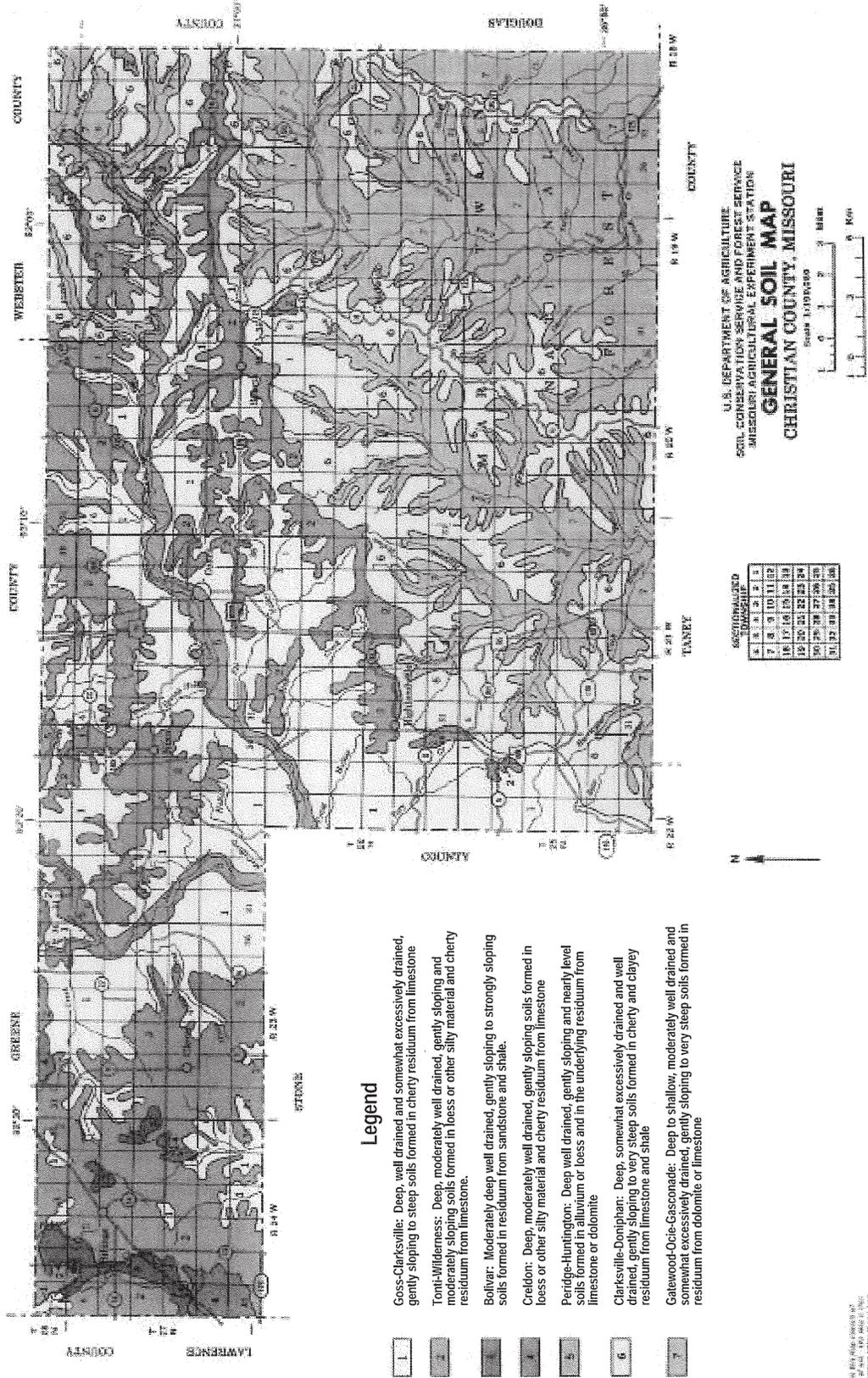
The General Soils Map (Figure 6-7) and Prime Farmland Map (Figure 6-6) should be used as general guides for development purposes. Any expenditure of funds for construction should be preceded by an on-site inspection by a soil scientist to determine specific soil limitations for that site. Due to the severe limitations for septic tank installation in many of the County's soils, it is

further recommended that all construction of on-site individual sewage systems be reviewed by a sanitary engineer to ensure appropriate installation and lateral field design and size.

A narrative description of the 17 soil series in the Christian County area is found in Appendix B. Also included in Appendix B are a series of tables that list average properties and development limitations of the various soil series in Christian County. These tables should be referenced during the development review process.

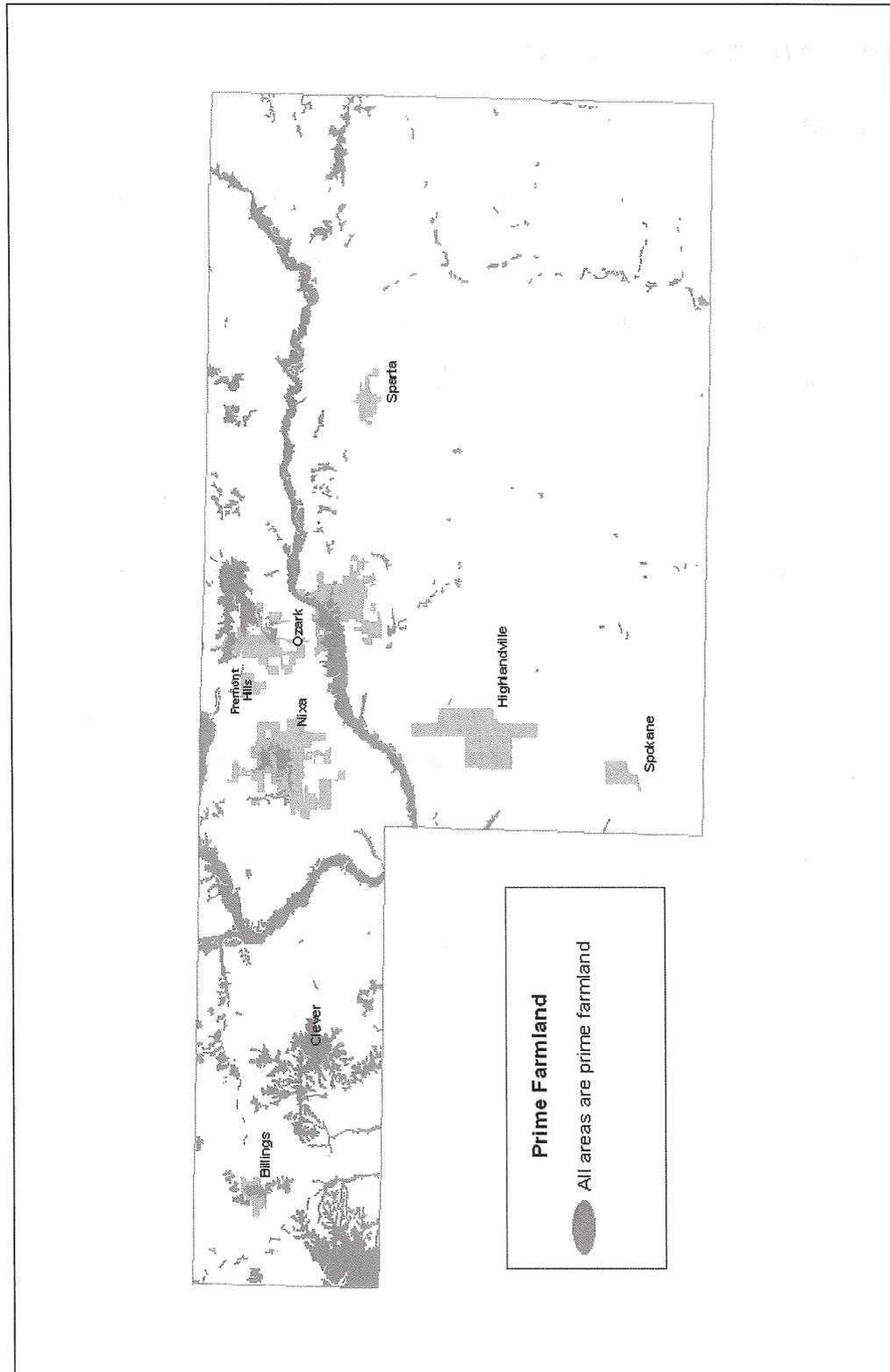
FIGURE 6 - 5

GENERAL SOILS MAP



Revised by the author, 1968. This map is for general information only. It is not to be used for legal purposes.

Figure 6 - 6
PRIME FARMLAND SOILS



ENVIRONMENTAL CONCERNS

Water Quality

A primary environmental concern in Christian County is preservation of groundwater quality. In addition to the municipal water systems that rely on groundwater, there are perhaps thousands of private wells drilled in the aquifer. As noted in the Physical Characteristics subsection, much of Christian County is considered a sensitive karst region. There are numerous sinkholes, losing streams, and caves throughout the county which form an underground drainage network connecting the surface water to the groundwater system.

These karst features represent a threat to groundwater quality as surface pollutants from stormwater runoff, agricultural chemical runoff and dumping can quickly enter the groundwater system through these conduits with little filtration. Pollution and soil runoff from construction sites is also a major concern. Most of Christian County's rivers and streams drain to Table Rock Lake or Bull Shoals Lake. The lakes are major resources for the region and degradation of water quality could have significant adverse impact on our citizens quality of life and the regional economy.

Air Quality

Southwest Missouri is the fastest growing area in the State. As the population grows, so do the number of air pollution sources. Sources can include cars, trucks, off-road vehicles/equipment, households, businesses/industry, and electricity production. In 2007, the Ozarks Clean Air Alliance (OCAA) was formed to begin reviewing air quality issues in Southwest Missouri and develop educational programs focused toward proactive and voluntary solutions to reduce air pollution and protect public health and the environment. The OCAA was formed from the Environmental Collaborative of the Community Partnership of the Ozarks. The OCAA is made up of over 40

organizations throughout Southwest Missouri and is facilitated by the Community Partnership of the Ozarks. Christian County is a member of this alliance and will strive to implement appropriate policies and practices recommended in the Clean Air Action Plan.

Hazardous Waste

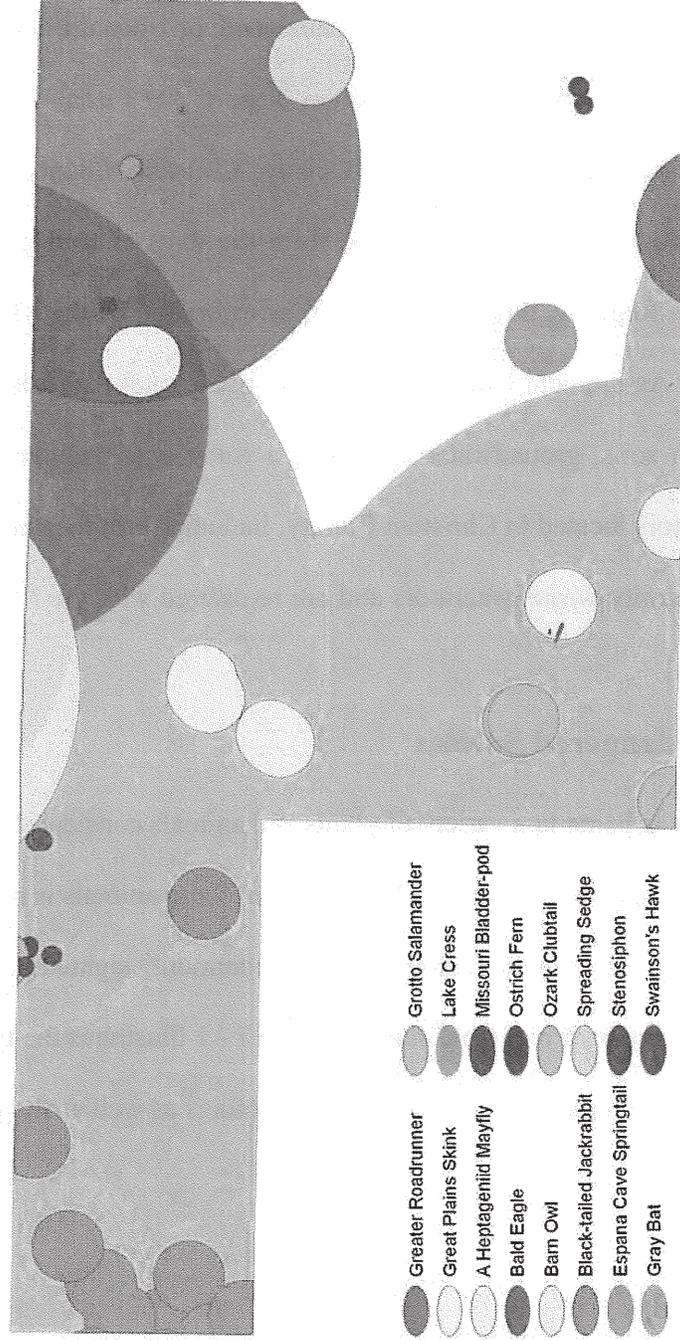
According to the “Registry of Confirmed, Abandoned, or Uncontrolled Hazardous Waste Disposal Sites” from the “Missouri Registry Annual Report” for Fiscal-Year 2004, there is one former lead and zinc smelting site in Christian County. Christian County Furnace is no longer operational and is considered a historic operation from the days of lead and zinc mining in the region. According to the Registry, this site is pending investigation by the Missouri Department of Natural Resources’ Site Assessment Unit (SAU). The Registry notes that it is common to find lead or zinc contaminants in soils, groundwater and surface water near smelter sites. There are nine hazardous waste generators located in Christian County, including two located in Nixa and seven in Ozark. All are small quantity waste generators and are registered with the Missouri Department of Natural Resources.

Threatened and Endangered Species

Christian County is home to a variety of plants and animals considered to be either threatened or endangered species. The presence of many of these animals is related to the karst topography and number of caves in the region. The most commonly sighted of these is the gray bat being seen in areas covering over half the County. Figure 7 - 1 illustrates the type of endangered species and also gives some impression of the areas of sightings as well as the proportionality in number of sightings.

FIGURE 7 - 1

Threatened and Endangered Species in Christian County



Prepared by: David Faucett
Prepared for: Christian County Planning and Zoning Dept.
Source: USDA, Natural Resources Conservation Service



EXISTING LAND USE

Land use refers to the activities of man and natural elements that are affixed to the earth's surface. All land can be described as being used in some manner, whether it is a man-made activity such as housing or agricultural production or a natural use such as trees, water or grasslands. The manner in which land is currently used is a key factor affecting future development potential.

Methodology

Existing land use data for Christian County was compiled by joining data from the County Assessors office with GIS technology as well as field "windshield surveys" of existing uses to produce mapping and statistical analysis with information based on each parcel of land. This information was augmented with aerial photography interpretation as well to consider natural features in assessing the county's existing land usage.

Land use data were aggregated into general use categories, which are discussed in the following pages. For analysis purposes, agricultural uses were grouped into three categories: (1) crop production, (2) dairy and beef cattle production and (3) hogs and poultry production. Acreage totals for agricultural uses represent the predominant use of the ownership parcel.

The existing land use inventory for Christian County was conducted only for the unincorporated portions of the County. Table 8-1, which summarizes land use acreage totals, includes a total acreage figure for the incorporated cities. This table includes all forms of land use within the cities, including streets and rights-of-way. All other data presented are for the unincorporated portions of the County only.

It should also be noted that the land use acreage totals presented here most likely include a degree of error in the determination of forestry acreage and acreage devoted to agricultural activities. Many of the heavily forested areas in the central and southern part of Christian County

are used for cattle grazing, an activity which is not easily detected from road side field surveys or aerial photo interpretation.

The detailed land use classification system used to aggregate specific land uses into general use categories is found in Appendix C. Figure 8-2 displays generalized existing land use patterns.

Residential Uses

Residential uses and Ag/residential uses account for approximately 62.4% of all developed land in Christian County. Single-family homes are the predominant residential use, developed on over 38,444 acres of land. Low-density residential development is the norm; throughout the rural areas of the County, there are few ownership parcels developed in residential use less than three acres. Residential density patterns in close proximity to the County's cities approximate 1-2 dwelling units per acre. Residential density patterns are dictated to a significant degree by lot size required for on-site septic tank absorption fields.

Acreage devoted to moderate or high density residential development (duplexes, apartments) within the County are minimal, with most such uses located in close proximity to the urban areas in the County. Mobile homes and mobile home parks are another major residential use in the County. While mobile homes and mobile home parks are found in virtually all sections of the County, these residential structures are generally concentrated along or in close proximity to Highways 160 and 65 in the central section of the County and in the northeastern third of the County.

The greatest concentration of new residential development is occurring in the growth corridors along Highways 160 and 65, running from the Greene County line on the north to south of the cities of Nixa and Ozark.

Commercial Uses

Commercial uses, which include wholesale and retail trade and service activities such as finance, professional services and commercial recreation, are generally located along the County's major road system, particularly along Highways 65, 160 and 14. Commercial uses represent approximately 0.46% of developed land in the County.

Industrial Uses

Industrial activity, which includes light and heavy manufacturing, extractive industries and communications, utilities and transportation, accounts for approximately 22% of all developed land uses. Quarry operations contribute significantly to the acreage totals for industrial activity. As with commercial activity, most industrial activity is concentrated along Highway 65 or along other major roads in the northern section of the County. The largest concentration of industrial activity is located north of the City of Ozark.

Agricultural Uses

Agriculture is the dominant land use in Christian County, with approximately 185,300 acres or 51.38% of the land area in the County devoted to agricultural activity. Most field crop and hay production is found in the prime farmland soils area in the northern third of the County. Dairy and beef cattle production are found throughout the County; however, a concentrated area of dairy cattle production is located in the northern panhandle section of the County, around the communities of Billings and Clever. Beef cattle grazing are also located throughout the forested areas in the central and southern portions of the County. As noted, dairy and beef cattle account for most of the animal husbandry activities in the County. Approximately 100 acres of land is devoted to hog production.

Forestry Uses

Extensive portions of the central and southern part of Christian County are devoted to forest cover, including both privately owned land (21,608 acres) and lands in the Mark Twain National Forest (51,312 acres). The extensive National Forest acreage in the southern third of the County precludes significant concentrations of urban development in this area. As indicated, many of the privately owned forestlands are used for cattle grazing.

Parks and Recreation

Approximately 3,836 acres of land in the unincorporated portions of the County are devoted to parks and recreation use. This figure includes Missouri Department of Conservation Lands, such as Busiek Park and the James River public access sites. Wilson's Creek National Battlefield is also included in this category.

As Christian County moves to First Class status in 2011 there will be new opportunities to enhance and expand amenities for the public in this area. As a First Class County the County Commission will be able to appoint a Board of Parks Commissioners which would have the authority to make suggestions for plans regarding the use and development of recreational land within the County. As a First Class County the County Commission may also levy certain annual taxes specifically for the acquisition, planning, improvement, maintenance and operation of parks within the County.

The County Commission will also have the authority to grant concession rights for refreshment facilities at County parks.

As a First Class County the County Commission will also be authorized to create a County Sports Authority. This Authority would have the power to acquire and operate recreational facilities suitable for all types of sports and recreation, either professional or amateur.

General Land Development Trends

As shown on Figure 8-2, the heaviest concentrations of urban development are found in the northern third and central section of the County, with development occurring along the Highway 65, 160 and 14 corridors in close proximity to Nixa and Ozark. Growth pressures are resulting in the conversion of prime farmland soils in these areas to urban development.

In general, the development pattern throughout the southern half of the County is one of very low density residential on scattered lots or smaller residential subdivisions. Density levels increase in close proximity to the Cities of Nixa and Ozark. However, development patterns in these areas are still considered low density, with most residential uses developed on lots of at least one acre or larger. While this pattern of growth certainly works to preserve a mathematical percentage of open space one must weigh the quality of this "open space" versus the impractical expense and thus inability of the County to provide and maintain quality infrastructure to this growing and ever dispersing population.

The County has experienced considerable new growth and development over the past twenty years. While there has been an increase in commercial and industrial uses during this time period, the majority of significant new development has been in residential uses. As might be expected, much of the County's new industrial and major commercial development over the past several years has occurred within the incorporated cities due to the availability of municipal water and sewerage services and the lack of alternative solutions to accommodate this type of development in the unincorporated portions of the county.

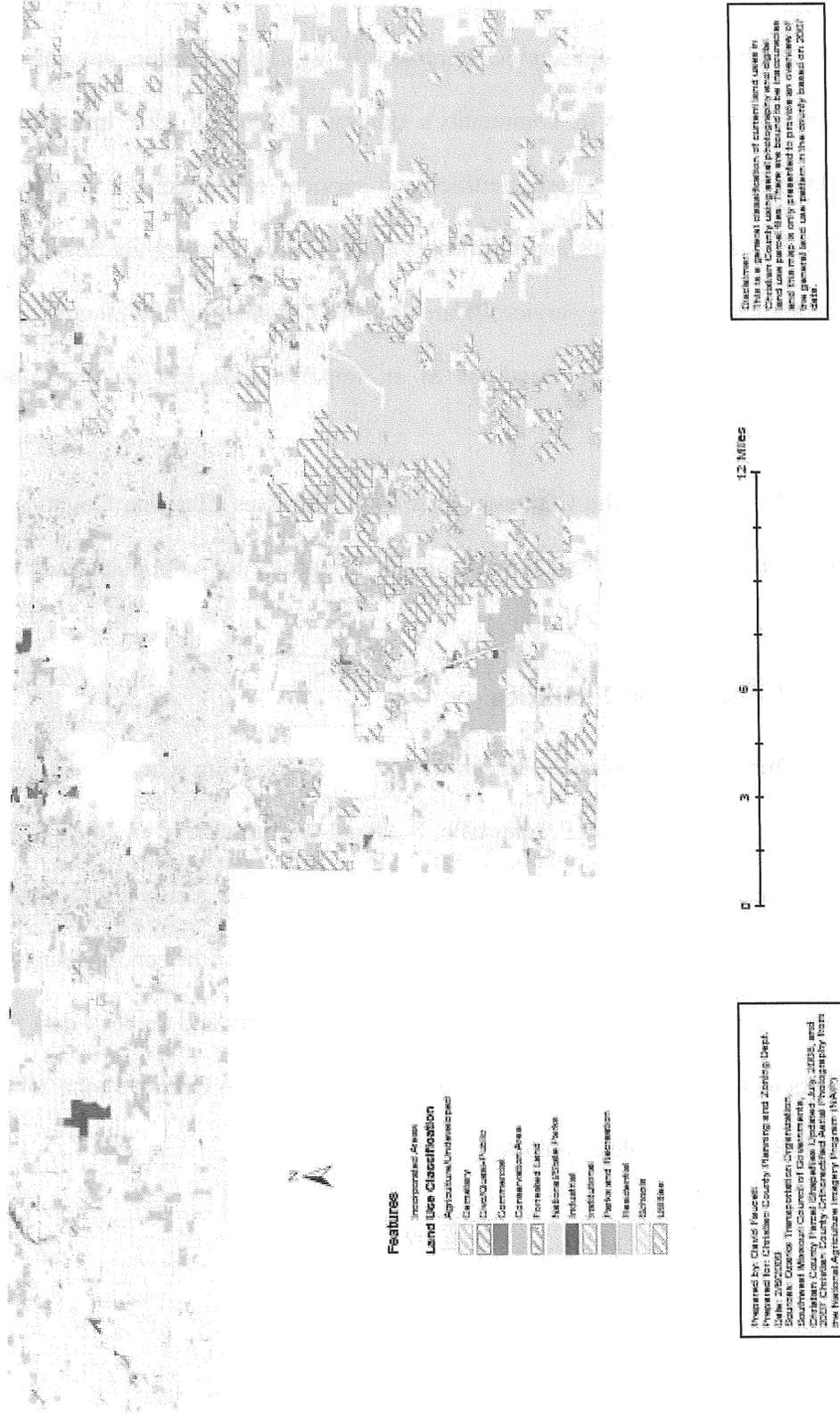
TABLE 8-1
Existing Land Use 2007

LAND USE	ACRES	PERCENT
Agriculture	185300	51.38%
Single family	38444	10.66%
Multi-family	1265	0.35%
Group Quarters	42.5	0.01%
All Com, retail, office, etc.	1641	0.46%
Industry	789	0.22%
City Hall, Courts, Post Office, etc.	326	0.01%
Quasi-public; church, community center	209	0.06%
Schools	556	0.16%
Parks, Recreation, Golf Course	615	0.17%
Conservation, Busiek, Mark Twain	54490	15.10%
Telecommunications, utilities	324	0.09%
Right of Way	6600	1.80%
Forrested/Undeveloped	69667	19.30%
Unclassed/Brownfields	366	0.14%
TOTAL	360634.5	100.00%

Source: Center for Resource Planning and Management, field surveys, aerial photography interpretation 2007.

GENERALIZED EXISTING LAND USE
FIGURE 8 - 2

Christian County Land Use Survey



PUBLIC FACILITIES AND SERVICES

Public facilities and services, such as schools, fire protection, law enforcement and libraries, help to shape not only a community's quality of life but also influence future growth and development potential. These facilities and services can affect the decision making process of where to locate as families and businesses enter an area. As private development tends to follow the location of community services (Daniels, 1988), evaluating and planning for current and future public facility and service needs is as an important element of the County's overall future development strategy.

