

## CITY COUNCIL AGENDA STATEMENT



**Meeting Date:** April 13th, 2021  
**To:** Honorable Mayor and Council Members  
**From:** Brian Shea, Planning Director  
**Through:** George Garrett, City Manager

**Agenda Item:** **Ordinance 2021-10** Approving The City’s “10-Year Water Supply Facilities Work Plan” As Required By The State Department Of Economic Opportunity Under Chapter 163, Part II, F. S.; To Include Updated Water Demand Projections, Identify Alternative And Traditional Water Supply Projects, And Describe Conservation And Reuse Activities Needed To Meet The Projected Future Demands. Planning Tools Are Available On The District’s Website For Your Use And District Staff Are Available To Provide Technical Assistance To Update The Work Plan, Including Reviewing Draft Work Plans Prior To Formal Plan Amendment Submittal; Providing For Severability; Providing For Repeal Of Conflicting Provisions; Providing For Transmittal Of This Ordinance To The State Department Of Economic Opportunity; And Providing For An Effective Date Upon The Approval Of This Ordinance By The State Department Of Economic Opportunity.

### **RECOMMENDATION:**

Staff recommends approval and adoption of the proposed Comprehensive Plan addendum.

### **APPLICANT:**

City of Marathon

**REQUEST:** Amending the City of Marathon 2005 Comprehensive Plan to include an updated addendum entitled “City of Marathon, Florida, 10-year Water Supply Facilities Work Plan” and to add one objective and six policies to the Comprehensive Plan.

**Detail:** As potential limitations on the continued use of traditional water supplies became increasingly apparent in the previous decades, the Florida Legislature enacted bills in 2002, 2004 and 2005 to more effectively address the state’s water supply needs by improving the coordination between local land use planning and water supply planning. The focus of the 2002 legislation was to add requirements to Chapter 163, Florida Statutes (F.S.), for local governments to prepare 10-year water supply facilities work plans and to incorporate the work plans into their comprehensive plans. This legislative change emphasized the need for local comprehensive plans to consider the applicable regional water supply plans prepared by the water management districts. In 2004, the Legislature further amended Chapter 163 to give local governments until December 1, 2006, to prepare the 10-year water supply facilities work plans. In 2005, the Florida Legislature significantly changed Chapters 163 and 373, F.S., to improve the coordination of water supply and land use planning. Senate Bills 360 and 444 strengthened the statutory linkage between the regional water supply plans prepared by the water management districts and comprehensive plans prepared by the local governments. The City in 2011 therefore adopted Ordinance 2011-05, adopting the City’s 10-Year Water Supply Facilities Work Plan.

## ANALYSIS OF COMPREHENSIVE PLAN CHANGE REQUEST:

### Preface

The current Land Development Regulations provide only brief guidance concerning the review of a proposed Comprehensive Plan Amendment.

Section 102.19 simply states:

Section 102.19. Standards for Review.

When considering an application for a Comprehensive Plan Amendment, the review shall include all standards and criteria of Fla. Stat. ch. 163.

Standards in Chapter 163, F.S. offer some additional guidance, but are limited. Pertinent sections of Chapter 163 promulgate process rather than establishing criteria for the development of a proposed Comprehensive Plan Amendment. Chapter 163.3184, Process for adoption of comprehensive plan or plan amendment, define the sequential process for transmittal, review, and approval of a Comprehensive Plan Amendment. Most relevant to this delineation of process is the definition of “**compliance**” which is recited for review below:

### **163.3184 Process for adoption of comprehensive plan or plan amendment.--**

(1) DEFINITIONS.--As used in this section, the term:

(b) "In compliance" means consistent with the requirements of ss. [163.3177](#), when a local government adopts an educational facilities element, [163.3178](#), [163.3180](#), [163.3191](#), and [163.3245](#), with the state comprehensive plan, with the appropriate strategic regional policy plan, and with chapter 9J-5, Florida Administrative Code, where such rule is not inconsistent with this part and with the principles for guiding development in designated areas of critical state concern and with part III of chapter 369, where applicable.

Thus, leading through an exhaustive process, the State Land Planning Agency must find a Comprehensive Plan or Plan Amendment in compliance in accordance with the above definition. Process as further defined in the section leads from Local Government Transmittal through review by the State Land Planning Agency and other required local and state government bodies to a finding of “in compliance” by the State Land Planning Agency.

Review is contemplated and expected to be completed by such agencies as the South Florida Regional Planning Council, whose responsibility it is to review the proposal for consistency with the Strategic Regional Policy Plan. Such review is not therefore, the responsibility of the local government to determine consistency in this regard and will not be addressed herein. Though referenced in the definition of compliance and elsewhere Chapters [163.3177](#), [163.3191](#), [163.3245](#), and [369](#) will not be reviewed as a compliance matter. Chapter [163.3177](#) defines required elements in a comprehensive plan. The City has an approved comprehensive plan which must be assumed to have all required elements. Chapter [163.3191](#) refers to the required Evaluation and Appraisal Report (EAR); a review of an approved comprehensive plan required of the City every seven years. The

City is not subject to an EAR at this juncture and therefore is not relevant as a criterion to the review herein. Finally, Chapter 163.3245 refers to the development of an optional sector plan. This optional element of an approved comprehensive plan was not adopted by the City and therefore will not be used as a criterion for review in this proposed amendment.

Other pertinent review elements leading to a determination of compliance are found in Chapter 163.3178 Coastal management, Chapter 163.3180 Concurrency, Chapter 9J-5 F.A.C., and the principals for guiding development in the Florida Keys Area of Critical State Concern. This application for a Comprehensive Plan amendment will be analyzed against the limited compliance issues found in sections of Chapter 163 F.S., the Chapter 9J-5 F.A.C. and Chapter 380 F.S. noted immediately above.

A review of this proposed addendum to the Comprehensive Plan will be based on any potential impacts that it might have on the adopted Comprehensive Plan, specific to the requirements identified immediately above.

### **Compliance Discussion**

Relevant criteria promulgated in Chapters 163, 380, and 9J-5 F.A.C. can be itemized in bullets as follows based on the critical concerns more specifically identified in the City's comprehensive plan:

- Natural Resource Protection
  - Wetlands
  - Estuaries
  - Living marine resources
  - Beaches / Dunes
  - Unique wildlife habitat
  - Water Quality
- Historical Resources
- Infrastructure / Concurrency Management
  - Wastewater
  - Stormwater
  - Potable Water
  - Solid Waste
  - Transportation
- Affordable Housing
- Hazard Mitigation
  - CHHA
  - Hurricane Evacuation
- Ports
  - Marina Siting
- Public Use
  - Shoreline use and Access
  - Water dependent and independent activity
- Land Acquisition
  - Conservation
  - CHHA
  - Public Services

These bullet items should be utilized as the focus points for review of the proposed addendum and for future comprehensive plan amendments.

**SUMMARY:**

ANALYSIS

Natural Resources

This amendment will support the proper management and conservation of the water resources of the City of Marathon, thus enhancing the overall quality of the City's natural resources.

Historical and Cultural Resources

No Significant Impact would result from the proposed changes.

Infrastructure

Wastewater infrastructure – This amendment supports and enhances the continued development and improvement of the City's wastewater infrastructure through municipal and intra-agency improvements.

Stormwater infrastructure – This amendment supports and enhances the continued development and improvement of the City's stormwater infrastructure through municipal improvements.

Potable Water – This amendment supports and enhances the continued development and improvement of the City's potable water delivery system.

Therefore, the purpose for the development of a 10 Year Water Supply Plan is to ensure that an adequate supply of potable water exists for the City of Marathon in the foreseeable future. Particularly, it is the intent of adopted water supply plans to integrate the data and policy direction found in the SFWMD Lower East Coast Water Supply Plan and the FKAA 20-Year Water System Capital Improvement Master Plan into the data, needs and growth projections, and policy direction for the City of Marathon.

Solid Waste – No Significant Impact would result from the proposed changes.

Transportation – No Significant Impact would result from the proposed changes.

Affordable Housing – No Significant Impact would result from the proposed changes.

Hazard Mitigation – No Significant Impact would result from the proposed changes.

Coastal High Hazard Areas - No Significant Impact would result from the proposed changes.

Hurricane Evacuation - No Significant Impact would result from the proposed changes.

Ports – Marina Siting - No Significant Impact would result from the proposed changes.

Public Use – Access to Water – No Significant Impact would result from the proposed changes.

Land Acquisition – No Significant Impact would result from the proposed changes.

### **Alternate Compliance Review Criteria**

Since there are no internal Comprehensive Plan change review criteria available in Chapter 102, Article 6, those that would apply for an LDR text change request (Chapter 102, Article 7) are useful. The basis for the LDR text change criteria are the same as for a Comprehensive Plan change ultimately.

Section 102.26 of the Land Development Regulations requires that the following standards and criteria be considered in any rezoning application. Each criteria and explanation of relevance to this application are listed below:

#### **A. The need and justification for the change**

With regard to water supply, current statutory provisions direct each local government to:

1. Coordinate appropriate aspects of its comprehensive plan with the appropriate water management district's regional water supply plan. [s. 163.3177(4)(a), F.S.]

2. Ensure that its future land use plan is based upon the availability of adequate water supplies and public facilities and services. [s. 163.3177(6)(a), F.S., effective July 1, 2005.] Data and analysis demonstrating that adequate water supplies and associated public facilities will be available to meet projected growth demands must accompany all proposed Future Land Use Map amendments submitted to the Department for review. The submitted package must also include an amendment to the Capital Improvements Element, if necessary, to demonstrate that adequate public facilities will be available to serve the proposed Future Land Use Map modification.

3. Ensure that adequate water supplies and facilities are available to serve new development no later than the date on which the local government anticipates issuing a certificate of occupancy and consult with the applicable water supplier prior to approving a building permit, to determine whether adequate water supplies will be available to serve the development by the anticipated issuance date of the certificate of occupancy. [s. 163.3180(2)(a), F.S., effective July 1, 2005.] This "water supply concurrency" is now in effect, and local governments should be complying with the requirement for all new development proposals. In addition, local governments should update their comprehensive plans and land development regulations as soon as possible to address these statutory requirements. The latest point at which the comprehensive plan must be revised to reflect the concurrency requirements is at the time the local government adopts plan amendments to implement the recommendations of the Evaluation and Appraisal Report.

4. For local governments subject to a regional water supply plan, revise the General Sanitary Sewer, Solid Waste, Drainage, Potable Water, and Natural Groundwater Aquifer Recharge Element (the "Infrastructure Element"), within 18 months after the water management district approves an updated regional water supply plan, to:

a. Identify and incorporate the alternative water supply project(s) selected by the local government from projects identified in the updated regional water supply plan, or the alternative project proposed by the local government under s. 373.0361(7), F.S. [s. 163.3177(6)(c), F.S.];

b. Identify the traditional and alternative water supply projects, bulk sales agreements, and the conservation and reuse programs necessary to meet current and future water use demands within the local government's jurisdiction [s. 163.3177(6)(c), F.S.]; and

c. Include a water supply facilities work plan for at least a 10-year planning period for constructing the public, private, and regional water supply facilities identified in the element as necessary to serve existing and new – Page 5 of 28 Pages – development. [s. 163.3177(6)(c), F.S.] Amendments to incorporate the water supply facilities work plan into the comprehensive plan are exempt from the twice-a-year amendment limitation. [s. 163.3177(6)(c), F.S.].

5. Revise the Five-Year Schedule of Capital Improvements to include any water supply, reuse, and conservation projects and programs to be implemented during the five-year period.

