CHAPTER 5: PUBLIC UTILITIES

I. INTRODUCTION

There are three main reasons for investing in utility infrastructure: to provide a safe, sufficient water supply, to treat wastewater to protect the environment and to effectively manage storm water. In addition to these basic needs, the City of Fairfield faces the continuing challenge of rehabilitating and repairing existing infrastructure as well as replacing aging lines. The City provides sanitary sewer, potable drinking water and drainage facilities in accordance with federal, state and local regulations. Public utilities are owned and operated by the City for the benefit of the community.

II. PUBLIC WATER FACILITIES AND SERVICE

The City of Fairfield's water system serves City residents and businesses as well as limited areas in adjoining West Chester Township and the City of Hamilton. The water system serves the entire City, with the exception of limited areas north of Symmes Road and within the Muhlhauser Road corridor, as indicated in Figure 5.1. The City has reciprocity with both the City of Hamilton and Butler County, separately, via long-term inter-governmental cooperation agreements. The City does not have any plans to expand service into these areas due to the financial impact associated with installing the water lines.

Ninety percent of the customers who receive water from Fairfield are residents while the remaining ten percent are comprised of the commercial/industrial businesses. Scattered throughout the City are between 50 - 100 residences on private wells. Once the wells are no longer operational, the property owner is required to connect to the public water system.

The City's water distribution system sends water through a network of mains and service lines throughout the City, including nearly 175 miles of water main, 2,288 fire hydrants and 2,394 main valves. Three booster stations are used to help move water throughout the City so as to provide adequate water pressure to consumers. The City's water storage capacity is seven (7) million gallons of water located in five (5) water tanks scattered throughout the community .

1.0 Drinking Water Supply and Quality

The City of Fairfield receives its water supply from the Great Miami Buried Valley Aquifer (GMBVA), a regionally extensive groundwater aquifer system that provides drinking water throughout central and southwest Ohio. The aquifer is designated as a sole source under the federal Safe Drinking Water Act signifying a protection status as a valued natural resource. Utilizing six deep wells, 1.4 billion gallons of water is pumped annually to the City's water plant for treatment. Capitalizing on the

close proximity to the GMBVA, the Cities of Hamilton and Cincinnati have well fields and water treatment plants within the City limits as well.

To ensure water quality and protection, the aquifer is monitored by the Hamilton to New Baltimore Groundwater Consortium, a multi-jurisdictional body that ensures the quality of the water in the aquifer. In addition, a Source Water Protection Program is in place in conjunction with the Cities of Hamilton and Cincinnati along with other local water purveyors to safeguard the GMBVA from contaminants. The City and the Consortium have worked hard to develop and implement a comprehensive Source Water Protection Plan to prevent contamination from impacting the aquifer. The Source Water Protection Program protects the health of people who use groundwater as a public drinking water source by providing protection zones around public wells to prevent, detect and remediate groundwater contamination. Development within these zones is regulated for the protection of groundwater and restrictions are placed on new businesses that have a high pollution risk potential.

The Fairfield Water Division monitors water quality in compliance with state and federal laws. The contaminant level standards set by the City are based on the National Primary Drinking Water Regulations in conjunction with the Safe Drinking Water Act. The city practices a more rigorous testing program than required by the Environmental Protection Agency for any detected contaminant in an effort to provide quality drinking water to its citizens. If contaminated, groundwater can remain unusable for many years.

Gravel mining operations in southwest Butler County will continue to be monitored to avoid any possible contamination to the ground water.