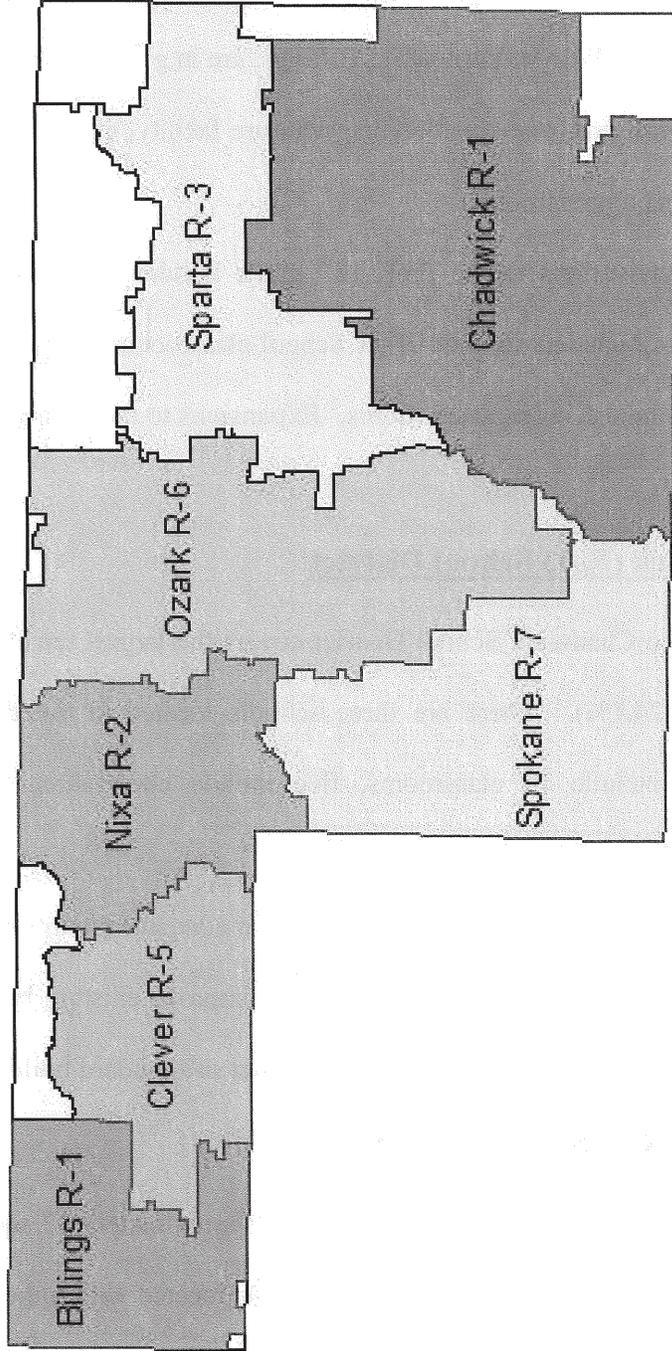
This section of the Comprehensive Plan addresses Christian County's public facilities and services, including schools, law enforcement, fire protection, ambulance/rescue services, libraries, and parks and recreation.

Public Educational Facilities

Thirteen public school districts serve a rapidly growing school-aged population in Christian County. Of these, the Ava, Bradleyville, Fordland, Marionville, Republic and Rogersville Districts do not have any school facilities in Christian County and serve only a few students from the County (Table 9-1). Figure 9-1 shows the service area boundaries of the school districts in Christian County. Table 9-2 summarizes enrollment, facility capacity and tax levy data for the districts with facilities located in the County. The County is also home to Ozarks Technical Community College-Richwood Valley Campus

FIGURE 9 - 1

Christian County School Districts



Billings (R-4) School District

The Billings School District covers a 40 square mile area (7.09 %) in the Christian County panhandle. This district is home to one elementary and one high school. The school facilities, located at 118 W. Mt. Vernon St., Billings, are in good condition. Facilities include 42 classrooms, two gymnasiums, one vocational/agriculture facility, eight offices, one cafeteria, one kitchen, one library, and ten restrooms.

Renovations to the PreK-12th grade building were completed in November 2008. This renovation included six new High School classrooms, a new High School computer lab, and two new Preschool-Kindergarten rooms. Expansions to the library, cafeteria and kitchen also occurred in 2008.

Chadwick (R-1) School District

The Chadwick School District covers the largest territory in Christian County (135 square miles or 24.1%). There are three schools located in the district's area--Chadwick R-1. The facilities include 19 classrooms, five mobile classrooms, two gymnasiums, one agricultural building, four offices and a cafeteria.

The school facilities are generally in adequate condition. Currently plans are in place and construction is slated to begin which will improve existing buildings, enlarge the library, enlarge the cafeteria and kitchen area and reconstruct substandard buildings.

Clever (R-5) School District

The Clever School District serves approximately 42 square miles (7.4%) in the panhandle area of the County. There are three schools located within the district, Clever Elementary, Clever Upper Elementary and Middle School, and Clever High School.

The elementary school and high school are in good to excellent condition while the middle school is in average condition. The Elementary School houses grades PK-3 and includes 24 classrooms, a gymnasium, and a cafeteria. The Upper Elementary serves grades 4-5 and is in good condition. The Middle School serves grades 6-8 and facilities include 18 classrooms, a computer lab, a science lab, and a gymnasium. The new high school reported an enrollment of 252 for the 2008-2009 school year and includes 22 classrooms, gymnasium building, vocational/agriculture building, a library, and a cafeteria.

Nixa (R-2) School District

The Nixa School District covers a 55 square mile area (9.75%). The facilities are all in excellent condition and include eleven campuses: The Early Childhood Learning Center, Century Elementary, Matthews Elementary, George Espy Elementary, Thomas Elementary, Inman Elementary, Main Street Elementary, High Pointe Elementary, the S.C.O.R.E school, Nixa Middle School, and Nixa High School.

The Early Childhood Special Education Program is offered to District children ages 3-5. The facility is located at 301 S. Main Street and shares facilities with Main Street Elementary. The school has 10 classrooms plus an additional mobile unit which houses the Parents as Teachers offices. The current enrollment for the Early Childhood Learning Center is 188 which is above the maximum capacity for the facility.

Century Elementary is located east of town on North Street next to Nixa Junior High. The facility was built in 2001, sits on 32 acres, houses grades K-4, and has a total enrollment of 456 for the 2008-2009 school year. It contains 25 classrooms, a computer lab, a library, and a multi-purpose room.

Matthews Elementary is located at 605 S. Gregg Road and sits on 20 acres. The school houses grades K-4 and is in excellent condition. The 2008 enrollment is 521 and 34.55 percent of the students are eligible for free and reduced lunch. The facility contains 27 classrooms, a mobile classroom, a computer lab, a library, and a multi-purpose room.

George Espy Elementary is located west of Nixa on Highway 14 and serves students in grades K-4 with a 2008 total enrollment of 426. The building was constructed in 1987, is in excellent condition and contains 35 classrooms, a library, and a multi-purpose room.

Thomas Elementary is located at the corner of Cherry and Market Streets and houses grades K-4. It has an enrollment of 347 in 2008 and 50.87 percent of the students are eligible for free and reduced lunch. The school was built in 1960 on a 9 ½ acre site and has undergone general maintenance and improvements, including a new roof and four new classrooms in 1985, and then three classrooms, a music room and a library expansion in 1998. The building is in good condition and contains 20 classrooms, a large library, a computer lab, an adaptive PE classroom, and an all purpose room with a stage and a kitchen.

Inman Elementary houses grades 5-6 with a total enrollment of 561 in 2008. Of the total enrollment 25.3% are eligible for free and reduced lunch. The facility located on 40 acres, at 1300 North Nicholas Road, is in good condition. The building has 31 classrooms, two modulars, a computer lab, a library, and a multi purpose gym/ cafeteria.

Main Street School is home to grades PK-6. In 2008 the school had a K-6 enrollment of 292 and a preschool enrollment of 127. The building was constructed in the 1940's and has undergone many improvements over the years. The school contains 19 classrooms, a library, a cafeteria, and a gymnasium with a stage.

High Pointe Elementary is the newest school in the Nixa R-2 district and is located east of town at 900 N. Cheyenne Road. The school was built in 2007 and houses grades K-4 with a total enrollment of 370 for the 2008-2009 school year. The facility has 36 classrooms, a library, a gymnasium, and a cafeteria.

The S.C.O.R.E School is the Nixa alternative high school and has an enrollment of 50 students. The school is located at 1398 W. Mount Vernon and is dedicated to providing alternative methods of learning that meet the individual needs of students. The facility includes six classrooms, a multipurpose room, and a computer lab.

Nixa Junior High School is located in the old high school building on North Street in Nixa and serves grades 7-8. The structure sitting on 10 acres was built in 1969 and contains 46 classrooms, seven classrooms in mobile units, a library, gymnasium, an all purpose room, an auditorium, kitchen, science laboratories, art facilities, industrial arts shop rooms, home economic rooms, and a track and football field. For the 2008-2009 school year Nixa Junior High recorded a total enrollment of 860 students with room to grow at least another 50 to 100 students with the addition of the mobile classrooms.

Nixa High School was built in 1998 and serves students in grades 9-12. The 225,000 square foot building is in excellent condition and sits on 43 acres located at 514 S. Nicholas Road. The facility capacity is 1,750 students. In 2008, high school enrollment was around 1,600, a 91% occupancy rate. The state of the art facility includes 90 classrooms, an enlarged library, a school theater, a football stadium, and a 3,000 seat gym.

Many changes are planned for the Nixa School District. Master plans include the construction of a new 5th and 6th grade school in 2009, junior high school in 2011 as well as additional high school classrooms, a new elementary school in 2013 and a new high school by

2017. The District will need to continue to revisit the issue of a second High School when planning for additional classrooms for the current High School.

Ozark (R-6) School District

The Ozark School District serves a 90 square mile area (15.95%) of the County and is home to seven schools--Ozark East Elementary, Ozark North Elementary, Ozark South Elementary, Ozark West Elementary, Ozark Upper Elementary, Ozark Junior High, and Ozark High School. All schools are in good to excellent physical condition.

Ozark East Elementary was built in 1994 and is located at 2449 East Hartley Road. The facility is in excellent condition and includes 28 classrooms, a gym, and a library. The facility serves grades K-4 and total enrollment for 2008 was 471.

Ozark North Elementary, located at 3608 North Highway NN, is in excellent condition and houses grades K-4. The building has 28 classrooms, a computer lab, a library, a gym, and a cafeteria/multi-purpose room. Total enrollment for 2008 was 439.

Ozark South Elementary is located at 1250 W. South Street. It is in good condition and houses grades K-4 with a 2008 total enrollment of 573. The building has 27 regular classrooms 3 special education rooms, cafeteria, a gym, and a library.

Ozark West Elementary is the newest school in the Ozark R-6 School District. The school, built in 2007, is located at 3105 W. State Highway CC. The building contains 28 classrooms, a gymnasium, cafeteria, a library, and computer lab. The school house grades K-4 and reported a total enrollment of 621 in 2008.

Ozark Upper Elementary is located along with Ozark North Elementary on Highway NN. The building, constructed in 1993, is in excellent condition and houses grades 5-6. The building

contains 50 classrooms, a computer lab, 2 gymnasiums, 2 libraries, and a cafeteria/multi-purpose room. When the new high school was built, the Upper Elementary expanded into the old junior high building providing the necessary extra classroom space. The school recorded a total enrollment of 823 in 2008.

The junior high, located on Jackson Street in the old high school building, is in good condition. The facility serves grades 7-8 and consists of 3 buildings, the main school, a west wing which is now occupied by the Finley River School, and a shop building, all of which are connected by a canopy. The facilities include a total of 60 classrooms, 2 gyms, a cafeteria, and a library. The junior high had an enrollment of 820 and the Finley River School had an enrollment of 40 for the 2008-2009 school year.

Ozark High School was built in 2004 and houses 1,477 students, grades 9-12. The three story, 247,621 square feet, brick structure contains 78 classrooms, 2 gymnasiums, 11 computer labs, a library, an auditorium, and a cafeteria. When the new high school was built the junior high moved to the old high school facility and the old junior high building was used to expand elementary school needs.

Overcrowding has become an issue for the district. In 2008, South Elementary was at 85% of its absolute capacity and West Elementary at 88% of its max capacity and above its preferred capacity. The capacity numbers listed in Table 9-2 are max capacity numbers that would be the absolute threshold with large class sizes. The school district prefers smaller class sizes therefore the preferred capacity for the Elementary schools is between 500-600 students, 900-1000 students in the Upper Elementary and Junior High School, and 1500-1550 in the high school.

In February 2009 the school district adopted a new long range master plan. The plan outlines the measures that will be taken to accommodate future growth in the Ozark R-VI School

District including the construction of a new middle school, a second high school, and three elementary buildings if growth remains at its current rate.

Sparta (R-3) School District

The Sparta School District serves residents in the east-central section of the county, covering a 66 square mile area (11.7%). There are two schools in the Sparta School District, elementary housing grades PK-5 and the middle school/high school which is the home to grades 6-12. The elementary school contains 31 classrooms, a multipurpose room, a cafeteria, and a library. The middle school/ high school is in good condition and contains 35 classrooms, a library, two gyms and one cafeteria. The elementary school had an enrollment of 360 students and the middle/high school reported an enrollment of 375 for the 2008-2009 school year.

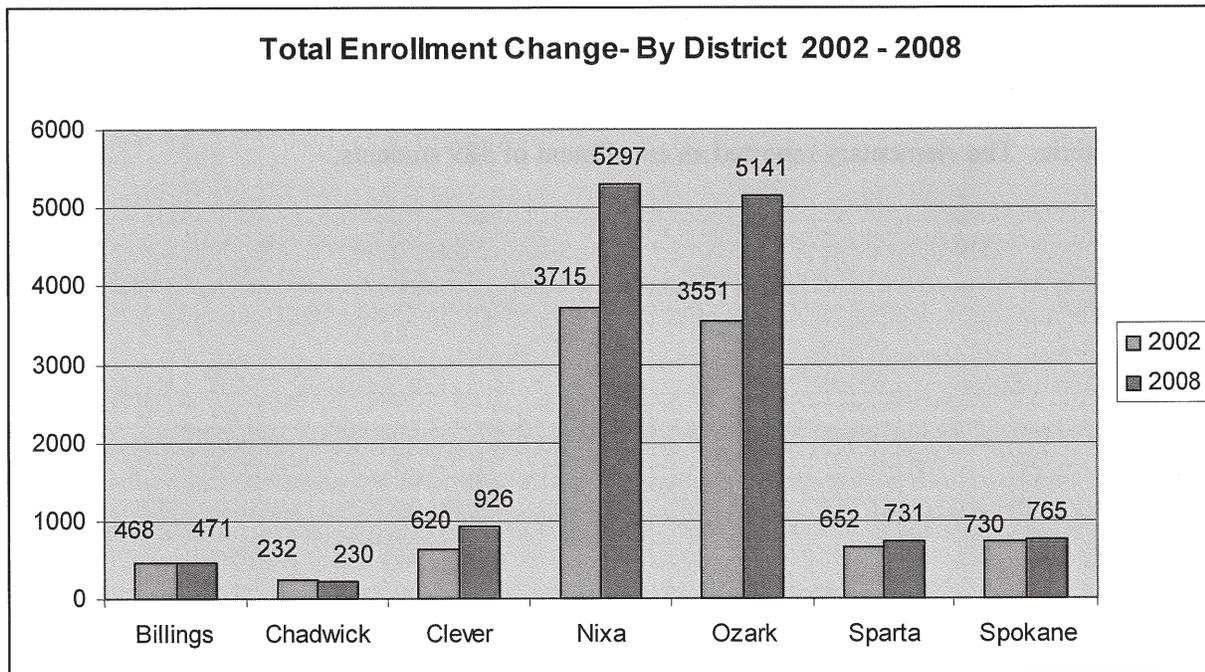
Sparta has seen many changes in the last decade. A new elementary was built in 1993 separating the school district into multiple buildings. In 1997, the high school gymnasium was expanded and renovated. Then in 2000, a cafeteria, a nurse's office, three classrooms, and a bathroom were added to the elementary facility. If funding is available, the District would like to construct a new High School facility by 2014.

Spokane (R-7) School District

The Spokane School District covers 81 square miles (14.36%) and serves residents in the southwestern section of Christian County. There are three schools within the Spokane School District--Highlandville Elementary, Spokane Middle School, and Spokane High School. The high school facilities which was constructed in 1992, includes 19 classrooms, a gymnasium, a library, and a cafeteria. The high school reported an enrollment of 220 students for the 2008-2009 school

year. The Middle School facility, in adequate condition, has 12 classrooms, a gymnasium, a library and a cafeteria. The 2008 enrollment for the Middle School was 145. The elementary facility is generally in good condition and includes 25 classrooms, one library, one gymnasium, two offices, and one cafeteria. The elementary reported an enrollment of 389 students.

FIGURE 9 -2



Outlying School Districts

A total of 385 students from Christian County are served by school districts with facilities located in adjacent counties. These districts are noted in Table 9-1.

TABLE 9-1

SCHOOL DISTRICTS OUTSIDE OF CHRISTIAN COUNTY
2008-2009 CHRISTIAN COUNTY ENROLLMENT

School District	No. Students	Location
Ava R-1	0	Douglas County
Bradleyville R-1	7	Taney County
Fordland R-3	14	Webster County
Marionville R-9	2	Lawrence County
Republic R-3	32	Greene County
Rogersville R-8	330	Webster County

TABLE 9-2
SCHOOL CHARACTERISTICS

District Name	Total District Enrollment		Capacity	2008-2009	Tax Levy
BILLINGS R-4				471	\$3.631
Elementary			300	256	
High School			400	215	
CHADWICK R-1				230	\$4.6997
Elementary	135	80%		107	
High School	150	79%		119	
CLEVER R-5				1064	\$3.43
Elementary	500	86%		434	
Upper Elementary	380	41%		159	
Middle School	300	73%		219	
High School	330	76%		252	
NIXA R-2				5798	\$4.31
Early Childhood Learning Center	186	101%		188	
Century Elementary	500	91%		456	
High Pointe Elem.	650	56%		370	
Main St. Elementary	500	83%		419	
Espy Elementary	550	77%		426	
Mathews Elementary	600	86%		521	
Thomas Elementary	450	77%		347	
Inman Elementary	600	93%		561	
S.C.O.R.E	60	83%		50	
Junior High	950	90%		860	
High School	1750	91%		1600	
OZARK R-6				5224	\$4.14
East Elementary	700	67%		471	
North Elementary	700	62%		439	
South Elementary	675	85%		573	
West Elementary	700	88%		621	
Upper Elementary	1100	75%		823	
Junior High	1100	75%		820	
High School	1700	87%		1477	
SPARTA R-3				735	\$3.500
Elementary	400	90%		360	
Middle/High School	425	88%		375	
SPOKANE R-7				754	\$4.2231
Elementary	450	86%		389	
Middle School	245	59%		145	
High School	280	78%		220	

Career Training Opportunities

OTC-Richwood Valley Campus

Ozarks Technical Community College Richwood Valley Campus, an extension of OTC's main campus located in Springfield, Missouri, opened in the spring of 2007. The three-story, 60,000 square foot facility is located on Highway 14 between Ozark and Nixa. The Richwood Valley branch of OTC offers The Life Science Technology Center, which houses a variety of general education classrooms, computer and science labs, and faculty offices.

Student amenities include a full-service student services facility, a learning resources center, an academic achievement center, a student café, as well as a 1.5 mile trail system. A community room is also available to outside organizations who wish to host a meeting at OTC - Richwood Valley.

Fire Protection Districts

Nine fire protection districts serve the Christian County area, *all* of which are tax supported. All of the fire protection districts have mutual aid agreements with surrounding districts, with assistance provided on a request basis.

Billings Fire Protection District

The Billings Fire Protection District serves area of Christian County west of Farm Road 14-7. This district also extends into portions of Stone, Lawrence and Greene Counties. Fire protection equipment is housed at 3 stations and the district operates with 40 volunteer firefighters. Stations are located throughout the district. One station is located in Billings on Washington Street, a second Station is located in Lawrence County on Highway 14 West, and a third is located on Highway 13. A fourth station is planned around the Greene County line. Fire protection equipment includes 17 pieces of equipment:

Station #1

Two 3200 gallon tankers
1500 gallon tanker
Heavy Rescue
Class A pumper
Brush Truck
Two suburbans (medical rescue)

Station #2

Class A pumper
2100 gallon tanker
1400 gallon tanker
Rescue Service Truck
Brush Truck

Station #3

Engine
Utility Truck
Pumper

The District's average response time is five minutes. The district also has mutual aid agreements with Clever, Republic, Crane, Hurley, Marionville, Marionville Rural, North Stone County, and Aurora.

The Billings District is supported by a \$0.3939 property tax levy. In addition to fire protection services, the district also provides first response services and instructors, storm warning, and participate in school programs. Plans to upgrade fire protection services include the addition of a fourth station currently under construction, additional equipment including 2 more engines and an aerial truck.

Brookline Fire Protection District

The Brookline Fire District services a small area of Christian County generally bounded by ZZ Highway on the east, Terrell Creek on the south, and P Highway on the west. The district has two stations; Station #1 is located in Brookline and Station #2 is sited at Farm Roads 97 and 178.

Fire protection services are provided by 26 volunteer firefighters and the district operates on a \$0.2435 property tax levy. Brookline has mutual aid agreements with Clever, West Republic, Willard and Battlefield. Equipment housed at the two stations include:

Station #1

1. 2002 KMA pumper rescue
2. 2,800 gallon tanker
3. 1,800 gallon tanker
4. 1,800 gallon tanker
5. Brush truck
6. 1989 Ford 4x4 rescue truck, fully equipped

Station #2

1. 1986 Smeal 1,000 gpm pumper
2. 2,100 gallon Ford tanker
3. 1,200 gallon Ford tanker
4. Brush truck
5. 1986 rescue truck, fully equipped with medical

The Brookline District maintains an average response time of 7 to 8 minutes depending on location and has a Class 8 fire insurance rating without fire hydrants. The district provides a range of public services, including storm warning and rescue services. Anticipated needs over the coming years include building a new station in Greene County and purchasing a hazmat truck and training four new hazmat technicians. The department also wants to train more first responders.

Chadwick Fire Protection District

The Chadwick Fire Protection District serves a 135 square mile area in the southern and eastern part of the County (same as the Chadwick School District boundaries). In November of 2001, the fire protection district was voted in as a tax supported department. The district has cooperative agreements with Sparta and Forsyth and an unwritten agreement with the Conservation Department and the National Park Service (Mark Twain National Forest area).

The district's fire equipment is housed on Highway 125 in Chadwick and includes 2 pumpers, 2 tankers, 1 rescue unit, and a small brush truck . The district operates on a \$ 0.2982 tax levy. The District's personnel is comprised of 17 volunteer fire firefighters and 15 first responders. All volunteers respond to calls, with the exception of grass fires. Under agreement with the National Park Service, the Chadwick volunteers will respond to a fire in the Mark Twain National Forest if a member's property is in imminent danger.

The district has several needs that are related to the lack of financial resources and the rural nature of the district's service area. One of the most immediate needs identified is to build new station out around the district and purchase more equipment.

Because the district covers a largely rural area, adequate sources of water supply are also a concern. The district either needs increased water carrying capacity or additional water supply sources in the field. The Chadwick District provides other services besides fire protection. The district also provides first responders and storm watchers. A storm-warning siren was donated to the district, but this must be repaired before it can be put into service.

Clever Fire Protection District

The Clever Fire Protection District serves the portion of Christian County located generally between Billings and Nixa. The district also has mutual aid agreements with Billings, Hurley, Nixa, Republic, Highlandville, Battlefield and Brookline.

The District has 3 fire stations, one is located in Clever, Boaz and another is situated in Stone County at Union City. Fire protection services are provided by 35 volunteers. The district operates on a \$0.3784 tax levy. Average response time to a fire is 8 minutes and the district has a fire insurance rating of 7 for rural and 4 for city.

Fire fighting vehicles maintained by the District include four pumper trucks, 5 tanker trucks, two brush trucks, one rescue and one heavy rescue truck.

In addition to fire protection services, the District also provides storm warning and emergency medical services. The District has 18 certified first responders and 5 emergency medical technician to assist on ambulance calls.

Highlandville Fire Protection District

The Highlandville Fire Protection District encompasses a 100 square mile area in the central and southern portions of the County. Fire protection is provided by 30 volunteer firefighters operating out of four stations, one station located south of Highlandville, a second station located in Abesville, third located at Steinert Lane and Highway 160 and a fourth at Saddlebrooke. Main equipment housed at these four facilities includes:

1. Station #1 – pumper, rescue, tanker, brush truck, service truck
2. Station #2 – pumper, tanker, brush truck, rescue vehicle
3. Station #3 – pumper, tanker, brush truck, rescue vehicle
4. Station #4 - (2) engine pumpers, tanker, brush truck, rescue vehicle

In addition to fire protection, the District also provides emergency medical services, first response, and storm warning. Emergency response equipment on hand includes air bags and two sets of jaws.

The District's operations are financed through a \$0.3765 tax levy. There are no user fee charges except in unusual circumstances. Written mutual aid agreements are in effect with Ozark, Nixa Western Taney, Hurley, and Southern Stone. The District maintains a fire insurance rating of 9 with a typical response time of four minutes from the point of notification via pagers to manning the fire trucks.

The District anticipates a fifth station, an additional tanker, engine and brush truck. The Highlandville District has also noted the need for additional water supply sources at appropriate locations throughout the County, such as a dry hydrant system.

Logan-Rogersville Fire Protection District

In addition to portions of Greene and Webster Counties, the Logan-Rogersville Fire Protection District also serves the northeast corner of Christian County along Highway U. The District maintains three stations in Greene County. Station #1, located on Highway 125, is the district's headquarters and houses the District's front line apparatus. Station #2 is located on Blackman Road and responds to all fire and medical emergencies on the west side of the district. The third Station, Station #5 is the maintenance station and is located on Farm Road 174 west of Rogersville. Station #4 and Station #6 are located in Webster County. Station #4 located at Highway AD and Highway KK and Station #6 located in the city hall of Rogersville. Station #3 is located in Christian County off of Highway VV, south of Rogersville. Mutual aid agreements are in effect with surrounding fire districts except Springfield.

The District operates on a \$0.3526 tax levy and is manned by 40 volunteer fire fighters, 22 full time staff. Of the total personnel, there are 17 emergency medical technicians, 5 paramedics and 30 first responders. Fire fighting equipment located at each of the six stations includes:

1. Station #1--one engine, one tanker, one rescue unit, one brush truck, one hazmat trailer
2. Station #2—one engine, one tanker, a truck, one rescue unit
3. Station #3--one engine, one tanker, one brush truck, one light tower unit
4. Station #4--one engine, one tanker, one brush truck, one hazmat trailer
5. Station #5 – Rehab complete with fans, coolers, bottled water, etc, staff truck
6. Station #6 – Staff truck, chief's car, a service vehicle.

All apparatus are equipped with multi channel radios. In addition to fire fighting equipment, the District also has specialized equipment for rescue services including two sets of Jaws, spreaders-cutters, light and heavy air bags, and six defibrillation unit. The district also

provides storm-warning services. The fire insurance ratings within the District range between 4 and 7 depending on location. Average response time is four minutes.

The District hopes to add a new engine to its apparatus in the coming years. The district has noted the need for additional water sources, such as fill wells located throughout its service area.

Nixa Fire Protection District

The Nixa Fire Protection District covers an area of approximately 53 square miles. District boundaries run north the Christian / Greene County line, west along the James River to the fork where the James meets the Finley River, north on the Finley River, east approximately halfway between Nixa and Ozark, then north to the county line.

The District is supported by a property tax assessment which is currently at \$0.6749 per hundred dollars of assessed valuation. All taxes are collected by the Christian and Stone County Assessor's Office.