6. To the extent necessary to maintain internal consistency after making changes described in Paragraphs 1 through 5 above, revise the Conservation Element to assess projected water needs and sources for at least a 10-year planning period, considering the appropriate regional water supply plan(s) or, in the absence of an approved regional water supply plan, the applicable District Water Management Plan, as well as applicable consumptive use permit(s). [s. 163.3177(6)(d), F.S.]. If the established planning period of a comprehensive plan is greater than ten years, the plan must address the water supply sources necessary to meet and achieve the existing and projected water use demand *for the established planning period*, considering the appropriate regional water supply plan. [s. 163.3167(13), F.S.].

7. To the extent necessary to maintain internal consistency after making changes described in Paragraphs 1 through 5 above, revise the Intergovernmental Coordination Element to ensure coordination of the comprehensive plan with applicable regional water supply plans and regional water supply authorities' plans. [s. 163.3177(6)(h)1., F.S.].

8. Address in the Evaluation and Appraisal Report (EAR), the extent to which the local government has implemented the 10-year water supply facilities work plan, including the development of alternative water supplies, and determine whether the identified alternative water supply projects, traditional water supply projects, bulk sales agreements, and conservation and reuse programs are meeting local water use demands. [s. 163.3191(2)(l), F.S.].

## **B. The consistency of the proposed amendment with the Comprehensive Plan**

The proposed Comprehensive Plan Amendment is consistent with existing Comprehensive Plan policies. The proposed amendment will enhance the City's water resources by encouraging proper management and conservation in consultation and coordination with the FKAA and the SFWMD through the FKAA water management plan.

C. Whether the proposed change shall further the purposes of the LDRs and other City Codes, regulations and actions designed to implement the Comprehensive Plan

The proposed Comprehensive Plan Amendment is consistent with existing Comprehensive Plan policies and with its LDRs. The proposed amendment provides direction and guidance for proper management and conservation of the City of Marathon's water resources.

**CONCLUSION:**

The proposed amendment is consistent with and furthers the goals of the City of Marathon Comprehensive plan.

**Sponsored by:** Garrett  
**Introduction Date:** April 13, 2021  
**Public Hearing Date:** April 13, 2021  
**Enactment date:**

**CITY OF MARATHON, FLORIDA  
ORDINANCE 2021-10**

**AN ORDINANCE OF THE CITY OF MARATHON, FLORIDA APPROVING THE CITY'S "10-YEAR WATER SUPPLY FACILITIES WORK PLAN" AS REQUIRED BY THE STATE DEPARTMENT OF ECONOMIC OPPORTUNITY UNDER CHAPTER 163, PART II, F. S.; TO INCLUDE UPDATED WATER DEMAND PROJECTIONS, IDENTIFY ALTERNATIVE AND TRADITIONAL WATER SUPPLY PROJECTS, AND DESCRIBE CONSERVATION AND REUSE ACTIVITIES NEEDED TO MEET THE PROJECTED FUTURE DEMANDS. PLANNING TOOLS ARE AVAILABLE ON THE DISTRICT'S WEBSITE FOR YOUR USE AND DISTRICT STAFF ARE AVAILABLE TO PROVIDE TECHNICAL ASSISTANCE TO UPDATE THE WORK PLAN, INCLUDING REVIEWING DRAFT WORK PLANS PRIOR TO FORMAL PLAN AMENDMENT SUBMITTAL; PROVIDING FOR SEVERABILITY; PROVIDING FOR REPEAL OF CONFLICTING PROVISIONS; PROVIDING FOR TRANSMITTAL OF THIS ORDINANCE TO THE STATE DEPARTMENT OF ECONOMIC OPPORTUNITY; AND PROVIDING FOR AN EFFECTIVE DATE UPON THE APPROVAL OF THIS ORDINANCE BY THE STATE DEPARTMENT OF ECONOMIC OPPORTUNITY.**

**WHEREAS**, the City of Marathon recognizes the vital role of fresh water in perpetuating human habitation; and

**WHEREAS**, the City of Marathon receives all of its fresh water resources through the Florida Keys Aqueduct Authority (FKAA); and

**WHEREAS**, the City of Marathon recognizes the importance of the management, protection, and conservation of all water resources within its boundaries; and

**WHEREAS**, the proposed plan will provide additional support, in accordance with federal guidelines and regulations, ensuring that its citizens and businesses will be allowed continued use, enjoyment, and benefits from the water resources within the City of Marathon; and

**WHEREAS**, the proposed ordinance will provide the opportunity for the City to come into compliance with statutory mandate, and



**NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF MARATHON, FLORIDA, AS FOLLOWS:**

**Section 1.** The above recitals are true, correct, and incorporated herein by this reference.

**Section 2.** Council hereby approves and adopts the City of Marathon, Florida 10-Year Water Supply Facilities Work Plan as a stand alone addendum to the City of Marathon Comprehensive Plan and the following policies as enumerated, renumbering existing objectives and policies accordingly:

Additions to existing text are shown by underline, changes to existing text on second reading are shown by double underline, and deletions are shown as ~~striketrough~~.

**Policy 3-5.1.2: Interlocal Agreement with FKAA to Identify the Availability of Water Supply to Serve Existing and New Development.**

By December 31, ~~2014~~ 2021 the City of Marathon shall enter into an interlocal agreement with the Florida Keys Aqueduct Authority to formulate a mechanism that will allow the FKAA and the City to identify the availability of water supply needed to serve existing and new development within the City, monitor the use of potable water, and implement such alternative water supply projects, traditional water supply projects, conservation projects and reuse necessary to meet the City's water supply needs.

**Policy 3-5.5.5 Encourage Use of Rainwater**

The City shall permit and encourage rainwater storage facilities for all household uses such as but not limited to, irrigation, car, patio, and boat washing. [~~§163.3177(6)(c).~~, F.S.]

**Objective 3-5.6 Ensure Adequate Water Pressures For Fire Protection**

The City shall continue to coordinate with FKAA to ensure adequate capacity is available to provide for fire flows for protection of the public health, welfare and safety. [~~§163.3177(3)(a)3.~~, F.S.]

**Policy 3-5.6.1 Coordinate with FKAA to Ensure Fire Flows**

The City shall coordinate with the FKAA, in accordance with its Capital Improvements Program, to continue upgrading the distribution system toward the goal of providing fire flow capabilities throughout Marathon as funds and land are available. Fire flows shall meet the provisions of the Florida Fire Prevention Code.

**Policy 3-5.6.2 Fire Flow LOS**

The City shall require that at the time a construction permit is issued, adequate fire flow is supplied to the site in accordance with the Florida Fire Prevention Code.

**Policy 5-1.1.12 Water Supply Compatibility**

The City, shall continue to coordinate with the County and Cities of Layton, Key Colony Beach, Key West, the Village of Islamorada, and FKAA as necessary to facilitate system-wide compatibility on such potable water-related issues as potable water levels of service, consumption projections, water conservation programs, and emergency management.

**Policy 5-1.1.13 Energy and Climate Plans**

The City, shall continue to coordinate with the County and Cities of Layton, Key Colony Beach, Key West, the Village of Islamorada, FKAA, and other South East Florida Regional Compact Climate Change partners as necessary to facilitate compatibility on such energy and climate related issues (including but not limited to, emergency management, flood risk, storm surge, threats to potable water supply, the potential for changing habitat and landscapes, the need for shoreline stabilization and the potential impacts to infrastructure necessary to serve proposed uses).

**Section 3.** The provisions of the City of Marathon Comprehensive Plan and all ordinances or parts of ordinances in conflict with the provisions of this Ordinance are hereby repealed for the term of this Ordinance.

**Section 4.** The provisions of this Ordinance are declared to be severable, and if any sentence, section, clause or phrase of this Ordinance shall, for any reason, be held to be invalid or unconstitutional, such decision shall not affect the validity of the remaining sentences, sections, clauses or phrases of the Ordinance, but they shall remain in effect it being the legislative intent that this Ordinance shall stand notwithstanding the invalidity of any part.

**Section 5.** The provisions of this Ordinance constitute a “land development regulation” as state law defines that term. Accordingly, the City Clerk is authorized and directed to forward a copy of this Ordinance to the State Department of Economic Opportunity for approval pursuant to Sections 380.05(6) and (11), Florida Statutes.

**Section 6.** This Ordinance shall be effective immediately upon approval by the State Department of Economic Opportunity pursuant to Chapter 380, Florida Statutes.

**PASSED AND ADOPTED ON SECOND READING XXX\_day of XXX 2021.**

**THE CITY OF MARATHON, FLORIDA**

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**Luis Gonzalez, Mayor**

AYES:

NOES:

ABSENT:

ABSTAIN:

**ATTEST:**

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Diane Clavier  
City Clerk

**APPROVED AS TO FORM AND LEGAL SUFFICIENCY FOR THE USE  
AND RELIANCE OF THE CITY OF MARATHON, FLORIDA ONLY:**

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Steven T. Williams, City Attorney

CITY OF MARATHON, FLORIDA



## 10-YEAR WATER SUPPLY FACILITIES WORK PLAN

**Prepared By:**

**City of Marathon Planning Department**

**March 2021**

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## **1.0 INTRODUCTION**

The purpose of the City of Marathon Water Supply Facilities Work Plan (the “Work Plan”) is to identify and plan for the water supply sources and facilities needed to serve existing and new development within Marathon’s jurisdiction. Chapter 163, Part II, F.S., requires local governments to prepare and adopt Work Plans into their comprehensive plans within 18 months after the water management district approves a regional water supply plan or its update. The *Lower East Coast Water Supply Plan Update* was approved by the South Florida Water Management District (SFWMD) on November 8, 2018.

Residents of the City of Marathon obtain their water directly from the Florida Keys Aqueduct Authority (FKAA), which is responsible for ensuring that enough capacity is available for existing and future customers.

The City of Marathon’s Work Plan will reference the data, projected supply and demand numbers, conservation initiatives and capital improvements already identified in the FKAA 20-Year Water System Capital Improvement Master Plan (the “Master Plan”) since Marathon is a retail buyer and the FKAA is the sole provider of water to the City. According to state guidelines, the Work Plan and the comprehensive plan amendments must address the development of traditional and alternative water supplies, bulk sales agreements, conservation and reuse programs and concurrency issues that are necessary to serve existing and new development for at least a 10-year planning period. The Marathon Work Plan will address a 10-year planning period and identify projects from the FKAA Work Plan consistent with this planning period.

The City’s Work Plan is divided into six sections:

Section 1 – Introduction

Section 2 – Background Information

Section 3 – Data and Analysis

Section 4 – Work Plan Projects/Capital Improvement Element/Schedule (FKAA)

Section 5 – Goals, Objectives, and Policies

Section 6 – Regional Issues Identified in Regional Water Supply Plans

### **1.1 Statutory History**

The Florida Legislature has enacted bills in the 2002, 2004, 2005, 2011, 2012, 2015, and 2016 sessions to address the state’s water supply needs. These bills, especially Senate Bills 360 and 444 (2005 legislative session), significantly changed Chapter 163 and 373 Florida Statutes (F.S.) by strengthening the statutory links between the regional water supply plans prepared by the water management districts and the comprehensive plans prepared by local governments. In addition, these bills established the basis for improving coordination between the local land

use planning and water supply planning.

