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Introduction

The South Florida Water Management District (SFWMD or District) develops and updates regional water supply plans to assess current and future water needs while protecting central and southern Florida's water resources. This *2023 Lower East Coast Water Supply Plan Update* (2023 LEC Plan Update) assesses existing and projected water demands as well as water sources to meet those demands through 2045.

The Lower East Coast (LEC) Planning Area includes all of Palm Beach, Broward, and Miami-Dade counties, most of Monroe County, and the eastern portions of Hendry and Collier counties. In addition, it includes the Seminole Tribe of Florida reservations and the Miccosukee Tribe of Indians of Florida reservations

TOPICS 🎝

- 2023 LEC Plan Update
- Goal and Objectives
- Legal Authority and Requirements
- Tribal Governments
- Regional and Local Planning Linkage
- Plan Development Process
- Progress Since the 2018 LEC Plan Update

(**Figure 1-1**). The 2023 LEC Plan Update presents population estimates and associated water demands and projections (**Chapter 2**), water resource and water supply development projects (**Chapters 7** and **8**, respectively), and related water supply planning information for the 2021 to 2045 planning horizon. Designed to be a planning guide for local and tribal governments, utilities, agricultural operations, and other water users, the 2023 LEC Plan Update provides a framework for local and regional water supply planning and management decisions in the LEC Planning Area.

The boundaries of the LEC Planning Area follow the north-to-south sheetflow pattern of the historical Everglades, draining into Florida Bay at the southern tip of the peninsula, and encompassing the Florida Keys island chain. As shown in **Figure 1-2**, the LEC Planning Area encompasses the LEC Service Areas and a large part of the Lake Okeechobee Service Area (LOSA). Lake Okeechobee borders four water supply planning areas and is formally included in this plan. The LEC Service Areas include major metropolitan areas from West Palm Beach to Miami. Portions of Palm Beach, Broward, and Miami-Dade counties as well as the Seminole Tribe of Florida's Brighton and Big Cypress reservations depend on surface water from Lake Okeechobee and its connected conveyance canals for supplemental water supply and aquifer recharge. The Everglades Agricultural Area (EAA), which comprises a large portion of LOSA, is located within the LEC Planning Area and also relies on surface water from Lake Okeechobee for irrigation water supply. Surface water from Lake Okeechobee is conveyed south through stormwater treatment areas (STAs) and water conservation areas (WCAs), which comprise the Everglades National Park (ENP).



Figure 1-1. LEC Water Supply Planning Area.





Unique and critical ecosystems such as the Everglades, Lake Okeechobee, Florida Bay, Biscayne Bay, and the Loxahatchee River are located in the LEC Planning Area. Two national parks (Everglades and Biscayne), a federally designated Wild and Scenic River (Northwest Fork of the Loxahatchee River), and five national wildlife refuges are also located within the LEC Planning Area boundaries. Because the LEC Planning Area depends on surface water from Lake Okeechobee and the Everglades—especially the WCAs—for a portion of its water supply, the LEC planning efforts are tightly linked with restoration efforts and management decisions concerning those water resources. Most restoration projects are part of the Comprehensive Everglades Restoration Plan (CERP), a joint effort between the SFWMD and the United States Army Corps of Engineers (USACE). In addition to important natural areas, the LEC Planning Area includes an extensive agricultural industry, several major urban communities, and the Seminole Tribe of Florida and Miccosukee Tribe of Indians of Florida reservations.

The primary sources of fresh water throughout the LEC Planning Area are surface water and groundwater from shallow aquifers. To a much lesser extent, reclaimed water is also used for nonpotable uses like irrigation. Major surface water resources include Lake Okeechobee, the WCAs, and their hydraulically connected water bodies. The availability of surface water and fresh groundwater in the LEC Planning Area is limited, primarily due to water resource protection criteria (**Chapter 4**). Groundwater resources in the LEC Planning Area include the surficial and Floridan aquifer systems (SAS and FAS). Further information about water source options is provided in **Chapter 5**.