The full-time staff provides 24 hour coverage. Equipment is located at four stations: Station No. 1 located at 711 N. Main Street and Station No. 2 located at 301 S. Nicholas Road in the city, Station No. 3 located at 1752 W. Tracker Road northwest of the city and Station No. 4 located at 1765 S. Nicholas Road southwest of the city. Administrative offices are located at Station No. 2. Main equipment and staffing includes:

4 – Engines	1 – Fire Chief
1 – Aerial	3 – Assistant Chiefs
2 – Tankers	3 – Battalion Chiefs
2 – Brush Units	6 – Company Officers
1 – Heavy Rescue	18 – Firefighters
4 – Staff Vehicles	1 – Administrative Assistant

1 – Water Rescue	1 – Chaplain
1 – Command Trailer	2 – Inspectors

We respond to all Fire, Rescue and Emergency Medical Services (EMS) calls within the district.

Normal response time in the city is 3-4 minutes. The Nixa Fire Protection District has mutual aid agreements with all surrounding fire departments.

100% of our firefighters are state-certified. Firefighters train on a weekly basis throughout the year and also attend training courses at the state and federal level.

The District is involved in several community projects which include MDA fund drives, annual fireworks display, school visitations for fire prevention, Sucker Day, Halloween activities, school athletic programs, all parades and festivals and other community service.

Ozark Rural Fire Protection District

The Ozark Rural Fire Protection District covers the central portion of Christian County surrounding Ozark, between the Greene County line on the north and close to the Taney County line on the south. The District has written mutual aid agreements with the Highlandville Fire Department and the Logan-Rogersville Fire Protection District. The District also has oral agreements with all other departments in the county. The Ozark District is supported by a \$0.3888 tax levy.

The District operates with 31 volunteer firefighters and 23 paid staff. Of the total personnel 12 are Emergency Medical Technicians, 2 paramedics, and 25 first responders. The District maintains four stations. Station #1 is located at 604 N. 3rd Street in Ozark, Station #2 is located at

Highway 65 and County Road CC, Station #3 is sited at Highway W at the Christian Center, and station #4 is located at 175 Pippenville Road. Major equipment maintained at the four stations includes:

Station #1—two engines, one squad/heavy rescue, one aerial, one tanker, one brush, three

staff cars, a public education trailer, and a water rescue boat.

Station #2—one engine, one brush truck/rescue truck, 1 tanker

Station #3—one 1,300 gallon tanker

Station #4—two engines, one tanker

Average response time to fire alarms within the District is 2 1/2 to 3 minutes and fire insurance ratings range from 3 to 5, depending on location. The District also provides rescue services and storm warning. At the present time, the District has no major problems or needs to maintain fire protection services. The District will soon be adding a brush truck to Station #3 and currently is attempting to add another ladder to Station #1 that will help to suppress fires in larger structures.

Sparta Fire Protection District

The Sparta Fire Protection District encompasses an area of 150 square miles in the northeastern part of Christian County. The District's equipment is housed at the Community Building in Sparta. The department has 2 pumpers, a tanker truck, a brusher truck, and a mini pumper.

The Fire District is supported by a \$0.2734 cent tax levy. The department has 26 volunteer fire fighters and maintains a 2 minute average response time. The District's fire insurance rating is 7 for within the city and 1,000 feet of its boundaries. The rating is 9 for farther out in the county.

The fire protection district plans on adding a working station in Bruner. The department also intends to upgrade safety with an anticipated FEMA grant.

Fire Protection Needs Summary

As noted in the preceding discussion several of the fire protection districts in Christian County are in need of additional revenues to finance training and equipment needs, including field communications equipment. All districts are now tax based, this is an improvement from 15 years ago when half the fire protection districts were supported by membership funding. The County and the rural fire districts should jointly work to develop and secure funding to establish fill wells and/or ponds at needed locations throughout the rural areas of the County.

Law Enforcement

Law enforcement in Christian County is provided by the police departments in the County's various cities and by the Christian County Sheriff's Department. The cities of Billings, Nixa and Ozark have 24-hour coverage, while the cities of Clever and Sparta have less than 24-hour coverage. All of the agencies in the county are able to gain assistance from the County's Sheriff's Department.

The Sheriff's Department is housed in the Christian County Justice Center in Ozark. The department has 78 fulltime personnel including the Sheriff, a Chief Deputy, six secretaries, a jail administrator, 30 jailers, five cooks, five investigators, one evidence officer, 26 patrol deputies, and two civil process deputies. In addition, the Department has 13 reserve patrolmen. Major equipment on hand for law enforcement includes vehicles, bullet proof vest, portable radios and cell phones with GPS (Global Positioning Systems).

Law enforcement personnel receive handgun and shotgun training to meet qualification requirements, training is also obtain in areas of communications, domestic violence, crisis intervention and many other areas in order to maintain their certifications. Criminal investigation and law enforcement needs continue to increase significantly in Christian County. Calls for service

(Table 9-3) have increased for some crimes in the County, but there has been also been a decrease in other areas of crime in the County. This decrease can be attributed in part to increased law enforcement and training, neighborhood watch programs, victims advocate programs, and other agencies being able to increase the amount of time and effort they spend working crimes.

TABLE 9-3
CALLS FOR SERVICE, 2006 - 2008

Crime	2006 No.	2007 No.	2008 No.
Burglary	150	139	172
Stealing	290	279	307
Property Damage	111	109	123
Assault	100	67	92
Domestic Violence	166	196	169

Source: Christian County Sheriff's Department, March 2009

In March 2002, the Christian County Sheriff's Department moved into the new Judicial Facility on the Ozark square across from the County Courthouse. The former jail held a maximum of 14 inmates. The new jail has a capacity 96 inmates. This increases our needs for manpower. Current needs identified by the department include a substantial increase in manpower. Also, in order to compete with other agencies, salary increases are needed. These current needs will become more critical as the County's population continues to grow over the next decade. The department's operations are currently funded through two 1/2-cent sales in which the County keeps 40% for the use in County revenue; the remainder is divided with the cities and the special road districts. A percentage of this sales tax contributes to the financing of the new Judicial Building. Once the building is paid off, the sales tax will revert to 3/8-cent where 1/4-cent is for law enforcement and 1/8-cent is for the maintenance and upkeep of the Judicial Building. Unfortunately, when this occurs, the drop in the amount of income will not be sufficient to sustain the maintenance of the building, along with the day to day departmental operations.

Christian County Emergency Management

The Christian County Emergency Management Agency is charged with preparing for disasters. This duty includes advising the County Commission on mitigation measures and implementing those measures deemed appropriate by the commission. In general, the county's policies encourage cooperation between Christian County agencies as well as cooperating county agencies and those of neighboring jurisdictions.

The mission of this office is coordination, resource management, preparedness, recovery, damage assessment, and volunteer management.

The Emergency Management Office is very involved in developing a Citizen Corps Program made up of several sub groups:

- CERT (Community Emergency Response Team)
- VIPS (Volunteers in Police Service)

And two new programs

- Fire Corps
- Neighborhood Watch

These programs are designed to be a supplemental source of assistance in times of special need or for special events.

911 Emergency Communications

In November of 1991 voters approved a countywide 911 emergency communications system, which is funded through a surcharge added to landline telephone bills. This charge went into effect in the Spring of 1992, and the 911 system came on-line in April of 1994. This service is supported through a 15% customer surcharge on telephone services provided by Southwestern Bell, Centurytel (formerly Verizon) and its subsidiaries. The 911 department is staffed with: a 911 Coordinator, a Director of Communications, and 13 full time telecommunicators. 3 employees of the dispatch staff hold the position of Shift Supervisor, while 2 of the 13 employees serve as Training Officers.

The County 911 Center provides full time dispatch services for 5 Law Enforcement agencies, including the county Sheriffs Department. The Center also provides part time and/or situational

dispatch services for the City of Ozark Police Department. Also, on a full time basis the 911 Center dispatches 6 county Fire Departments. The City of Nixa dispatches law enforcement calls within the city limits, and the Nixa Fire District. However, the 911 area for the city of Nixa is set by the Fire District boundaries. Any law enforcement call that is outside the city limits of Nixa, but within the fire district boundaries, is received by the City of Nixa, then transferred to the County 911 Center for service.

The County 911 Center also maintains all Missouri Uniform Law Enforcement System files, inquiries, and entries. This includes warrant entries for all the county courts, and 4 municipal courts, as well as all lost and/or stolen property reported to the Sheriffs Office, or the 4 municipal departments. All employees must attend and pass the required 40 hour state certification, instructed by the Missouri State Highway Patrol to access and operate the system. The Highway Patrol requires an eight hour recertification class every 3 years there after. Employees must also obtain the required 40 hour certification through the Association of Public-Safety Communications Officials, and maintain 24 hours of continuing education hours/credits every 3 years there after.

Ambulance/Rescue Services

Ambulance services in Christian County are provided by Cox Ambulance Services. Services are provided to two separate districts in the County, one, which is tax supported and the second which is supported by user fees. The tax-supported district includes most of the County, with the exception of western panhandle area (Billings and Clever area). This ambulance district is supported through two separate sources: (1) a property tax levy of \$0.137 per \$100 assessed valuation and (2) user fees of \$653.00 for basic emergency services and \$549.00 for transfer/non-emergency services.

The eastern district has three operating stations located in Nixa, Ozark and Sparta. A Total of 32 fulltime and 20 part-time personnel help staff these stations. The average response time from each station is five minutes. A standing mutual aid agreement is available from the surrounding communities.

Cox Paramedics-Republic serves the user-fee ambulance district in the Billings and Clever area. Ambulances are dispatched from the station in the City of Republic. This service has 20 fulltime staff and 6 part-time personnel. In addition to the user-fees, a special membership program for emergency services is provided on a subscription basis. For a \$36 annual fee, the district will accept insurance and Medicare payments as payment in full for emergency services.

Air ambulance services for Christian County are available through Cox Air Care and St. John's Lifeline-Air Ambulance. Both air ambulances serve all of Christian County.

Library Services

Residents' informational and recreational needs are served by the Christian County Library District. Founded April 1949 at the minimum ten cent levy, Christian County Library has had a single levy increase in sixty years. In 1972, voters approved supporting library services at twenty cents per hundred dollars. Reduced by reassessment and Hancock, the 2009 collectable levy of \$.087 is a third of Missouri's average twenty-five cent support. Income is inadequate to build, equip, stock, staff or operate adequate facilities. Thus, funding, facilities, collection, programming and collections are well below state and national public library averages.

In 2008, Christian County Library issued new library cards to 3,886 individuals. Attendance at library headquarters was 102,430 and 6,252 visited the Clever Public Library. The library's internet connection was used by 20,296 people within the building, not counting wireless users for the first half of the year, catalog searches or use of the laptop computers in library classes or

scheduled open labs. The library's chief website was used 178,898 times. Materials checked out were 196,201. Not counting the e-books or other virtual sources, 5,408 new books and audio and video materials were added to the collection. In 2008, 466 children registered for the summer reading program.

Christian County Library operates sixty-three hours per week. Services are provided to Clever Public Library twenty hours a week. The library van makes deliveries three half days a week during the school year and less during the summer. Over 73,000 books and audio and video materials are available for public use. Most of the library's thirty-one subscription databases are remotely accessible. Total active card holders are 21,231.

In Missouri, county library districts are governed by a five member Board of Trustees, each appointed for four year terms by the County Commission. The terms are staggered, with one trustee's term expiring for three years out of four and two terms expiring in the fourth year. Insofar as possible, trustees are of different ages, occupations, genders, strengths, interests, backgrounds and residences throughout the county. Outgoing members are replaced with someone from the same general part of the county. Trustees represent the public to the library and the library to the public. At regular meetings, trustees set policy, adopt budgets, keep aware of library progress and hire a library director who is in charge of library operations.

Friends of the Christian County Library's spring and fall book sales and other fundraising efforts pay for library participation in business expos, prizes for summer reading programs, flowers for the picnic area, and many other equipment, materials and services not covered by the library budget.

The library headquarters in Ozark was built in 1972 when County population was a fifth of the 2009 population. An addition was constructed in 1984. Most county libraries serving over

70,000 have branch locations. Typically, branches are within ten miles of all residents. Christian County's single ten thousand square foot building is a bit northwest of the center of the county, leaving some southeast county residents over thirty miles and many residents in south and west Christian County citizens at or near twenty miles from the library. To update services to all residents; to serve residents living far from the library; and to help compensate for budget-restricted facilities, collection and services, the library offers remotely-accessible databases, community pick-up and drop-off sites and a regular van delivery schedule. Still the shortfalls result in many statistics, when computed on the per capita level, being well below average. A standard comparison tool, Hennen's American Public Library Ratings often called HAPLR, uses weighted per capita criteria such as building and collection size, attendance and circulation, income and programming attendance from public libraries' annual statistical reports to compare what each library offers and how citizens use the services. Christian County Library's 2008 HAPLR score, based on the 2007 report on 2006 statistics was 322 of a possible 1,000. The average score of Missouri public libraries is 462. HAPLR places the library at the national percentile of twenty-one percent. Overall, of 550 American public library districts serving between 50,000 and 100,000, the size of Christian County's income, facilities, collection and staffing place it at 423rd.

The Christian County Library District operates primarily on a \$0.087 per \$100 assessed valuation real and personal property tax levy. In 2008, property tax and in the interest on it made 93% of all library income. The balance of library income derived 5% from state aid and athletes and entertainers' tax, 0.7% cost recovery from late materials returns, printouts, and photocopies; and 1.3% from gifts and replacement of lost or destroyed materials. These percentages do not include one-time income from major grants.

In addition to operating the Christian County Library, the district in September of 2007 began an annual contract to provide collection, staff, library automation, internet, and materials delivery to the newly-founded Clever Public Library. It is housed in the office of a former fire station. The City of Clever, through a \$180,000 bequest restricted for library services, and fundraising efforts of Friends of the Clever Public Library provide the building, supplies, furnishings, equipment and utilities. If adequate funding becomes available, a branch library will replace the current arrangement. Library users may also request materials to be delivered for them to pick up at J & M Foods in Sparta or the Nixa Community Center during their regular hours. Library users may return borrowed items at bookdrops in all four locations.

The library has available for up to one hour per day per person use ten public-use internet computers, one of them restricted to use by children. In addition, two adult and one children's area computers are library catalogs and a computer is a sign-up and notification station for computer use waiting lines. Internet access is provided on a T-1 line through the Remote Electronic Access to Libraries, REAL, Project of the State of Missouri and Missouri Research Network, MoreNET. The library recently became eligible for T-5 access, possibly later in 2009. In compliance with the Children's Internet Protection Act, internet access arrives pre-filtered. Wireless users are authenticated via an individual access code supplied before log-in.

The Christian County Library uses Innovative Interfaces Inc. (III) library automation system to catalog, locate and track library materials and maintain the records of users and material via barcodes. Resources and personnel for maintaining the system are pooled in the eight-county Consortium of Ozarks Libraries (COOL). Library patrons have access to materials belonging to other library districts through requests staff submit on their behalf to the Missouri Library Network

Corporation (MLNC), the OCLC cooperative, and First Search, a single search method of looking at the catalogs of hundreds of libraries simultaneously.

Three library websites serve users at any computer with internet access. The catalog at coolcat.org allows searches, requests, renewals and checking on personal materials loan records. The transcribed records website at www.rootsweb.com/~moccl provides guidance and information for researching families and history in Christian County. The library home page at christiancounty.lib.mo.us is a frequently updated, customized collection of information about the library and its services and the most useful and reliable websites in the categories of Reference, Christian County, Missouri, the United States, the World, Family and Home, History and Genealogy, Work and Play.

Particularly useful and convenient are the databases, some provided statewide and paid with state funds, others carefully chosen and subscribed to by the district for the use of Christian County residents. Databases of searchable and full-text newspapers and magazines; hundreds of the best reference books; business contacts and information; auto repair; small engine maintenance; hobby and craft information; legal forms; homework help; genealogy; history; literature; educational and vocational practice tests; reader's advisory; over eight thousand electronic books; science and biography are available for use at any internet connection, usually with the library card number. Companies do not offer remote access to a couple of popular subscription databases, Ancestry and the Kansas City Star, for remote access. These must be used in the library at library computers or on personal laptop computers. Access to all is through <http://christiancounty.lib.mo.us/databases.html>.

Meeting citizens' current and anticipated future library needs will require funding levels nearer those of library districts which better meet those needs. Since 2002, the district has

conducted surveys, focus groups, panel discussions and related means to determine citizen priorities and ways of providing the modern and adequate services available in other better supported districts. Convenient library locations, hours and access for residents throughout the County; a drive-through pick-up service; a diversified collection, in the full range of current formats from print, audio, and video to on-line, to match the increasingly diverse interests of the county's growing population; space for collections, programming, equipment and library users; remote 24-7 on-line access to many of the library sources; and staffing to facilitate full library services are among citizen-identified needs.

As a basis for a decision on a ballot issue, citizens ask most often "Where will it be?" and "What will it look like?" Combined with the disappearance of suitable land and the increasing price of remaining land, the board decided to answer these questions before approaching the voters with a proposal to provide twenty-first century library services to Christian County. In 2008, the district hired a real-estate attorney, Thom Field of Neale & Newman, to identify, negotiate and obtain sites for three library locations using criteria determined from the studies. Proposed are a headquarters building between Nixa and Ozark of approximately 35,000 to 37,000 square feet to serve the over 40,000 residents within or near those cities; and two branches of about 5,000 square feet each, centered in the east and west parts of Christian County at Sparta and Clever to serve the remainder of the County. A list of ideas and requests from previous citizen input and consultant studies will be refined and finalized at public hearings prior to completing library designs. The estimated cost for the three libraries is about eleven million dollars. The district hired Sapp Design Associates, Architects, to coordinate engineering and surveying services to determine site suitability and to design and coordinate construction of library facilities. Carson Elliff of Yates, Mauck, Bohrer, Elliff & Fels was named Bond Attorney and Julie Portman with Edward Jones,

Underwriter. As soon as all sites are determined to be suitable for building sites and under contract, the Library Board of Trustees will set an election date at which voters may decide whether to support convenient, adequate, modern library services for Christian County. The date is expected to be soon after July 2009. Should citizens approve funding, we anticipate plans to be completed, contractors hired and construction begun on all facilities within months. Barring unforeseen delays, all three locations should be open and operating within three years of the election. In addition to the property tax, every effort will be made to raise private funds, cooperate with others, and seek grants to enhance the basics provided by the levy, provide for features not payable with public funds, hasten the time when income can be spent for ongoing and future library services, and to address evolving future expectations and demands.

Table 9-4

COMPARISON OF PUBLIC LIBRARY STATISTICS 2006 – REPORTED 2007

CATAGORIES	US average	MO average	Christian County
Tax Rate (per \$100)	various support methods	\$0.25	\$ 0.0872
Per capita Spending	23.51	26.27	9.55
Volumes per capita	2.37*	5.96	1.21
Library visits per capita	3.98	4.91	1.64
Circulation per capita	5.54	7.15	2.57

Sources: haplr-index.com 2008; CCL statistics; Missouri State Library, Institute for Museum and Library Services; National Center for Educational Statistics.

All per capita statistics are based on 2000 census figures, so CCL actual will be lower than stated, due to population growth. *US average volumes per capita from HAPLR is print only. Missouri and Christian County also includes audio, video and e-book counts.

Parks and Recreation

While Christian County has considerable acreage available for recreation opportunities, there are no parks or recreation facilities that are owned or operated by the County government. The vast majority of lands available for public recreation are contained in the Mark Twain National Forest. Approximately 51,312 acres of national forest are located in Christian County; the Ava/Cassville District Rangers office locally administers this area.

The Mark Twain National Forest in Christian County contains two developed recreation areas--Cobb Ridge and Camp Ridge. Cobb Ridge provides group camping facilities, individual camping units and trailer space. Camp Ridge facilities include camping units, picnic areas and trailer spaces.

One of the more notable recreation opportunities in the Mark Twain Forest is the Glade Top Trail, a 23-mile panoramic trail that winds along narrow ridge tops and valleys in the southern part of the County. Also, 6000 acres of the national forest are available for use by all terrain vehicles. The ATV use areas are administered by a partnership between the Forest Service and the Ozark Enduro Riders, Inc., a Springfield area motorcycle club. This club helps to maintain the ATV trails in the Chadwick Motorcycle Use Area. Other recreation opportunities in the national forest include fishing, hunting and horse and hiking trails.

The National Park Service administers the Wilson's Creek National Battlefield, a portion of which is located in the northwestern panhandle of Christian County. This historic site provides education opportunities for visitors about the history and lifestyle before during and after the battle which took place in 1861. The site also offers walking, hiking, equestrian and jogging trails.

The Missouri Department of Conservation administers Busiek State Park, located along Highway 65 in the southern part of the County. This site offers opportunities for hunting, hiking,

biking and picnicking. The Department of Conservation administers two public access points on the James River. Shelvin Park is a 20-acre access site located southwest of Nixa on Highway M. The 24-acre Delaware Town Access is located west of Nixa.

As growth continues in Christian County, there will be an increasing need for recreation opportunities in the unincorporated portions of the County. It is suggested that planning for future parks, open space and recreation needs should be incorporated in the continuing planning process for Christian County. The County should also encourage developers to provide usable recreation and open space areas in residential developments as urbanization continues.

UTILITIES-

Water and sewerage facilities are primary environmental infrastructure components that provide for basic health and safety needs of the people of Christian County. The availability and capacity of these facilities are also key determinants of future growth and development potential. In addition to water and sewer services, this chapter of the Plan also summarizes electric, gas, and solid waste disposal services in Christian County.

Water Supply/Services

The residents and businesses in Christian County derive their water supply from groundwater supplied through municipal water systems, other public water systems and private wells. The County government itself does not provide public water services. Each of the incorporated cities in Christian County has its own municipal water system with the exception of Fremont Hills. Fremont Hills is connected to the Ozark water system. The City of Nixa and the City of Ozark has also extended water service to some developments outside of their city limits.

According to records maintained by the Missouri Department of Natural Resources (DNR) there are approximately 42 active public water systems in Christian County in addition to the municipal systems. These include systems serving subdivisions, apartment complexes and mobile home parks. The communities of Chadwick and Highlandville also have public water districts serving approximately 300 and 1300 persons, respectively. The vast majority of developments in the unincorporated portions of the County derive water from private wells.

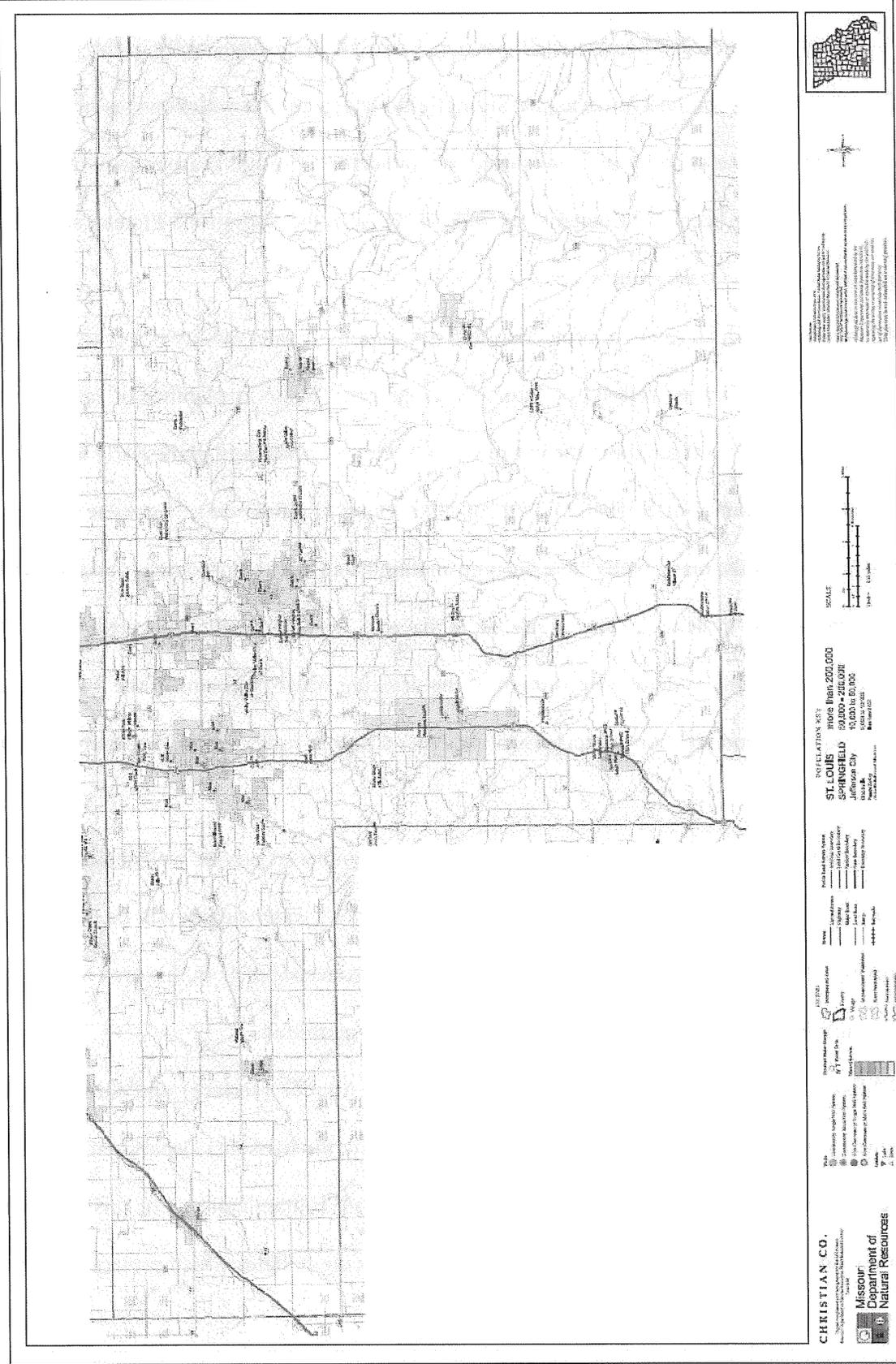
TABLE 10-1
WATER SYSTEMS FOR MUNICIPALITIES AND WATER DISTRICTS

City/ Public Water District (PWD)	Persons Served	Average Daily Consumption	Maximum Daily Consumption	Capacity	Service Connections	Finished Storage	Source of Supply	Permit to Dispense
Billings	1125	.100 MGD	.180 MGD	.475 MGD	1414	.200 MG	3 Wells	1/1/1942
Clever	1010	.100 MGD	.115 MGD	.590 MGD	755	.050 MG	2 Wells	1/1/1948
Nixa	12000	1.0 MGD	2.0 MGD	2.3470 MGD	7346	.715 MG	7 Wells	1/1/1942
Ozark	25945	1.0 MGD	1.50 MGD	6.60 MGD	7328	.725 MG	9 Wells	1/1/1929
Sparta	800	.110 MGD	.163 MGD	.6040 MGD	853	.100 MG	2 Wells	1/1/1960
PWD #1 Chadwick	280	.02 MGD	.027 MGD	.194 MGD	128	.010 MG	1 Well	1/1/1964
PWD # 2 Highlandvill e	1280	.058 MGD	.078 MGD	.50 MGD	542	.065 MG	3 Wells	1/1/1972
Saddlebrook e	25				12		1 Well	11/20/2003
Spokane	85	N/A	N/A	N/A	49	.015 MG	1 Well	12/29/94

Source: Department of Natural Resources, Water System Details, 2009.

