Hallandale Beach Water and Wastewater Improvements for Future Growth

January 7, 2026

Hallandale Beach

Agenda

Part 1: Water

Part 2: Wastewater

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Part 1: Water

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The City's water plant uses two treatment technologies

Technology 2: Nanofiltration Membranes

Technology 1: Lime Softening

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The City's existing WTP has two treatment processes

1 Lime Softening

Early 1900s Technology
Built in 1950
Design Capacity: 10 mgd

2 Membrane Treatment

State-of-the-Art Technology
Built in 2007
Design Capacity: 6 mgd
(expandable to 13 mgd)

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Water plant current design capacity is 16 mgd

Lime Softening Design Capacity = 10 mgd

Membrane Treatment Design Capacity = 6 mgd

16 mgd

Are we allowed to produce 16 mgd? No

Why?

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Two key factors determine how much drinking water the City can produce…

1. Raw Water Permit Allocation

Water Use Permit
No. 06-00138-W
January 2019

sfwmd.gov

Current Biscayne Allocation = 8.29 mgd

2. Treatment Technology Used

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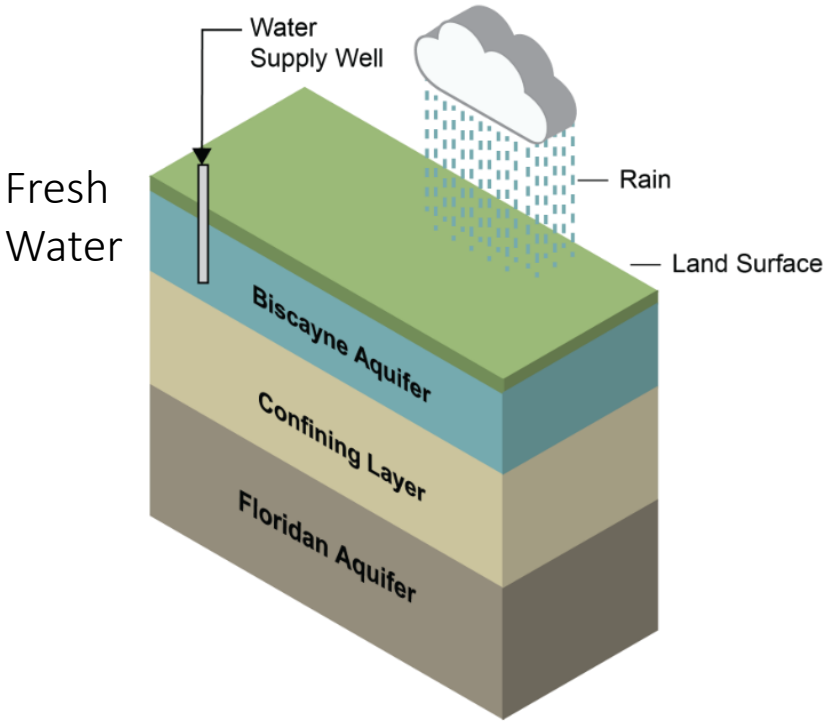
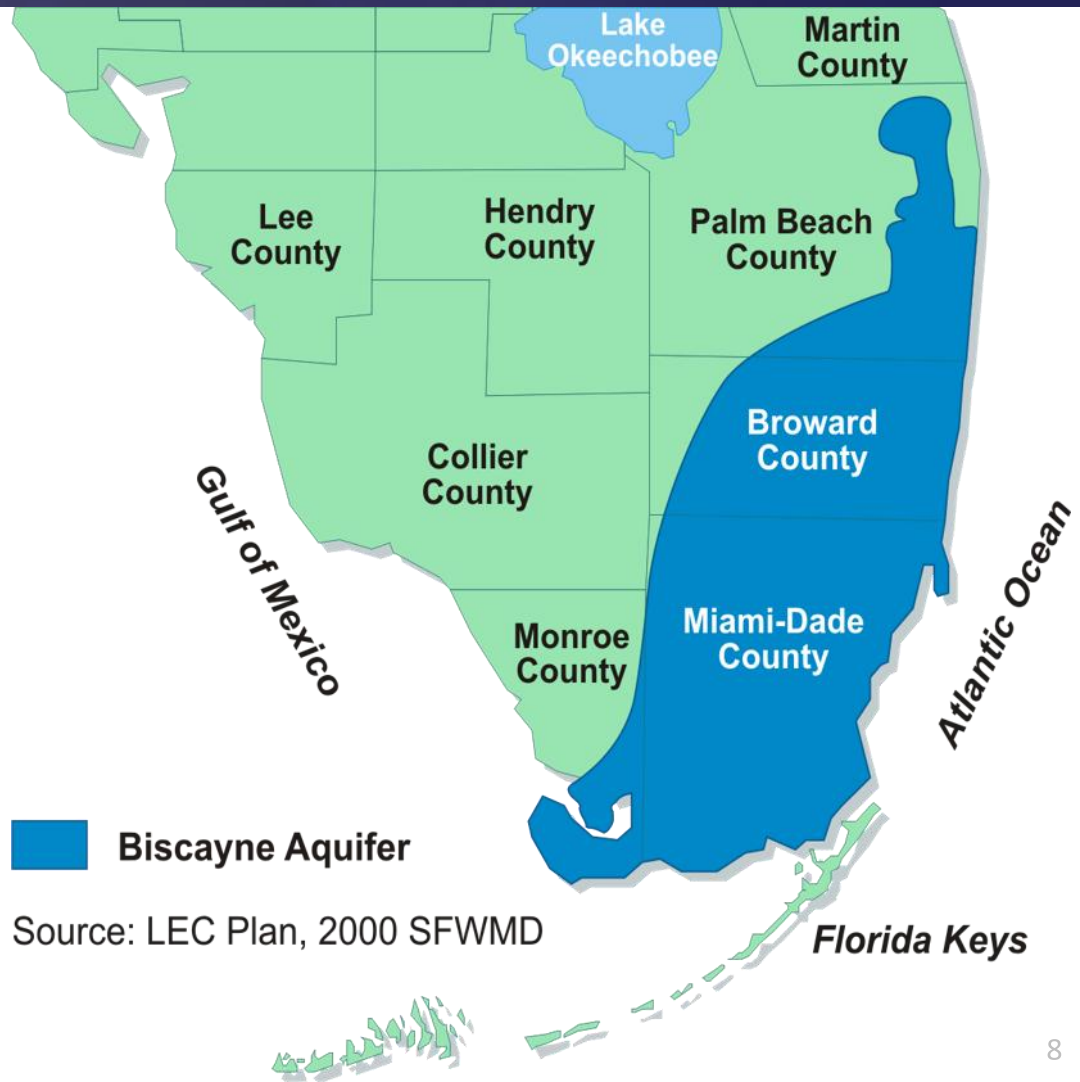
Where does the City's water supply come from?