## 1.2 Statutory Requirements

Each local government must comply with the following requirements:

1. Coordinate appropriate aspects of its comprehensive plan with the SFWMD's *Lower East Coast Water Supply Plan*, [163.3177(4)(a), F.S.]
2. Ensure that the Comprehensive Plan is based upon availability of adequate water supplies and public facilities and services [s.163.3177(6)(a), F.S., effective July 1, 2005]. Data and analysis demonstrating that adequate water supplies and associated public facilities will be available to meet projected growth demands must accompany all proposed Future Land Use Map amendments submitted to the Department for review. The submitted package must also include an amendment to the Capital Improvements Element, if necessary, to demonstrate that adequate public facilities will be available to serve the proposed Future Land Use Map modification.
3. Ensure that adequate water supplies and facilities are available to serve new development no later than the date on which the City of Marathon anticipates issuing a certificate of occupancy and consult with the applicable water supplier prior to approving building permits, to determine whether adequate water supplies will be available to serve the development by the anticipated issuance date of the certificate of occupancy [s.163.3180 (2)(a), F.S., effective July 1, 2005].
4. For local governments subject to a regional water supply plan, revise the General Sanitary Sewer, Solid Waste, Drainage, Potable Water, and Natural Groundwater Aquifer Recharge Element (the "Infrastructure Element"), within 18 months after the water management district approves an updated regional water supply plan, to:
  - a. Identify and incorporate the alternative water supply project(s) selected by the local government from projects identified in the updated regional water supply plan, or the alternative project proposed by the local government under s. 373.0361(7), F.S. [s. 163.3177(6)(c), F.S.];
  - b. Identify the traditional and alternative water supply projects, bulk sales agreements, and the conservation and reuse programs necessary to meet current and future water use demands within the local government's jurisdiction [s. 163.3177(6)(c), F.S.]; and
  - c. Include a water supply facility work plan for at least a 10-year planning period for constructing the public, private, and regional water supply facilities identified in the element as necessary to serve existing and new development. [s. 163.3177(6)(c), F.S.] Amendments to incorporate the water supply facilities work plan into the comprehensive plan are exempt from the twice-a-year amendment limitation. [s. 163.3177(6)(c), F.S.]

5. Revise the Five-Year Schedule of Capital Improvements to include any water supply, reuse, and conservation projects and programs to be implemented during the five-year period.
6. To the extent necessary to maintain internal consistency after making changes described in Paragraph 1 through 5 above, revise the Conservation Element to assess projected water needs and sources for at least a 10-year planning period, considering the SFWMD's *Lower East Coast Water Supply Plan*, as well as the Florida Keys Aqueduct Authority's consumptive use permit. [s.163.3177 (6)(d), F.S.]

If the established planning period of a comprehensive plan is greater than ten years, the plan must address the water supply sources necessary to meet and achieve the existing and projected water use demand for established planning period, considering the appropriate regional water supply plan. [s.163.3167 (13), F.S.]

7. To the extent necessary to maintain internal consistency after making changes described in Paragraphs 1 through 5 above, revise the Intergovernmental Coordination Element to ensure coordination of the comprehensive plan with applicable regional water supply plans and regional water supply authorities' plans. [s.163.3177(6)(h)1., F.S.]
8. Address in the Evaluation and Appraisal Report the extent to which the local government has implemented the 10-year water supply facilities work plan, including the development of alternative water supplies, and determine whether the identified alternative water supply projects, traditional water supply projects, bulk sales agreements, and conservation and reuse programs are meeting local water use demands. [s.163.3191 (2)(1), F.S.]

## **2.0 BACKGROUND INFORMATION**

### **2.1 Overview**

The City of Marathon was incorporated in 1999, making it the fifth municipality established in Monroe County. The islands of Marathon are Boot Key, Knight Key, Hog Key, Vaca Key, Stirrup Key, Crawl and Little Crawl Key, East and West Sister's Island, Deer Key and Fat Deer Key, Long Point Key and Grassy Key. The current permanent population estimate is 8,297 residents based on the Census 2010 data. The 2020 estimate from the Bureau of Economic and Business Research (BEBR) is a population of 9,097 residents. The City of Marathon has a significant "seasonal visitor population", with the Comprehensive Plan estimating 5,386 seasonal visitors for 2020. All of these population segments will utilize the City's potable water resources. The combined amount of all population segments represents the "functional population" of the City that will create a demand for water usage. For this Plan, the functional population value is used in all per capita calculations and estimates.

The City of Marathon has a Building Permit Allocation System (BPAS) that limits new residential growth to 30 new units per year. The potential expansion of the



City's current boundaries through annexations is possible, but not likely.

Tables 1, 2 and 3 show the City's permanent, seasonal, and functional population projections through 2020.

**TABLE 1:**

***Population Estimates and Projections, 2000 – 2020***

<i>Year</i>	<i>Total Units</i>	<i>Occupied Units</i>	<i>Persons Per Occupied Unit</i>	<i>Population</i>
2000	6,791	4,597	2.19	10,067
2005	6,941	4,692	2.19	10,275
2010	6,187	3,718	2.23	8,297
2015	6,311	3,850	2.20	8,463
2020	6,437	3,927	2.20	8,632

Source: City of Marathon Comprehensive Plan Data, Inventory, and Analysis; Census 2010

**TABLE 2:**

***Seasonal Visitor Population Projections, 2000 - 2020***

<i>Year</i>	<i>Units</i>	<i>Occupancy Rate</i>	<i>Person/Unit</i>	<i>Population</i>
2000	2,829	59.7%	2.92	4,931
2005	2,829	59.7%	2.92	4,931
2010	2,913	59.7%	2.92	5,078
2015	3,000	59.7%	2.92	5,229
2020	3,090	59.7%	2.92	5,386

Source: City of Marathon Comprehensive Plan Data, Inventory, and Analysis; Monroe County Tourism Development Council

**TABLE 3:**

***Functional Population of City and Service Area***

<i>Year</i>	<i>Functional Population City</i>	<i>Functional Population Service Area</i>
2000	14,998	153,080
2005	13,541	155,438

2010	-	13,375	146,581
2015		13,541	148,043
2020		13,861	149,504

Source: City of Marathon Comprehensive Plan Data, Inventory, and Analysis; FKAA Master Plan; Census 2010

### Existing Land Use Profile

The City has no current plans to acquire additional lands through annexation or purchase. Given the geographical constraint of a municipality composed of islands with finite room to accommodate growth, at some point the City will reach build out and the permanent population will cease to show any significant fluctuation. The seasonal population may continue to fluctuate in the future due to economic forces such as the cost of gasoline, airfare, and the ability to maintain a second or third home. The functional population, dependent on the seasonal population will continue to exhibit some change from year to year but will not continue to expand. The existing land use profile below indicates the land use categories and the percentage of gross acreage they utilize.

### Existing Land Use Profile

<u>PC Code</u>	<u>Description</u>	<u>Area (Square Feet)</u>	<u>Area (Acres)</u>	<u>Units</u>	<u>Building Size (Square Feet)</u>	<u>Density (DU/Acre)</u>	<u>FAR (SF/SF)</u>
<b>Single-Family</b>							
<u>01</u>	<u>Single-Family</u>	<u>28,616,961</u>	<u>657.0</u>	<u>2,332</u>	<u>n/a</u>	<u>3.5</u>	<u>n/a</u>
<b>Mobile Homes</b>							
<u>02</u>	<u>Mobile Homes</u>	<u>2,920,737</u>	<u>67.1</u>	<u>501</u>	<u>n/a</u>	<u>7.5</u>	<u>n/a</u>
<b>Multi-Family</b>							
<u>03</u>	<u>Multi-family (10 units or more)</u>	<u>649,260</u>	<u>14.9</u>	<u>5</u>	<u>n/a</u>	<u>0.3</u>	<u>n/a</u>
<u>04</u>	<u>Condominium</u>	<u>3,977,718</u>	<u>91.3</u>	<u>1268</u>	<u>n/a</u>	<u>13.9</u>	<u>n/a</u>
<u>05</u>	<u>Timeshare</u>	<u>490,939</u>	<u>11.3</u>	<u>6</u>	<u>n/a</u>	<u>0.5</u>	<u>n/a</u>
<u>08</u>	<u>Multi-family (less than 10 units)</u>	<u>8,752,444</u>	<u>200.9</u>	<u>481</u>	<u>n/a</u>	<u>2.4</u>	<u>n/a</u>
-	<b><u>Subtotal</u></b>	<b><u>45,408,059</u></b>	<b><u>1042.5</u></b>	<b><u>4593</u></b>	<b><u>n/a</u></b>	<b><u>4.7</u></b>	<b><u>n/a</u></b>
<b>General Commercial</b>							
<u>11</u>	<u>Stores, One Story</u>	<u>1,102,215</u>	<u>25.3</u>	<u>n/a</u>	<u>228,050</u>	<u>n/a</u>	<u>0.2069</u>
<u>12</u>	<u>Mixed Use - Residential / Commercial</u>	<u>1,735,231</u>	<u>39.8</u>	<u>n/a</u>	<u>291,578</u>	<u>n/a</u>	<u>0.1680</u>