2023 LEC PLAN UPDATE

The 2023 LEC Plan Update reflects the changes experienced in the LEC Planning Area since 2018, describes the effects these changes have had on water use, and provides updates to projected water demands from 2040 to 2045. The 2023 LEC Plan Update consists of three documents: 1) the planning document, 2) the appendices, and 3) the *2021-2024 Support Document for Water Supply Plan Updates* (2021-2024 Support Document; SFWMD 2021b). The planning document and appendices focus on the LEC Planning Area. The 2021-2024 Support Document discusses aspects common to four of the SFWMD regional planning areas, including the legal authority and requirements for water supply planning. The Upper Kissimmee Basin is not included in the Support Document because it is part of the Central Florida Water Initiative, which has its own support documents. Additional supporting information for the District's planning areas is available in the recent publication titled *Physical Features and Water Resources of the South Florida Water Management District* (SFWMD 2022b).

GOAL AND OBJECTIVES

The goal of the 2023 LEC Plan Update is to identify sufficient water supply sources and future projects to meet existing and future reasonable-beneficial uses during 1-in-10-year drought conditions through 2045 while also sustaining the water resources and related natural systems. The objectives in the *2018 Lower East Coast Water Supply Plan Update* (SFWMD 2018) were reviewed and modified for this 2023 LEC Plan Update as follows:

- 1. **Water Supply** Quantify sufficient volumes of water and water supply projects to meet reasonable-beneficial consumptive uses projected through 2045 under 1-in-10-year drought conditions.
- 2. **Natural Systems** Protect natural systems and water resources, including the Everglades, estuarine and riverine systems, and other federal, state, and local natural resource areas.
- 3. Water Conservation and Alternative Source Development Encourage water conservation measures to improve water use efficiency. Continue to encourage development of the FAS as an alternative water supply (AWS) and monitor the aquifers to enhance understanding of the relationships among water use, water levels, and water quality. Develop water storage options, including aquifer storage and recovery (ASR) systems and reservoirs, and promote projects that increase use of reclaimed water.
- 4. **Linkage with Local and Tribal Governments** Provide information to support local government Comprehensive Plans. Promote compatibility of the 2023 LEC Plan Update with local and tribal government land use decisions.
- 5. **Compatibility and Linkage with Other Efforts** Achieve compatibility and integration with the following planning-related activities within the region:
 - CERP and other environmental restoration projects
 - Other state and local water resource initiatives
 - Existing and proposed environmental projects
 - Modifications to operating schedules for the regional system, including Lake Okeechobee
 - Water use permitting process, minimum flow and minimum water level (MFL) criteria, water reservations, and restricted allocation areas (RAAs)
 - Local, District, and state resiliency efforts addressing the impacts of climate change, including rising sea levels and changing rainfall and flood patterns

LEGAL AUTHORITY AND REQUIREMENTS

The legal authority and requirements related to water supply planning are included in Chapters 163, 187, 373, and 403, Florida Statutes (F.S.) with Chapter 373, F.S. establishing the District's legal authority. In accordance with Florida's Water Protection and Sustainability Program, regional water supply plans and local government Comprehensive Plans must ensure that adequate potable water facilities are constructed and concurrently available to meet the demands of new development. The water supply planning region identified in this plan shall be considered a Water Resource Caution Area under Rule 62-40.520(2), Florida Administrative Code and for purposes of Section 403.064, F.S., and affected parties may challenge the designation pursuant to Section 120.569, F.S.

In addition to water supply planning, the SFWMD is required by statute to provide updates for a variety of resource development, restoration, and monitoring programs implemented within the District's boundaries. Such updates are provided in the annual publication of the *South Florida Environmental Report*, which is referenced as needed in this plan update.

TRIBAL GOVERNMENTS

The Seminole Tribe of Florida is a federally recognized Indian Tribe organized pursuant to Section 16 of the Indian Reorganization Act of 1934 and recognized by the State of Florida pursuant to Chapter 285, F.S. The Seminole Tribe of Florida's Big Cypress, Coconut Creek, and Hollywood reservations are located in the LEC Planning Area in Hendry and Broward counties (**Figure 1-1**). The Big Cypress reservation land use is primarily agricultural and residential. The Coconut Creek reservation land use is commercial, and much of the Hollywood reservation land use is residential and commercial.

The Miccosukee Tribe of Indians of Florida is a federally recognized Native American tribe, who was part of the Seminole Nation until they organized as an independent tribe in 1962. The Miccosukee Tribe of Indians of Florida is recognized by the State of Florida pursuant to Chapter 285, F.S. The Miccosukee Tribe of Indians of Florida have several reservations located in the LEC Planning Area in Broward, Miami-Dade, and Hendry counties (**Figure 1-1**). Much of the reservation land use is residential, commercial, and recreational.