Biscayne Aquifer
Occurs Just Below Land Surface
(City's existing supply)





Source: LEC Plan, 2000 SFWMD

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The City has Two Sources of Biscayne Aquifer Water

1 City Wells

City owns five wells

2 Broward County Wells

Water received via a pipeline

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The City's use of the Biscayne Aquifer is limited by its Water Use Permit

Water Use Permit
No. 06-00138-W
January 2019

sfwmd.gov

1 City Wells

4.03 mgd

To Lime Softening Treatment

2 Broward County

4.26 mgd

To Nanofiltration Membrane Treatment

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City's Biscayne Aquifer withdrawal allocation
= 4.03 + 4.26 = 8.29 mgd

Can the City's Biscayne Aquifer withdrawal allocation be increased above 8.29 mgd to meet future demands?

The Biscayne Aquifer is fully allocated.

No increase in Biscayne Aquifer withdrawal allocation is feasible.

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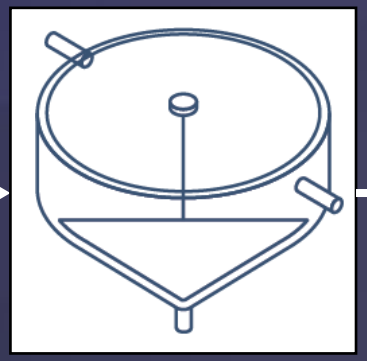
The amount of drinking water that can be produced depends on the treatment technology…

City Wells

4.03 mgd

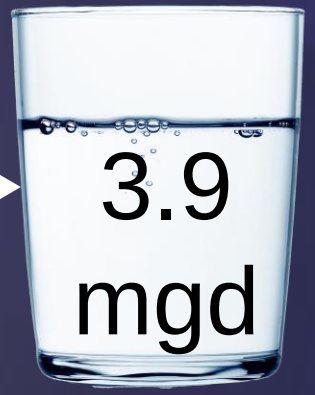
Raw Water

Lime Softening



98%

Drinking Water

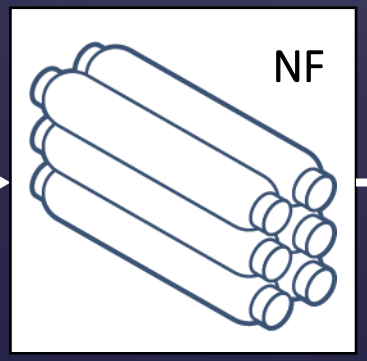


Broward County

4.26 mgd

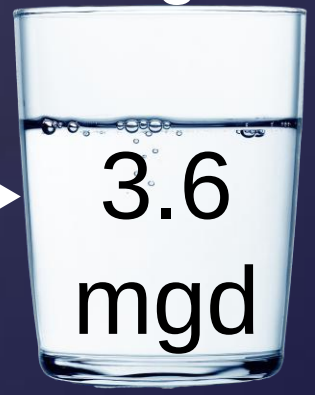
Raw Water

NF Membrane



85%

Drinking Water



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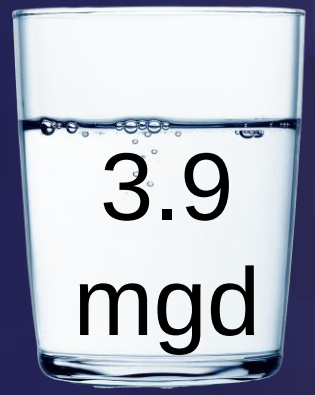
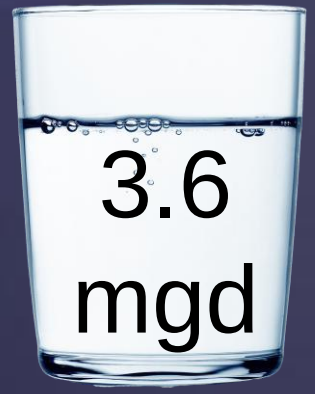
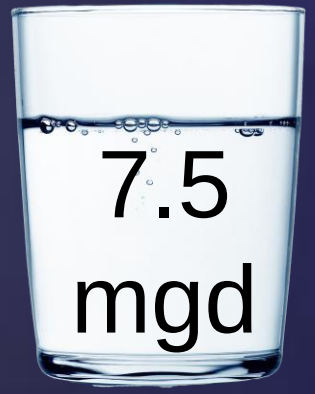
What is the maximum amount of drinking water the City can currently produce?

Drinking Water from Lime Softening		Drinking Water from Membranes		Total Drinking Water
	+		=	

7.5 mgd is an Average Value. On any single day, the City can produce up to the maximum design capacity of our treatment infrastructure. Daily values averaged over one year cannot exceed 7.5 mgd.

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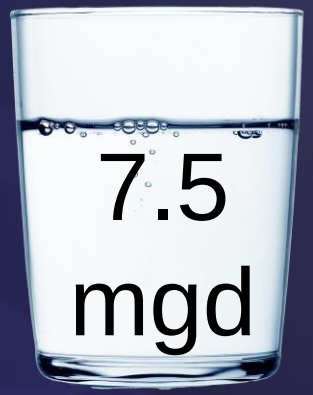
The current treatment and supply infrastructure can meet the City current water demand as evidenced by the below

Current Average Day Drinking Water Production Capacity



Current Average Day Drinking Water Demand

6.5 to 6.9 mgd

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7.5 mgd is greater than 6.9 mgd. Hence, the City has sufficient treatment capacity to meet current demand.