<u>13</u>	<u>Department Store</u>	<u>444,312</u>	<u>10.2</u>	<u>n/a</u>	<u>91,738</u>	<u>n/a</u>	<u>0.2065</u>
<u>14</u>	<u>Supermarket</u>	<u>4,951</u>	<u>0.1</u>	<u>n/a</u>	<u>1,704</u>	<u>n/a</u>	<u>0.3441</u>
<u>16</u>	<u>Community Shopping Center</u>	<u>938,120</u>	<u>21.5</u>	<u>n/a</u>	<u>385,075</u>	<u>n/a</u>	<u>0.4105</u>
<u>17</u>	<u>Office Building, One Story</u>	<u>795,035</u>	<u>18.3</u>	<u>n/a</u>	<u>85,322</u>	<u>n/a</u>	<u>0.1073</u>
<u>18</u>	<u>Office Building, Multi Story</u>	<u>124,145</u>	<u>2.8</u>	<u>n/a</u>	<u>34,848</u>	<u>n/a</u>	<u>0.2807</u>
<u>19</u>	<u>Professional Services Building</u>	<u>112,907</u>	<u>2.6</u>	<u>n/a</u>	<u>16,405</u>	<u>n/a</u>	<u>0.1453</u>
<u>21</u>	<u>Restaurant or Cafeteria</u>	<u>511,287</u>	<u>11.7</u>	<u>n/a</u>	<u>61,342</u>	<u>n/a</u>	<u>0.1200</u>
<u>22</u>	<u>Fast Food Drive Thru Restaurant</u>	<u>230,581</u>	<u>5.3</u>	<u>n/a</u>	<u>10,882</u>	<u>n/a</u>	<u>0.0472</u>
<u>23</u>	<u>Financial Institution</u>	<u>516,968</u>	<u>11.9</u>	<u>n/a</u>	<u>49,047</u>	<u>n/a</u>	<u>0.0949</u>
<u>25</u>	<u>Repair Shop (Not Automotive)</u>	<u>153,915</u>	<u>3.5</u>	<u>n/a</u>	<u>28,148</u>	<u>n/a</u>	<u>0.1829</u>
<u>26</u>	<u>Gas Station / Convenience Store</u>	<u>306,193</u>	<u>7.0</u>	<u>n/a</u>	<u>28,076</u>	<u>n/a</u>	<u>0.0917</u>
<u>27</u>	<u>Marinas</u>	<u>2,496,192</u>	<u>57.3</u>	<u>n/a</u>	<u>215,307</u>	<u>n/a</u>	<u>0.0863</u>
<u>29</u>	<u>Wholesale Outlet</u>	<u>285,051</u>	<u>6.5</u>	<u>n/a</u>	<u>42,067</u>	<u>n/a</u>	<u>0.1476</u>
<u>30</u>	<u>Florist or Greenhouse</u>	<u>6,771</u>	<u>0.2</u>	<u>n/a</u>	<u>706</u>	<u>n/a</u>	<u>0.1043</u>
<u>33</u>	<u>Nightclub or Lounge or Bar</u>	<u>28,428</u>	<u>0.7</u>	<u>n/a</u>	<u>15,255</u>	<u>n/a</u>	<u>0.5366</u>
	<b><u>Subtotal</u></b>	<b><u>9,792,301</u></b>	<b><u>225</u></b>	<b><u>n/a</u></b>	<b><u>1,585,550</u></b>	<b><u>n/a</u></b>	<b><u>0.1619</u></b>
<b><i>Commercial Fishing</i></b>							
<u>44</u>	<u>Packing Plant, Seafood Etc.</u>	<u>156,212</u>	<u>3.6</u>	<u>n/a</u>	<u>14,291</u>	<u>n/a</u>	<u>0.0915</u>
<b><i>Tourist Commercial</i></b>							
<u>36</u>	<u>MH Parks, Private Camping, Rec. Parks</u>	<u>4,958,469.8</u>	<u>113.8</u>	<u>n/a</u>	<u>98,156</u>	<u>n/a</u>	<u>0.0198</u>
<u>39</u>	<u>Hotel or Motel</u>	<u>4,339,251</u>	<u>99.6</u>	<u>n/a</u>	<u>514,790</u>	<u>n/a</u>	<u>0.1186</u>
	<b><u>Subtotal</u></b>	<b><u>9,297,721</u></b>	<b><u>213.4</u></b>	<b><u>n/a</u></b>	<b><u>612,946</u></b>	<b><u>n/a</u></b>	<b><u>0.0659</u></b>
<b><i>Industrial</i></b>							
<u>41</u>	<u>Light Manufacturing</u>	<u>59,281</u>	<u>1.4</u>	<u>n/a</u>	<u>16,993</u>	<u>n/a</u>	<u>0.2867</u>
<u>42</u>	<u>Heavy Industrial</u>	<u>81,602</u>	<u>1.9</u>	<u>n/a</u>	<u>4,186</u>	<u>n/a</u>	<u>0.0513</u>
<u>43</u>	<u>Lumber Yard</u>	<u>35,252</u>	<u>0.8</u>	<u>n/a</u>	<u>10,500</u>	<u>n/a</u>	<u>0.2979</u>
<u>46</u>	<u>Other Food Processing</u>	<u>210,238</u>	<u>4.8</u>	<u>n/a</u>	<u>19,929</u>	<u>n/a</u>	<u>0.0948</u>
<u>47</u>	<u>Gravel Pit</u>	<u>1,961,060</u>	<u>45.0</u>	<u>n/a</u>	<u>3,200</u>	<u>n/a</u>	<u>0.0016</u>
<u>48</u>	<u>Warehousing</u>	<u>430,982</u>	<u>9.9</u>	<u>n/a</u>	<u>117,353</u>	<u>n/a</u>	<u>0.2723</u>

49	Open Storage	70,841	1.6	n/a	2,412	n/a	0.0340
-	<b>Subtotal</b>	<b>2,849,257</b>	<b>65</b>	<b>n/a</b>	<b>174,573</b>	<b>n/a</b>	<b>0.0613</b>
<b>Education</b>							
72	Private School or College / Research Center	78,392	1.8	n/a	13,941	n/a	0.1778
84	Public College	371,928	8.5	n/a	-	n/a	0.0000
83	Public School	1,936,589	44.5	n/a	226,274	n/a	0.1168
-	<b>Subtotal</b>	<b>2,386,908</b>	<b>54.8</b>	<b>n/a</b>	<b>240,215</b>	<b>n/a</b>	<b>0.1006</b>
<b>Institutional</b>							
71	Church	1,159,277	26.6	n/a	107,605	n/a	0.0928
73	Private Hospital	322,857	7.4	n/a	28,826	n/a	0.0893
74	Nursing Home	155,142	3.6	n/a	22,434	n/a	0.1446
76	Mortuary or Cemetery	14,821	0.3	n/a	4,560	n/a	0.3077
77	Club or Lodge	3,609,006	82.9	n/a	91,828	n/a	0.0254
85	Public Hospital	212,463	4.9	n/a	62,467	n/a	0.2940
-	<b>Subtotal</b>	<b>5,473,568</b>	<b>125.7</b>	<b>n/a</b>	<b>317,720</b>	<b>n/a</b>	<b>0.0580</b>
<b>Public Buildings/Grounds/Facilities</b>							
86	County (other than PC List)	18,152,665	416.7	n/a	350,256	n/a	0.0193
87	State (other than PC List)	26,310,450	604.0	n/a	75,943	n/a	0.0029
88	Federal (other than PC List)	6,118,458	140.5	n/a	6,314	n/a	0.0010
89	Municipal (other than PC List)	6,582,639	151.1	n/a	19,893	n/a	0.0030
91	Utilities	1,682,785	38.6	n/a	67,984	n/a	0.0404
94	Right of Way	4,960,710	113.9	n/a	n/a	n/a	n/a
-	<b>Subtotal</b>	<b>63,807,707</b>	<b>1,464.8</b>	<b>n/a</b>	<b>520,390</b>	<b>n/a</b>	<b>0.0082</b>
<b>Military</b>							
81	Military	243,588	5.6	n/a	14,465	n/a	0.0594
<b>Recreation</b>							
38	Golf Course	2,523,868	57.9	n/a	n/a	n/a	n/a
92	Private Park	1,020	0.0	n/a	n/a	n/a	n/a
-	<b>Subtotal</b>	<b>2,524,888</b>	<b>58</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>

<b><u>Conservation</u></b>							
<u>82</u>	<u>US Mainland Forest, Parks, Rec Area</u>	<u>1,663,142</u>	<u>38.2</u>	<u>n/a</u>	<u>2,784</u>	<u>n/a</u>	<u>0.0017</u>
<u>99</u>	<u>Nature Conservancy, Fl Keys Land Trust</u>	<u>3,917,739</u>	<u>89.9</u>	<u>n/a</u>	<u>10,282</u>	<u>n/a</u>	<u>0.0026</u>
	<b><u>Subtotal</u></b>	<b><u>5,580,881</u></b>	<b><u>941.8</u></b>		<b><u>13,066</u></b>		<b><u>0.0003</u></b>
<b><u>Vacant</u></b>							
<u>00</u>	<u>Vacant Residential</u>	<u>57,413,345</u>	<u>1,318.0</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
<u>10</u>	<u>Vacant Commercial</u>	<u>8,913,931</u>	<u>204.6</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
<u>70</u>	<u>Vacant Institutional</u>	<u>126,956</u>	<u>2.9</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
	<b><u>Subtotal</u></b>	<b><u>66,454,232</u></b>	<b><u>1,525.6</u></b>	<b><u>n/a</u></b>	<b><u>n/a</u></b>	<b><u>n/a</u></b>	<b><u>n/a</u></b>
	<b><u>TOTAL</u></b>	<b><u>213,975,322</u></b>	<b><u>4,912.2</u></b>				
<b><u>Submerged</u></b>							
<u>95</u>	<u>Submerged Land</u>	<u>35,444,852</u>	<u>813.7</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
	<b><u>TOTAL</u></b>	<b><u>249,420,173</u></b>	<b><u>5,725.9</u></b>	<b><u>n/a</u></b>	<b><u>n/a</u></b>	<b><u>n/a</u></b>	<b><u>n/a</u></b>

Source: City Comprehensive Plan Data, Inventory, and Analysis – Future Land Use Section

## **2.2 Relevant Regional Issues**

As the state agency responsible for water supply in the Lower East Coast (LEC) planning area, the SFWMD plays a pivotal role in resource protection, through criteria used for Consumptive Use Permitting. As pressure increased on the Everglades ecosystem resource, the Governing Board initiated rulemaking to limit increased allocations dependent on the Everglades system. As a result, the Regional Water Availability Rule was adopted by the Governing Board on February 15, 2007 as part of the SFWMD's water use permit program. This reduced reliance on the regional system for future water supply needs and mandates the development of alternative water supplies and an increase in the use of conservation and reuse techniques.

The LEC Planning Area relies on fresh groundwater and surface water for urban, agricultural, and industrial uses. However, traditional freshwater sources in the LEC Planning Area are not sufficient to meet projected 2040 water demands. Analyses indicate increases in allocations of fresh groundwater from the SAS and surface water from Lake Okeechobee are not available to meet the growing needs of the LEC Planning Area during 1-in-10-year drought conditions.

The regional issues identified for 2040 in the Lower East Coast Water Supply Plan

Update (adopted November 8, 2018) include:

1. Fresh surface water and groundwater are limited; further withdrawals could have impacts on the regional system, wetlands, existing legal uses, and saltwater intrusion. As a result, additional alternative water supplies need to be developed.
2. Expanded use of reclaimed water is necessary to meet future water supply demands and the Ocean Outfall Law.
3. Expanded use of brackish groundwater from the Floridan aquifer system requires careful planning and wellfield management to prevent undesirable changes in water quality.

The sole source provider of potable water to Monroe County is FCAA, whose wellfield is located in Florida City. The limited availability of SAS withdrawals presents a potential risk to the water supply for all of Monroe County. FCAA is a permitted Floridan Aquifer User, which should offset any anticipated drought-driven saltwater intrusion event. FCAA also operates reverse osmosis facilities in Marathon and Stock Island.

Other regional water issues have been identified by the Southeast Florida Regional Climate Change Compact, which includes Palm Beach, Broward, Miami-Dade, and Monroe Counties. The Compact communities have agreed to use a sea level rise prediction of between 6 and 10 inches by 2030, and between 14 and 26 inches by the year 2060 for planning purposes in the Southeast Florida region until more definitive information on future sea level rise is available (the Compact's A Unified Sea Level Rise Projection for Southeast Florida, October 2015). The potential landward movement of the saltwater intrusion line resulting from the impact of sea level rise may affect future decisions regarding the implementation of capital improvements, requiring adaptation mitigation strategies to preserve the potable water supply. Monroe County's climate change and sustainability consultants have recently summarized hydrologic modeling by the United States Geological Survey that suggests relatively low risk to the FCAA wellfields in Florida City under even the worst-case 2060 sea level rise scenarios. However, FCAA continues to monitor the most current data and analysis regarding this issue.

FCAA is a permitted Floridan Aquifer User, which should offset any anticipated drought-driven saltwater intrusion event. Further, FCAA also operates RO facilities in Marathon and Stock Island, with a combined supply capacity of 3 MGD, as an alternative water source for the county during emergencies and extreme peaks in demand.

### **3.0 DATA AND ANALYSIS**

#### **3.1 Population Information**

The City's current and future population figures stated herein are derived from City of Marathon Planning and Zoning Department, BEBR, and 2010 U.S. Census Data.

Between 1990 and 2000, the City of Marathon's population grew from 10,404 to 10,741, an increase of 3.2%. Although the City's 2005 Objections, Recommendations, and Corrections Report (ORC) predicted a decline in population, based on the projections prepared by BEBR, in 2005 it was estimated that the City's population had increased to 10,850 residents. These estimates were revised downward for later years, leading to a BEBR-estimated population of 10,295 people in 2009. Despite this marginal correction, these estimates stand in stark contrast to the 2010 census data, which became available to City Staff during the previous preparation of this report.