REGIONAL AND LOCAL PLANNING LINKAGE

The SFWMD's regional water supply planning process is closely coordinated and linked to the local water supply planning of municipal/county governments and utilities. Coordination and collaboration among all water supply planning entities is needed throughout the regional water supply plan development and approval process.

While this 2023 LEC Plan Update addresses regional and Districtwide water supply issues, local governments are required to plan for their water and wastewater needs (as well as other infrastructure and public service elements) through their Comprehensive Plans. These Comprehensive Plans also include Water Supply Facilities Work Plans (Work Plans), which are required by statute. Local governments are required by Chapter 163, F.S. to update their Work Plans and adopt revisions to their Comprehensive Plans within 18 months following approval of this 2023 LEC Plan Update. Revisions may include population projections, established planning periods, existing and future water resource projects, intergovernmental coordination activities, conservation and reuse measures, and the capital improvements element. More information on Comprehensive Plan and Work Plan requirements is provided in the 2021-2024 Support Document (SFWMD 2021b).

To assist local governments in updating their Comprehensive Plans and Work Plans, the SFWMD has developed technical assistance tools and informational documents, which are available on the SFWMD website (https://www.sfwmd.gov/doing-business-with-us/work-plans). Additional information about developing a Work Plan is available from the Florida Department of Economic Opportunity website (https://www.floridajobs.org/community-planning-and-development/programs/community-planning-table-of-contents/water-supply-planning).

This 2023 LEC Plan Update describes how anticipated water supply needs will be met in the LEC Planning Area through 2045. The planning process used to develop this plan update is outlined below.

PLAN DEVELOPMENT PROCESS

PLAN DEVELOPMENT PROCESS





Planning and Assessment Data Collection, Analyses, and Issue Identification

The process incorporated public participation and coordination with local stakeholders, including water supply utilities, agricultural operations, nongovernmental environmental groups, local and tribal governments, the Florida Department of Environmental Protection, the Florida Department of Agriculture and Consumer Services, and other appropriate state and federal agencies. A review of previous planning efforts in the region and documentation of activities since the approval of the 2018 Lower East Coast Water Supply Plan Update (SFWMD 2018) were key starting points.

Using the 2018 Lower East Coast Water Supply Plan Update (SFWMD 2018) as a foundation, developing this plan update involved collecting the latest information on current and projected population and water demands (Chapter 2), water conservation (Chapter 3), water resource protection (Chapter 4), water source options (Chapter 5), and water resource analyses (Chapter 6).

Evaluation of Water Resources and Water Source Options

This phase of the planning process involved reviewing existing monitoring data and updated regional modeling used for evaluation of water resources to identify issues. Where projected demands exceed available supplies, water supply project options were identified, including alternative water supplies and water conservation.



Identification of Water Resource and Water Supply Development Projects

Where resource conditions warranted, water resource development projects were identified (Chapter 7). Water supply development projects intended to meet water needs over the planning horizon were identified, compiled, and evaluated by the SFWMD with input from stakeholders, the public, and other agencies. The SFWMD also considers water supply projects in local government Work Plans. Tribal Work Plans, and adopted Sector Plans, which are required to identify needed water supplies and available water sources pursuant to Section 163.3245(3)(a)2., F.S. Additionally, the projects were screened for permitting feasibility (Chapter 8).

Public Participation

Public participation is a key component of the water supply plan development process to ensure the plan addresses the issues and concerns of stakeholders and that the future direction and projects are appropriate for future water needs. The SFWMD held three virtual workshops for this water supply plan update. Stakeholders representing a variety of interests in the region, such as agriculture, industry, environment, utilities, local government planning departments, tribal representatives, and state and federal agencies as well as the general public, were invited to attend the workshops. The workshops provided participants with an opportunity to review and comment on projected demands, water supply issues, the condition of regional water resources, water source options, groundwater modeling, and other key aspects of the water supply plan update.