FIGURE 10 - 1

Missouri DNR Well Locations



As discussed in the Physical Characteristics Section, many of the private wells in the County are tapped into the shallow aquifer known as the Springfield Plateau aquifer which ranges in depth of 0 - 450 feet which is prone to pollution from surface contaminants. For this reason many of the wells drilled since 1987 have been constructed to exclude water from the Springfield Plateau aquifer and dug deeper down to the Ozark aquifer.

Maintenance, which refers to protection and restoration of water quality is a critical concern for the current population as well as for future development. While availability of safe drinking water is a general concern throughout the entire County, the issue has been particularly acute in the unincorporated community of Spokane (south of Nixa along Highway 65). Spokane derives its water from private wells; many wells have become contaminated due to improperly designed and/or failing on-site septic systems. The area's soils have a fragipan, which severely limits the functioning of septic tank systems. Resolution of the drinking water problems in the Spokane area will likely require a combination of actions to establish a public water system and public sewage disposal system.

A second concern noted by County residents is the number of private wells being drilled in the in many areas of the County. There is concern that the area's water supply will be depleted due to the sinking of too many wells. Maintenance of adequate water supplies in this area may require controls on minimum lot size to regulate the number of wells permitted.

Christian County is home to both the Springfield Aquifer (surface) and Ozark Aquifer (1st confined water source). These two areas are classified by the Missouri Department of Natural Resources as having the highest level of potential for possible contamination. For this reason it is imperative that the County be vigilant in adopting and enforcing policies which protect this natural resource.

Sewage

As with the water systems in Christian County, there is no one public sanitary sewer system serving the entire County. Outside of the individual municipal sanitary sewer systems and a few public systems serving mobile home parks and subdivisions, most residents in the County rely on septic tank disposal systems. Until recently the only governance of on-site sewage disposal systems has come under the jurisdiction of the Missouri DNR, which regulates commercial systems and residential developments with more than 14 lots.

As noted in the preceding paragraphs, there has been growing concern in Christian County for the safe disposal of sewage and protection of the area's groundwater supply. In order to address these concerns, Christian County adopted regulations in April 1992 that govern residential, on-site sewage disposal systems. These regulations apply to all new individual systems as well as rehabilitation/replacement of existing failing systems. Funded by user fees, the regulations are administered by the Christian County Health Department. In 2001 the Christian County Commission adopted an amendment to the county UDC prohibiting central wastewater systems within the unincorporated areas of the county. The critical key to the ongoing success of this program will be public education on the benefits of proper sewage disposal and cooperation between public regulatory agencies, advisory boards and the development community to achieve implementation.

Electric Services

Electric services in Christian County are provided by a number of rural electric cooperatives and municipally owned systems. The City of Nixa operates its own electric utility. In May of 1992 Nixa entered into agreement with Springfield City Utilities for the purchase of power that will replace power from other contract sources. This is an agreement that was re-approved in August of

2002. Other utility companies serving Christian County include the Webster Electric Cooperative, White River Valley Cooperative, Empire Electric, Ozark Electric Cooperative, KAMO Electric Cooperative and N.W. Electric Power Cooperative. The electric cooperatives serving the County are not restricted to individual geographic service areas and many companies provide service within the same area.

Natural Gas Services

In 1994 Missouri Gas Energy purchased KPL Gas Service, the only natural gas provider in Christian County. The total number of customers (meters) including both residential and commercial in Christian County is 15,046 and can be broken down as follows:

Nixa---8285

Ozark ---5570

Clever---756

Billings---435

Based on the age of the distribution systems in these towns and the leakage and cathodic protection records the rating would be "good".

MGE has three main feeder lines located in Christian County.

- I. A 3" high pressure line running from Billings to Clever approximately 5 miles long installed in 1968. (MAOP 90 PSI)
2. A 6"high pressure line running from Weaver Road to Nixa and Ozark installed in 1961, (MAOP 275 PSI)
3. An 8" high pressure line running from a Southern Star Pipeline tap south of James River Power Plant in Springfield to a point between Ozark and Nixa installed in 2006. (MAOP 500 PSI)

Solid Waste Disposal

There are no solid waste disposal sites in Christian County and the County itself provides no services or programs for solid waste disposal. Private trash haulers provide disposal services, with wastes taken to landfills in surrounding counties.

Throughout the rural areas of the County, disposal of solid wastes is becoming a serious concern due to increased dumping along rural County roads, illegal trash dumps on private property and trash dumping in sinkholes. Residents in rural areas of the County have also reported difficulties in securing the services of trash haulers due to travel distances, compounding the problems of on-site trash dumping.

The State of Missouri's solid waste disposal law places stringent limitations on wastes that can now be taken to the area's landfills. These restrictions, along with significantly higher landfill tipping fees, are contributing to the illegal roadside dumping problem throughout the County.

State law (RSMo Section 260.305) also requires Missouri's counties to develop plans for solid waste disposal and reduction of the waste stream. In May 1992 the Missouri DNR approved the formation of Solid Waste Management District "O", which includes Christian, Greene, Webster, Polk and Dallas Counties. The district is charged with creating a regional disposal plan and maintaining the provisions.

A countywide recycling program for Christian County was established in 1997. The main location of the recycling center is at 1300 West Hall Street in Ozark. The gates are open Tuesday through Saturday with bins available daily. Mobile recycling bins are also placed in the other participating municipalities throughout the county. A recycling schedule with drop-off dates and locations is published weekly in the local newspaper. Accepted materials include: paper,

cardboard, tin cans, aluminum cans, plastic beverage bottles, glass jars and bottles, and window glass. In addition, a compost site is available at the main location for grass clippings.

TRANSPORTATION

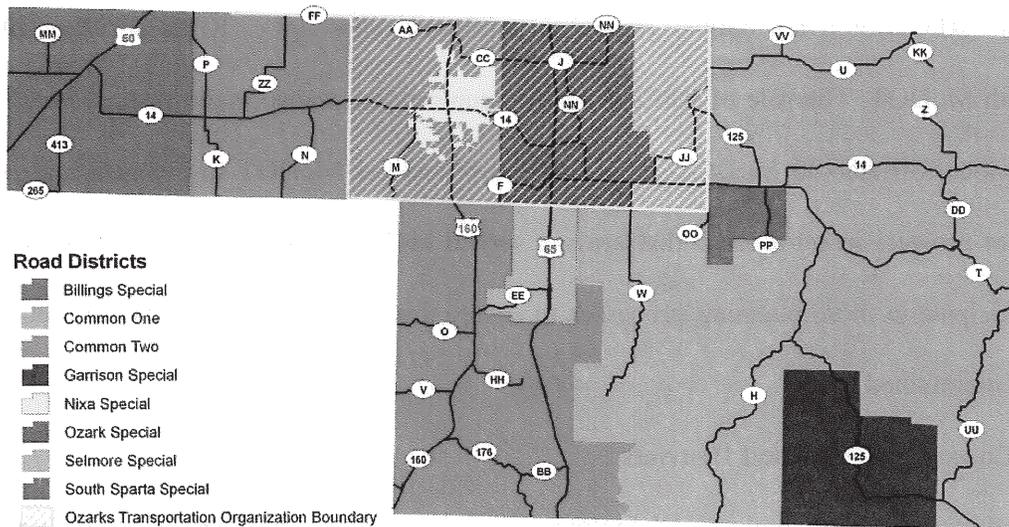
Roads and Highways-Responsible Entities and Planning Agencies

The public roads and highways in Christian County are the responsibility of numerous different public entities and differing levels of government, including city, county, state and special road district entities.

Missouri Department of Transportation (MoDOT)

MoDOT is responsible for the maintenance of state routes and segments of the federal highway system in Christian County. Federal highway system routes include U.S. 65, U.S. 60 and U.S. 160. State routes include all other lettered and numbered routes in the county. (see Figure 11-1)

FIGURE 11 - 1
MoDOT Roads, Ozarks Transportation Organization, and Christian County Road Districts



Ozarks Transportation Organization (OTO)

OTO is the federally designated Metropolitan Planning Organization (MPO) that serves as a forum for cooperative transportation decision-making by state and local governments, and regional transportation and planning agencies. MPOs are charged with maintaining, conducting a “continuing, cooperative, and comprehensive” regional transportation planning, and project programming process. Federal funding for transportation projects and programs are channeled through this planning process. OTO’s planning area encompasses the Springfield metro region and extends into Christian County as shown in Figure 11-1 above.

The Southwest Missouri Council of Governments (SMCOG)

Christian County is a part of SMOG, which is the state authorized Regional Planning Commission (RPC) for a ten county region in southwest Missouri. RPCs serve as planning partners with MoDOT. The role of RPCs is to communicate the transportation needs identified by county and local officials to MoDOT. This framework enables MoDOT to evaluate and program improvement projects in rural areas that are not served by MPOs. It is imperative that Christian County participate in these planning processes to ensure that transportation needs are met in terms of MoDOT maintained roads.

Christian County Special Road Districts

In addition to state maintained highways and roads, the Christian County Commission maintains county roads within two districts--Common 1 and Common 2. Six special road districts also separately maintain numerous roads throughout the County. These special road districts include Billings, Garrison, Nixa, Ozark, Selmore, and South Sparta. This multiplicity of entities responsible for road planning and maintenance poses difficulties for assuring countywide planning of an interrelated road system, such as; application of uniform minimum road standards and equitable levels of road maintenance throughout the County.

The County road districts and the special road districts are funded through a combination of road tax levies, sales tax revenues and county road and bridge gasoline tax revenues. The Billings, Nixa, Ozark, Selmore, and South Sparta Special Road Districts have their own road tax levies as established by the voters in the respective districts. Sales tax and gasoline tax revenues finance Common 1 and 2 along with Garrison districts.

EXISTING CONDITIONS AND NEEDS SUMMARY

The preceding sections of this document have detailed current conditions and needs in Christian County, determined through the processes of several public information forums as well as primary and secondary data collection and analysis. An understanding of the man-made and natural environment is essential to the development of goals and objectives for the future of Christian County and the formulation of action strategies, policies and priorities for achieving the goals and quality of life desired by the residents of Christian County.

The following summary notes the primary conditions, needs and issues affecting future development and growth in Christian County:

Demography and Population Growth

1. Christian County has grown over the past two decades at extremely rapid rates of growth, with in-migration of population being the primary component of population change. Continued in-migration is expected at similar growth rates over the coming decade.
2. Youth and younger, working-aged persons dominate the County's population. The immediate implications of the population structure are the needs for expanded public education facilities, family housing and related community/public services, such as parks and recreation opportunities and day care.
3. While currently the median age in Christian County is comparatively low, over the next twenty years, the baby boom population within the region will enter retirement years. The focus on community services will shift to meeting the needs of an aging population, such as health care and alternative housing types.
4. During this rapid growth period, population increases have outpaced the creation of new jobs in the within the county. This has led to the development of a bedroom community which feeds the economies of adjoining counties while at the same time hampering the ability of Christian County to provide for its citizens.

Physical Characteristics

1. Christian County has a varied natural environment, ranging from relatively flat lowland areas to rugged hills and valleys. The County is characterized by karst topography. The geologic features of karst, such as sinkholes, lineaments, caves and losing streams, place limitations on development due to the potential for surface contaminants to enter the groundwater supply.
2. Maintenance of groundwater quality is a critical environmental concern as development proceeds in the County. This concern is reflected in the need for the appropriate disposal of sewage, solid waste materials and stormwater runoff.

Land Use

1. Christian County is undergoing rapid urbanization. Over the last few years the County has with the focus of growth occurring in the northern portion of the County and along the Highway 65 and Highway 160 corridors. These growth corridor areas are expected to continue to be the focus of future development over the next decade.
2. Although experiencing rapid urban development, agriculture continues to be the primary land use in the County. The greatest levels of urbanization are occurring in many of the prime farmland soils areas. As urban development encroaches on agricultural operations, particularly the animal husbandry industry, there is significant potential for problems arising from incompatible land use activities.
3. Outside of the incorporated cities, very low-density residential development is the norm throughout the County. Single family residential, mobile homes and mobile home parks are the dominant residential structure types in the County.

Public Facilities/Services

1. Maintaining an adequate level of public facilities and services for a rapidly growing population will be a primary concern over the next decade.
2. Although several school districts have new or expanded facility projects underway, there is a need for facility development in some districts to keep up with current and anticipated school enrollment levels.
3. County law enforcement needs have increased, including manpower, equipment and training, due to the growing population and rising criminal activity.
4. Many of the area's fire protection districts are in need of additional revenues for upgrading equipment and training. There is also a need to fill wells, particularly in the more rural parts of the County, and improved field communications.

5. Federal and State agencies maintain several recreation and cultural facilities in Christian County, including the Mark Twain National Forest, Busiek State Park and Wilson's Creek National Battlefield. There are, however, no park and recreation facilities operated by the County. As the population continues to grow and urban densities increase, there will be a need for parks and recreation facility development.

Utilities

1. Christian County derives its water from the ground. Outside of municipal water systems and public water systems serving scattered subdivisions and mobile home parks, most residents use private wells. Many wells throughout the County have been contaminated by effluent from improperly designed/installed septic tank systems. Maintaining groundwater quality is a priority concern.
2. The cities in Christian County and a few private developments have their own sewage disposal systems. Most development in rural areas utilize on-site sewage disposal. Implementation of the County's recently adopted on-site sewage disposal regulations is an essential priority.
3. As residential areas are divided up into more and more parcels it is important for the County to adopt policies which will allow the implementation of central wastewater systems. This will allow the clustering of homes and preservation of open space. It is also imperative that policies are in place to safeguard proper maintenance.

Transportation

1. Increasing population growth and urbanization is placing strains on the many of the primary roads in the County, such as Highway 14, Highway CC and Highway EE. There is the need to establish upgraded standards for securing sufficient right-of-way for road improvements as development proceeds.
2. Road maintenance responsibility is shared by the State, the County and several special road districts. There is a need to establish uniform standards for surface materials and right-of-way for the County level road system.

GOALS AND OBJECTIVES

General Development Philosophy

One of the most pressing challenges for Christian County is how to maintain a quality of life desired by its residents in the face of rapid urbanization. Historically a rural-based, agricultural community, Christian County continues to attract residents desiring to live in a more rural environment while others desire more and more of the amenities found in urbanized areas. This rapid growth has brought change to the physical and cultural landscape of Christian County.

More people means greater and often conflicting demands on the County's resources. Christian County's resources are finite, whether they are natural resources such as land, water and forests, or man-made resources, such as roads, schools and money. What actions will best serve the public good is a central question in the formulation of strategies to guide future growth and resource allocation in Christian County. The general development philosophy of the Christian County Comprehensive Plan, which sets the framework for strategies and programs to implement the County's goals, is to provide for future development that is compatible with and preserves the best qualities of rural life and to maintain the integrity of the County's physical resource base. In looking toward future development we must also look at development which has already occurred and consider how new growth opportunities will best utilize existing infrastructure.

The allocation of resources and implementation of programs and projects should ultimately be based on the desires and expressed needs of the population. Desires and needs are translated into goals and objectives which set the framework for actions to be undertaken in the guidance of future development in the County. Goals are general statements of desired intent to be achieved. Objectives further define aspects of the larger general goal, and then policies are shorter-range actions to be undertaken to achieve the community's desired goals.

The goals and objectives for Christian County are based on evaluation of existing conditions and desires of the population expressed through the public information meetings process.

Overall Land Use Goal

Foster a safe, convenient, attractive, compatible and fiscally responsible land use pattern that includes a variety of housing, recreational and commercial opportunities while respecting agriculture and unique community assets such as historic sites and environmentally sensitive areas.

Countywide Growth Objectives and Policies

Objective: Ensure that new development is compatible with existing and planned uses of surrounding properties.

Policy: Use the generalized land use categories in **Figure 16 -5** for future land use planning. *The “Typical Land Uses” column lists examples and should not be considered all inclusive.* Residential densities are expressed in dwelling units per gross acre of a project.

Policy: Use the Future Land Use Map in (Appendix A) to guide land use and development decisions. Zoning decisions shall be consistent with the adopted Future Land Use Map and the other policies of this plan. The Future Land Use Map does not affect existing subdivisions or permitted development. While the map may indicate a particular land use type, the County shall consider the adequacy of infrastructure and the character of the area before approving zoning or other development proposals.

Policy: Maintain the Future Land Use Map and map adopted Plan amendments as they occur.

Objective: Require that adequate public facilities and services be available at an acceptable level of service concurrent with development.

Policy: Require development applications within Urban Service Areas (USA’s) to include an analysis of the development’s infrastructure and service demands relative to the available capacity.

Policy: Require development to pay its proportional share of public facilities and services based on the demand created by the development.

Policy: Provide developers with a menu of acceptable options to equitably provide adequate public facilities. Finance options may include: Development Agreements; Neighborhood Improvement Districts; or other legal and appropriate exactions.

Policy: Require developers to provide financial assurances that on-site improvements are constructed and maintained to an acceptable standard. Assurances may be in the form of: an irrevocable letter of credit; an escrow agreement; a surety bond; or a cash deposit.

Objective: Eliminate structural, electrical, mechanical and plumbing hazards and ensure that new housing is built and maintained in a manner that ensures the safety of the occupants.

Policy: Require that all new residential and commercial structures and additions be inspected to meet the standards specified in the applicable IRC, IBC, NEC and IFC codes.

Policy: Require dilapidated residential structures to be rehabilitated, or demolished and properly disposed.

Urban Service Area Objectives

Objective: Establish Urban Service Areas (USAs) around each city to ensure that new development is consistent with the rational growth of communities.

Policy: Require land uses and the intensity of development within USAs to be consistent with the land use plan mutually adopted by the County and applicable City.

Policy: Require urban and suburban development within the USAs to conform to improvement standards mutually agreed to by the applicable City and County.

Policy: For cities without adopted plans, provide the opportunity to comment on development proposals located within their USA.

Policy: In areas that can not be developed to urban standards within 5 years of a development application, allow interim development within the USA that is consistent with the agriculture areas (1 dwelling per 10 acres) to minimize construction, septic tanks and land fragmentation within the USA.

Objective: Coordinate public infrastructure improvement requirements with the cities within their respective USAs.

Policy: Coordinate infrastructure and drainage improvements with the cities and other service providers to ensure efficient use of public funds.

Objective: Facilitate the creation of a diverse housing stock within existing communities that caters to different household needs preferences.

Policy: Ensure that USAs provide sufficient land for projected growth of the cities and that USA land use plans allow a mix of dwelling unit types.

Rural Residential Objectives

Objective: Ensure that growth occurring outside the incorporated areas of the County does not create undue stress on the environment or encroachment on lands historically best suited for agricultural purposes.

Policy: Maintain rural residential densities between 1 dwelling per 3 acres and 1 dwelling per 5+ acres. Lot sizes smaller than 3 acres should be limited to PUDs and developments served by approved centralized or community sewer systems.

Policy: Minimize development within the 100 year floodplain

Policy: Ensure that development meets appropriate setback requirements from sinkholes, karst areas and other environmentally sensitive areas.

Policy: Develop LESA-based suitability criteria to avoid the premature development of rural residential land.

Objective: Ensure that residential uses are compatible with neighboring uses.

Policy: Review all development proposals for conformance with the Future Land Use Plan.

Policy: Require residential development adjacent to agriculture uses to provide vegetative buffers, windbreaks and other means of mitigating potential incompatibilities to avoid interference with existing agricultural operations.

Policy: Limit commercial activity within Rural Residential areas to home occupations, direct marketing of agricultural products and neighborhood scale commercial services at intersections of 2 paved roads.

General Commercial Objectives

Objective: Establish transit oriented commercial districts at interchanges and in transportation corridors to provide retail and service opportunities for regional and long distance motorists.

Policy: Establish general commercial districts that are designed: as nodes in close proximity to interchanges and intersections as well as along major transportation corridors; in scale and intensity appropriate to road and public service capacity; to accommodate uses that primarily serve the traveling public and the surface transportation industry; and with landscaping, signage control, hard surface parking and loading, stormwater retention, architectural and performance standards that result in attractive amenities.

Agricultural Lands Objectives

Objective: Minimize negative impacts on agriculture operations from non-agricultural uses.

Policy: Encourage new non-agriculture uses in the agriculture areas to plant a vegetative buffer between the use and agricultural operations.

Policy: Allow commercial activities that are commonly accessory to and support the viability of agricultural operations in agriculture areas.

Policy: Minimize development within 100-year floodplains.

Economic Goal

Create a local economy that provides varied employment and trade opportunities built upon efficient and equitable use of Christian County's cultural, natural, built and human resources.

Objective: Encourage development of non-farm employment within cities to support their roles as energetic centers of diverse commercial and industrial activity.

Policy: Support labor force enhancement efforts that focus on education and training to attract investment and job creation within our communities.

Policy: Encourage employment opportunities within cities to provide stability and a decent living wage through targeted performance-based incentives.

Policy: Coordinate with cities and economic development interests to explore opportunities for joint development of a business and industrial park.

Policy: Limit commercial zoning in unincorporated areas to facilities that serve the needs of rural residents to regional businesses at highway interchanges.

Objective: Create safe, attractive and functional highway-oriented commercial areas that capitalize on regional transportation access without detracting from the economic vitality of cities.

Policy: Participate in state transportation planning to improve the condition, capacity and safety of MoDOT roads within the County.

Objective: Increase the diversity of employment opportunities that meet the needs and capabilities of Christian County residents.

Policy: Coordinate with local school districts and colleges to encourage businesses and governmental entities to extend internship and apprentice opportunities to local students.

Policy: Support efforts to identify and target recruitment efforts to businesses that are complementary to the existing industrial base.

Policy: Facilitate discussions with cities to locate and develop an industrial park in An appropriate area that will provide opportunities for long-term employment growth.

Physical Environment Goal

Ensure that development decisions minimize degradation of natural resources and promote a clean, safe and aesthetically pleasing environment for all current and future citizens.

Objective: Protect land adjacent to lakes, rivers, streams and wetlands.

Policy: Limit construction within 100-year floodplains to necessary infrastructure development.

Policy: Require vegetative buffers and natural stormwater filtration systems for all non-agricultural development adjacent to water and major drainage ways.

Policy: Encourage the use of vegetative buffers, terracing and other stormwater management techniques that improve the quality of stormwater runoff and limit stream contamination.

Objective: Establish development standards that minimize the impact of human activity on the natural environment.

Policy: Encourage development codes and site planning requirements to integrate reasonable open spaces for conservation, recreation and drainage purposes.

Policy: Encourage the retention of specimen trees during site preparation for construction and other development activities.

Policy: Support recycling, composting and other legitimate solid waste reduction activities.

Objective: Support long-term conservation of land resources.

Policy: Encourage the placement of conservation easements, deed restrictions and other mechanisms that preserve land resources in conformance with the Future Land Use Plan.

Policy: Provide technical support to any person or entity wishing to conserve land resources by providing property data, land use monitoring and educational materials on land conservation tools and practices.

Public Facilities and Services Goal

Ensure that public services, facilities and utilities support community life in a safe, effective and efficient manner, while justly allocating the costs of providing these public goods.

Objective: Ensure adequate water and sewage disposal for all development in Christian County.

Policy: Support and enforce the individual sewage disposal system regulations.

Policy: Provide assistance to the County Health Department in establishing an ongoing public awareness program on the goals and requirements of the sewage disposal regulations.

Policy: Encourage the establishment of special water districts in rural areas of the County impacted by problems of groundwater contamination.

Policy: Regulate the intensity of development to ensure that land absorption capacities for disposal of sewage and maintenance of water table levels for well water production are not exceeded. Establish minimum lot sizes, based on water and sewage capacities, in the land development regulations for the County.

Policy: Support efforts to rehabilitate, replace and/or upgrade failing individual and public sewage systems and water systems.

Policy: Establish a policy providing for centralized wastewater treatment systems that incorporates sufficient bonding or other security measures to protect the County from undue expense yet allows for an alternative means of treating waste water in areas unable to be serviced by municipal infrastructure.

Objective: Encourage cooperation and coordination between area school districts, local and county government and agencies/boards charged with land development responsibilities.

Policy: Promote the sharing of information between planning staffs and school district boards to ensure adequate understanding of respective needs and the diverse criteria utilized in planning to evaluate development potential.

Policy: Support cooperation between school districts, the County and its cities to help maximize the utilization of community facilities.

Policy: Work with local school districts to encourage support for adequate funding levels to maintain a high quality of education for Christian County's residents.

Policy: Encourage the provision of incentives for developers to donate land for future school facilities.

Policy: Coordinate with school districts on siting decisions to ensure that adequate facilities will be available to future schools.

Objective: Promote the development and preservation of recreational and cultural resources in the County.

Policy: Support adequate funding levels to ensure continued quality delivery of educational and leisure resources through the Christian County Library.

Policy: Actively explore options and opportunities for expanded recreational lands and facilities that can be capitalized on and made available to County residents following transition to first class status as a County.

Transportation Goal

Provide and maintain a quality transportation system that emphasizes safety, cost effectiveness and connectivity while remaining consummate to a diverse range of land use patterns.

Objective: Address transportation safety, capacity and adequacy in the development decision-making process.

Policy: Require traffic impact studies as part of the development applications for projects that will significantly impact street system safety and capacity.

Policy: Invite the input of Road Districts when appropriate by providing detailed development project descriptions.

Policy: Incorporate traffic safety considerations as review elements in the land development regulations and development approval process.

Policy: Require adequate, minimum sight distance clearances at intersections of roads and at property access points along roads in the County. This policy should apply to the location of permanent structures, infrastructure, vegetation and storage of agricultural products and equipment.

Policy: Encourage developers to provide sidewalks in residential areas developed at urban densities.

Policy: Require sidewalks along major collectors and arterials in urbanized areas of the County.

Objective: Coordinate with the Road Districts to ensure that road construction and maintenance is consistent with existing and future traffic patterns.

Policy: Coordinate with the Road Districts to conduct a comprehensive road inventory of the County to assemble and maintain data on surfaces, widths, conditions, traffic counts and other relevant data. Based on this inventory and future traffic demand calculated from the Future Land Use Plan, the functionality of each roadway should be determined and appropriate right-of-way and improvement standards established.