According to 2010 U.S. Census Data, the City's population had decreased to 8,297. Most of this decline occurred after 2005 as a result of the impacts of Hurricane Wilma and the 2008 downturn in the economy. The City has no current basis upon which to project recovery and growth over the next five to ten years. The City previously established an estimate of a conservative baseline increase of two percent per five years. Using this baseline, population estimates for 2015 are 8,463; and 2025 to 8,805 (this represents a decrease of 18 percent below the 2005 population estimates provided by BEBR). The current 2020 BEBR has estimated the population at 9,097. Using this value, a baseline of seven percent every five years is established. This would create a population estimate of 9,734 in 2025, and 10,416 by 2030. The 2030 population projection would be the equivalent of the previous 2010 projection prior to the receipt of the Census information.

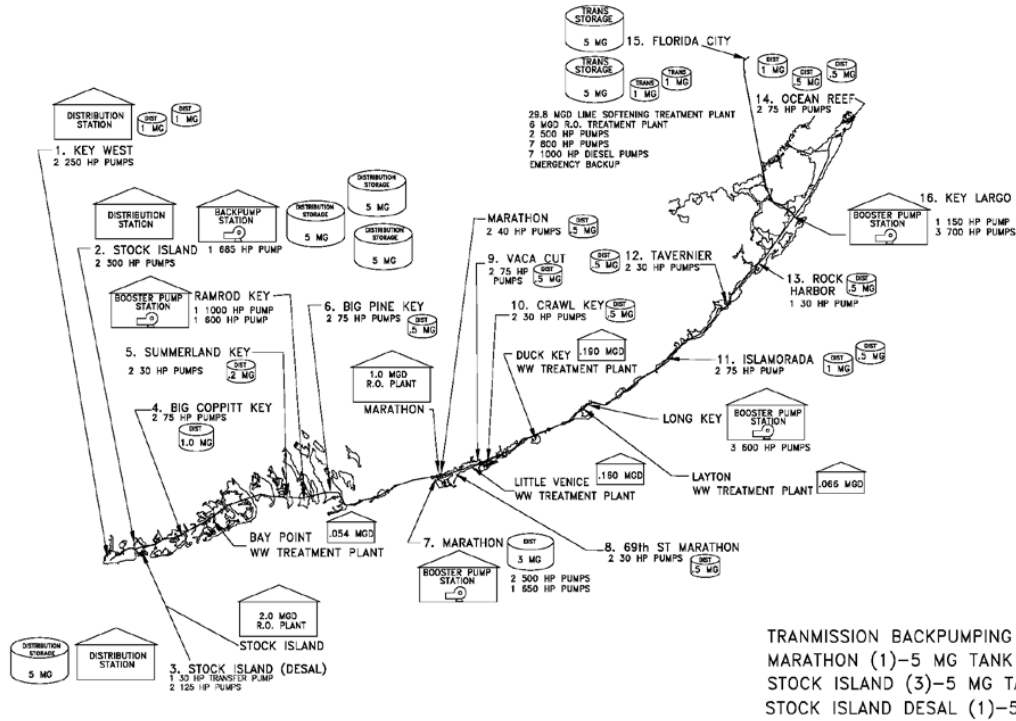
### **3.2 Maps of Current and Future Areas Served.**

The service area of FKAA includes all of Monroe County plus that area in Miami-Dade County within one mile of the transmission pipeline. The service area includes a mix of commercial, industrial, and residential zonings that typify the land uses of a suburban area. Minimal service exists in Miami-Dade County, consisting of service to only a ranger station just outside of the treatment plant. FKAA does not expect that the distribution facilities of the system will be significantly expanded in Miami-Dade County.

The map depicting current and future City boundaries served by the Transmission and Distribution System are provided in Figure 1. A GIS overlay map is provided in Exhibit B for clarity.

**Figure 1**

**FLORIDA KEYS AQUEDUCT AUTHORITY  
TRANSMISSION & DISTRIBUTION  
SYSTEM OVERVIEW  
45.2 MG STORAGE CAPACITY**



1/4/10  
Revised Per John Crowe 4/8/10

**3.3 Potable Water Level of Service Standard**

Pursuant to the Comprehensive Plan, the City has an adopted LOS for potable water of 66.5 gallons per day per capita for residential use and 0.35 gallons per square foot of nonresidential use and an overall LOS of 100 gpd per capita (See Table 6-3 Summary of Level of Service Standards, City of Marathon Comp Plan).

Census 2010 indicated that the City’s household size is 2.23. An equivalent residential

Unit is defined as the amount of water use (gallons per day) that is equivalent to the amount a single household would use. Per the City of Marathon’s Comprehensive Plan, the Residential LOS standard is 66.5 gallons per capita per day. Therefore, total household LOS standards would be 2.23 X 66.5 = 148.3 gallons. The accepted value for residential equivalents throughout the City of Marathon is 167 gallons per day.

The proposed LOS standards for residential, non-residential, overall and the equivalent residential unit are displayed below per table 3-2 under Policy 3-1.1.3 of the Comprehensive Plan.



<b>MEASURE</b>	<b>LOS STANDARD</b>
<b>Residential LOS</b>	<b>66.5 gal/cap/day (167 g/ERU/day)</b>
<b>Nonresidential LOS</b>	<b>0.35 gal/sq.ft./day</b>
<b>Overall LOS</b>	<b>100 gal/day</b>
<b>Minimum Pressure</b>	<b>20 PSI per customer</b>
<b>Minimum Quality</b>	<b>Shall be defined by the USEPA (part 143 National Secondary Drinking Standards, 40 CFR 143, 44FR 42198).</b>

### **3.4 Population and Potable Water Demand Projections**

The FCAA 20-Year Water System Master Plan's *Population and Water Demand Forecast* states that according to the U.S. Census Bureau, the permanent population of Monroe County peaked at 82,180 in 1993. Since that time, the population has decreased to approximately 77,000 permanent residents in 2017. The State of Florida has designated the Keys as an "Area of Critical Concern" and beginning in 2023, will no longer allow issuance of new building permits for the municipalities in the Keys. Development within the Keys is highly regulated to ensure timely evacuation of its visitors and residents prior to severe hurricanes.

The 2040 population of the FCAA service area was estimated to be 77,101 in the Lower East Coast Water Supply Update, prepared by the South Florida Water Management District in 2018. This value is essentially equivalent to the current population and consistent with the expectation that the permanent population will remain constant over the next 20 years.

### **3.5 Water Supply Provided by Local Government**

The City does not provide water. The FCAA is the area service provider.

### **3.6 Water Supply Provided by Other Entities**

The Florida Keys Aqueduct Authority (FCAA) is the sole provider of potable water in the Florida Keys, established by Special Legislation, Chapter 76-441, L.O.F. (as amended). FCAA's primary water supply is the Biscayne Aquifer, a shallow groundwater source. The FCAA's wellfield is located within an environmentally protected pine rockland forest west of Florida City. The location of the wellfield near Everglades National Park, along with restrictions enforced by state and local regulatory agencies, contributes to the unusually high water quality. These wells contain some of the highest quality groundwater in the state, meeting all regulatory standards prior to treatment. Additionally, the FCAA is continually monitoring, assessing, and working to eliminate potential hazards to our water source, including inappropriate aquifer utilization, unsuitable land uses, and the potential for saltwater intrusion.

The groundwater from the wellfield is treated at the FCAA's Water Treatment Facility in Florida City, which currently has a maximum water treatment design capacity of 29.8 million gallons per day (MGD). The primary water treatment process is a

conventional lime softening/filtration water treatment plant and is capable of treating up to 23.8 MGD from the Biscayne Aquifer. The secondary water treatment process is the newly constructed reverse osmosis (RO) water treatment plant which is capable of producing 6 MGD from the brackish Floridan Aquifer. The product water from these treatment processes is then disinfected and fluoridated. The FKAA treated water is pumped 130 miles from Florida City to Key West supplying water to the entire Florida Keys.

The FKAA maintains storage tank facilities which provide an overall storage capacity of 45.2 million gallons system wide. The sizes of tanks vary from 0.2 to 5.0 million gallons. These tanks are utilized during periods of peak water demand and serve as an emergency water supply. Since the existing transmission line serves the entire Florida Keys (including Key West), and storage capacity is an integral part of the system, the capacity of the entire system must be considered together, rather than in separate service districts.

Additionally, two saltwater RO plants, located on Stock Island and Marathon, are available to produce potable water under emergency conditions. The RO desalination plants have design capacities of 2.0 and 1.0 MGD, respectively.

#### Demand for Potable Water

Figures 2 and 3 provide a historical overview of the water demands in the FKAA service area including Water Use Permit (WUP) allocation limits, yearly percent changes, and remaining water allocations. In March 2008, South Florida Water Management District (SFWMD) approved the FKAA's modification of WUP 13-00005-5-W for a 20-year allocation from the Biscayne and Floridan Aquifers. This modified WUP provides an annual allocation of 8,751 Million Gallons (MG) or 23.98 MGD and a maximum monthly allocation of 809 MG with a limited annual withdrawal from the Biscayne Aquifer of 6,492 MG or 17.79 MGD and an average dry season (December 1st-April 30th) of 17.0 MGD.

In order to meet the requirements of this limitation, the FKAA constructed a new Floridan Aquifer Reverse Osmosis (RO) water treatment system. This RO water treatment system is designed to withdraw brackish water from the Floridan Aquifer, an alternative water source approximately 1,000 feet below the ground surface and treat the water to drinking water standards. The RO water treatment plant provides added capability to limit Biscayne aquifer withdrawals and is designed to meet current and future water demands. The RO water treatment system provides an additional 6.0 MGD of potable water.

Along with the new reverse osmosis water treatment plant, compliance with withdrawal limits can also be accomplished by using other alternative water sources (blending of the Floridan Aquifer, reclaimed water and operation of the RO desalination plants), pressure reduction, public outreach, and assistance from municipal agencies in enforcing water conservation ordinances.