Individual meetings were held throughout the planning process with public supply utilities, the Seminole Tribe of Florida, other planning agencies, local government planning departments, and agricultural representatives to discuss water demand projections and coordinate planning efforts. During meetings with the region's major utilities and local governments, population and demand estimates and projections were reviewed and verified, and the condition of regional water resources and AWS development efforts were discussed. Additionally, presentations were made to the District's Governing Board, providing overviews of the plan update and soliciting comments. Following the public comment period, the final version of the plan update was brought to the District's Governing Board for consideration of approval.

PROGRESS SINCE THE 2018 LEC PLAN UPDATE

Since the *2018 Lower East Coast Water Supply Plan Update* (SFWMD 2018), the following activities have improved the understanding of and are supporting the sustainability of the region's water resources, water supply, and natural systems.

Hydrologic Studies, Monitoring, and Modeling

- **Updated Delineation of the Saltwater Interface** The SFWMD reviewed 2019 water quality data from Broward and Palm Beach counties and prepared updated maps comparing the 2009, 2014, and 2019 extent of saltwater intrusion within the SAS (**Appendix D**). Miami-Dade County contracts with the United States Geological Survey (USGS) to maintain and update its monitoring network and its saltwater interface maps. The USGS published the 2011 interface line in 2014 (Prinos et al. 2014) and a 2018 interface map of southern Miami-Dade County in 2019 (Prinos 2019). Further information on the updated delineation of the saltwater interface efforts is provided in **Chapter 6**.
- FAS Monitoring Network The SFWMD continues to maintain and update a network of more than 108 FAS monitor wells, 24 of which are within the LEC Planning Area. Water level data from the monitor wells help manage use of the FAS as a water supply source. In addition, water quality sampling and analyses are conducted periodically to observe any trends that might signal overuse of the resource.

- **Hydrogeologic Studies** Between 2018 and 2023, the SFWMD and its partners completed the following hydrogeologic investigations in the LEC Planning Area:
 - Saltwater interface monitoring and mapping program (Shaw and Zamorano 2020)
 - Groundwater chemistry of the Lower Floridan aquifer upper permeable zone in Central and South Florida (Geddes et al. 2020)
 - Hydrogeology and groundwater salinity of Water Conservation Area 2A (Janzen and Baker 2020)
 - Hydrogeologic investigation and aquifer performance testing at Morikami Park, southeastern Palm Beach County, Florida (Lindstrom 2020)
 - Cycle testing summary report Hillsboro Canal aquifer recharge, storage, and recovery system (Verrastro 2018)
 - Geochemistry of the Upper Floridan aquifer and Avon Park permeable zone within the South Florida Water Management District (Geddes et al. 2018)
 - Installation of a monitoring well cluster at the S-356 pump station (Smith 2018a)
 - Installation of monitor wells at three sites in Miami-Dade County (Smith 2018b)
- USGS/SFWMD Cooperative Monitoring Water level and water quality monitoring at existing monitor wells provides critical information to develop groundwater models, assess groundwater conditions, and manage groundwater resources. The SFWMD maintains extensive groundwater monitoring networks and partners with the USGS to provide additional support and funding for ongoing monitoring. Well details and monitoring data are provided in various SFWMD technical publications and in the District's corporate environmental database, DBHYDRO. Data from sites monitored by the USGS are archived in a USGS database and published annually.
- Lower West Coast Surficial and Intermediate Aquifer Systems Model The Lower West Coast Surficial and Intermediate Aquifer Systems Model (LWCSIM) was designed and constructed to evaluate changes in water levels in the SAS and intermediate aquifer system (IAS) for the 2014 and 2040 withdrawal scenarios. The model was completed and simulations were conducted during 2020. Information about this modeling effort, including model results, are provided in the *2022 Lower West Coast Water Supply Plan Update* (SFWMD 2022a). The LWCSIM model boundary incorporates western portions of the LEC Planning Area.
- **East Coast Floridan Model** The East Coast Floridan Model (Giddings et al. 2014) was updated and used for the *2021 Upper East Coast Water Supply Plan Update* (SFWMD 2021a) to identify potential changes in water quality, flows, and water levels in the FAS for the 2019 and 2045 withdrawal scenarios (Billah et al. 2021).
- **East Coast Surficial Model** The East Coast Surficial Model, a density dependent groundwater model under development by the District, will have the ability to evaluate changes in water levels and water quality in the SAS for the 2021 and 2045 withdrawal scenarios. The model is under development and is expected to be completed in 2024 (**Chapter 6**).
- **Monitor Well Installations in Broward County** The SFWMD installed Biscayne aquifer monitor wells (BS-2 and BS-3) in southeastern and northeastern Broward County to evaluate the movement of salt water in 2021 and 2023, respectively.