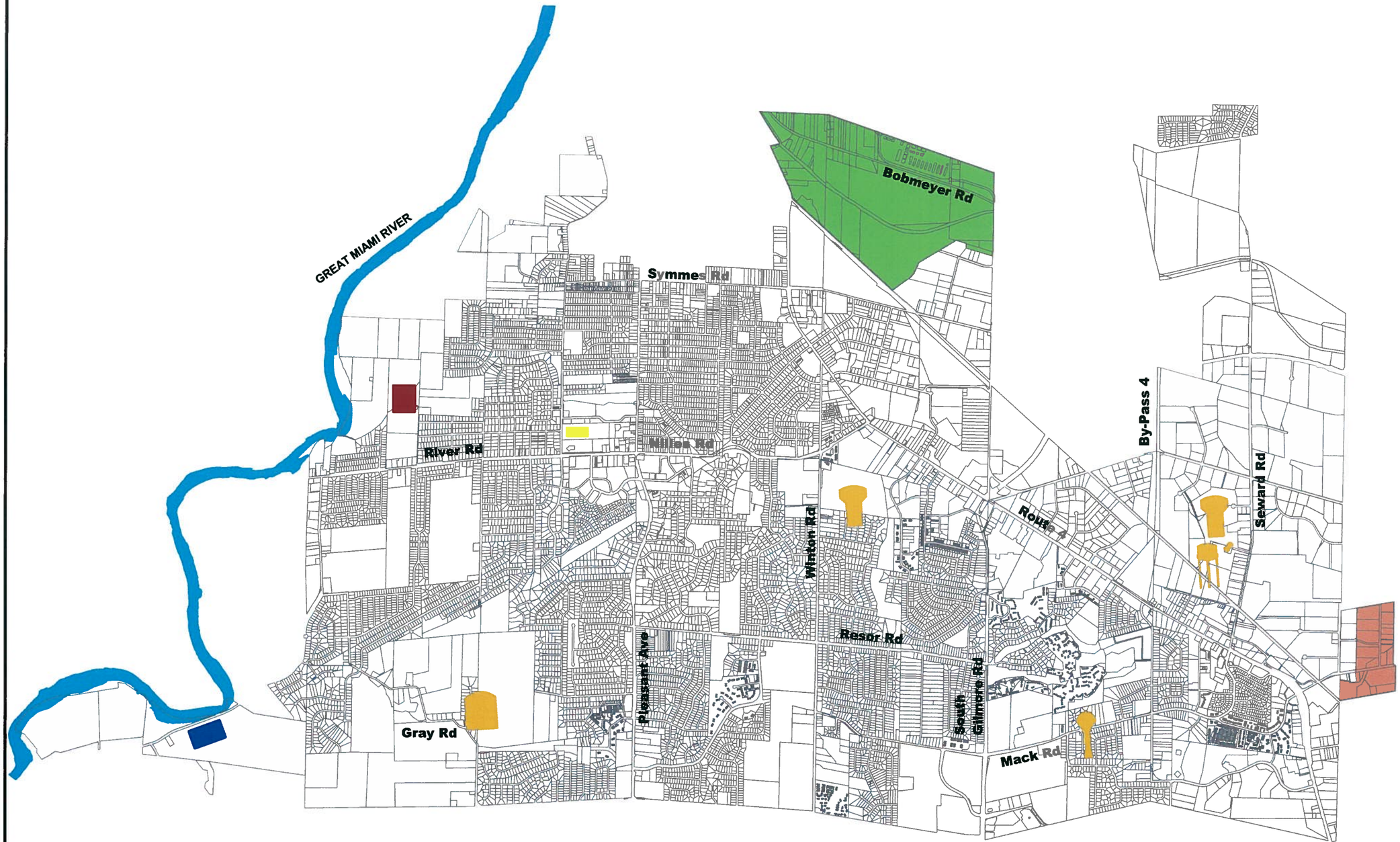
2.0 Water Treatment Facility

The City's water treatment plant is designed to pump raw water from wells and produce a consistently high quality finished water. The average daily production is 5.2 million gallons per day. However, during the summer season this typically increases just over 50% due to irrigation. The plant has a design capacity of 9 million gallons per day, which means it will not be necessary to perform any major expansions to the water plant. Due to the fact that water treatment plants in general consistently demonstrate that actual capacity is substantially greater because very strict and conservative engineering standards are used for the design rating, the City will go through a re-rating study that could expand the rated capacity to over 12 million gallons per day. This re-rating is anticipated to be sufficient to meet the future needs of the City.

In addition, the City is environmentally conscious in the disposal of its by-products. Lime residue, which is a by-product of the water softening process, is transported off-site for agricultural fertilization in lieu of sending it to a landfill.