Policy: Coordinate with road districts to codify road design standards and work to ensure that new roads are designed and built to meet these standards.

Policy: Require right-of-way dedications through the platting process and ensure that the right-of-way allows for the installation of utilities and drainage facilities.

Policy: Evaluate the equity and effectiveness of the County's current road improvement system.

Objective: Require development to design and construct adequate internal road systems that are integrated with the existing and future roads and consistent with the County's thoroughfare plan.

Policy: Require platted right-of-way to extend to the adjacent property boundaries to enhance access and connectivity between development projects.

Policy: Require that internal local subdivision roads, whether dedicated for public maintenance or other entity approved by the County, be constructed to the adopted minimum road standards.

Policy: Internal subdivision roads may be privately owned and maintained by a Home Owners Association or other entity approved by the County, provided that public services may use the right-of-way.

Objective: Support and encourage increased efforts and resource allocation from the Missouri Highway and Transportation Department to meet the current and projected transportation system needs of the County.

Policy: Support the timely implementation of planned improvements to the County's U.S. Highway system, including widening of Highway 65 to four-lanes into the Branson area and the realignment of Highway 160.

Policy: Establish a timetable and priority list for repair and replacement of bridges in the County. Work with the Missouri Highway and Transportation Department and other appropriate governmental agencies to identify potential funding sources for bridge improvements.

Community Image Goal

Create an environment that nurtures pride within the community and conveys a positive healthy image to residents, visitors and travelers.

Objective: Create and preserve aesthetically pleasing transportation corridors.

Policy: Adopt landscaping standards that require commercial establishments to provide landscaped parking facilities.

Policy: Require screening of outdoor storage materials.

Policy: Establish commercial sign standards to minimize negative aesthetic impacts in commercial areas as permitted by state law.

Policy: Support the incorporation of aesthetically pleasing design elements into State and Federal transportation projects within Christian County.

Objective: Preserve, promote and enhance historic sites, structures and other community assets that define Christian County's heritage.

Policy: Review development proposal impacts on the historic assets of Christian County as part of the decision-making process.

Policy: Coordinate with local and state historic preservation interests to conduct and disseminate an inventory of local historic assets and advise property owners of historic preservation incentives available from the Missouri Department of Natural Resources.

Policy: Incorporate historic site review as a review element of the subdivision and site development regulations.

Policy: Promote the designation of sites identified as having historical or archeological significance on the National Register of Historic Places.

LAND USE DEVELOPMENT PRINCIPLES

Recommended principles for future land use development and related infrastructure are discussed in this section of the Comprehensive Plan. These principles, applied in conjunction with

related development standards and policies found in the County's zoning ordinance and subdivision regulations, serve as actions to be taken to achieve Christian County's goals and objectives for future development.

Residential Development Standards

The primary urban development pattern in Christian County has been very low density, single-family residential use. This residential development density pattern has resulted from not only a lifestyle choice for rural living, but also from lot size needed for on-site sewage disposal systems. Unless plans are instituted to establish a countywide public sewer system(s), sewage disposal requirements mandated by the Missouri Department of Natural Resources will continue to be a primary determinant of residential density patterns in the County. Although there are residential developments in the County with lot sizes less than one acre, minimum subdivision lot sizes are generally in the range of 3-5 acres. For the purposes of the future land use plan recommendations, the following density standards are used:

Very Low Density Residential	1 dwelling unit per 5+ acres
Low Density Residential	1 dwelling unit per 1-4 acres
Moderate Density Residential	Up to 4 dwelling units per acre

Commercial Development Standards

Most commercial development in Christian County is presently clustered along limited access highways and primary and secondary arterials, with the greatest concentration of development in the northern portion of the County. Most such activities are in the category of

freestanding convenience services, small strip shopping centers and highway-oriented commercial uses.

As urbanization proceeds, additional commercial development will be warranted to serve the growing population. Arguably, this type of development has lagged behind demand creating a loss of economic development to adjoining counties. It is recommended that commercial development be encouraged to locate in clustered developments along major roads and that commercial development should be designed to be reasonably compatible with surrounding land uses.

Industrial Development Standards

Industrial activity in Christian County is predominantly located along the County's limited access highways (Highways 160 and 65) and in scattered locations along other primary and secondary arterials. Future industrial development is limited by the lack of public sewer systems with industrial hookup capacities in the unincorporated portions of the County. It is anticipated that most future industrial activity will locate adjacent to existing municipal sewer systems or in areas where infrastructure expansion is anticipated. It is important that appropriate areas for this type of development be identified in the County's future land use map to encourage major employers to locate in Christian County.

Historic Preservation

"Preservation does not mean merely the setting aside of thousands of buildings as museum pieces. It means retaining the culturally valuable structures as useful objects: a home in which human beings live, a building in the service of some commercial or community purpose. Such preservation insures structural integrity, relates the preserved object to the life of the people around it, and not least, it makes preservation a source of positive financial gain rather than another expense."

- Lady Bird Johnson, (1966)

A critical aspect of planning a sustainable community is the protection and preservation of historically significant places. Christian County has an interesting and colorful history that is the foundation of the cultural and social life of the County. Preservation of historic context is critical for future generations and for maintaining the identity of the area. This section of the Comprehensive Plan outlines historic places within the County and suggestions for preservation and possible economic benefits that may accrue from such actions.

Places of national historic significance within Christian County include Wilson's Creek Battlefield, Mark Twain National Forest, and the County Courthouse in Ozark. These places present great opportunities for attracting tourists and preservation agencies should maintain proper management practices. Of course, many other locations have significant meaning to the local people and shape the character of the area. Places such as the Weaver House, the historic Ozark Mill, Riverside Inn as well as the archeological site of Delaware Town, an early reservation settlement of the Delaware Indians, are all existing locations that are firmly embedded in the heritage of the County.

Other lesser known location and events significant to the historic development of Christian County include J.L. Lee Timber and Tie Company, the Battle of Dug Springs, Smallin Cave, Garrison Cave, and Garrison Spring. The Lee Timber and Tie Company was the largest employer in the County during the early 20th century and is an important cornerstone to the economic and cultural history of the area. The Battle of Dug Springs took place on Old Wire Road a few miles southwest of Clever and involved nearly 12,000 soldiers. This was a significant precursor to the Battle of Wilson's Creek and yet very little is known about it. Smallin Cave once served as a shelter for the Osage Indians and later used as a munitions warehouse by the Union Forces during the Civil War. It was first discovered by Henry Schoolcraft in 1818 and originally named Winoca

cave after an Osage Indian word meaning Underground Spirit. Smallin Cave has the world's largest natural cave opening resulting from acidic ground water. Garrison Cave, associated with historic Garrison Spring, is the longest cave system in southwest Missouri. There are also more than 200 other caves in Christian County as well as hundreds of springs and other geological features.

One of the biggest tourism draws to Christian County is Wilson's Creek National Battlefield which was the site of the first Civil War battle west of the Mississippi River. It is an important location that serves as a reminder of patriotism and the historic events of Christian County. As a unit of the National Park Service, Wilson's Creek is managed and planned to preserve historical buildings and mitigate environmental impacts from human consumption. It is because of the work of the National Park Service and recognition of the need to preserve the past that the battlefield still exists today and serves as a major part of Christian County heritage and revenue. The County should follow this model of preservation in regards to other natural and historic locations. The establishment of historic district ordinances would accomplish this goal and be in conformance with overall goal of creating a more traditional zoning practice.

Building Restoration

Protecting historic locations typically involves saving and refurbishing old buildings which can occur in several different ways. Preservation is considered the maintenance of a property without any additions or other alterations to the site. This technique is most suitable for existing

structures that are in good condition. Some historic buildings may be dilapidated and in need of restoration, returning the structure to its original condition.

Rehabilitation occurs when a building can no longer return to its original function but does maintain its architectural integrity allowing for alterations to certain portions of the building. A Federal tax credit for rehabilitation is applied to reconstruction costs incurred during the restoration process, 10% for buildings constructed before 1936 and 20% for certified historic structures (irs.gov). Reconstruction is another possibility for building restoration when a structure no longer exists but can be rebuilt using replicated design and/or materials. This process is applicable to Christian County due to the number of historic places that no longer contain an existing structure. Investment in rehabilitation projects should be a point of emphasis for local governing bodies.

The National Register of Historic Places

Recently the Ozark Courthouse Square received approval to be listed on the National Register of Historic Places (NRHP), only the third location in the County given such recognition (Wilson's Creek National Battlefield, Prehistoric Rock Shelter and Cave Sites). The process took over a year when the property was nominated by the Ozark Historic Preservation Commission (OHPC) and later approved by the Missouri Advisory Council on Historic Preservation. It might prove beneficial for the Christian County Historical Society to follow a similar process as the OHPC by researching and creating a list of places to be nominated for the NRHP.

Certain benefits result from a building or district being listed on the Register including the potential for investment tax credit for rehabilitation of properties. Even if the properties are not approved for the Register it would still be useful for local agencies to consider these historic places in the early stages of planning projects. It is important for the Historical Society to work with

municipalities in the creation of a list of historic places and the protection buildings, structures, sties, objects, and districts.

The protection and establishment of a Historic District or building creates a way to protect significant historic properties, protect against a specific threat of development, or to maintain property values. This is particularly true in older urbanized areas of Christian County where many historic buildings are located. Restoration of a historic downtown could possibly bring in tourists, entice businesses to locate in the district, and create a strong sense of place and community identity.

TRANSPORTATION PLAN

“The relationships between transportation and society are numerous, deep, varied, ancient, and complex. Any summary of them sounds trite. Everyone has had extensive personal experiences using transportation. Transportation has influenced each of our choices about where to live, spend

vacations, shop and work. So inescapable is the tie between transportation and society that, like gravity, we take it for granted and can't imagine a world without it."

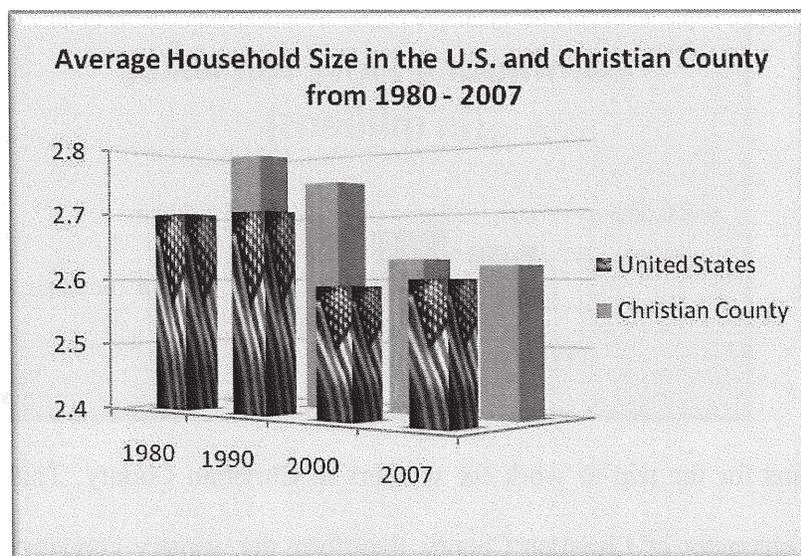
-Damian Kulash, President and CEO, Eno Transportation Foundation

Transportation is vital to contemporary economies and lifestyles. The high degree of mobility and freedom offered by automobiles and the extensive nature of the road network as a public good is the lifeblood of exchange and commerce. This mobility and freedom also allows people to pursue a greater range of activities, opportunities, and interaction, which in turn offers more choices in how and where we live out our lives. Relatively inexpensive farmland close to urban centers has been the target of homebuilders where both profit margins and market demand meet to produce low-density landscapes that require cheap and efficient transportation to support all of our far-flung households. Interdependence and specialization are the hallmarks of successful market economies. However, these same traits have resulted in a society where virtually no one is self-sufficient and it is necessary to leave the home perhaps several times in one day to shuttle kids to and from school, to feed and clothe ourselves, and to generally do what it takes to keep a roof over our heads. The need to travel from place to place to participate in these various activities and the process of shipping freight to production facilities and goods to market represents the demand for transportation.

Emerging trends of shrinking household size in the U.S. and Christian County (Figure 15-1) and "just in time" (JIT) production have increased the demand for travel at a faster rate than concurrent rates growth in population and the economy.

FIGURE 15 - 1

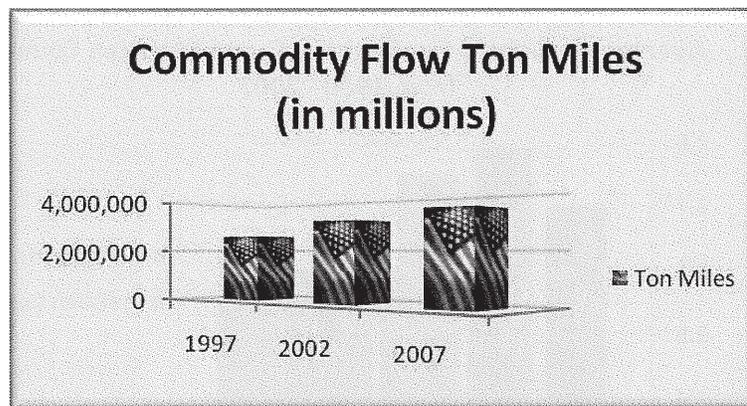
Average Household Size Decline in the U.S. and Christian County from 1980-2007. Sources: U.S. Census Bureau American Community Survey 2005 – 2007 and the Missouri Census Data Center



The classic assembly line production method with its requisite need to stockpile raw materials and warehouse inventory has given way to more efficient JIT production where goods are assembled on demand. This system requires extensive supply-chains and break-in-bulk shipping that feeds more trips in lightweight trucks that may have previously been consolidated in fewer heavy-duty vehicles, onto the transportation network. Figure 15-2 shows the rise in commodity flows by truck from 1997 to 2007. While the need to travel represents demand, the transportation network or system forms the supply-side, constantly changing and expanding to meet the demand of society as a whole. Roads and highways are the primary elements of the transportation system in Christian County. Figure 15.3 depicts the reliance on the individual automobile

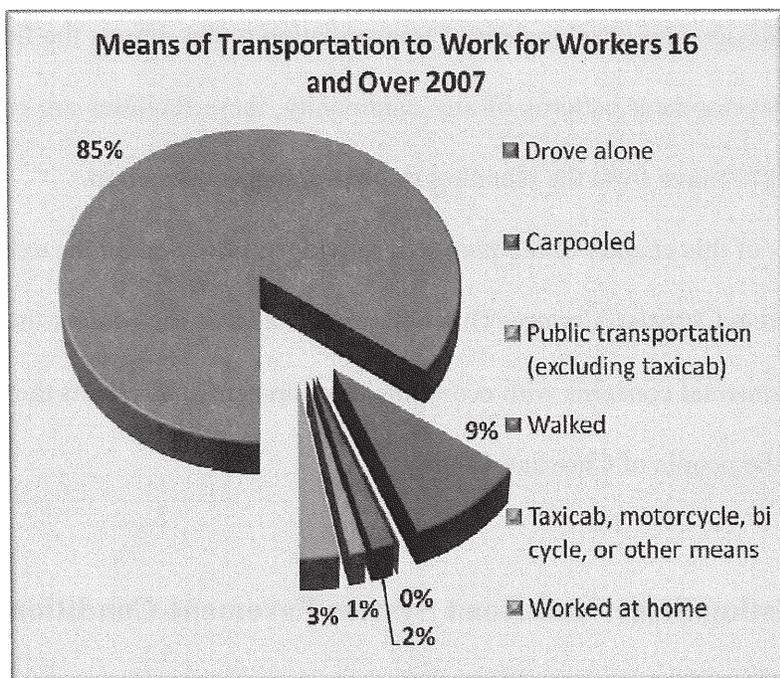
FIGURE 15 - 2

Rise in Commodity Flows
Source: U.S. Census Bureau American Community Survey 2005 – 2007



as the primary means for the trip to work for workers in Christian County. This is indicative of suburban and rural character of Christian County, therefore; the primary concern of transportation planning in Christian County is a safe and efficient surface network that is in tune with emerging environmental issues and the need for economic growth.

FIGURE 15 - 3
Means of Transportation to Work for Christian County Workers
Source: U.S. Census Bureau American Community Survey 2005 – 2007



Auto-oriented transportation systems contribute to poor air quality by increasing ground level ozone due to emissions of volatile organic compounds and nitrogen oxides from the burning of carbon-based fuels. In 2008, the Environmental Protection Agency (EPA) lowered the acceptable standard for the presence of these compounds in the lower atmosphere from 84 parts per million ppm to 75 ppm. At this time, the Springfield Metropolitan Statistical Area (MSA) measure was 77 ppm. If this measure remains above the acceptable standard in consecutive years it is possible that the EPA could classify Christian County, being a part of the Springfield MSA, as a non-attainment area in terms of air quality standards.

The impacts of a non-attainment designation are often overstated. It should be construed, however, as an action forcing mechanism for local decision makers to consider environmental impacts in long term planning. In terms of the transportation system, this has led toward a trend in regional planning to enhance facilities by accommodating alternate methods for getting around such as walking and biking.

Although the design and development of transportation routes affects the future development potential and land development patterns of any community, these facilities are costly to build and may take many years to move from the planning stage to actual construction.

The remainder of this chapter of the plan will provide information on the existing transportation system in Christian County. This will provide a basis for a future thoroughfare plan that balances environmental concerns with economic development and reflects the transportation values and goals of the people of Christian County

Existing Street and Road System Pavement Conditions

There are approximately 938 miles of County and State maintained roads in Christian County. As noted in Table 10-1, the County maintains 730.6 miles of roads and 40% of these roads are surfaced with gravel or stone. The majority of the county roads are paved with low type bituminous, which covers 57.6% of the county's roads.

In general, the hard surfaced roads in Christian County are in good to excellent condition. Road conditions decline on many of the County's gravel and stone-surfaced roads, however. Overall, roads with poorer surface conditions are located in the lowland valleys of the hilly terrain in the southern parts of the County. Several country roads are often impassable during heavy rains due to flooding or washout of surface gravel/stone.

TABLE 15.1

MILEAGE OF ROADS BY SURFACE TYPE

Surface Type	County Road Miles	State Road Miles
Gravel or Stone	295.8	0.0
Low Type Bituminous	420.6	387.2
High Type Bituminous	12.8	144.1
P.C. Concrete	1.1	38.1
Retread Surface	---	---
Total Surfaced	730.3	569.4
Graded and Drained	0.0	---
Unimproved	0.3	---
Total Miles Roads	730.6	569.4

Source: Missouri Highway and Transportation Department, Division of Planning, 2002

As previously noted, roads maintained by Christian County and the special road districts are subject to the individual standards adopted by each maintenance entity. In many instances, the special road districts do not have uniform standards for all roads within their particular jurisdiction. Road construction requirements (bedding and paving) are determined on an individual basis. Christian County Common 1 and 2 do require all roads dedicated for County maintenance to have a hard paved surface.

Functional Classification, Access Management and Right of Way

According to the Federal Highway Administration, functional classification is the process by which streets and highways are grouped into classes, or systems, according to the character of service they are intended to provide. This process determines how travel is channelized within the network in a logical and efficient manner. Functional classification defines the nature of this channelization process by defining the part that any particular road or street should play in serving the flow of trips through a highway network.

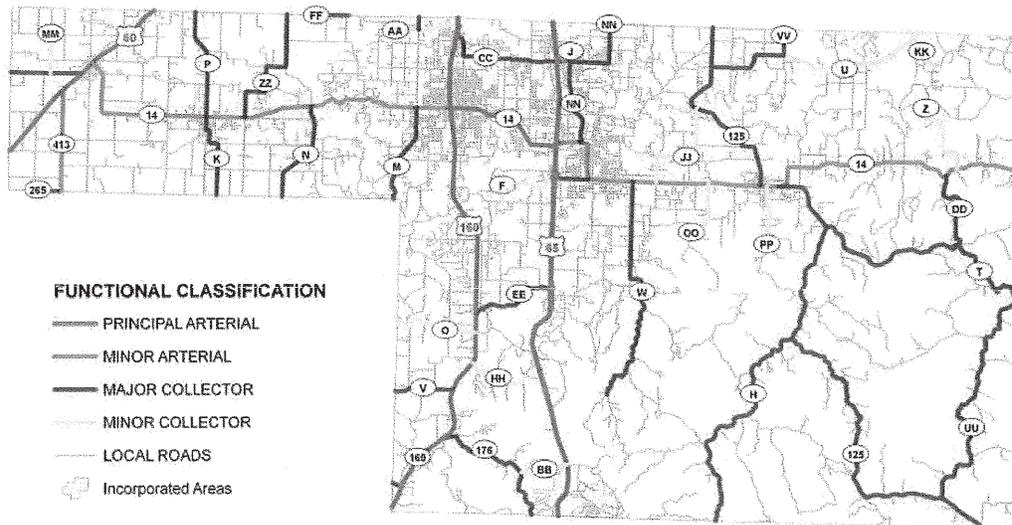


Figure 15-4 Current Rural Functional Classification of Christian County Roads
Source: Missouri Department of Transportation 2007 Planning Data

Figure 15-4 depicts the current functional classification of the road network in Christian County. Table 15-1 provides a general description of the intended function of classified segments and represents the hierarchy of the network. Higher classed roads serve to move traffic through the system and require wider rights of way (ROW) to accommodate several lanes for high volumes of traffic. Access to higher classed roads is strictly limited to reduce delay and impediments to the flow of vehicles. As you step down through the network hierarchy, access to adjacent property becomes the priority and movement becomes secondary.

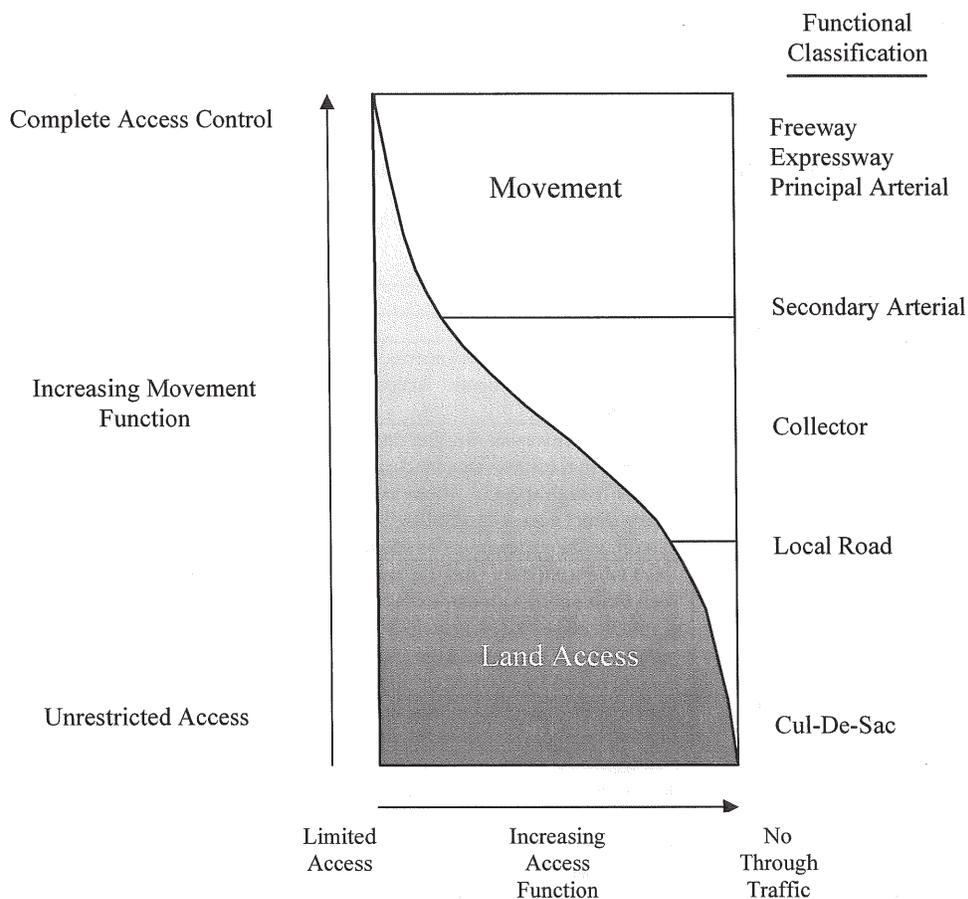


Figure 15-5 Relationship Between Access and Function of Roads

In most cases ROW width narrows as the need to move traffic lessens. As development occurs and vehicle traffic increases, many roadways deteriorate into highly congested routes that experience unacceptable delays and crashes.

While MoDOT retains access management rights along state routes and highways, Christian County has the leeway to develop a jurisdictional future classification system that can serve as the basis for local access management policies, ROW requirements and design standards. The OTO MPO and many incorporated areas within the county have major thoroughfare plans in place. OTO has also developed design standards for classified roads within its planning area in Christian

County. Christian County should update its major thoroughfare plan in coordination with other local plans as much as possible. The lack of adequate right-of-way for future road improvements is the most critical concern for transportation planning in Christian County.

Table 15-2 Roadway Classification System			
	Urban	Rural	Description
Interstate/Freeway	U1	R1	Characterized by limited access, designed for high-speed high-volume movements. Access permitted only at interchanges.
Principal Arterial	U2	R2	Key, non-freeway or non-interstate, intercity or interregional routes. Intended to serve long-distance trips at relatively high speeds. These are controlled access facilities where direct access to abutting land is controlled to maximize the movements of through traffic.
Minor Arterial	U3	R3	Used where existing land use and roadway sections have been built out to a greater extent than those roadway segments classified as Principal Arterial and where the probability of major land use change is not as high. Distinguished by existing or planned restrictive medians.
Collector	U4	R4	Nearly the same as minor arterial, but are distinguished by existing or planned non-restrictive medians or centers.
Local Roads	U5	R5	Distinguished by existing land-use and roadway sections that are built out and where significant land-use changes or roadway widening will be limited. These are typically not designed for high speed travel and in rural areas these tend to be residential roads with low traffic volumes.

Source: Access Management Model Ordinance. Southwest Missouri Council of Governments. 2006

Major Corridors

North/South

U.S. Highways 160 and 65 serve as the primary north/south corridors in Christian County. These roadways deliver traffic to the major regional activity centers of Springfield and Branson. Most of Christian County's population growth is centered along these routes in the northern portion of the county. These corridors have seen significant increases in traffic volumes in recent years. In the five year period from 2002-2007 volume has increased significantly along U.S. 65 (see Appendix D for traffic counts on all state roads in Christian County). The 2002 estimated average annual daily traffic (AADT) count along U.S. Highway 65 from the Christian County line to

Highway CC north of Ozark was 42,165. By 2007 AADT had risen 17% to 49,357. Although volume begins to drop off as you continue south towards the Taney County line (AADT 21,966) traffic has increased on all segments of U.S. 65 in Christian County an average of 21.34%.