Water Supply Studies

- Annual Estimated Water Use Reports The SFWMD prepared annual reports that summarize estimated use (based on reported withdrawals) for the water use categories: Public Supply, Domestic Self-Supply, Agriculture, Commercial/Industrial/Institutional, Landscape/Recreational, and Power Generation. A copy of the annual reports can be found at <u>https://www.sfwmd.gov/our-work/water-supply</u>.
- 2023 Water Supply Cost Estimation Study The SFWMD funded an engineering evaluation of the capital and operational costs of various water supply facilities including groundwater wellfields, surface facilities, water treatment processes, storage, piping and distribution facilities, and other ancillary components that was completed in 2023. A copy of the report can be found at https://www.sfwmd.gov/our-work/water-supply.

Regulations and Operations

- Aquifer Storage and Recovery Storage Horizon Restricted Allocation Area Near the C-18W Reservoir The SFWMD established water use permitting criteria for an RAA in 2022 for the underground storage horizon of the ASR wells associated with the CERP Loxahatchee River Watershed Restoration Project.
- Lake Okeechobee System Operating Manual (LOSOM) A re-evaluation of the lake regulation schedule by the USACE began in 2019 to coincide with the Herbert Hoover Dike repairs which were completed in 2022. The process is ongoing, and completion of the water control plan is anticipated by the end of 2023.

Water Storage, Construction, and Restoration Projects

- **C-51 Reservoir Phase 1** In January 2017, the SFWMD designated the C-51 Reservoir Phase 1 as a pilot alternative water supply development project, pursuant to Section 373.037, F.S. The reservoir and connection to the L-8 flow equalization basin is expected to be completed by the end of 2023 and is expected to provide up to 35 million gallons per day (mgd) for Public Supply (**Chapter 7**).
- Herbert Hoover Dike/Lake Okeechobee In 2007, the USACE designated the Herbert Hoover Dike as a Level 1 risk, the highest risk for dam failure. Twenty-eight water control structures were replaced with new structures, one culvert was removed, and three were filled in. Construction of all works are completed, and the Dam Safety Action Classification rating improved from a Level 1 to a Level 4 (lowest risk of dam failure).



- **Lake Okeechobee Watershed Restoration Project** Part of CERP, the purpose of the Lake Okeechobee Watershed Restoration Project (LOWRP) is to improve the ecology of Lake Okeechobee, decrease regulatory releases to the St. Lucie and Caloosahatchee estuaries, restore freshwater wetlands in the watershed, and improve water supply for existing legal users. Although this project and its components are located outside of the LEC Planning Area, improvements to water supply of Lake Okeechobee are critical to the region. The LOWRP Final Integrated Project Implementation Report and Environmental Impact Statement was released for public and agency review in 2020. The recommended plan included aboveground storage, underground storage with 80 ASR wells, and two wetland restoration sites. Concerns related to the acceptability and cost of the plan received during state, agency, and tribal review resulted in direction to refine the recommended plan by removing the aboveground storage component and its 25 associated ASR wells. The LOWRP Final Report of the USACE Chief of Engineers is pending and is anticipated to be received in 2024–2026 for the wetland restoration and 55 ASR well components. Planning, design, and test/exploratory wells for the ASR well program have been initiated, and the design of a 10 mgd Demonstration Facility at the C38S location is under way. A feasibility study has been initiated for other reservoir locations in the watershed that may add up to 200,000 acre-feet of additional storage.
- Central Everglades Planning Project Everglades Agricultural Area (CEPP EAA) Designed to reduce damaging discharges from Lake Okeechobee to the northern estuaries, the CEPP EAA project consists of a combination of canals, a 6,500-acre STA (A-2 STA), and a 10,500-acre reservoir (A-2 Reservoir) to reduce harmful discharges from Lake Okeechobee to the northern estuaries and to send more water south to the Everglades. The A-2 STA and the A-2 Reservoir construction has commenced and is anticipated to be completed by November of 2023 and November 2024, respectively. North New River Conveyance and Miami Canal Improvements have been designed and are scheduled to be completed in November of 2025 and 2026, respectively. All aspects of the A-2 Reservoir are anticipated to be completed in 2030 with a 240,000 acre-foot storage capacity.
- Modified Deliveries to Everglades National Park Modifications to the Central and Southern Florida (C&SF) Project have been completed and are operational to improve natural water flows to Shark River Slough in ENP.
- C-111 South Dade Project Completed in 2018, this project was designed to restore natural hydrologic conditions in Taylor Slough and the eastern panhandle of ENP while also preserving the current level of flood protection for agricultural lands in southern Miami-Dade County. Pump replacements at S-332B and S-332C are expected to be completed in 2026.
- Combined Operational Plan The Combined Operational Plan defines operations for the constructed features of the Modified Water Deliveries (MWD) to ENP and Canal 111 (C-111) South Dade project components to convey water from WCA-3A to ENP. The construction components have been completed, and the updated Combined Operational Plan has been implemented since 2020.