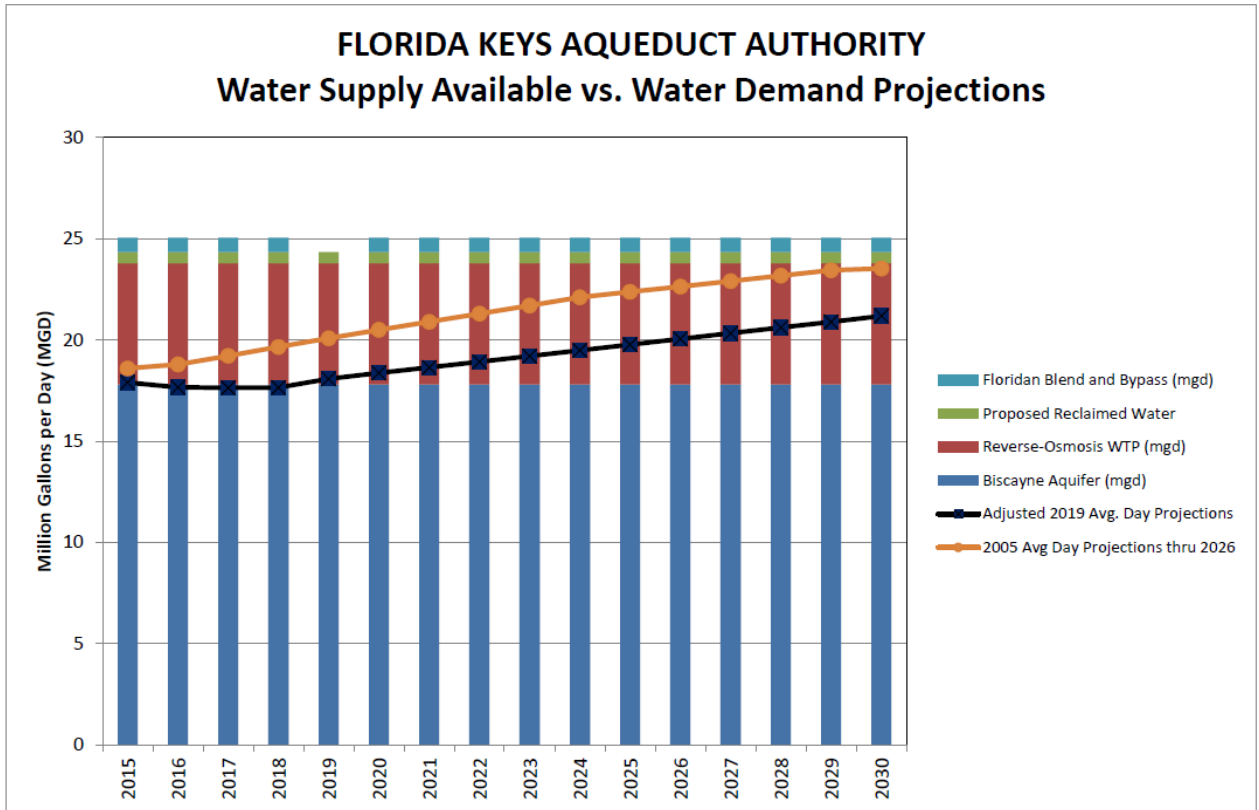
<b>Figure 2. Annual Water Withdrawals 2002-2018</b>				
<b>Year</b>	<b>Annual Withdrawal (MG)</b>	<b>% Change</b>	<b>WUP Limit (MG)</b>	<b>WUP +/- Annual Allocation (MG)</b>
2002	6,191	10.03%	7,274	1,083
2003	6,288	1.57%	7,274	986
2004	6,383	2.74%	7,274	813
2005	6,477	0.16%	7,274	803
2006	6,283	-2.49%	7,274	964
2007	5,850	-7.35%	7,274	1,428
2008	5,960	1.89%	8,751	2,791
2009	5,966	0.09%	8,751	2,785
2010	5,919	-0.79%	8,751	2,832
2011	6,327	6.89%	8,751	2,424
2012	6,042	-4.50%	8,751	2,709
2013	6,105	1.04%	8,751	2,646
2014	6,377	4.46%	8,751	2,374
2015	6,530	2.40%	8,751	2,221
2016	6,462	-1.04%	8,751	2,289
2017	6,324	-2.13%	8,751	2,427
2018	6,526	3.10%	8,751	2,225
Source: Florida Keys Aqueduct Authority, 2019				

**Figure 3. 2019 Potable Water Demand Summary**

<b>FLORIDA KEYS AQUEDUCT AUTHORITY</b>				
<b>Potable Water Demand Summary - New Water Demand, Actual Water Demand, and Expected Water Demand</b>				
<b>Municipality</b>	<b>Year - 2019</b>		<b>Year - 2019</b>	<b>Year 2020</b>
	<b>New Water Service - Gallons/Year</b>	<b>Metered Water - Gallons/Year</b>	<b>Actual Water Demand - Gallons/Year*</b>	<b>Expected Water Demand - Gallons/Year</b>
Unincorporated Monroe County	2,335,000	2,194,005,542	2,824,051,412	2,826,386,412
City of Key West	617,000	1,569,905,703	2,020,730,729	2,021,347,729
City of Marathon	1,337,700	586,491,003	754,911,833	756,249,533
City of Key Colony	0	108,107,301	139,152,144	139,152,144
City of Layton	0	12,290,772	15,820,275	15,820,275
City of Islamorada	324,500	654,275,664	842,162,008	842,486,508
<b>Entire Florida Keys</b>	<b>4,614,200</b>	<b>5,125,075,985</b>	<b>6,596,828,401</b>	<b>6,601,442,601</b>
<b>SFWMD WUP Annual Allocation</b>			<b>8,751,000,000</b>	<b>8,751,000,000</b>
*metered + unmetered water demand (ie. flushing, leaks, etc.)				

Figure 4 illustrates projected water supply availability vs projected water demand. Demand for potable water is influenced by many factors, including the number of permanent residents, seasonal populations and day visitors, the demand for commercial water use, landscaping practices, conservation measures, and the weather.

**Figure 4. FCAA Water Supply Available vs. Water Demand Projections**



The Florida Keys Aqueduct Authority draws from four different supply sources in the Keys. Most of the supply (approximately 17.79 MGD) is fresh groundwater from the Biscayne Aquifer, which is treated through a lime softening process. This is supplemented with approximately 6 MGD of groundwater from the brackish Floridan Aquifer, which is treated at FCAA’s Low-Pressure Reverse Osmosis facility; both the lime softening plant and the LPRO facility are located at the J. Robert Dean Water Treatment Plant in Florida City. Additionally, two seawater desalination plants located in Marathon and Stock Island contribute emergency water supply; the Marathon plant has a capacity of 1 MGD and the Stock Island plant has a capacity of 2 MGD.

Per the terms of FCAA’s water use permit with South Florida Water Management District, the water supply is limited to a maximum daily withdrawal of 17 MGD during the dry season (December-April) if aquifer levels fall below 1.25 NGVD29 at USGS monitoring well G-613.

**Figure 5. FKAA Water Supply Sources**

Water Supply Sources

Location	Source Water	Treatment Process	Capacity (MGD)
Florida City	Biscayne Aquifer	Lime Softening	17.79 <sup>1</sup>
Florida City	Floridan Aquifer	Low-Pressure Reverse Osmosis	6
Marathon	Seawater	Desalination and/or R.O.	1
Stock Island	Seawater	Desalination and/or R.O.	2

<sup>1</sup> Max day withdrawal limited to 17 MGD during dry season if aquifer level falls below 1.25 NGVD29 at USGS monitoring well G-613 between December 1 and April 30.

**3.7 Conservation**

The City currently coordinates with the FKAA to assist with water conservation and reuse efforts per Comprehensive Plan Objective 4-5.2 *Promote Water Conservation*. The City also actively participates in implementing the FKAA’s Water Conservation Plan consistent with SFWMD’s Water Shortage Plan and Water Conservation Program. Comprehensive Plan Policy 6-1.2.2: *Protect and Conserve Potable Water Supply* states:

1. Potable water shall be conserved through enforcement of conservation measures;
2. The City shall require the use of alternative water supplies such as treated wastewater, stormwater, cisterns, and reverse osmosis systems for landscape irrigation; and
3. The City shall require the use of water-saving plumbing fixtures on all new development.

Additional conservation measures are mandated by state regulations such as ultra-low volume fixtures and rain sensor devices and are currently utilized by the City. The Comprehensive Plan shall reflect all conservation measures contained within the Lower East Coast Water Supply Plan except those measures that are solely the responsibility of the provider, FKAA such as establishing rates and leak detection and repair. Additionally, the City enforces all FKAA or SFWMD mandates for restricted water use. The City is supportive of all measures the FKAA implements to conserve water including a leak detection program, conservation-based rate schedule and the use of reclaimed water/ Grey water use in the City. The City has reviewed the possibility of requiring reuse of water. City-wide reuse does not appear to be feasible at the current time based on the existing infrastructure that is operated and maintained by the FKAA.

The City’s existing policies and the proposed new policies that support water conservation provide a good baseline for moving toward the goal of reduced consumption and usage of water. The City acknowledges that there are numerous variables that may affect the use and conservation of water, but the framework

provided is anticipated to lessen overall consumption and reduce the LOS standard over a 20-year horizon.

### **3.7.1 County-wide Issues**

Water conservation is one method available to promote the reduction of use and increase of availability of potable water. FCAA implements a high base water rate for water use, which effectively deters wasteful water use. Implementation of mandatory year-round watering restrictions also aid in conserving water.

### **3.7.2 Local Government Specific Actions, Programs, Regulations, or Opportunities**

The City will continue to coordinate future water conservation efforts with the FCAA and the SFWMD to ensure that Best Management Practices (BMP) are utilized. The City will continue to implement the existing goals, objectives and policies in the comprehensive plan that promote water supply and conservation in a manner that will satisfy consumer demand while creating no adverse impacts to the environment. The City will participate in the Interlocal Agreement between Monroe County and the other municipalities that will ensure the availability of potable water prior to the issuance of a building permit. Currently the City requires a letter of coordination from FCAA stating that water will be available for all development prior to the issuance of a building permit.

## **3.8 Reuse**

Water reuse is a method for supplementing water availability. Desalination at the source through reverse osmosis is presently incorporated within the design of new water treatment facilities that tap into the Floridan Aquifer. The cost of developing a centralized collection, treatment and distribution system for recycled water separate from the FCAA infrastructure in the City shall be reviewed for financial feasibility. The City has implemented a public infrastructure program to construct and operate central sewer collection and treatment systems. Sewage treatment facilities have the capability to make available gray water for non-potable water applications, such as irrigation for City parks and potentially private entities such as the Sombrero Golf Course. However, the lack of possible users has inhibited the necessary investment to create and maintain a viable reuse water distribution system, and the portion of the FDEP permits to use reclaimed water have been temporarily suspended.

### **3.8.1 Regional and County-wide Issues**

State law supports reuse efforts. For the past years, Florida's utilities, local governments, and water management districts have led the nation in implementing water reuse programs that increase the quantity of reclaimed water used and public acceptance of reuse programs. Section 373.250(1) F.S. provides that "water reuse programs designed and operated in compliance with Florida's rules governing reuse are deemed protective of public health and environmental quality." In addition,

Section 403.064(1), F.S., provides that, “reuse is a critical component of meeting the State’s existing and future water supply needs while sustaining natural systems.”

### **3.8.2 Local Government Specific Actions, Programs, Regulations, or Opportunities**

The City will support the SFWMD and Monroe County water reuse projects, and implementation of new regulations or programs designed to increase the volume of reclaimed water used and public acceptance of reclaimed water.

### **3.9 Climate Change and Sea Level Rise**

Southeast Florida is widely considered one of the most vulnerable regions to the impacts of climate change and sea level rise. This is especially true of the Florida Keys, a 112-mile string of offshore islands connected by US 1 to Miami-Dade County. As discussed earlier, potential landward movement of the saltwater intrusion line resulting from the impact of sea level rise may affect future decisions regarding the implementation of capital improvements, requiring adaptation mitigation strategies to preserve the potable water supply. Monroe County’s climate change and sustainability consultants have recently summarized hydrologic modeling by the United States Geological Survey that suggests relatively low risk to the FKAA wellfields in Florida City under even the worst-case 2060 sea level rise scenarios. However, FKAA continues to monitor the most current data and analysis regarding this issue. Currently the City of Marathon does not have an Energy and Climate Element of the Comprehensive Plan. It is therefore recommended to currently address Climate Change and SLR through existing governmental coordination and through existing plans such as the Southeast Florida Regional Compact on Climate Change.

### **3.10 Local Government Specific Actions, Programs, Regulations, or Opportunities**

FKAA presently operates two reverse osmosis (RO) plants within Monroe County, in Marathon and Stock Island, which have a combined production capacity of 3 MGD. A Floridan wellfield and RO water treatment facility were constructed by FKAA in Florida City and have been operational since the fall of 2009. This RO water treatment plant treats the brackish water of the Floridan Aquifer and has a production capacity of 6 MGD. Storage facilities maintained by the FKAA have a total storage capacity of 45.2 MG; of this amount, there is 12 MG of storage available in above ground storage reservoirs at Florida City. The remaining capacity is obtained from tanks located throughout the transmission and distribution system that provide an additional 33.2 MG of storage capacity. It is therefore anticipated that FKAA will be well positioned to accommodate all of Monroe County’s future water demands as sea level rise impacts South Florida’s regional water supply.