3.0 Future Improvements to the Water System

The focus of Fairfield's water system is and will continue to be maintenance and replacement of existing water lines. The City is taking a pro-active approach to replacing



FAIRFIELD, OHIO
19 55
City Of Opportunity

WATER SERVICE TERRITORIES (2010)

Legend

- CITY OF FAIRFIELD SERVICE AREA
- BUTLER COUNTY SERVICE AREA
- CITY OF HAMILTON SERVICE AREA
- FAIRFIELD WATER TANK
- CITY OF FAIRFIELD WATER PLANT
- CITY OF HAMILTON WATER PLANT
- CITY OF CINCINNATI BOLTEN WATER PLANT

N
W E
S

0.00 0.25 0.50 0.75 1.00
Miles

City of Fairfield
Development Services
5350 Pleasant Ave
Fairfield, Ohio 45014
(513) 867-5345
www.fairfield-city.org

COMPREHENSIVE PLAN

outdated, aging public mains via a critical needs assessment. In addition, the City has had difficulties moving large volumes of water across town from the water treatment plant east to businesses in the Seward Road area. A new interceptor line will need to be constructed to correct this problem.

The City maintains, as part of its long and short term planning efforts, a comprehensive water modeling program for the water distribution system. The model, Info Water, is an example of state-of-the-art technology which allows the City to evaluate the performance of the water distribution system. This also allows the City to determine the potential impact of new connections and assurance that fire fighting capacities are sufficient to meet expected demands. And, just as importantly, it allows the City to carefully evaluate the investment of capital resources to ensure that funding is directed in an effective and efficient manner.

III. PUBLIC WASTEWATER FACILITIES AND SERVICE (Sanitary Sewers)

The City of Fairfield owns and operates a wastewater system that serves City residents and businesses as well as limited areas in adjoining West Chester Township and the City of Hamilton. Fairfield's wastewater system, which is made up of 173 miles of sanitary sewers, serves the entire City with the exception of a limited area just south of the Butler County Regional Airport. In addition, parcels located east of State Route Bypass 4 in the industrial section of Fairfield, receive wastewater treatment service from Butler County, but the responsibility of the repair, maintenance and replacement of the collection system is the responsibility of Fairfield. See Figure 5.2. The City does not have any plans to take over this service due to the high costs and possible operational problems of pumping wastewater across town, however, it may be appropriate to explore treating waste water from the industrial area east of State Route By-Pass 4 that is currently being treated by Butler County. This will allow for a possible reduction in rates, which will help Fairfield remain competitive in attracting new businesses.

Individual septic systems are scattered throughout the City, most of which are located in the western portion of the community in areas that do not have access to public infrastructure and is largely undeveloped. These systems are regulated and monitored by the Butler County Health Department. Property owners with existing systems are required to access public sewers in lieu of completing any major repairs. In addition, the requirements for a new system set by the Health Department are very stringent and costly, which will encourage all new developments to access public sewers. An engineering study (Gray Road Corridor Study) has been conducted to develop a concept plan that delineates the best layout options for sewer collection services in this underserved area. It will help the City to determine the maximum number of residential dwellings that can be constructed based on existing capacity.

1.0 Wastewater Treatment Plant

The City's Wastewater Treatment Plant processes an average of 5.4 million gallons of wastewater a day. This average represents nearly a 13% decline in wastewater flow continuing a 15 year trend in reductions due to an ongoing effort to eliminate

ground water infiltration and rainwater into sewer lines. The treated water is discharged into the Great Miami River and the remaining organic solid waste is used as fertilizer in agricultural land application programs.

In order to reduce capacity, the City discourages the discharge of any storm water, surface water, ground water, roof run-off, subsurface drainage, cooling water or unpolluted industrial process water in to any sanitary sewer in the City. In addition, the City of Fairfield does not allow discharge to a public sewer any wastewater containing pollutants of such character or quantity that will not be susceptible to treatment or interfere with the process of collection and treatment systems; to constitute a hazard to human or animal life; or to the water course receiving the treatment plant effluent; nor cause the treatment plant to violate its National Pollutant Discharge Elimination system (NPDES) permit.