High growth in traffic volume has occurred along U.S. 160 through Nixa in northern Christian County. From the Greene County line to Highway 14 AADT has increased 31% from 2002 to 2007, growth of nearly 6,500 trips per day. South of Nixa, U.S. 160 becomes a two-lane undivided highway; AADT at this point has grown only 6.6% over the same period. Along the southern portion of U.S. 160 traffic counts drop off and have actually decreased on some segments from 2002 to 2007.

Highway 125 serves the eastern portion of Christian County. The northern portion of this corridor from the Green County line to Sparta has seen a large increase in traffic volume since 2002. From Sparta to Route JJ AADT has increased from 786 in 2002 to 2376 in 2007, a change of 202.3%. Continuing on to Route U volume has increased 108% resulting in an additional 1943 trips per day. Counts along Highway 125 South of Sparta have remained fairly constant during this period before decreasing slightly through the Mark Twain National Forest towards Taney County and beyond.

East/West

U.S. Highway 60 traverses the western panhandle of the county for approximately 7.8 miles at a northeast to southwest orientation from the Greene County line towards Lawrence County. U.S. 60 serves the Town of Billings and through traffic from Monnet to Springfield. Volumes along this segment have remained fairly constant from 2002-2007 at roughly 15,000 AADT north of Billings, decreasing to 12,500 at Rte 413, and then 10,500 at the Lawrence County line.

State Highway 14 is the only east/west corridor that traverses the entire county. State Highway 14 runs from the Douglas County line in the northern portion of the county through to the Lawrence County line in the panhandle. Highway 14 serves nearly every incorporated area within the county with the exceptions of Highlandville and Saddlebrook. Traffic volume has increased 51% along all segments of this route from Sparta to Ozark resulting in an additional 2200 from Highway PP near Sparta to 4200 AADT at Highway W in Ozark. On the western portion of Highway 14 from Highway N to U.S. 60 traffic volume has increased by nearly 12% from 2002 to 2007. Between the cities of Nixa and Ozark traffic volumes on State Highway 14 have increased slightly from 11,574 AADT in 2002 to 11,909 in 2007. These counts reflect the rapid population growth in the north central portion of the County. Traffic flow along Mo. State Highway 14 is of particular concern as this road functions as a primary arterial yet is not designed to modern arterial standards. Existing land development patterns along significant segments of Highway 14, particularly in the Nixa-Ozark area, leave little opportunity to secure additional right-of-way for any future highway widening without extensive costs.

Highways EE and CC serve as major east/west connectors between U.S. 160 and U.S. 65. Highway CC connects the northern portions of the Cities of Nixa and Ozark. Traffic Volume has increased 48.2% from 2002 to 2007 resulting in an additional 3,376 trips per day. Highway EE connects the City of Highlandville along U.S. 160 and U.S. 65. Highway EE serves approximately 4,000 trips per day. Currently, both of these routes are not designed to the standards of their current function. The majority of segments along these roads are two-lane with no shoulders. There are also safety concerns with alignment issues dictated by the nature of the topography in the county.

Planned Transportation System Improvements

This section describes a list of improvements that are currently under way or scheduled to begin over the next few years according to the OTO Transportation Improvement Program (TIP) and the MoDOT Statewide Transportation Improvement Program.

- U.S. 60: Capacity improvements from Chappel Dr. in Monett to Kansas Ave. in Republic; Conversion of 2-lane to 3-lane alternating intermittent passing lanes
- U.S. 65: Pavement improvements from southern MPO boundary to Rte. EE
- MO 14: Improve interchange capacity at U.S. 65 in Ozark
- MO 14: Resurface roadway from Rte. 160 to the Finley River Bridge in Ozark
- Rte CC: Resurface roadway from Rte 160 to Rte 65
- Rte AA: Resurface from U.S. 160 to the end of route
- ROW study for MO 14 bypass from MO W south of Ozark to MO NN north of Ozark
- ROW study for extension of Longview Rd. west of U.S. 65 to MO NN in Ozark

Although not programmed yet, top priorities in the OTO MPO in Christian County include capacity improvements on Rte CC from U.S. 160 to MO NN and Pheasant Rd and capacity improvements on MO 14 from MO NN in Ozark to a new north/south corridor west of Nixa. The OTO is currently studying the property impact of three different alignments for the extension of Kansas Expressway south of the James River Freeway to MO 14 in Christian County.

Other Transportation

Aviation

Christian County is served, in terms of passenger service and airfreight, by the Springfield-Branson Regional Airport located in the northwest section of Springfield. Air services commenced in May 2009 at the new Branson Airport, 8 miles south of the center of Branson in Taney County. This new facility will offer general aviation and commercial aviation facilities with the latest technologies. The 58,000 square ft. terminal will ultimately have capacity to handle more than 1 million enplanements annually. The old airport in Ozark is still classified as a public use airfield. A plan to expand this facility for general aviation purposes through a cooperative partnership with the City of Ozark and the Springfield-Branson Regional Airport has been tabled. There are also several private landing strips, located primarily in the northeastern part of the county.

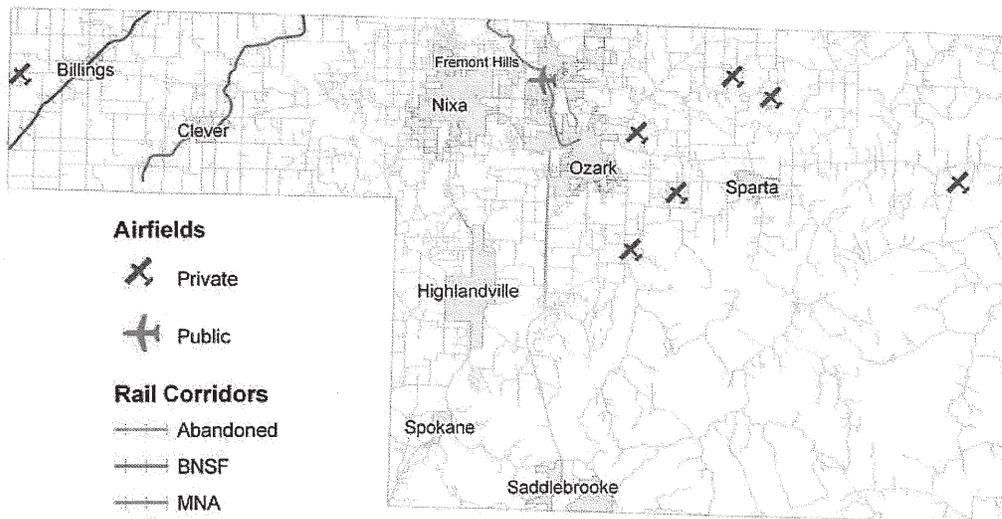


FIGURE 15-6
Airfields and Rail Corridors

Rail

Burlington Northern/Santa Fe Railroad operates along the only functioning rail line in Christian County running parallel to U.S. Highway 60 through the western panhandle. Figure 10.6 depicts two other rail corridors that are no longer operational but still intact. It may be possible to preserve these corridors for future use for transit or trails.

Public Transportation

No municipal transportation services operate in Christian County with the exception of OATS Inc., which provides specialized route transportation services on a request or limited route basis to anyone regardless of age or income. Days of the week and times of transit to specific towns are available through the internet or by calling an OATS driver in the county. Appointments for pick-up are also made by contacting the driver.

Pedestrian/Bike routes and Greenways

The rural character and large extent of Christian County renders pedestrian accommodations problematic in terms of maintenance and usability. However, as parts of the county become urbanized some consideration should be made as to how to connect those who choose to walk to nearby activities and opportunity. Christian County maintains many well-paved local roads that serve low volumes of traffic that make them ideal bike routes for commuting and recreation. The OTO major thoroughfare plan identifies specific roadways as bike routes. There is a great opportunity for the county to continue these routes outside of the MPO boundary. The OTO also makes provisions for the extension of greenways into northern Christian County. The City of Ozark has begun to develop a trail system to connect the city with the OTC Richwood Campus on

Highway 14 west of U.S. 65. The hydrology of Christian County is well suited for the development of multi-use trails and greenways.

Local Program Funding

Local Programs provides federal funding to cities and counties for their transportation improvements. Please reference the Local Public Agency Manual available online at <http://www.modot.mo.gov/business/manuals/localpublicagency.htm> for a guide to utilizing federal funding made available to local agencies through the programs listed below.

Transportation Enhancements (TE)

This program provides funding through a competitive selection process for transportation related activities other than routine highway and bridge construction. Transportation Enhancement funds are available to develop a variety of project types, that are located in both rural and urban communities. The projects help create more travel choices by providing funding for such things as sidewalk construction, bike lanes and to convert abandoned railroad rights of way to trails. Communities may also use the Transportation Enhancement Program to revitalize local regional economies by restoring historic buildings, renovating streetscapes or providing transportation museums and visitor centers.

Off-System Bridge Replacement and Rehabilitation (BRO)

This program provides funding to counties for replacement or rehabilitation of deficient bridges.

Qualified bridges for this program in Christian County include:

- Bridge 14153 on Terrell Rd across Terrell Creek

- Bridge 28202 on Harper Rd across Pedelo Creek
- Bridge 23796 on Red Bridge Rd. across Bull Creek
- Bridge 24207 on Swan Creek Rd. across Swan Creek
- Bridge 24198 on Chadwick Rd. across Cedar Creek

Programs such as these make use of federal funds. In most of these cases, local matching funds are required. For this purpose there are many different options for Christian County to fund transportation projects including:

- Obligation bonds
- Special assessments
- Impact fees
- Developer agreements

More complex instruments and strategies involve delineating improvement districts such as the ones listed below. These are only some of the alternatives available and are only meant to provide general guidance for funding transportation improvements in the county.

Community Improvement District A Community Improvement District (CID) may be either a political subdivision or a not-for-profit corporation. CID's are organized for the purpose of financing a wide range of public-use facilities and establishing and managing policies and public services relative to the needs of the district.

Tax Increment Financing Tax Increment Financing (Local TIF) permits the use of a portion of local property and sales taxes to assist funding the redevelopment of certain designated areas within your community. Areas eligible for Local TIF must contain property classified as a "Blighted",

"Conservation" or an "Economic Development" area, or any combination thereof, as defined by Missouri Statutes.

Transportation Development Districts Transportation Development Districts (TDDs) are organized under the Missouri Transportation Development District Act, Sections 238.00 to 238.275 of the Missouri State Statutes. The district may be created to fund, promote, plan, design, construct, improve, maintain and operate one or more projects or to assist in such activity.

Transportation Development Corporations Transportation Development Corporations (TDCs) are organized under the Missouri Transportation Corporation Act, Sections 238.300 to 238.367 of the Missouri State Statutes. TDCs act in promoting and developing public transportation facilities and systems and in promoting economic development.

FUTURE LAND USE

Future land use is one of the most important elements of the Comprehensive Plan for Christian County and should serve as the principle guide for growth, development and preservation decisions and actions affecting the future of Christian County over the next decade. The Future Land Use element is closely related to and supported by other recommended policies of the Plan, including policies, on transportation, the environment, community facilities and utilities. Future land use and development pattern recommendations contained in this chapter are shown on the Generalized Future Land Use Map (Appendix A). (To be finalized following approval of draft)

Many factors were taken into consideration in the development of the future land use map. Existing land use patterns, which have developed over the past several decades and environmental characteristics serve as the basic starting point for the framework of future, land use in Christian County. The County's transportation system and availability of utility infrastructure (water and sewage disposal) are also key locational factors influencing not only types of recommended development but also the density of development throughout the County. These as well as numerous other factors were considered within the framework of a modeling program utilizing quantitative and qualitative data. Urban Service areas or planning tiers which have been established by municipalities and are recognized by the County are also an important consideration when identifying future growth patterns.

Methodology

The Generalized Future Land Use Map displays the anticipated land use patterns that would best encourage responsible growth within the parameters of existing development and infrastructure

patterns, environmental constraints and resource management concerns. This land use pattern seeks to reinforce and support the County's goals, including but not limited to:

1. Allowing for growth while preserving the best features of rural life in unincorporated areas.
2. Maintaining and protecting the natural environment, including the groundwater supply.
3. Promoting compatibility and gradual transition in intensity of land use.

The factors of existing land use, existing and proposed transportation networks and their usage patterns, community facilities, utilities, environmental constraints (i.e. sinkholes, floodplains) and environmentally sensitive areas, and goals and objectives were taken into consideration to arrive at the recommended land use for sections of land in Christian County. Geospatial data revealing factors, such as drainage ways, floodplains, sinkholes and soils were examined to determine areas of environmental constraints and areas suitable for agricultural production. Allocation of land areas for specific types of urban land uses, such as residential, commercial and industrial, were then based on a combination of the existing development patterns, land development location standards and population projections to ensure adequate acreage to meet anticipated population growth and related development needs.

Land Use Conflict Identification Strategy (LUCIS)

A part of the process in developing a future land use map was conducting a LUCIS modeling analysis. In this modeling system, planners were able to consider land use suitability in the categories of agricultural, conservation and urban based on specific criteria and represented in terms of low to high levels. (see Figs. 16-1, 2 & 3).

FIGURE 16 - 1

Christian County Agricultural Land Use Suitability

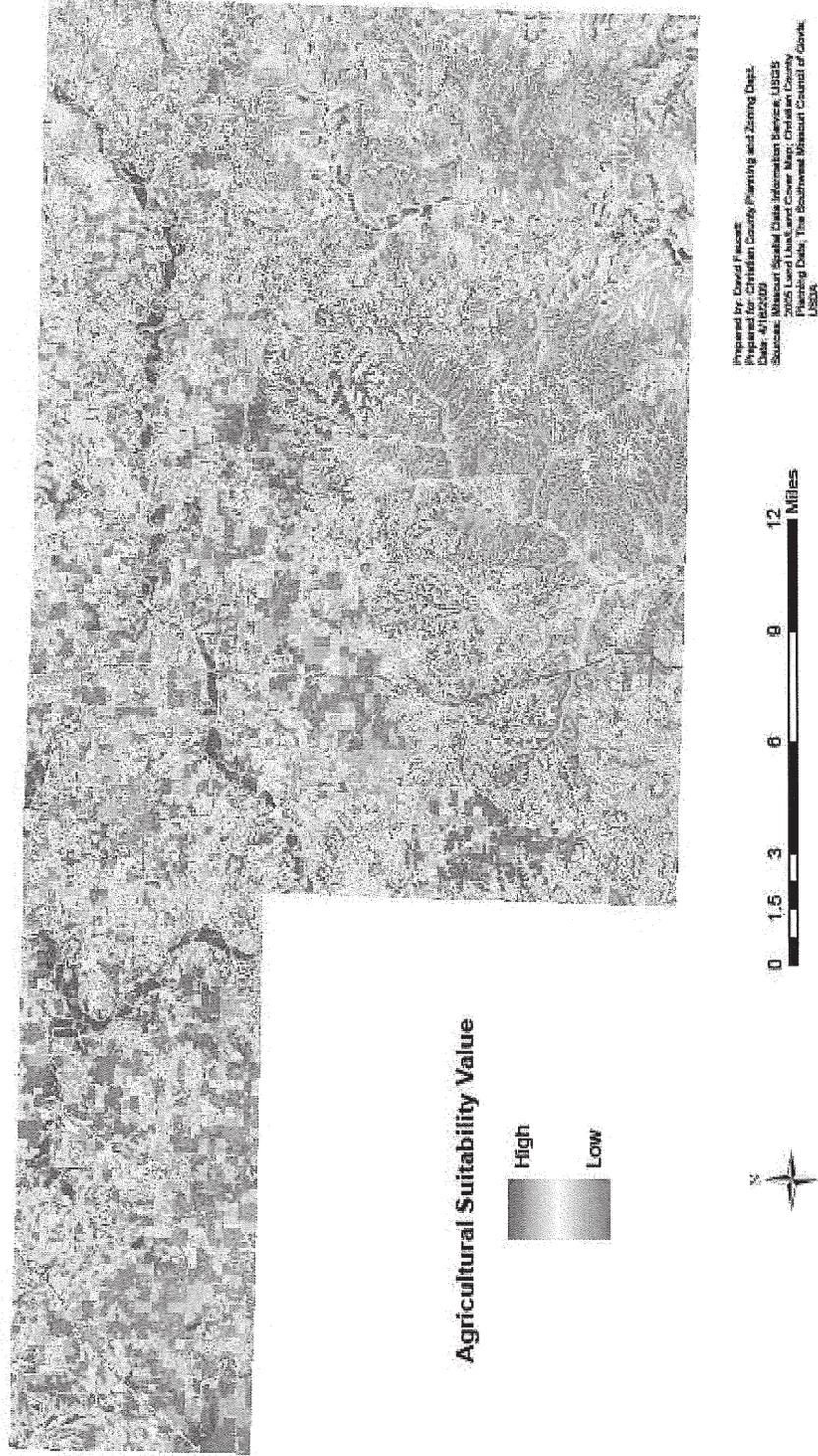


FIGURE 16 - 2

Christian County Conservation Land Use Suitability

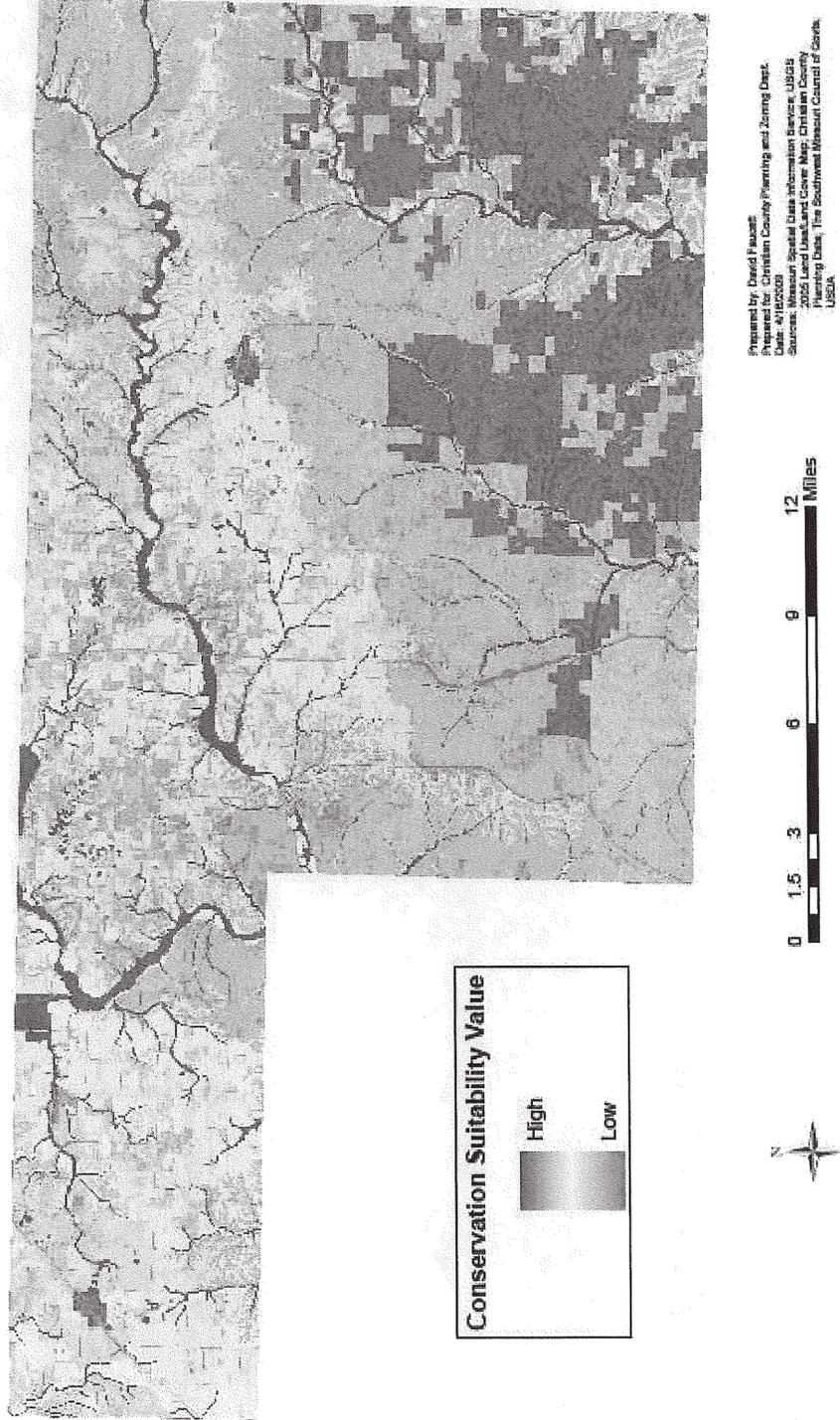
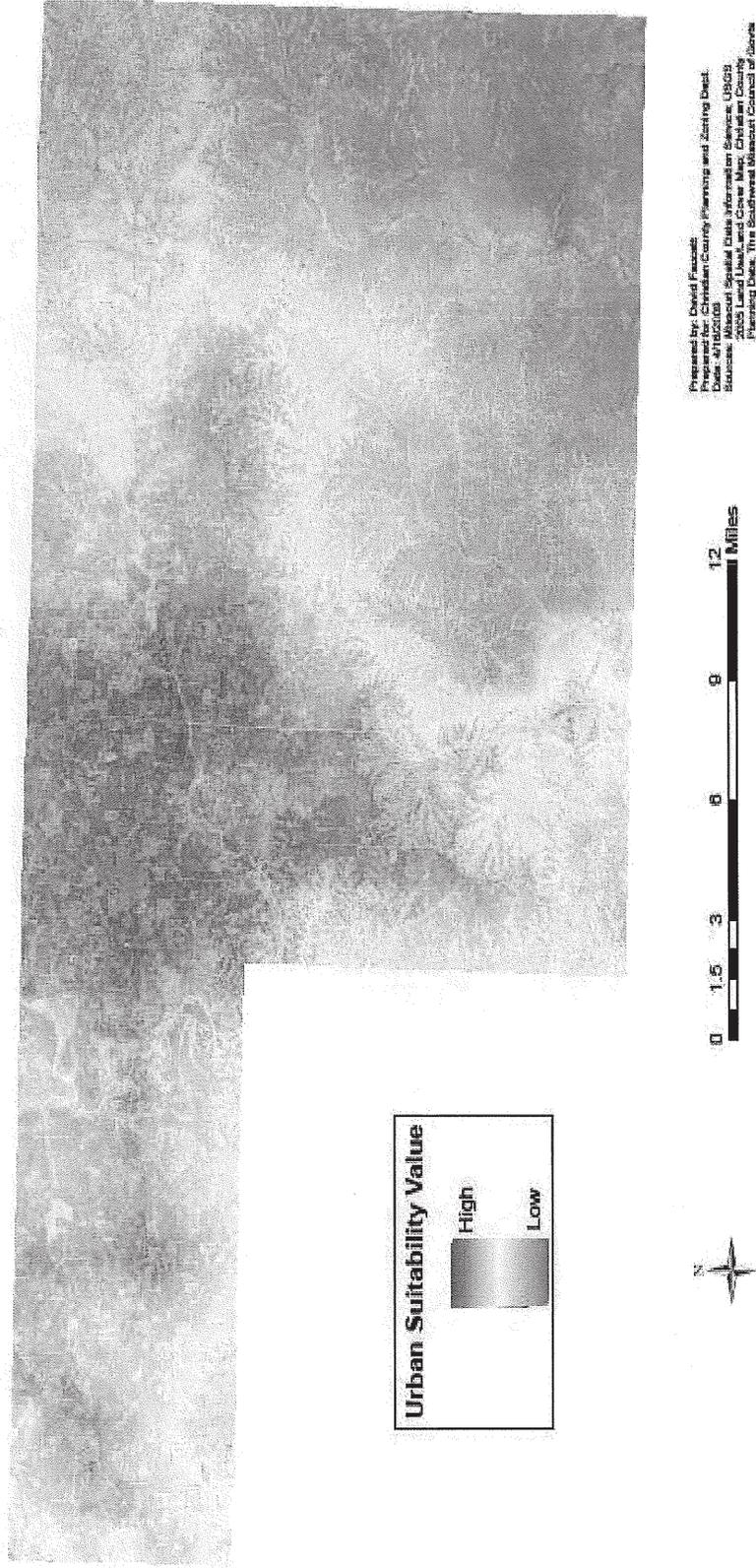


FIG 16 - 2

FIGURE 16-3

Christian County Urban Land Use Suitability



These categorical assessments of suitability were then compared to one another in order to identify areas of conflict. The result is a visual representation of the County in terms of how the land might best be used in the future with the least amount of conflict in projecting appropriate usage.

(Fig. 16-4)

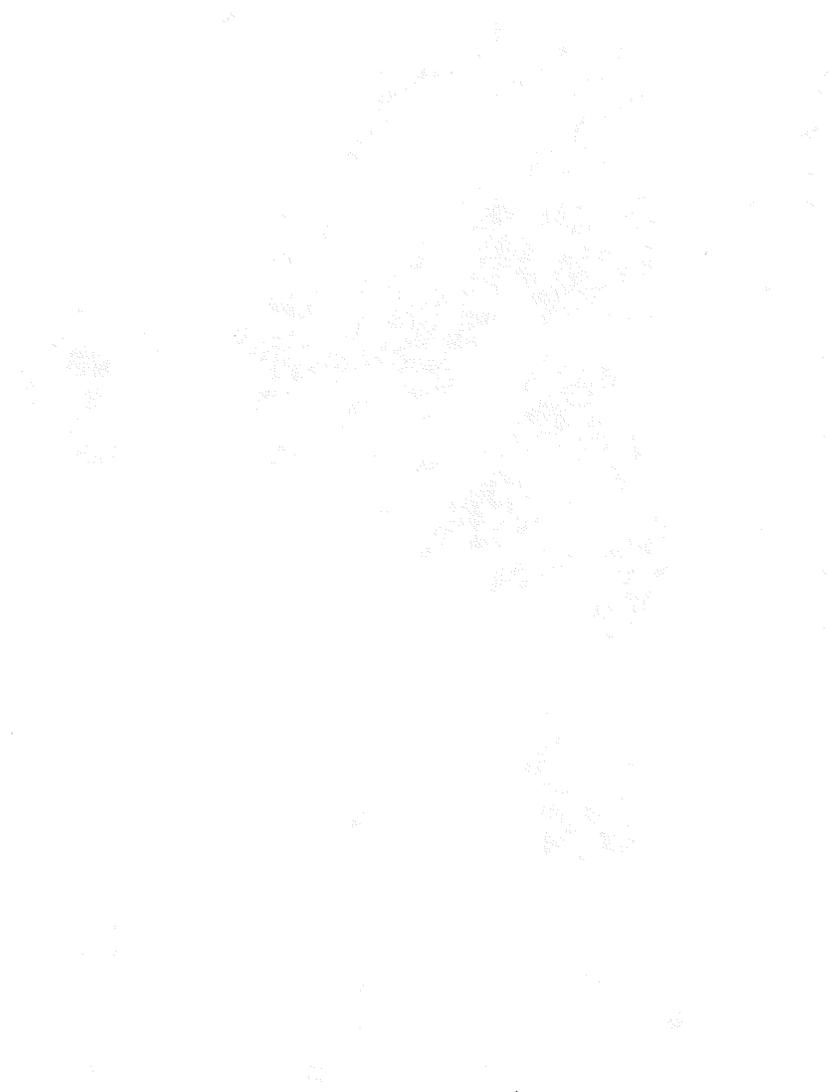


FIGURE 16 - 4

Land Use Conflict Identification Strategy Model (LUCIS) Christian County, Missouri



Prepared by: David Plascid
 Prepared for: Christian County Planning and Zoning Dept.
 Date: 4/16/2009
 Source: 2005 Land Use/Land Cover Map, Christian County
 Planning Dept. The Southwest Missouri Council of Governments
 USA



This study took data, converted to a GIS format combined with subjective survey data (see Appendix F) in which respondents expressed their preferences in terms their choice for proximity of their residence to various activities and amenities.