## **4.0 CAPITAL IMPROVEMENTS**

The FKAA 20-Year Water System Capital Improvement Master Plan (the “FKAA CIP”) identifies all proposed work projects affecting the City of Marathon.

#### **4.1 Work Plan Projects**

The FKAA 20-Year Water System Capital Improvement Master Plan identifies all proposed work projects within Monroe County (See Exhibit A: Section 7.2 of the master plan).

#### **4.2 Capital Improvements Element/Schedule**

Due to the FKAA’s role as sole provider of potable water, the City’s Capital Improvements Element does not include any itemized projects or expenditures. However, Comprehensive Plan Objective 9-1.2: *Develop and Implement a Concurrency Management System* states “Pursuant to Ch. 163, F.S., and Rule 9J-5.0055 F.A.C., the City shall develop and implement a Concurrency Management System, which shall ensure that facilities and services needed to support development are available concurrent with the impacts of new development and redevelopment.”

The City will adopt by reference the FKAA CIP thus linking water availability and programmed improvements with the City’s Concurrency Management System to continue the permit review and approval process that requires evidence of water supply availability prior to the issuance of a building permit and certificate of occupancy.

### **5.0 GOALS, OBJECTIVES AND POLICIES**

Staff has formulated one new objective, and six new policies to meet the statutory requirements regarding potable water supply. The proposed new policies are listed below:

#### **Policy 3-5.1.2: Interlocal Agreement with FKAA to Identify the Availability of Water Supply to Serve Existing and New Development.**

By December 31, ~~2014~~ 2021 the City of Marathon shall enter into an interlocal agreement with the Florida Keys Aqueduct Authority to formulate a mechanism that will allow the FKAA and the City to identify the availability of water supply needed to serve existing and new development within the City, monitor the use of potable water, and implement such alternative water supply projects, traditional water supply projects, conservation projects and reuse necessary to meet the City’s water supply needs.

#### **Policy 3-5.5.5 Encourage Use of Rainwater**



The City shall permit and encourage rainwater storage facilities for all household uses such as but not limited to, irrigation, car, patio, and boat washing. [§163.3177(6)(c)., F.S.]

### **Objective 3-5.6 Ensure Adequate Water Pressures For Fire Protection**

The City shall continue to coordinate with FKAA to ensure adequate capacity is available to provide for fire flows for protection of the public health, welfare, and safety. [§163.3177(3)(a)3., F.S.]

#### **Policy 3-5.6.1 Coordinate with FKAA to Ensure Fire Flows**

The City shall coordinate with the FKAA, in accordance with its Capital Improvements Program, to continue upgrading the distribution system toward the goal of providing fire flow capabilities throughout Marathon as funds and land are available. Fire flows shall meet the provisions of the Florida Fire Prevention Code.

#### **Policy 3-5.6.2 Fire Flow LOS**

The City shall require that at the time a construction permit is issued, adequate fire flow is supplied to the site in accordance with the Florida Fire Prevention Code.

#### **Policy 5-1.1.12 Water Supply Compatibility**

The City shall continue to coordinate with the County and Cities of Layton, Key Colony Beach, Key West, the Village of Islamorada, and FKAA as necessary to facilitate system-wide compatibility on such potable water-related issues as potable water levels of service, consumption projections, water conservation programs, and emergency management.

#### **Policy 5-1.1.13 Energy and Climate Plans**

The City, shall continue to coordinate with the County and Cities of Layton, Key Colony Beach, Key West, the Village of Islamorada, FKAA, and other South East Florida Regional Compact Climate Change partners as necessary to facilitate compatibility on such energy and climate related issues (including but not limited to, emergency management, flood risk, storm surge, threats to potable water supply, the potential for changing habitat and landscapes, the need for shoreline stabilization and the potential impacts to infrastructure necessary to serve proposed uses).

## **6.0 REGIONAL ISSUES IDENTIFIED IN REGIONAL WATER SUPPLY PLANS**

### **6.1 Lower East Coast Water Supply Plan Update, November 8, 2018**

The sole source provider of potable water to Monroe County is FKAA, whose wellfield is located in Florida City. The limited availability of SAS withdrawals presents a potential risk to the water supply for all of Monroe County. FKAA is a permitted Floridan Aquifer User, which should offset any anticipated drought-driven saltwater intrusion event. FKAA also operates reverse osmosis facilities in Marathon and Stock Island.

## **6.2 Integrating Climate Change & Water Supply Planning In Southeast Florida, Southeast Florida Regional Climate Change Compact, June 10, 2014**

The Southeast Florida Regional Climate Change Compact, which includes Palm Beach, Broward, Miami-Dade, and Monroe Counties, predicts that the sea level will rise (the Compact's A Unified Sea Level Rise Projection for Southeast Florida [October 2015] predicts that the sea level will rise between 6 and 10 inches by 2030). This may have implications regarding the ability of the local utility to provide fresh potable water from the Biscayne Aquifer to Monroe County as the saltwater intrusion line shifts westward towards the FKAA wellfield. Monroe County's climate change and sustainability consultants have recently summarized hydrologic modeling by the United States Geological Survey that suggests relatively low risk to the FKAA wellfields in Florida City under even the worst-case 2060 sea level rise scenarios. However, FKAA continues to monitor the most current data and analysis regarding this issue.

## **7.0 REFERENCES**

- Florida Keys Aqueduct Authority, 20-Year Water System Capital Improvement Master Plan, 2020
- Florida Keys Aqueduct Authority, Annual Water Demand Update Through 2030
- Florida Keys Aqueduct Authority, Annual Water Demand Update by Municipal Boundary
- Florida Keys Aqueduct Authority Projected 5-Year Capital Improvement Plan
- South Florida Water Management District, Lower East Coast Water Supply Plan Update, November 8, 2018
- Southeast Florida Regional Climate Change Compact, A Unified Sea Level Rise Projection for Southeast Florida, October 2015
- Southeast Florida Regional Climate Change Compact, Integrating Climate Change & Water Supply Planning In Southeast Florida, June 10, 2014

## **8.0 EXHIBITS**

Exhibit A: Section 7.2 of the Florida Keys Aqueduct Authority 20-Year Water System Capital Improvement Master Plan, December 2020.

Exhibit B: Florida Keys Aqueduct Authority Facilities Overview Map.



# SECTION 7

## FINANCIAL PLAN



FLORIDA KEYS AQUEDUCT AUTHORITY

## SECTION 7

### Financial Plan

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This Section describes the financial plan to fund the current 5-year Capital Improvement Program. The funding will be provided by various sources of revenue available from the Water System. It is expected that the majority of the funding will come from leveraging water revenues from the rate payers as a source of repayment on long term bond issues. Sound financial practices and financing tools will be utilized to protect the financial integrity of the system as well as reduce interest costs to minimize the impact on rate payers.

#### 7.1 Capital Improvement Funding Strategy

The projects outlined in this section will be detailed in a rolling 5-year capital funding program, which will be presented to the FCAA Board of Directors annually as part of the budget process. FCAA will maintain the integrity of the existing System's credit ratings in the bond market by maintaining or improving the ratings that currently exist on the outstanding bonds as shown in Section 7.2. Implicit in maintaining the System's bond ratings is strict adherence to the bond covenants under FCAA's Master Bond Resolution. The overall capital improvement funding strategy will strive to minimize and spread out on an intergenerational basis the impact of rate adjustments required to amortize the proposed bond issues with a fair allocation of costs to current and future beneficiaries or users.

#### 7.2 Existing Debt and Bond Covenants

As of September 30, 2018, FCAA has the following outstanding water bonds in the aggregate principal amounts, interest rates, and bond ratings as shown in **Table 7-1**.



**TABLE 7-1**  
Existing Water Bonds

Description	Interest Rate	Final Maturity	Amount Outstanding as of 9/30/18	Bond Ratings		
				Moody's	S&P	Fitch
Series 2008 refunding water bonds	Variable rate	9/1/2035	\$ 52,625,000	A3	A-	A+
Series 2013A water bonds	1.64%	9/1/2021	\$ 7,820,000			
Series 2013B water bonds	3.52%	9/1/2033	\$ 6,280,000			
Series 2014A water bonds	3.52%	9/1/2033	\$ 2,195,000			
Series 2015A water refunding bonds	3.75%-5.00%	9/1/2037	\$ 34,560,000	A3	A-	A+
Series 2015B water refunding bonds	2.52%	9/1/2030	\$ 15,600,000	A3	A-	A+
Series 2019A water bonds	4.18%	9/1/2049	\$ 50,000,000	A3		A+

FCAA has a Master Bond Resolution authorizing the issuance of future bonds. Both the Master Resolution and Supplemental Series Resolutions have covenant with the bondholders which, in addition to other matters, dictates the funds and accounts to be established together with the flow of funds, establishment of rates, and coverage tests for the issuance of additional debt. All outstanding bonds are secured by net revenues of the water system after payment of operation and maintenance expenses. FCAA has covenanted to maintain rates such that net revenues together with impact fees will be adequate to pay 120 percent of annual debt service requirements. FCAA has the ability to pledge assessments as additional security for the payment of bonds but has currently not instituted an assessment program.

### 7.3 Five-Year Capital Improvement Funding

This section represents an update of the 5-year capital funding analysis. The 5-year funding analysis reflects specific funding for each project identified during this period. The major funding sources for projects during the next 5 years include the use of available water reserves, funds from additional water rate increases, and funds from the issuance of additional revenue bonds. Other potential sources of funding being pursued include a loan through the Water Infrastructure Finance and Innovation Act (WIFIA), state appropriations, and other grants for infrastructure repair and construction.

**Table 7-2** shows the planned funding sources for each water project planned through Fiscal Year 2024. The 5-year estimated total cost to complete the projects identified from Fiscal Years 2020–2024 is \$140.5 million, as shown on **Table 7-2**.