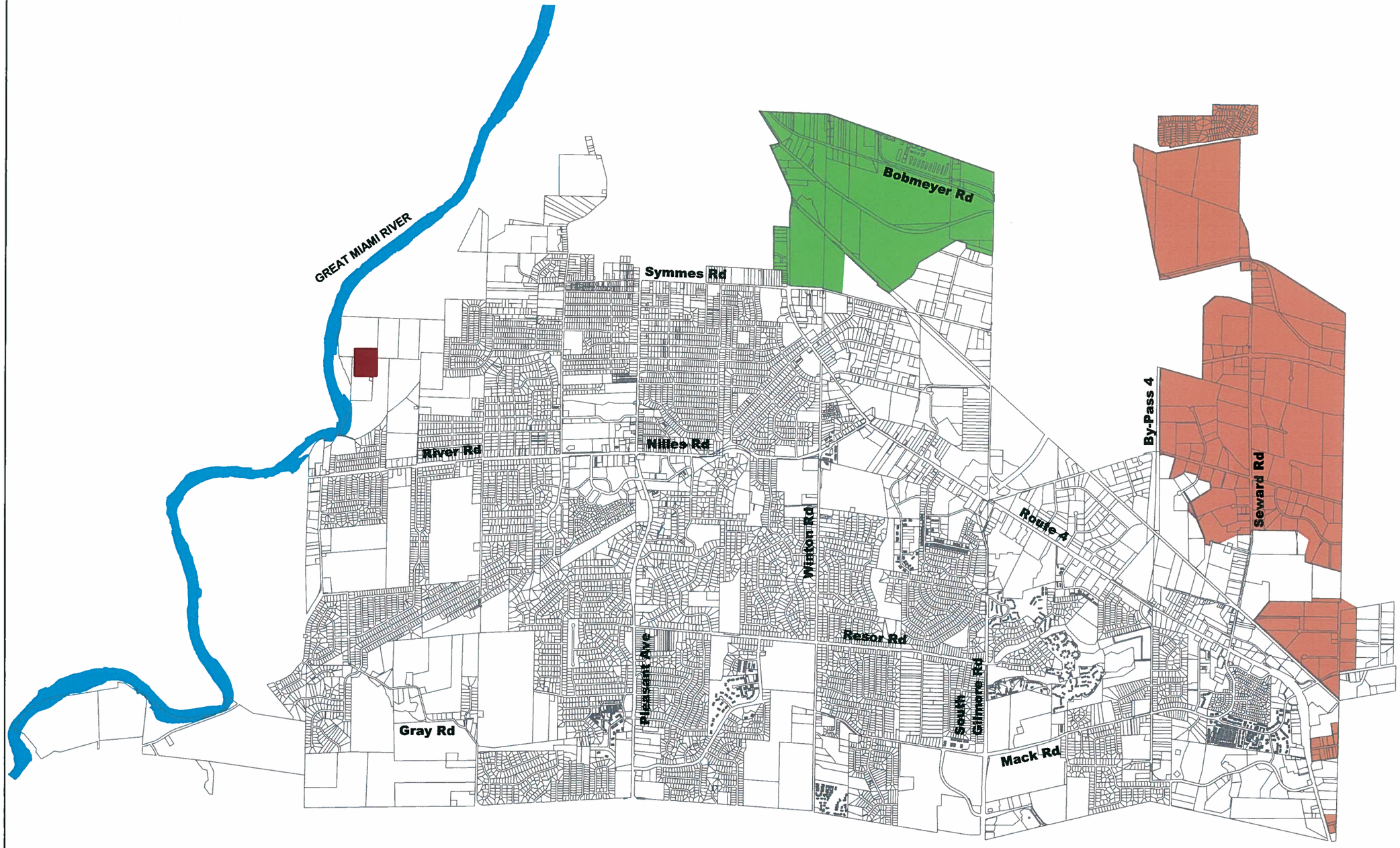
Since the original wastewater treatment plant was completed in 1967, Fairfield has continued to expand and modernize its wastewater treatment processes. The current plant operates at 50% capacity, but increases during wet weather flow due to extraneous storm water. A wet weather relief pump station was constructed in 1996 to address inflow and infiltration during heavy rains. The City does not foresee the necessity to make any major improvements to the facility to accommodate future development.

2.0 Planned Improvements to the Sewer System

The many existing sewer lines in Fairfield are 42 years old and need on-going maintenance, repair or replacement. There are two programs the City implements to monitor the conditions and maintenance of the sewer mains. The Sanitary Sewer Inspection Program, which visually inspects the wastewater collection infrastructure and the Closed Circuit Television Inspection Program, which identifies potential problems such as roots and cracks in the sewer mains. The goal of the City is to provide this inspection every ten years and to clean the mains every five years. The City's sewer maintenance and repair programs are included in the Capital Improvement Program.