Maintaining the quality of the groundwater supply is a primary factor controlling the proposed density levels in Christian County. As most of the unincorporated portions of the County utilize individual, on-site sewage disposal systems, low-density development patterns are recommended in these areas unless approved alternative methods for collective onsite sewage disposal and clustering of homes might offer the opportunity to preserve greater areas of open space.

General Development Pattern

The Generalized Future Land Use Map, which will be shown as shown as Appendix A is a approximate representation of how Christian County intends to develop. It reflects continuity in focusing future urban development in the current growth corridor areas along Highways 160, 65 and 14 as well as other pockets with developing transportation connectivity extending from the Greene County line on the north to south of the cities of Nixa and Ozark. This area has become the core urbanizing area of Christian County over the past decade. Other areas of prime farmland soils and which are predominantly used for agriculture, including the panhandle section of the County west of the James River and the northeastern section of the County, are proposed to remain in agricultural uses with compatible, very low density urban development.

FIGURE 16 - 5
Generalized Land Use Categories

Category	Permitted Land Uses	Density	Location
Agricultural Districts	Agricultural production, very low density residences, conservation subdivisions, home occupations, agriculture services, direct marketing of agriculture products and neighborhood services.	Generally 1 dwelling unit per 10 or more acres.	Throughout the entire County, excluding USA's, commercial corridors, and established rural residential areas.
Residential & Transitional Districts	Single family detached residential dwellings, conservation subdivisions and neighborhood services	Generally 1 dwelling unit per 3 – 5+ acres	Typically located in close proximity to USA's and incorporated areas as well as other areas with good connectivity.
Commercial Districts	Regional commercial trade services, retail and offices serving the local and traveling public, regional research and development; and indoor warehousing.	Lot sizes dependant on development and availability of public services.	Near highway interchanges, major transportation corridors and select intersections of paved arterial roads.
Industrial Districts	Low intensity industrial, business park and warehouse development.	Lot sizes dependant on development and availability of public services.	Adjacent to arterial roads with adequate capacity in USA's and General Commercial areas.
PUD / Mixed Use	Residential, commercial, industrial and other land use types in varying mixtures as appropriate within the adjacent community.	Lot sizes dependant on proposed development, availability of public services and compatibility with adjacent uses.	Within USA's and other areas where adequate services can be provided to support the proposed development.

Generally, the southern portion of the County is shown in forestry and very low density development uses, taking into account the existing road system, rugged topography, septic tank disposal requirements and substantial acreage not available for development (Mark Twain National Forest and Busiek State Park). More intensive urban development in this area is not recommended due to the constraints of inadequate road paving and rights-of-way for urban traffic levels and the potential for significant environmental damage (including erosion and siltation of streams) resulting from removal of vegetative cover on rugged slopes.

Based on future population projections and generally accepted formulas for land use need requirements (see Appendix E) the Generalized Future Land Use Map attempts to represent the appropriate amount of future land needed in generalized use categories in order to accommodate and support the needs of the residents of Christian County into the future.

It should be noted that the Generalized Future Land Use Map depicts general land development patterns only. It is not a zoning map and should not be used alone to determine appropriate land uses for individual pieces of property. This map is a tool to be used in conjunction with the other elements of the Comprehensive Plan, such as goals and objectives, the County's land development controls and specific characteristics of a site to determine the appropriate development pattern for that site.

Residential Land Use Patterns

Figure 16-5 depicts the most common density patterns of residential uses that are expected to be seen as the unincorporated portions of Christian County continue to develop. These include Rural Residential (1 dwelling unit per 3 - 10 acres), Agricultural Resources (1 dwelling unit per 10 or more acres) and Planned Unit Development (PUD), where development projects are looked at as a whole unit and may be approved for smaller lot sizes, mixture of land uses and other alternative

design factors based on compatibility with adjacent land uses, availability of public services and provisions for open space and common areas.

At present, over 97% of residential uses are either single family or mobile homes on individual ownership lots. It is anticipated that single family will continue to be the predominant residential use, with duplex development and mobile home parks comprising most of the balance of residential uses.

Higher density residential use proposals are recommended to locate in close proximity to already urbanized areas in the Nixa-Ozark growth corridor area. Residential uses developed within these urban service areas will require connection to nearby municipal sewer systems or package sewage treatment systems either immediately or in the foreseeable future. A higher density, including multifamily residential is also recommended as a land use buffer between commercial areas and lower density residential uses.

It is quite possible that densities greater than 4 dwelling units per acre may be appropriate and acceptable on certain sites within the urban growth area. However, any such proposal should be evaluated individually, taking into consideration the factors of sewage disposal, water supply and potential for annexation by an incorporated community with existing zoning and other land development requirements.

Very low-density residential development is proposed to locate outside of the urban growth area and/or wherever individual septic tank systems must be used. Furthermore, only very low density residential uses are recommended in areas with slopes greater than 12%, in order to reduce the potential of deforestation, soil erosion, sedimentation and the higher costs of providing for upgraded transportation infrastructure. Very low-density residential uses are also recommended as a preferred land use buffer between working farms and more intensive urban development.

Based on population projections from the U.S. Census Bureau, a minimum of approximately 60,143 acres of land will be needed to accommodate new residential development by the year 2020 and 101,842 acres by the year 2030. These projections are for the County as a whole and do not distinguish between unincorporated areas and municipalities. This residential acreage need is based on the projection that 85% of the acreage needs will be for very low density and 15% will be for low density. (see Appendix E for space allocation formulas).

Commercial Land Use Patterns

Most future commercial activity is recommended to locate adjacent to or nearby the County's primary road system (arterials and collectors) in the urban growth area. Future commercial activity is clustered near existing commercial development and at intersections of major roads (i.e. along Highway 160, 65, 14) as well as other naturally developing activity centers. Due to the availability of municipal water and sewer, it is expected that most future commercial activity will locate in or in close proximity to the cities. Approximately 786 additional acres of commercial land will be required in Christian County by the year 2020 and 1331 acres by the year 2030.

Industrial Land Use Patterns

Most current industrial activity is located in or adjacent to the cities, with the largest concentration of activity along Highways 160 and 65 near Nixa and Ozark. Future industrial activity is recommended to locate in these areas due to the proximity to municipal water and sewer. In addition to utility concerns, other locational factors considered in the allocation of space for industrial uses include relatively flat topography and convenient access to major roads.

Due to the specific locational requirements for industrial activity, it is recommended that appropriate space be allocated for industrial growth well into the future. Based on the population

projections for the County as it heads toward the year 2030, approximately 696 additional acres of land for industrial activities should be provided. It should be noted that not all anticipated future commercial and industrial growth will occur in the unincorporated portions of the County, regardless of the population growth expected in these areas. A percentage of such growth can be expected to occur in the municipalities due to availability of water, sewer and already existing industrial parks.

Agricultural Land Use Patterns

Existing land use, infrastructure patterns and soil type were the principle factors used to arrive at recommendations for preservation of agricultural uses in Christian County. The County's prime farmland soils (see Figure 6-7) are generally located in the northern portion of the County and in the relatively flat, southwestern section of the County (west of Highway 160). While many of the prime farmland soils have already been converted to urban development in the Nixa-Ozark area, significant acreage of working farmland still remain in the western panhandle section, the northeast and in the southwest parts of the County. These areas are recommended primarily for continued agricultural uses. In the panhandle section, the James River serves as a natural boundary between future urbanization and agricultural uses.

Development occurring in these areas is recommended to be limited to very low-density residential development so as to minimize potential conflicts and incompatibility of urban uses with agricultural activity.

Commercial activities that service or are supportive of the agricultural base in these areas may be warranted at certain locations. Such commercial activity should be located on major roads and should be reviewed on an individual basis for compatibility with surrounding development patterns and needs.

Summary Comments

As noted, the recommended future land use pattern for Christian County to the year 2030 is intended to focus growth in the urbanizing core area in the north and central sections of the County and along developing transportation corridors. It is further intended to discourage urban levels of development in sensitive environmental areas and in areas with inadequate levels of infrastructure (roads, water and sewer) to accommodate such growth.

Not all land shown for urban development on Appendix A will actually develop over the coming decades. Constraints to development, such as site-specific environmental limitations, ownership patterns and configuration of land parcels will limit potential development in some areas. Furthermore, not all land can be expected to develop precisely at the intensity of usage levels shown on the Generalized Future Land Use Map. The potential availability of municipal water and sewerage services may allow for intensity levels slightly greater than or less than those recommended in the Plan. Evaluation of development proposals should take into consideration the availability and capacity of the infrastructure system, along with surrounding development patterns, to determine whether changes in intensity levels are appropriate for the location of a particular development.

IMPLEMENTATION STRATEGIES AND PRIORITIES

Implementing the Comprehensive Plan is an integral element of the planning process for Christian County. The Plan outlines recommendations and strategies for the future development of the County and should be viewed as the official document guiding public and private land development decisions and actions. Success of the Plan will be measured by the degree to which the Plan is put to use. Implementation of the Plan will depend on a combination of regulatory controls and voluntary programs and actions on the part of both the public and private sectors. The source of the Plan's authority is found in Section 64.630 of the Missouri Revised Statutes which addresses the creation of a zoning plan, the division of land into districts, and the regulations pertaining to those districts. It states: "The regulations shall be made in accordance with a comprehensive zoning plan, and shall give reasonable consideration, among other things, to the then existing character of the districts, their suitability for particular uses, conservation of the value of buildings and of existing development, and encouragement of the most appropriate use of land throughout the county."

The implementation phase will be especially critical as the County intends to move toward a more traditional, Euclidian form of zoning. While the County is not "starting from scratch", there are substantial differences in policy, procedure and overall philosophy that will need to be addressed. A significant step in this transition will be the creation of a future land use plan. While this plan (or map) is not intended to depict the future use of specific parcels, it does intend to present an approximate vision for land use patterns which will be compatible with one another, respect the plans of incorporated communities and also facilitate orderly growth and development that serves the County as a whole. The future land use map will also serve as a guide offering support as decisions regarding appropriate zoning classifications are being made. Initiating the

basic tools needed for implementation of the recommendations and policies guiding future land development decisions is the most fundamental and strategic planning priority for the County. A new zoning ordinance and subdivision regulations will be created to amend the existing UDC and permanent zoning districts will replace the land use permitting system currently in use. These districts will be placed on a map with existing land uses helping to provide a starting point for its creation.

While a number of the goals and related policies in the Comprehensive Plan are long term and on-going in nature, there are a number of strategic actions or priorities, which should be the focus of continued planning efforts over the next five years. Table 16-1 summarizes recommended priorities and strategies for implementation of the Christian County Comprehensive Plan between 2009 and 2015. These priorities include both actions needed to establish the basic framework for implementation as well as key land development concerns noted in the various sections of the Comprehensive Plan.

Approximate time frames for addressing individual implementation strategies, along with identification of entities responsible for implementation, are also noted in Table 17-1. More than one entity may be responsible for initiating and carrying out a particular strategy. In these cases, the primary responsible entities are noted.

Due to the County's rapid rate of growth, the goals and objectives of the Comprehensive Plan and the strategic priorities should typically be reviewed and updated in approximately five years. In light of the fact that Christian County is rapidly approaching a transition to "First Class" status it is recommended that a small review be done at that point as well. This action is recommended to determine whether the Plan still reflects public desires and community needs and whether the development recommendations of the Plan are still appropriate.

Table 17 - 1

NEAR TERM ACTIONS (Present through 5 years)					
ACTION STEPS	IMPLEMENTATION RESPONSIBILITY				
	Christian County Commission	Planning & Zoning Dept.	Agencies / Municipalities	Private Developers	Health Department
Land Use Goals					
Use the land use categories in Figure 16 -5 for future land use planning. Create and use a Future Land Use Map to be used to guide land use and development decisions.		◆			
Amend the current UDC to include a more traditional, Euclidian form of zoning format which will also establish separate documents for subdivision regulations, environmental regulations and road standards.	◆	◆			
Transportation Goals					
Work with adjoining municipalities to ensure completion of planned improvements to Hwy CC between Ozark and Nixa.	◆		◆		
Establish road design standards for County roads which fall within Urban Service Areas which are compatible with existing municipal standards.	◆	◆	◆		
Economic Development Goals					
Coordinate with cities and economic development interests to explore opportunities for joint development of a business and industrial park.	◆	◆	◆	◆	
Support the establishment of commercial businesses in appropriate areas as designated on the Future Land Use map.		◆		◆	
Environmental Goals					
Establish a policy providing for centralized wastewater treatment systems that incorporates sufficient bonding or other security measures to protect the County from undue expense yet allows for an alternative means of treating waste water in areas unable to be serviced by municipal infrastructure.	◆	◆			◆

ONGOING ACTIONS					
ACTION STEPS	IMPLEMENTATION RESPONSIBILITY				
	Christian County Commission	Planning & Zoning Dept.	Agencies / Municipalities	Private Developers	Building Inspectors Department
Land Use					
Maintain the Future Land Use Map and adopted plan amendments as they occur.		◆			
Require development applications within USA's to include an analysis of the development's infrastructure and service demands relative to the available capacity.		◆	◆	◆	
Require developers to provide financial assurances that on-site improvements are constructed and maintained to an acceptable standard.		◆		◆	
Require that all new residential and commercial structures and additions be inspected to meet applicable adopted building codes.				◆	◆
Require dilapidated residential structures to be rehabilitated, or demolished and properly disposed.					◆
Support the development of transit oriented commercial districts near interchanges and in transportation corridors to provide retail and service opportunities for Christian County residents.	◆	◆		◆	
Minimize negative impacts on agriculture operations from non-agricultural uses		◆			
Limit commercial activity within Rural Residential areas to home occupations, direct marketing of Ag products and neighborhood scale commercial services at intersections of two paved roads.		◆			
Facilitate the creation of a diverse housing stock within existing communities that caters to different household need preferences.		◆	◆	◆	
Physical Environment					
Enforce FEMA's floodplain development regulations within the 100 year floodplain.		◆			
Support and enforce the State and County stormwater and soil and erosion control policies and regulations.		◆			

ONGOING ACTIONS					
ACTION STEPS	IMPLEMENTATION RESPONSIBILITY				
	Christian County Commission	Planning & Zoning Dept.	Agencies / Municipalities	Private Developers	Health Department
Economic Goals					
Support the establishment of commercial businesses in appropriate areas as designated on the Future Land Use map.		◆	◆	◆	
Support labor force enhancement efforts that focus on education and training to attract investment and job creation within our communities.	◆		◆		
Support efforts to identify and target recruitment efforts to businesses that are complimentary to the existing industrial base	◆		◆	◆	
Public Facilities & Services Goals					
Support and enforce the individual disposal system regulations.					◆
Provide assistance to the County Health Department in providing an ongoing public awareness program on the goals and requirements of the sewage disposal regulations.		◆			◆
Encourage the establishment of special water districts in rural areas of the County impacted by the problems of groundwater contamination.	◆	◆			◆
Support efforts to rehabilitate, replace and/or upgrade failing individual and public sewage and water systems.	◆				◆
Support cooperation between school districts, the County and it's cities to help maximize the utilization of community facilities.	◆	◆	◆		
Support adequate funding levels to ensure continued quality delivery of educational and leisure resources through the Christian County Library.	◆		◆		
Actively explore options and opportunities for expanded recreational lands and facilities that can be capitalized on and made available to County residents following transition to first class status as a County.	◆	◆			

ONGOING ACTIONS					
ACTION STEPS	IMPLEMENTATION RESPONSIBILITY				
	Christian County Commission	Planning & Zoning Dept.	Agencies / Municipalities	Private Developers	Health Department
Transportation Goals					
Require traffic impact studies as part of the development applications for projects that will significantly impact street system safety and capacity.		◆		◆	
Incorporate traffic safety considerations as review elements in the land development regulations and development approval process		◆	◆	◆	
Require adequate, minimum sight distance clearances at intersections of roads and at property access points along roads in the County.		◆			
Coordinate with the Road districts to conduct a comprehensive road inventory of the County to assemble and maintain data on surfaces, widths, conditions, traffic counts and other relevant data.	◆	◆	◆		
Establish a timetable and priority list for repair and replacement of bridges in the County. Work with the Missouri Highway and Transportation Department and other appropriate governmental agencies to identify potential funding sources for bridge improvements.	◆		◆		
Community Image Goals					
Create and preserve aesthetically pleasing transportation corridors.	◆	◆	◆		
Support the incorporation of aesthetically pleasing design elements into State and Federal transportation projects within Christian County.	◆		◆		
Review development proposal impacts on the historic assets of Christian County as part of the decision making process.		◆		◆	

APPENDIX A

(Generalized Future Land Use Map Will Be Inserted Here)

APPENDIX B

SOIL SERIES GENERAL CHARACTERISTICS

Bardley series (member of mapping unit 25D, Ocie-Bardley-Gatewood complex) uplands.

Slopes range from 2 to 14 percent. Permeability is moderate. Surface runoff is medium to rapid, and available water capacity is low. The surface texture is cherty silt loam. Most areas are in woodland, with some areas used for hay and pasture.

Bolivar series (mapping unit 23B, Bolivar fine sandy loam)

The Bolivar series consists of moderately deep, well-drained soils on ridgetops on uplands. Slopes range from 2 to 14 percent. Permeability is moderate. Surface runoff is medium, and available water capacity is low. Most areas have been cleared and are used for hay and pasture. A few areas are used for row crops or are in woodland. This series is considered prime farmland.

Captina series (member of mapping unit 8B, Captina-Needley silt loams)

The Captina soils are deep, very gently sloping and well-drained soils on uplands and ridges. Captina soils are found on the top and sides of ridges. These soils have a fragipan with slow to moderate permeability. Surface runoff is medium. The soils are suited for row and small grain crops and for trees.

Cedargap series (mapping unit 93A, Cedargap cherty silt loam; member of mapping unit 92A, Cedargap-Secesh silt loams)

The Cedargap series consists of deep, well-drained soils in flood plains of small streams. Slopes range from 0 to 3 percent. Permeability is moderately rapid. Surface runoff is low, and available water capacity is moderate. Most areas are in hay and pasture, with a few areas in row crops or woodland. This series is considered prime farmland.

Clarksville series (mapping unit 45D, 45E, 45F, and 45G, Clarksville very silt loam; member of mapping unit 35D, Doniphan-Clarksville complex)

The Clarksville series consists of deep, somewhat excessively-drained soils on ridgetops and side slopes of ridges on uplands. Slopes range from 2 to 60 percent. Permeability is moderately rapid. Surface runoff is rapid, and available water capacity is low. Most areas are in woodland, with a few areas in pasture and hay in regions of less slope.

Creldon series (mapping unit 6B, Creldon silt loam)

The Creldon series consists of deep, moderately well-drained soils that have a fragipan. These soils are on broad ridgetops on uplands. Slope ranges from 1 to 4 percent. Permeability is moderate above the fragipan and low in the fragipan. Surface runoff is medium, and available water capacity is moderate. Most areas are used for hay and pasture, with some areas used for row crops. This series is considered prime farmland.

Doniphan series (member of mapping unit 35D, Doniphan-Clarksville cherty silt loams)

The Doniphan series consists of deep, well-drained soils on ridgetops on uplands. Slopes range from 2 to 14 percent. Permeability is moderate. Surface runoff is medium to rapid, and available water capacity is low. Most areas are in pasture and woodland, with a few areas in row crops.

Gasconade series (mapping unit 83G, Gasconade Rock Outcrop complex)

These soils are shallow, strongly sloping to very steep and are excessively drained. Located on broken side slopes and upland areas, these soils exhibit moderately slow permeability and rapid surface runoff. The soils are poorly suited for trees or building development.

Gatewood series (member of mapping units 24F, Gatewood-Ocie-Rock complex; and 25D, Ocie-Bardley-Gatewood complex)

The Gatewood series consists of moderately deep, moderately well-drained soils on uplands. Slopes range from 9 to 65 percent. Permeability is moderately slow. Surface runoff is rapid, and available water capacity is low. The surface texture is cherty silt loam. Most areas are in woodland, with some areas used for hay and pasture.

Goss series (mapping units 43C and 43D, Goss cherty silt loam)

The Goss series consists of deep, well-drained soils on ridgetops and side slopes on uplands. Slopes range from 2 to 20 percent. Permeability is moderate. Surface runoff is medium to rapid, and available water capacity is low. Most areas have been cleared and are used for hay and pasture. A few areas are in woodland, and a few areas on the lesser slopes are in row crops.

Huntington series (mapping unit 55A, Huntington silt loam)

The Huntington series consists of deep, well-drained soils on flood plains. Slopes range from 0 to 3 percent. These soils are subject to occasional flooding. Permeability is moderate.

Surface runoff is medium and available water capacity is very high. Most areas are used for hay and pasture, with some areas used for row crops. This series is considered prime farmland.

Needleye series (member of mapping unit 8B, Captina-Needleye silt loam)

The Needleye series consists of deep, moderately well-drained soils that have a fragipan. Needleye series soils are found in depressed areas on the top of broad ridges on uplands. Slopes range from 1 to 3 percent. Permeability is slow in the fragipan. Surface runoff is medium, and available water capacity is medium. Most areas are cleared and used for hay and pasture, with a few areas in row crops and a few areas in woodlands. This series is considered prime farmland.

Ocie series (mapping unit 22C, Ocie cherty silt loam; and member of mapping units 24F, Gatewood-Ocie-Rock outcrop and 25D, Ocie-Bardley-Gatewood complex)

The Ocie series consists of deep, moderately well-drained soils on uplands. Slopes range from 2 to 35 percent. Permeability is moderate in the upper part of the profile and slow in the lower part. Surface runoff is medium and available water capacity is low. Most areas are in woodland, with some areas in hay and pasture.

Peridge series (mapping unit 21B, Peridge silt loam)

The Peridge series consists of deep, well-drained soils on high stream terrace and on uplands around the heads and sides of drainage ways. Slopes range from 2 to 5 percent. Permeability is moderate. Surface runoff is medium to high, and available water capacity is high. Most areas are used for hay and pasture, with a few areas in woodland or used for row crops. This series is considered prime farmland.

Secesh series (member of mapping unit 92A, Cedargap-Secesh silt loams)

The Secesh series consists of deep, well-drained soils on flood plains. Slopes range from 1 to 3 percent. Permeability is moderate. Surface runoff is slow, and available water capacity is moderate. Most areas are used for hay and pasture, with a few areas in woodlands or used for row crops. This series is considered prime farmland.

Tonti series (mapping unit 81B, Tonti silt loam)

The Tonti series consists of deep, moderately well-drained soils that have a fragipan. These soils are on ridgetops and high terraces. Slopes range from 2 to 5 percent. Permeability is moderate above the fragipan and slow in the fragipan. Surface runoff is medium, and available water capacity is low. Most areas have been cleared and are used for hay and pasture, with a few areas in woodland or used for row crops.

Wilderness series (mapping unit 5C, Wilderness cherty silt loam)

The Wilderness series consists of deep, moderately well-drained soils that have a fragipan. These soils are on ridges on uplands. Slopes range from 2 to 9 percent. Permeability is moderate above the fragipan and slow in the fragipan. Surface runoff is medium, and available water capacity is low. A perched water table is at a depth of 1 to 2 feet from December to March in most years. Most areas have been cleared and are used for hay and pasture. Some areas are in woodland, with a few areas used for row crops.

Soils Features

Tables B-1 through B-3 summarizes general suitability of the soil series in Christian County for building development, on-site sewage disposal and general soils characteristics. The following terminology is used to describe the various soil limitations summarized in these tables:

Slight	Soil properties and site features are generally favorable for the indicated use. Limitations are minor and easily overcome.
Moderate	Soil properties or site features are not favorable for the indicated use. Special planning, design or maintenance is needed to overcome or minimize the limitation.
Severe	Soil properties or site features are so unfavorable or so difficult to overcome that special design; significant increases in construction costs and possible increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

TABLE B-1
SOIL AND WATER FEATURES

The symbol > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated.

Soil Name and Map Symbol	Frequency	Flooding		High Water Table		Bedrock		Risk of Corrosion			
		Duration	Months	Depth	Kind	Perched	Dec-Apr	Depth	Potential	Uncoated Concrete	Concrete
6B Crelton	None	None		1.5-3.0	Perched	Dec-Apr	>60	Moderate	High	High	High
22C Ocie	None	None		3.0-5.0	Perched	Dec-Mar	40-60	Moderate	High	High	Moderate
23B Bolivar	None	None		>6.0			20-40	Moderate	Low	Moderate	Moderate
24F Gatewood	None	None		>6.0			20-40	Moderate	High	High	Moderate
Ocie Rock outcrop.	None	None		3.0-5.0	Perched	Dec-Mar	40-60	Moderate	High	High	Moderate
25D Ocie	None	None		3.0-5.0	Perched	Dec-Mar	40-60	Moderate	High	High	Moderate
Bardley	None	None		>6.0			20-40	Moderate	Moderate	Moderate	Moderate
Gatewood	None	None		>6.0			20-40	Moderate	Moderate	Moderate	High
27D Bolivar	None	None		>6.0			20-40	Moderate	Moderate	Moderate	High
35D Doniphan	None	None		>6.0			>60	Moderate	Moderate	Moderate	High
Clarksville	None	None		>6.0			4-20	Moderate	Moderate	High	Low
45D, 45F, 45G Clarksville	None	None		>6.0			>60	Moderate	Moderate	Low	High
83G Gasconade	None	None		>6.0			4-20	Moderate	Moderate	High	Low
Rock outcrop.	None	None		>6.0				Moderate	Moderate	High	Low
94 Pits.											