**TABLE 7-2**

**Five-Year Capital Improvement Funding Plan**

Line No.	Description	Funding Source	Projected Fiscal Year Ending September 30					Total 2020-2024
			2020	2021	2022	2023	2024	
<b>CAPITAL COSTS - WATER SYSTEM</b>								
<b>Facilities and Structures</b>								
1	Key West Administration Building Replacement	Series 2019A	\$ 9,000,000	\$ 9,000,000	\$ 4,364,000	-	-	\$ 22,364,000
2	Stock Island garage replacement	RR	-	-	-	-	\$ 420,000	\$ 420,000
3	<b>Total Water Supply</b>		<b>\$ 9,000,000</b>	<b>\$ 9,000,000</b>	<b>\$ 4,364,000</b>	<b>-</b>	<b>\$ 420,000</b>	<b>\$ 22,784,000</b>
<b>Water Treatment Plant</b>								
4	SIRO Facility	RR & Series 2021	\$ 3,000,000	\$ 14,000,000	\$ 18,000,000	\$ 15,000,000	-	\$ 50,000,000
5	<b>Total Water Treatment Plant</b>		<b>\$ 3,000,000</b>	<b>\$ 14,000,000</b>	<b>\$ 18,000,000</b>	<b>\$ 15,000,000</b>	<b>-</b>	<b>-</b>
<b>Water Transmission System</b>								
6	Grassy Key transmission line replacement	Series 2019A	\$ 8,000,000	-	-	-	-	\$ 8,000,000
7	Transmission Terminus rehabilitation	RR	-	-	-	\$ 840,000	\$ 3,360,000	\$ 4,200,000
8	Islamorada transmission line replacement	Series 2019A & RR	\$ 2,670,000	\$ 13,350,000	\$ 10,680,000	-	-	\$ 26,700,000
9	<b>Total Water Transmission System</b>		<b>\$ 10,670,000</b>	<b>\$ 13,350,000</b>	<b>\$ 10,680,000</b>	<b>\$ 840,000</b>	<b>\$ 3,360,000</b>	<b>\$ 38,900,000</b>
<b>Distribution Mains</b>								
10	Simonton, Front and Whitehead Streets Distribution Line Replacement	RR	\$ 750,000	-	-	-	\$ 1,250,000	\$ 2,000,000
11	Ocean Reef distribution and storage improvements	RR	-	-	-	\$ 3,200,000	\$ 3,900,000	\$ 7,100,000
12	New distribution system at No Name Key	RR	\$ 2,600,000	-	-	-	-	\$ 2,600,000
13	<b>Total Distribution Mains</b>		<b>\$ 3,350,000</b>	<b>-</b>	<b>-</b>	<b>\$ 3,200,000</b>	<b>\$ 5,150,000</b>	<b>\$ 11,700,000</b>
<b>Repairs and Upgrades</b>								
14	Box girder bridge coating/coupling replacement	RR	-	-	-	-	\$ 3,870,000	\$ 3,870,000
15	Generator control panel replacement at Florida City	RR	-	-	-	-	\$ 500,000	\$ 500,000
16	Stock Island pump station and generator replacement	RR	\$ 7,000,000	-	-	-	-	\$ 7,000,000
17	Repair/upgrade subaqueous crossing	RR	\$ 2,000,000	-	-	-	-	\$ 2,000,000
18	Repair/upgrade cathodic protection	RR	\$ 2,700,000	-	-	-	-	\$ 2,700,000
19	Repair/Upgrade electrical and instrumentation	RR	\$ 1,000,000	-	-	-	-	\$ 1,000,000
20	<b>Total Distribution Pump Station &amp; Storage</b>		<b>\$ 12,700,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>\$ 4,370,000</b>	<b>\$ 17,070,000</b>
21	<b>Total</b>		<b>\$ 38,720,000</b>	<b>\$ 36,350,000</b>	<b>\$ 33,044,000</b>	<b>\$ 19,040,000</b>	<b>\$ 13,300,000</b>	<b>\$ 140,454,000</b>
22	Revenue and reserves	RR	\$ 19,756,400	\$ 17,532,000	\$ 2,825,600	\$ 4,040,000	\$ 13,300,000	\$ 57,454,000
23	Series 2019A Bonds	Series 2019A	\$ 18,963,600	\$ 18,818,000	\$ 12,218,400	-	-	\$ 50,000,000
24	Future Revenue Bonds	Series 2021	-	-	\$ 18,000,000	\$ 15,000,000	-	\$ 33,000,000
25	<b>TOTAL WATER SYSTEM FUNDING SOURCES<sup>1</sup></b>		<b>\$ 38,720,000</b>	<b>\$ 36,350,000</b>	<b>\$ 33,044,000</b>	<b>\$ 19,040,000</b>	<b>\$ 13,300,000</b>	<b>\$ 140,454,000</b>

The total five-year funding sources are summarized on **Table 7-3**.

**TABLE 7-3**  
Five-Year Capital Funding Sources

Funding Source	Five-Year Amount	% of Total
Revenue and Reserves	\$ 57,454,000	40.91%
Series 2019A Bonds	\$ 50,000,000	35.60%
Series 2021 Bonds	\$ 33,000,000	23.50%
<b>Total</b>	<b>\$ 140,454,000</b>	<b>100.00%</b>

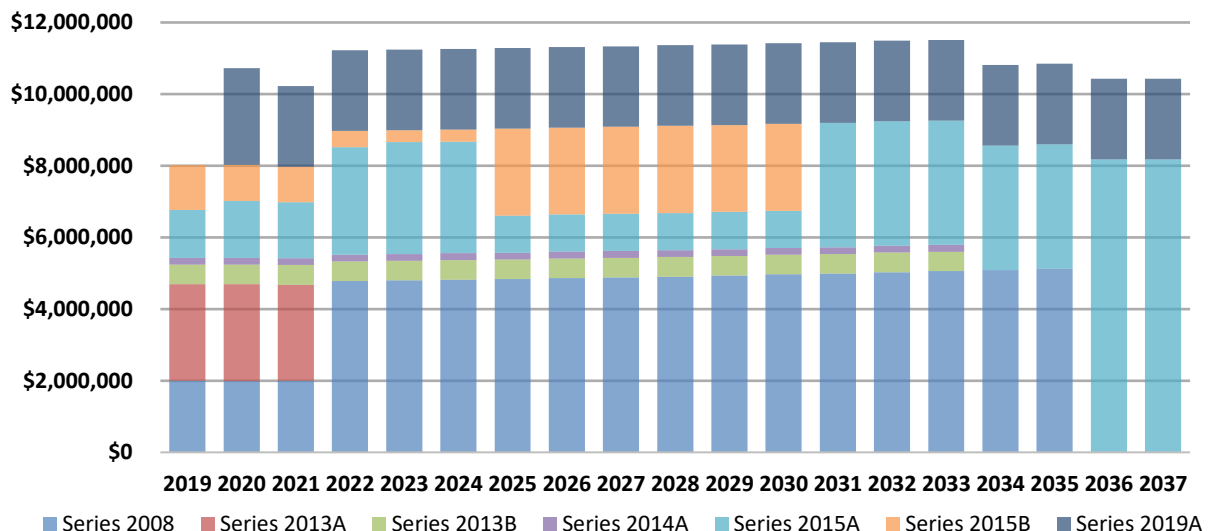
As shown above, the capital funding plan through Fiscal Year 2024 is dependent on the issuance of additional revenue bond financing (Bond4) as summarized in **Table 7-4**.

**TABLE 7-4**  
Issuance of Additional Revenue Bonds

Series 2021 Bonds	
Principal Amount	\$ 50,000,000
Project Funds Available	\$ 50,000,000
Issuance Date	Jun-20

**Figure 7-1** illustrates the annual debt service for existing debt for FKAAs water system. The issuance of additional debt is contingent on the ability of FKAAs water revenues to meet the debt service payments and other bond covenants of existing and future debt instruments. Previous analyses have indicated the need to increase water rates over a several-year period. This process began with an initial water rate adjustment implemented by FKAAs effective October 2019.

**FIGURE 7-1**  
Annual Debt Service



**Table 7-5** illustrates future projected water rate adjustments beyond October 2019. As shown below, additional rate adjustments of 3 percent annually are projected for Fiscal Year 2020 through Fiscal Year 2022 (October 2019 through October 2021) in addition to annual rate adjustments set forth in the FCAA Rules. These rate adjustments are consistent with previous projections completed prior to issuance of the Series 2019 Bonds. The financial forecast supporting the rate projections will be reviewed prior to the issuance of additional bonds and the initiation of the rulemaking process in each year to determine the actual water rate levels necessary.

**TABLE 7-5**  
Projected Water Rate Adjustments

Fiscal Year	Annual Rate Indexing <sup>1</sup>	Additional Rate Increase <sup>2</sup>	Cumulative Rate Adjustment
2020	2.50%	3.00%	5.50%
2021	1.50%	3.00%	10.00%
2022	1.50%	3.00%	14.50%
2023	1.50%	0.00%	16.00%
2024	1.50%	0.00%	17.50%

<sup>1</sup>Amounts reflects projected annual rate indexing as set forth in the FCAA Rules.

<sup>2</sup>Additional rate adjustments are calculated based on rates effective October 2019. Additional rate adjustments shown are assumed to become effective in October at the beginning of the fiscal year (e.g., the Fiscal Year 2020 rate adjustment of 5.5% is assumed to become effective October 2020).

Based on similar financial assumptions used in the financial feasibility of the Series 2019 Bonds, the projected rates are expected to adequately fund the cash needs of the FCAA Water System and exceed the minimum debt service coverage ratios required to satisfy the revenue bond obligations. The projected debt service coverage under the proposed rates is summarized on **Table 7-6**.

Other factors that could adversely (or positively) affect the results and financing strategy during the next 5 years include the following:

- Changes in interest rates prior to issuance of additional bonds
- Construction and other cost changes above or below projected levels
- Operating cost increases due to inflation and other factors
- Amount of grant funds or other outside revenue sources available
- Regulatory or other changes to operating conditions
- Changes to customer growth patterns and water demand projections

In addition to the factors above, FCAA staff will continue to pursue debt reduction strategies, financing alternatives, or other initiatives in order to mitigate future rate adjustments. Such factors have not been quantified as part of the financial forecast used to project future water rates and debt financing.



**TABLE 7-6**Projected Debt Service Coverage<sup>1</sup>

Fiscal Year	Debt Service Coverage (without System Development Charge Revenue) <sup>1</sup>	Debt Service Coverage (including System Development Charge Revenue) <sup>1</sup>
2020	1.37	1.48
2021	1.66	1.77
2022	1.48	1.57
2023	1.56	1.64
2024	1.63	1.71
Min. Required	1.1	1.2

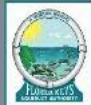
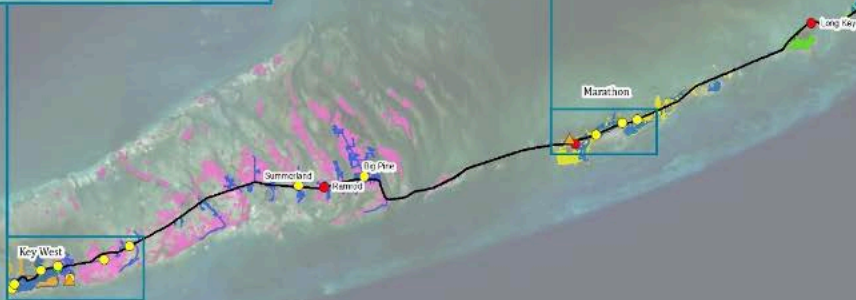
<sup>1</sup>Debt service coverage equals Water System net revenues divided by the total Water System annual debt service. Amounts are based on the water rate adjustments projected herein.

## 7.4 20-Year Capital Improvement Funding

The preceding Section 7.3 and exhibits provide the financing plan and projected water rate adjustments needed to fund capital improvements through Fiscal Year 2024. Because financial forecasting is less reliable beyond a 5-year period, a detailed funding analysis has not been completed past Fiscal Year 2024. As future projects move within the 5-year planning horizon, specific capital strategies will be developed. Such capital funding will likely include additional borrowing as well as cash funding from rates. The underlying objective will be to continue to fund necessary capital improvements, minimize future water rate adjustments, and maintain the creditworthiness of the FCAA Water System.

**Legend**

- |                                  |                             |
|----------------------------------|-----------------------------|
| ▲ Low-Pressure Reverse Osmosis   | <b>FKAA Operation Areas</b> |
| ▲ Lime-Softening Water Treatment | Area 1                      |
| ▲ Emergency Seawater R.O. Plant  | Area 2                      |
| ● Distribution Pump Stations     | Area 3                      |
| ● Transmission Pump Station      | Area 4                      |
| ● Backpump Stations              | Area 5                      |
| — Transmission Main              |                             |
| — Distribution Main              |                             |



**FIGURE 1-2**  
Florida Keys Aqueduct Authority  
Facilities Overview Map