The City maintains, as part of its long and short term planning efforts and on-going maintenance program, a comprehensive sewer modeling program for the wastewater collection system. The model, XPSWMM, is an example of state-of-the-art technology which allows the City to evaluate the performance of the collection system and identify potential problem areas. This also allows the City to determine the potential impact of new connections and additional source of wastewater discharge. And, just as important, it allows the City to carefully evaluate the investment of capital resources to ensure that funding is directed in an effective and efficient manner.

In addition, the City will investigate and consider necessary improvements to the sanitary sewer facilities recommended in the Gray Road Corridor Study such as the necessity to upgrade the Lake Manor sewage pump station.



WASTEWATER SERVICE TERRITORIES (2010)

Legend

- CITY OF FAIRFIELD SERVICE AREA
- BUTLER COUNTY SERVICE AREA
- CITY OF HAMILTON SERVICE AREA
- FAIRFIELD WASTEWATER TREATMENT PLANT

N
W E
S

0.00 0.25 0.50 0.75 1.00
Miles

City of Fairfield
Development Services
5350 Pleasant Ave
Fairfield, Ohio 45014
(513) 867-5345
www.fairfield-city.org

COMPREHENSIVE PLAN

IV. STORM WATER MANAGEMENT/ STORM WATER DRAINAGE

Fairfield receives about 41 inches of precipitation annually. This water either soaks into the ground (infiltration) or flows over land to creeks, streams or ponds (storm water runoff). Storm water run-off is that portion of rainfall that is not lost to infiltration, surface storage or evaporation. Most of the runoff in Fairfield flows to Pleasant Run Creek, which eventually leads to the Great Miami River. The runoff in the eastern portion of the City flows to the Mill Creek. In addition to managing the storm water produced in Fairfield, the City also receives runoff from northern Hamilton County due to the formation of the natural watershed. This storm water flows into Pleasant Run Creek.

1.0 Detention

The impact of development changes the natural flow of storm water. Constructing new buildings, parking lots, driveways and streets in areas that used to be natural land reduces infiltration and increases storm water runoff, which leads to higher flows in area streams. To reduce this effect, the City of Fairfield requires that detention/ retention facilities be constructed with all new development projects. See Figure 5.3. The objective of detention facilities is to regulate run-off from a rainfall and to control discharge to downstream areas in order to reduce the impact on downstream drainage systems. These facilities temporarily detain storm water runoff and gradually release it through a designed outlet structure at an acceptable rate. In Fairfield, a separate storm sewer system is typically constructed when new streets, subdivisions and commercial sites are developed. The storm sewer collection system eventually discharges to a swale, stream, river or another surface water body.

Fairfield requires on-site detention/retention facilities for all new development and redevelopment projects that result in an increased amount of impervious surface. A detention basin is a dry surface area and a retention basin is a permanent pond where additional storage capacity is provided above the normal water level. City ordinances require that the construction of these facilities reduce a 100 year post-development peak flow rate from new development to a two year pre-developed level. The storm water quality benefits of the detention/retention facilities include the reduction of peak flows, which can erode stream channels and the pollutant removal characteristic of retention ponds. The City has two regional detention basins it maintains and 42 residential basins that it maintains for non-routine maintenance such as the repair or replacement of damaged structural components.

2.0 Drywell System

Fairfield has an extensive service of drywells used for storm water collection located in the northwest section of the City. These are subsurface structures that receive storm water run-off and allow it to infiltrate into surrounding soils and directly into the groundwater. There is no discharge to a stream or other surface water body. Throughout the northwest portion of the City the topography is flat and soils are laden with gravel, which presents ideal conditions for storm water runoff to percolate into the ground and

eventually to the aquifer where the City and surrounding communities obtain their drinking water. The City of Fairfield manages its drywell system through a routine maintenance program.

3.0 Storm Water Pollution

When it rains, thousands of gallons of water enters Fairfield's storm sewer system. As the runoff flows across lawns, driveways, parking lots and streets, it collects pollutants such as used motor oil, paint, pesticides, fertilizers, litter and other wastes. Since storm water is naturally channeled to streams, rivers or the underground aquifer, there is no opportunity for treatment to remove pollution. If left unmanaged, this runoff can change both water quality and quantity, affecting waterways physically, chemically and biologically.