Dumps

Flooding-Frequency: Occasional means flooding occurs no more than once every two years.

Flooding-Duration: Frequent Means flooding occurs more than once every two years.

Brief means two to seven days. Very Brief occurs less than two days.

High Water Table: Apparent means a thick zone of freewater in the soil.

Perched means water standing in a saturated zone of the soil above a dry zone.

TABLE B-2

BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined below.)

Soil name and Map Symbol	Shallow Excavations	Dwellings without Basements	Dwellings with Basements	Small Commercial Buildings	Local Roads and Streets	Lawns and Landscaping
6B Creldon	Severe: wetness	Moderate: wetness	Severe: shrink-swell	Moderate: wetness	Severe: low strength	Moderate: wetness
22C Ocie	Moderate: too clayey, depth to rock	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength, shrink-swell	Moderate: large stones
23B Bolivar	Moderate: depth to rock	Moderate: shrink-swell	Moderate:shrink-swell depth to rock	Moderate: shrink-swell	Moderate: low strength, shrink-swell	Moderate: thin layer
24F Gatewood	Severe: slope, depth to rock	Severe: shrink-swell, slope	Severe: shrink-swell depth to rock, slope	Severe: shrink-swell, slope	Severe: low strength, slope, shrink-swell	Severe: small stones, slope
Ocie	Severe: slope	Severe: shrink-swell, slope	Severe: shrink-swell slope	Severe: shrink-swell, slope	Severe: low strength, slope, shrink-swell	Severe: slope
Rock outcrop.						
25D Ocie	Moderate: too clayey, depth to rock, slope	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell, slope	Severe: low strength, shrink-swell	Moderate: large stones, slope
Bardley	Severe: depth to rock	Moderate: shrink-swell,	Severe: depth to rock	Severe: slope	Severe: low strength	Severe: small stones
Gatewood	Severe: depth to rock	Severe: shrink-swell	Severe: depth to rock, shrink-swell	Severe: shrink-swell, slope	Severe: low strength, shrink-swell	Moderate: large stones, slopes
27D Bolivar	Moderate: large stones, depth to rock, slope	Moderate: shrink-swell, large stones, slope	Moderate:depth to rock, slope, shrink-swell	Severe: slope	Moderate: low strength, slope, frost action	Severe: large stones
35D Doniphan	Moderate: too clayey, slope	Moderate: shrink-swell, slope	Moderate: shrink-swell, slope	Severe: slope	Severe: low strength	Severe: small stones
35D Clarksville	Moderate: too clayey, slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: frost action, slope	Severe: small stones
45D Clarksville	Moderate: too clayey, slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: frost action, slope	Severe: small stones
45F, 45G Clarksville	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope, small stones
83G Gasconade	Severe: large stones, slope, depth to rock	Severe: large stones, slope, depth to rock	Severe: large stones, slope, depth to rock	Severe: large stones, slope, depth to rock	Severe: large stones, slope, depth to rock	Severe: large stones, slope, thin layer
Rock outcrop.						
94 Pits. Dumps.						

Large stones - Rock fragments 3 inches (7.5 cm) or greater.

Shrink-swell - Expansion and contraction of clays from wetting and drying.

TABLE B-3

SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined below.)

Soil Name and Map Symbol	Septic Tank Absorption Fields	Seware Lagoon Areas	Trench Sanitary Landfill	Area Sanitary Landfill	Daily Cover for Landfill
6B Crelton	Severe: wetness, percs slowly	Moderate: slope	Severe: wetness, too clayey	Moderate: wetness	Poor: too clayey, small stones, hard to pack
22C Ocie	Severe: percs slowly, wetness	Severe: wetness	Severe: too clayey, depth to rock	Moderate: depth to rock	Poor: too clayey, hard to pack
23B Bolivar	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Poor: area reclaim
24F Gatewood	Severe: percs slowly, slope, depth to rock	Severe: depth to rock, slope	Severe: too clayey, slope, depth to rock	Severe: slope, depth to rock	Poor: too clayey, area reclaim, hard to pack
Rock outcrop.					
25D Ocie	Moderate: percs slowly, large stones	Severe: seepage	Severe: too clayey, large stones	Severe: seepage	Poor: too clayey, small stones
43D Goss	Moderate: percs slowly, slope, large stones	Severe: seepage, slope	Severe: too clayey, large stones	Severe: seepage	Poor: too clayey, small stones
44G Goss	Severe: slope	Severe: seepage, slope	Severe: slope, too clayey, large stones	Severe: seepage, slope	Poor: too clayey, small stones, slope
Gasconade	Severe: depth to rock, slope, large stones	Severe: depth of rock, large stones	Severe: depth to rock, slope, too clayey	Severe: depth to rock, slope	Poor: area reclaim, too clayey, large stones
45E Clarksville	Severe: slope	Severe: seepage, slope	Severe: seepage, slope, too clayey	Severe: seepage, slope	Poor: too clayey, small stones, slope
55A Huntington	Severe: flooding	Severe: flooding	Severe: flooding, wetness	Severe: flooding	Good
81B Tonti	Severe: percs slowly, wetness	Moderate: slope	Severe: too clayey, wetness	Moderate: wetness	Poor: hard to pack, too clayey
92A Cedargap	Severe: flooding	Severe: seepage, flooding	Severe: flooding, seepage	Severe: flooding, seepage	Poor: small stones
Seceesh	Severe: flooding	Severe: seepage, flooding	Severe: flooding, seepage	Severe: flooding, seepage	Poor: small stones
93A Cedargap	Severe: flooding	Severe: seepage, flooding	Severe: flooding, seepage	Severe: flooding, seepage	Poor: small stones

Perc slowly: slow movement of water through the soil.
 Seepage: movement of water through the soil.

APPENDIX C

EXISTING LAND USE CLASSIFICATION SYSTEM

<u>Grouping</u>	<u>Sub-grouping and Examples</u>
<u>Residential</u>	<p><u>Single Family</u> - Detached single family homes.</p> <p><u>Duplexes</u> - Two-family homes.</p> <p><u>Multi-Family</u> - Triplexes, apartments.</p> <p><u>Group Quarters</u> - Boarding houses; retirement homes; juvenile care homes.</p> <p><u>Mobile Homes</u> - Mobile homes on individual lots.</p> <p><u>Mobile Home Parks</u> - Mobile homes in a group park.</p>
<u>Commercial</u>	<p><u>General Commercial</u> - Retail and wholesale establishments selling: dairy products, bakeries, auto parts, clothing, shoes, furniture, food, appliances, drugs, liquor, hardware,, sporting goods, books, jewelry, etc.; photographic studios; beauty and barber shops; shoe repair, funeral homes; health clubs; repair services for appliances; theaters; bowling alleys; hotels and motels; restaurants; photo copy and blueprint services; other similar uses. Banks and banking services; credit agencies; real estate sales; insurance agents; title and abstract; investment offices; medical and dental labs; services such as: legal, architectural, engineering, accounting, advertising, data processing, management and other similar uses.</p> <p><u>Heavy Commercial</u> - Motor vehicle sales and service; service stations; motorcycle sales and service; laundries and dry cleaners; carpet and upholstery cleaners; motor vehicle renting; car washes; building materials; lawn and garden shops; mobile home dealers; equipment rentals; agricultural products; kennels; other similar uses.</p>

Industrial

Light Industrial - Warehouses; wholesale trade establishments; automobile auctions; truck warehouses. Production such as: clothing, lumber and paper products; professional instruments; and other similar uses.

Heavy Industrial - Production of new products such as: stone, glass, concrete and clay products; metal products; machinery and equipment; petroleum products; rubber and leather products; chemicals; ordinance; and extractive industries.

**Transportation,
Communication &
Utilities**

Transit services such as taxi, school buses; transit maintenance services; telephone; radio and television broadcasting; electric, gas, water and sanitary sewer services and facilities.

Public/Semi-Public

All public and private schools and educational services; museums; art galleries; historic sites; libraries. Government offices; public health services; post offices; job services; social service agencies. Nursing homes; convalescent homes. Churches; cemeteries; business associations; labor unions; civic organizations; political organizations.

Parks & Recreation

Parks; special activity facilities; playgrounds; gymnasiums; fairgrounds; campgrounds.

Streets & Right-of-Way

Public and private streets and rights-of-way.

Agriculture/Rural Residential

Fallow land; farming; cattle grazing and related activities; hogs and poultry production with associated single family residences.

Forest

Public and privately owned forested land with no obvious activity.

Vacant

Vacant lots in urbanized areas.

APPENDIX D

**TABLE D-1
 ---2002 - 2007--- AVERAGE ANNUAL DAILY TRAFFIC COUNTS
 Christian County, Missouri**

ROUTE	SEGMENT MILEAGE	BEGINNING SEGMENT DESCRIPTION	AADT		PERCENT CHANGE 2002 - 2007
			2002	2007	
B-65	1.341	RTE 65			
AA	2.2	BEGIN STATE CON	528	496	-6.1
AA	0.536	RTE 160	4,140	3886	-6.1
BB	2.05	RTE 176	220	222	0.9
CC	0.5	RTE 160	7,010	10386	48.2
CC	4.072	E RD SEC 36			
DD	3.454	RTE 14	158	166	5.1
EE	3.567	RTE 160	4,182	3908	-6.6
HH	2.64	RTE 160	538	664	23.4
JJ	3.5	RTE 125	1,246	1182	-5.1
JJ	0.8	MCCRACKEN			
JJ	0.224	W RD SEC 30			
KK	1.476	RTE U	340	352	3.5

MM	1.517	BEGIN STATE CONS	190	210	10.5
NN	3.01	Route 60	2,040	x	
NN	3.205	RTE J	5,300	8390	58.3
OO	2.55	RTE 14	222	298	34.2
PP	0.5	RTE 14	1,004	902	-10.2
PP	1.5	E RD SEC 36			
UU	0.54	DOUGLAS CO LINE	174	x	
UU	2.16	RTE T S JCT	168	98	-41.7
UU	1.2	W RD SEC 29			
UU	4.5	E RD SEC 32			
UU	2.553	E RD SEC 20			
VV	1.006	GREENE CO LINE	996	1278	28.3
ZZ	1	GREENE CO LINE	1,162	1364	17.4
ZZ	1.9	W RD SEC 2-35			
ZZ	0.9	W RD SEC 3-10			
ZZ	0.7	E RD SEC 10			
ZZ	0.987	W RD SEC 9-16			
A	0.677	RTE 65	362	x	
F	3.025	BEGIN STATE CON	1,256	1014	-19.3
H	2.6	RTE 125	500	398	-20.4
H	7.294	W RD SEC 2			
J	0.567	RTE 65	7,876	14772	87.6
K	0.6	RTE 14	4,042	5660	40.0
K	0.4	SW RD IN CLEVER			
K	2.454	S RD SEC 29			
M	0.8	STONE CO LINE			
M	3.071	NW RD SEC 33			
N	4.045	RTE 14	1,128	1440	27.7

O	3.375	STONE CO LINE				
P	3	GREENE CO LINE		4376		
P	1.307	E RD SEC 28				
T	3.1	RTE 125	480	526	9.6	
T	2.7	N RD SEC 11				
T	3.71	RTE DD	502	552	10.0	
T	0.64	RTE UU N JCT	454	x		
T	0.107	RTE UU S JCT	538	506	-5.9	
U	3.141	RTE 125	454	522	15.0	
U	1.859	RTE VV	426	742	74.2	
U	1	S RD SEC 5				
U	2.99	S RD SEC 4				
U	0.284	RTE KK	1,110	1168	5.2	
V	2.283	STONE CO LINE	582	546	-6.2	
W	0.25	BEGIN STATE CON	2,448	x		
W	3.25	RTE 14	2,682	2868	6.9	
W	1.4	W RD SEC 13				
W	0.7	CHRISTIAN CENTER				
W	2.686	E RD SEC 19				
Z	3.372	BEGIN STATE CON	208	174	-16.3	
13	3.914	RTE 60	2,404	2836	18.0	
14	1.51	LAWRENCE CO LINE				
14	0.99	RTE MM	886	882	-0.5	
14	0.222	W C-L BILLINGS				
14	6.098	RTE 60 N JCT	1,718	1919	11.7	
14	1.51	RTE K-P	2,562	2863	11.7	
14	2.58	RTE ZZ	3,000	3348	11.6	
14	4.33	RTE N	3,960	4423	11.7	

14	1.32	RTE M	7,114	x	
14	4.76	RTE 160	11,574	11909	2.9
14	1.01	RTE 65	16,544	19010	14.9
14	1.64	RTE NN	19,028	18678	-1.8
14	1.72	BUS 65	15,868	16594	4.6
14	0.88	RTE W	8,150	12326	51.2
14	2.02	RTE JJ	5,804	8776	51.2
14	2.01	RTE OO	5,190	7846	51.2
14	0.26	RTE 125 W JCT	6,108	9234	51.2
14	0.44	RTE PP	4,380	6626	51.3
14	7.36	RTE 125 E JCT	3,718	3104	-16.5
14	0.54	RTE DD	1,828	x	
14	2.598	RTE Z	1,564	1528	-2.3
60	3.13	LAWRENCE C/L	10,088	10826	7.3
60	0.96	RTE 13	12,426	12676	2.0
60	0.61	RTE 14 S JCT	15,261	15514	1.7
60	0.3	RTE 14 N JCT	15,094	14508	-3.9
60	2.811	N C-L BILLINGS			
65 SB	1.5	GREENE CO LINE	21,985	25454	15.8
65 NB	1.5	GREENE CO LINE	20,180	23903	18.4
65 SB	3.28	RTE CC-J	15,309	18936	23.7
65 NB	3.28	RTE CC-J	15,074	19796	31.3
65 SB	1.42	RTE 14	14,727	18512	25.7
65 NB	1.42	RTE 14	14,070	17741	26.1
65 SB	3.726	RTE F	10,598	12469	17.7
65 NB	3.726	RTE F	10,997	11576	5.3
65	7.27	RTE EE	17,724	22298	25.8
65		END DIV PAV	17,714	x	

65	2.11	RTE BB-A	17,451	21966	25.9
125	0.5	GREENE CO LINE			
125	1	SW RD SEC 33			
125	2.1	RTE U	1,790	3733	108.5
125	2.3	RTE JJ	786	2376	202.3
125	1.7	WRD SEC 23			
125	0.413	N C-L SPARTA			
125	2.687	RTE 14 E JCT	3,022	3130	3.6
125	3.4	RTE T	2,066	2142	3.7
125	1.56	CHADWICK			
125	8.34	RTE H	686	472	-31.2
125	2.89	SE RD SEC 34			
125	1.911	RTE UU	664	456	-31.3
160 EB	0.25	GREENE CO LINE			
160 WB	0.25	GREENE CO LINE			
160 EB	0.49	RTE AA	10,953	14267	30.3
160 WB	0.49	RTE AA	10,953	14443	31.9
160 EB	2.799	RTE CC	9,636	12554	30.3
160 WB	2.799	RTE CC	9,636	12709	31.9
160 EB	0.259	RTE 14	6,853	7386	7.8
160 WB	0.259	RTE 14	6,853	7236	5.6
160	0.302	END DIV PAV	10,776	11489	6.6
160	3.3	S C-L NIXA			
160	0.654	RTE EE	9,838	7574	-23.0
160	1.192	RTE O	7,722	5946	-23.0
160	1.299	RTE HH	7,116	5478	-23.0
160	2.042	RTE V	8,232	6340	-23.0
160	2.614	RTE 176 N JCT	8,482	x	

160	0.975	RTE 176 S JCT	6,766	6528	-3.5
176	0.368	STONE CO LINE			
176	3.417	RTE 160 N JCT	758	580	-23.5
176	2.4	RTE BB	658	690	4.9

Source: Missouri Department of Transportation.

*A Actual Count

*B Revised Count (based on growth factor formula).

All other counts are estimated projections for 1991.

APPENDIX E

LAND USE SPACE ALLOCATION FORMULAS

This appendix provides space allocation formulas used in determining future acreage requirements in the Land Use element of the Comprehensive Plan. The specific formulas and assumptions applied to arrive at acreage needs for residential, industrial and commercial developments in the unincorporated portions of the County are noted below.

Residential Development Requirements

1. Past editions of the Christian County Comprehensive Plan operated on the assumption that 60% of future population growth would occur in the unincorporated (rural) portions of the County. Recent census data shows that from the years 2000 - 2007, 76.5% of the County's growth has occurred in what are now incorporated areas. This statistic and the concept it represents is a number that is difficult to define due to the fact that much of this development originated in the unincorporated County but was then later annexed into the jurisdiction of one of the various municipalities. For this reason we will now look at future land use needs on an aggregate basis for the County as a whole and no longer from a rural / urban perspective.

2.	<i>Projected Year 2020 Population</i>	<i>107,318</i>
	<i>- 2007 Population</i>	<i>- 73,066</i>
	<i>Additional Year 2020 Population</i>	<i>34,252</i>
	<i>Projected Year 2030 Population</i>	<i>131,066</i>
	<i>- 2007 Population</i>	<i>- 73,066</i>
	<i>Additional Year 2030 Population</i>	<i>58,000</i>

4. Assume 90% of new population to reside in single family dwellings, 10% in multiple family dwellings.

$$.90(34,252) = 30,827 \text{ Additional Population in Single Family Dwellings in Year 2020}$$

$$.10(34,252) = 3,425 \text{ Additional Population in Multiple Family Dwellings in Year 2020}$$

$$.90(58,000) = 52,200 \text{ Additional Population in Single Family}$$

Dwellings in Year 2030

*.10(58,000) = 5,800 Additional Population in Multiple Family
Dwellings in Year 2030*

5. Assume average household size of 2.62 persons for single-family dwellings and 1.8 persons for multiple family dwellings.

Additional Population = Additional Single Family Dwellings
Average H.H. Size

$\frac{30,827}{2.62} = 11,766$ Additional Single Family Dwellings-Year 2020

$\frac{52,200}{2.62} = 19,924$ Additional Single Family Dwellings-Year 2030

$\frac{3,425}{1.8} = 1,903$ Additional Multiple Family Dwellings-Year 2020

$\frac{5,800}{1.8} = 3,222$ Additional Multiple Family Dwellings-Year 2030

6. *Total Additional Dwellings Year 2020 = 13,669*

Total Additional Dwellings Year 2030 = 23,146

7. Project 85% of dwelling units at density of 1 d.u./5 acres and 15% of dwelling units at density of 1 d.u./acre.

$.85(13,669) \times 5 = 58,093$ acres

$.15(13,669) = 2,050$ acres

Total Additional Residential Acres Year 2020 = 60,143 acres

$.85(23,146) \times 5 = 98,370$ acres

$.15(23,146) = 3,472$ acres

Total Additional Residential Acres Year 2030 = 101,842 acres

Commercial Development Requirements

1. Future commercial acreage requirements are projected on the basis of 1,000 square feet of commercial space for every person added to the population. This formula is based on acreage requirements to serve the local population. Commercial activity designed to draw and serve customers from outside the local area, such as tourists, would require additional space allocation.

2. Projected Year 2020 Additional Population = 34,252
 $34,252(1,000) = 34,252,000 \text{ sq. ft.} = 786 \text{ Acres}$
786 Acres Additional Commercial Land by Year 2020

3. Projected Year 2030 Additional Population = 58,000
 $58,000(1,000) = 58,000,000 \text{ sq. ft.} = 1331 \text{ Acres}$
1331 Acres Additional Commercial Land by Year 2030

Industrial Development Requirements

1. Future industrial space requirements are projected on the basis of 12 acres per 1,000 additional residents. The following requirement is projected 20 years into the future (2020-2030) as industrial activity has specific site location requirements that necessitate reserving appropriate space for a longer time period.

2. Projected Year 2030 Additional Rural Population = 34,252
 $(58,000/1000) \times 12 \text{ (20 year requirement)} = 696 \text{ Acres}$
696 Additional Acres Industrial Land by Year 2030

APPENDIX F

Citizen Survey

Please rate the **importance** of the following criteria based on residential location preferences. The question you are being asked to address is how important it is to you personally to live in an area with these things nearby and not whether they are at this time. *Accessibility* in this case means the ease with which the following attractions or opportunities can be reached from your home. Please circle the level importance for each question based on the following scale:

- 5) Highly Important
- 4) Very important
- 3) Important
- 2) Somewhat Important
- 1) Not Important

1. Accessibility to employment

5 4 3 2 1

2. Accessibility to schools and or daycare

5 4 3 2 1

3. Accessibility to shopping centers

5 4 3 2 1

4. Accessibility to parks and recreation

5 4 3 2 1

5. Accessibility to health care services

5 4 3 2 1

6. Accessibility to public transport or multi-use trails

5 4 3 2 1

7. Proximity to emergency services; fire stations, police, emergency rooms, etc.

5 4 3 2 1

8. Proximity to public utilities; sanitary sewer, water, etc.

5 4 3 2 1

9. Land values, home price and age of structure

5 4 3 2 1

Please take a moment to answer a few more short questions

Number of persons in your household? _____

Number of school age children or otherwise dependent persons in your household? _____

Number of vehicles available? _____

Do you work or have been most recently employed in Christian County?

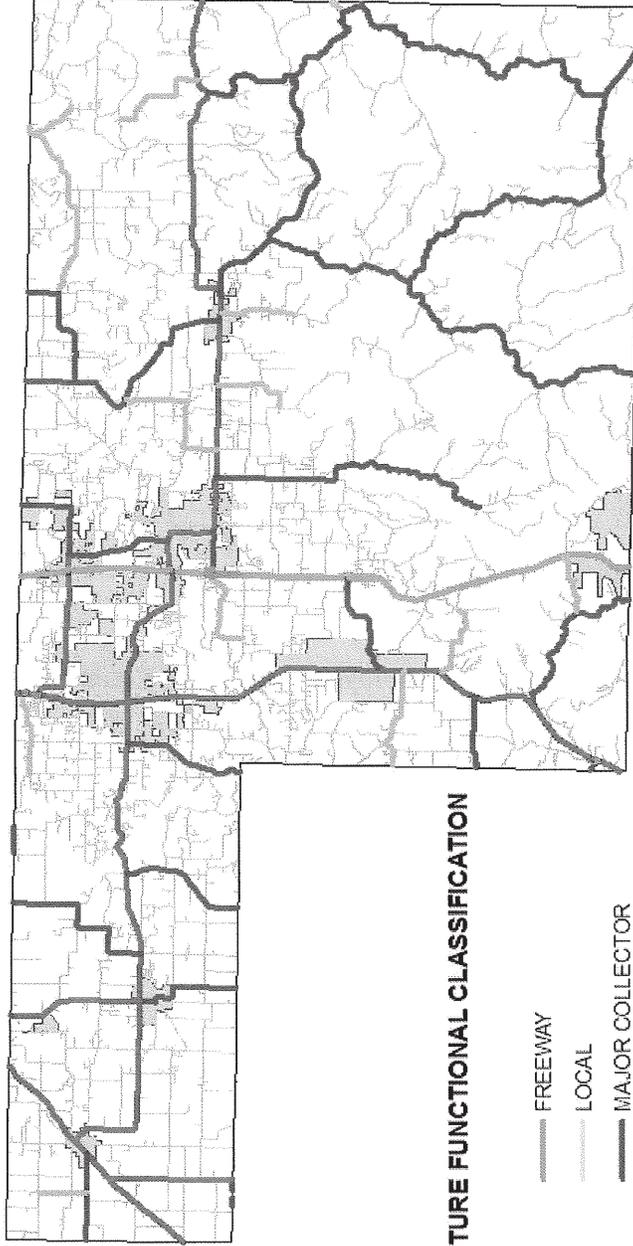
Yes / No

If no, in which county do you currently work or have been most recently employed?

That's it, you're finished. Thank you very much for taking the time to help us. It is greatly appreciated.

APPENDIX G

Christian County Major Thoroughfare Plan



FUTURE FUNCTIONAL CLASSIFICATION

- FREEWAY
- LOCAL
- MAJOR COLLECTOR
- MINOR ARTERIAL
- MINOR COLLECTOR
- PRINCIPAL ARTERIAL

GLOSSARY

Aquifer - A rock formation or group of formations that contains sufficient saturated, permeable material to yield quantities of water to wells and springs.

Average Daily Traffic (ADT) - The total traffic volume during a given time period, in whole days greater than a day and less than a year, divided by the number of days in the time period.

Flood (100-Year) - A base flood having one percent chance of annual occurrence.

Floodplain - Low-lying region along rivers and streams, periodically subject to natural flooding.

Floodway - The channel of a river or other watercourse and the adjacent portion of the floodplain required to discharge the 100-year flood without cumulatively increasing the water surface elevation more than one foot.

Fragipan - An often hard and impervious layer beneath the surface soil. A fragipan appears cemented and restricts root penetration and the downward percolation of surface waters. When moist, it tends to rupture suddenly under pressure.

Karst Topography - The relief of an area underlain by calcium-rich limestones and dolomite bedrock. Surface waters, entering the bedrock through fractures and joints, dissolve the calcium in the bedrock, resulting in the formation of sinkholes, caves and other underground features which connect the surface water with the groundwater.

Loess - Fine grained silt materials deposited by wind.

Losing Stream - A stream which loses its water to the underlying groundwater system in areas of karst topography.

Metropolitan Statistical Area - A city of 50,000 or more people, including the suburbs of the city and the surrounding economic area. The Springfield MSA includes Greene and Christian Counties.

Percolation - The downward flow or infiltration of water through the pores of rock or soil.

Pollutant - Any gas, liquid or solid introduced into an environment that makes a resource unfit for a specific purpose.

Porosity - A measure of the space between the grains or cracks in soil and rock that can fill with water.

Runoff - The precipitation discharged into stream channels from an area. Water that flows off the land without sinking into the soil is called surface runoff.

Septic System - An underground system using a septic tank for the decomposition of domestic wastes.

Sinkhole - A steep depression in the landscape, normally associated with karst topography, where the underlying limestone bedrock has been dissolved.

Slope - The inclination of the land surface from horizontal.

Soil Permeability - The ability of the soil to transmit groundwater or other fluids through pores and cracks.

Soil Series - A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils have horizons that are similar in composition, thickness and arrangement.

Transportation System Management Improvements (TSM) - Non-structural improvements to a transportation system to ease congestion and improve upon the movement of traffic. Examples: ride-share programs, one-way streets, traffic signal improvements, bicycle paths, pedestrian separation, etc.

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