- **C-111 Spreader Canal Western Project** The goal of this project is to establish more natural flows in Taylor Slough, which will improve the timing, distribution, and quantity of water flowing into Florida Bay. The canal operating range was lowered to capture more seepage, and seasonal variation was added in March 2016. In 2018, the capacities of two pump stations were increased to deliver more water to Taylor Slough. Phase 2 is in the planning phase. The project is anticipated to be completed parallel to the Biscayne Bay and Southeastern Everglades Ecosystem Restoration (BBSEER) Project in 2026.
- **Biscayne Bay and Southeastern Everglades Ecosystem Restoration Project** The current drainage system and development of wetlands have altered the deliveries of fresh water to Biscayne Bay. The BBSEER Project will restore depth and duration of freshwater flow to the bay, improve diversity of plants and animals, and increase the ecological resiliency of coastal vegetation habitats in southeastern Miami-Dade County to sea level change. The project also will restore the ecological and hydrological connectivity between the bay coastal wetlands, the Model Lands, and Southern Glades. The project is currently in the planning and modeling stages with a tentatively selected plan decision anticipated in 2024.
- Western Everglades Restoration Project This project aims to improve the quantity, quality, timing, and distribution of water in the western Everglades by making alterations to existing canals. Authorization for the construction of the project is anticipated in 2024.
- Sam Jones/Abiaki Prairie C-139 Annex Restoration Project The goal of this project is to restore historical Everglades hydrologic conditions to 7,800 acres of former citrus grove. Within the project footprint, a 2,800-acre Phase 1 construction effort was completed which included citrus removal, farm bed leveling, and initial replanting of native vegetation. The remaining project footprint will be completed in the Phase 2 construction effort, which began January 2021 after additional citrus removal within its footprint was performed. Construction is expected to be completed by 2027 and biological restoration will be implemented through 2032.
- Biscayne Bay Coastal Wetlands L-31E Flow-way – This component of CERP is meant to rehydrate coastal wetlands and reduce point source discharges from the C-102, C-103, and Military canals. The SFWMD constructed the final four culverts in 2018. The USACE will construct the remaining features of the L-31 East Flowway (five pump stations) with anticipated completion by 2024.



Alternative Water Supply and Water Conservation Cost-Share Funding

As part of the regional water supply plans' water resource development component (**Chapter 7**), and to assist local water users in implementation of the water supply development component (**Chapter 8**), the SFWMD periodically provides funding assistance to public water suppliers, local governments, special districts, homeowners' associations, water users, and other public and private organizations for AWS and water conservation projects that are consistent with the SFWMD's core mission. In 2019, the Florida Department

of Environmental Protection and SFWMD initiated annual funding for the construction and implementation of AWS and water conservation projects to qualified applicants through the AWS Funding Program.

- Alternative Water Supply From Fiscal Year (FY) 2018 through FY2022, the SFWMD provided approximately \$7.8 million for eight AWS projects that have been completed or are under construction in the LEC Planning Area, generating 16 mgd of additional reclaimed water capacity and 2.6 mgd of additional reclaimed distribution or storage.
- Water Conservation From FY2018 through FY2022, the SFWMD provided approximately \$1.04 million for 20 water conservation projects that were completed or are being implemented in the LEC Planning Area. The projects are estimated to save 413.60 million gallons per year (1.13 mgd).

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