Fairfield's Storm Water Quality Management Plan is designed to reduce the pollution and damage caused by storm water runoff. It follows and meets the guidelines of the National Pollutant Discharge Elimination System (NPDES) Phase II Storm Water Program. This program requires local communities to institute control measures and implement "best management practices" to reduce storm water pollution in order to improve the water quality of streams, lakes and other surface waters. Efforts the City has implemented to help manage storm water quality include street sweeping, catch basin cleaning, leaf and brush pick up, controlling construction site erosion, regulating development within the City's source water protection zone and inspecting the storm sewer system to find and eliminate pollution sources.

The Source Water Protection Program provides storm water quality benefits because it addresses a number of potential pollution sources such as hazardous material spills and operations that use hazardous materials.

V. GOALS, OBJECTIVES AND POLICIES

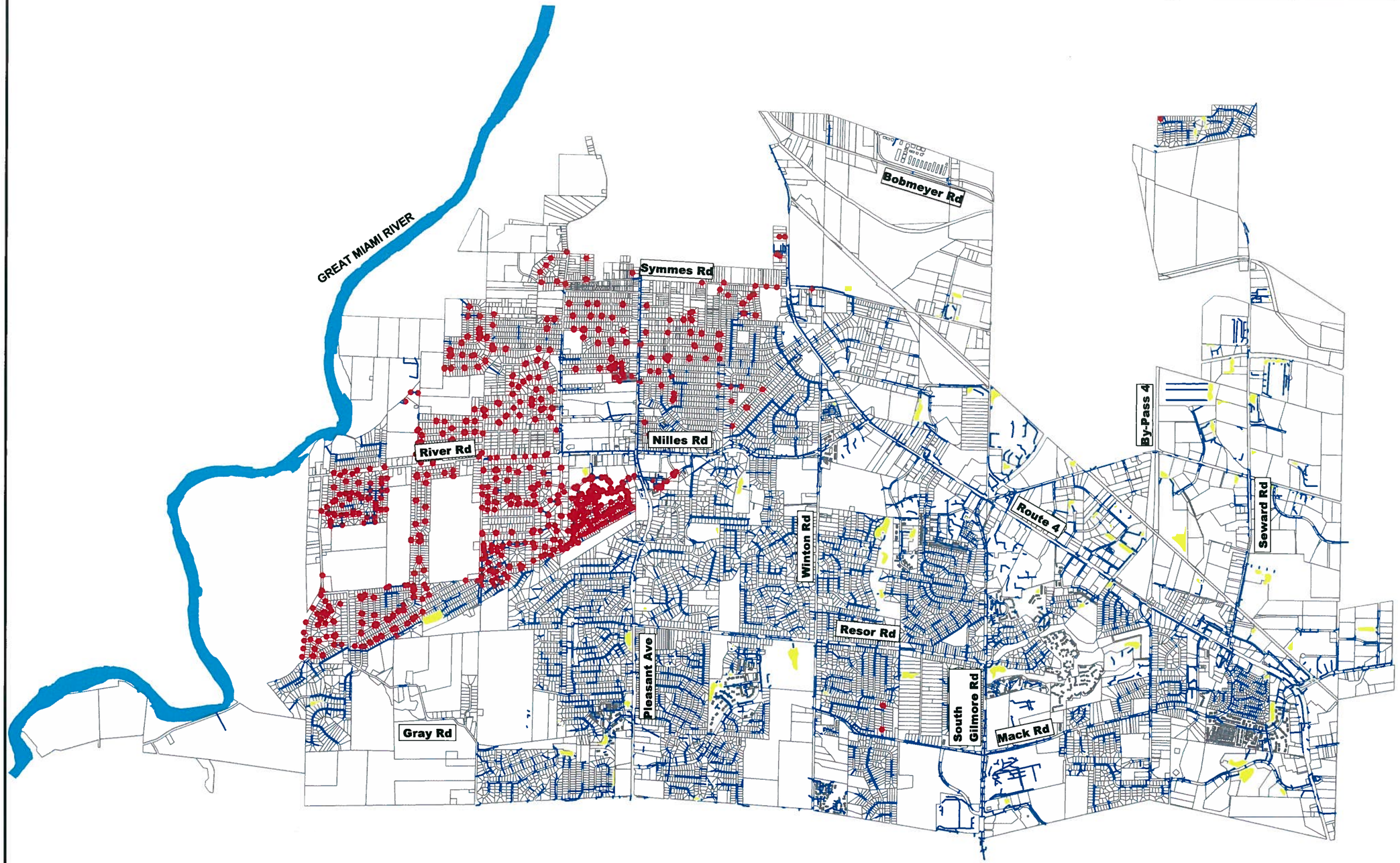
The following goal, objectives and policies provide a basic framework for all utility decisions that are either owned or managed by the City of Fairfield.

1.0 Goal: The City will provide and maintain a high quality, cost-effective, energy and resource efficient public water supply, public wastewater treatment and storm water management systems.

Objectives and Policies for Water Supply

Objective 1: Provide and maintain an adequate supply of safe water for drinking and fire protection, with quality service at a reasonable rate.

Policy 1: Extend Fairfield water service connections to areas that are not served in Fairfield at the feasible time.



FAIRFIELD, OHIO 19 55 City Of Opportunity

STORM DRAINAGE SYSTEM (2010)

Legend

- DRYWELL
- DETENTION BASIN
- STORM MAIN

N
W E
S

0.00 0.25 0.50 0.75 1.00
Miles

City of Fairfield
Development Services
5350 Pleasant Ave
Fairfield, Ohio 45014
(513) 867-5345
www.fairfield-city.org

COMPREHENSIVE PLAN

Policy 2: Meet all of the requirements of the Safe Drinking Water Act as administered by the United States Environmental Protection Agency (USEPA).

Policy 3: Strictly enforce the provision of the Source Water Protection Program to protect the groundwater from contamination.

Policy 4: Ensure adequate capacity for both domestic uses and for fire suppression, for future development by conducting a re-rating study to expand the capacity of the water treatment plant and water distribution system.

Objectives and Policies for Sanitary Sewer Service

Objective 2: Protect the public health and environment by providing exceptional wastewater collection, treatment and related services to the City of Fairfield in a well-planned and cost-effective manner.

Policy 1: Provide and maintain wastewater collection and treatment services.

Policy 2: Extend Fairfield sanitary sewer services to areas that are not served by Fairfield at the feasible time.

Policy 3: In order to increase capacity at the wastewater treatment plant, study and implement ways to decrease inflow and infiltration.

Policy 4: Recruit and retain businesses that are environmentally sensitive and practice "green" processes of waste management, including pre-treatment of waste stream.

Objective 3: Expand the public sanitary sewer facilities necessary to accommodate the growth of the City in a cost-efficient manner and with an efficient use of resources.

Policy 1: Continue to lead the planning, design, construction and repair of public sanitary sewer facilities.

Policy 2: Continue to assume ownership and responsibility for maintenance of sanitary sewers upon acceptance of improvements.

Policy 3: Analyze and implement the findings of the Gray Road Corridor Study, as feasible.

Objectives and Policies for Storm Water Management

Objective 4: Maintain storm water drainage systems to meet or exceed required service levels; expand the public facilities necessary to accommodate the growth of the City and accomplish this mission with efficient use of resources.

Policy 1: Provide City residents with access to professional review of drainage problems that occur on or adjacent to their property and provide possible solutions.

Policy 2: Encourage the reduction of storm water run-off and low-impact development techniques for storm water management wherever such practices are feasible.

Policy 3: Improve and maintain drainage facilities so as to ensure protection from flooding, prevention of degradation of receiving waters and protection of natural drainage features.

Policy 4: Meet all of the requirements of the National Pollutant Discharge Elimination System Storm Water Program (NPDES) and implement best management practices to reduce storm water pollution.

Objectives and Policies for Water Supply, Sanitary Sewer Service and Storm Water Management.

Objective 5: This element shall be used to assist in determining the funding priority for public utility improvements that are necessary to meet existing deficiencies, to accommodate future growth and to replace obsolete or worn-out facilities.

Policy 1: Improvements, based on their priority, shall be included in the five year Capital Improvement Plan.

Objective 6: Continue to maintain inter-governmental coordination and agreements with the City of Hamilton, Butler County, Hamilton to New Baltimore Groundwater Consortium and the City of Cincinnati Water Works. In addition, extend open communications with all surrounding jurisdictions, government agencies and non-profit entities.