The City's water plant needs to be able to support its expected growth to year 2050 buildout population…

Current Average Water Demand		Water Demand for Planned Development		Additional Needed for Year 2050 Buildout	=	Water Demand Year 2050 Buildout Population
6.5 to 6.9 mgd	+	1.2 mgd	+	1.6 mgd	=	9.7 mgd

Year 2050 Average Day Drinking Water Demand Estimate

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The City can also purchase water from North Miami Beach if there is a emergency

Estimated buildout population is 60,569 in the year 2050

Year	2019 Water Use Permit (WUP) Forecast	2024 Broward County Population Forecast Allocation Model (PFAM)	Percent Difference
2025	42,110	43,109	2.4%
2030	43,574	47,886	9.9%
2035	44,696	50,241	12.4%
2040	45,818	54,687	19.4%
2045	46,782	57,657	23.2%
2050	47,745	60,569 **Buildout Pop**	26.9%

Old Forecast (for reference)

Current Forecast

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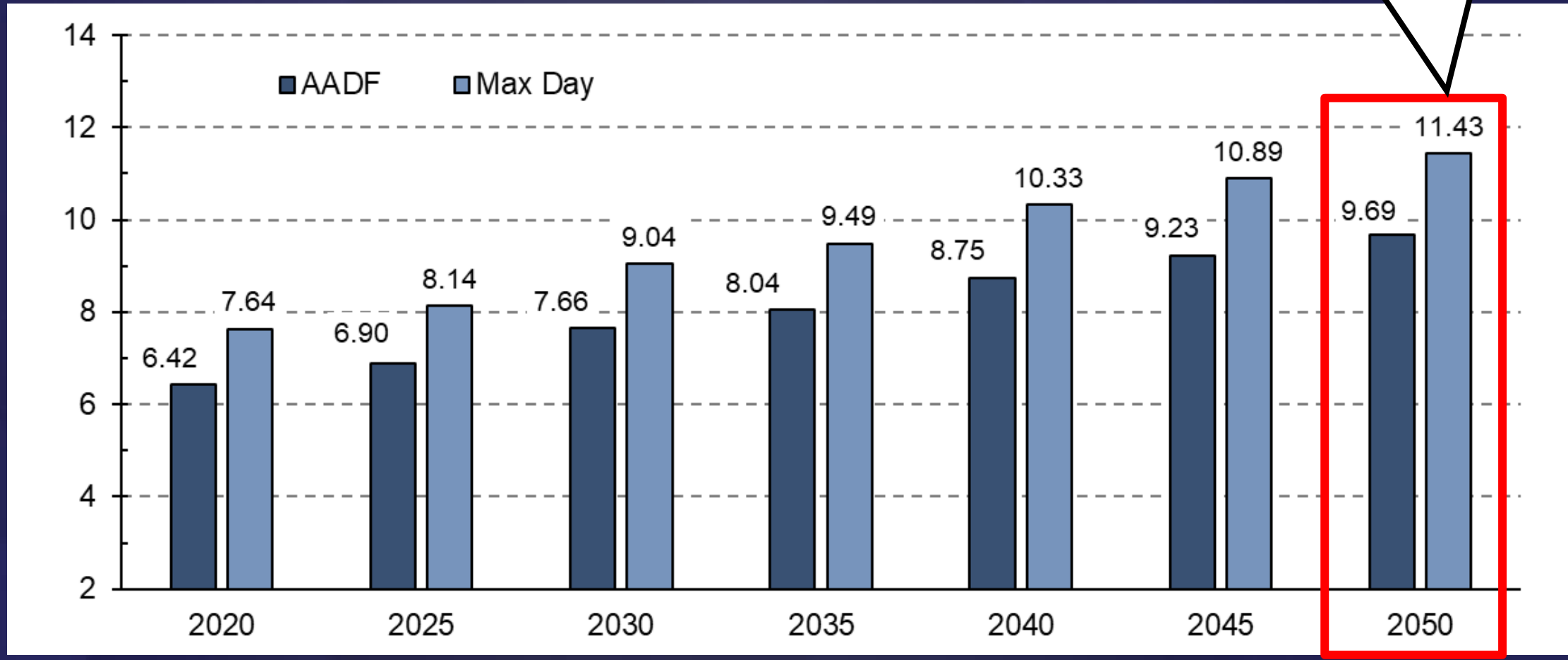
Drinking Water Demand Forecast

The City needs to increase its treatment capacity to meet Year 2050 demand (i.e., buildout population)



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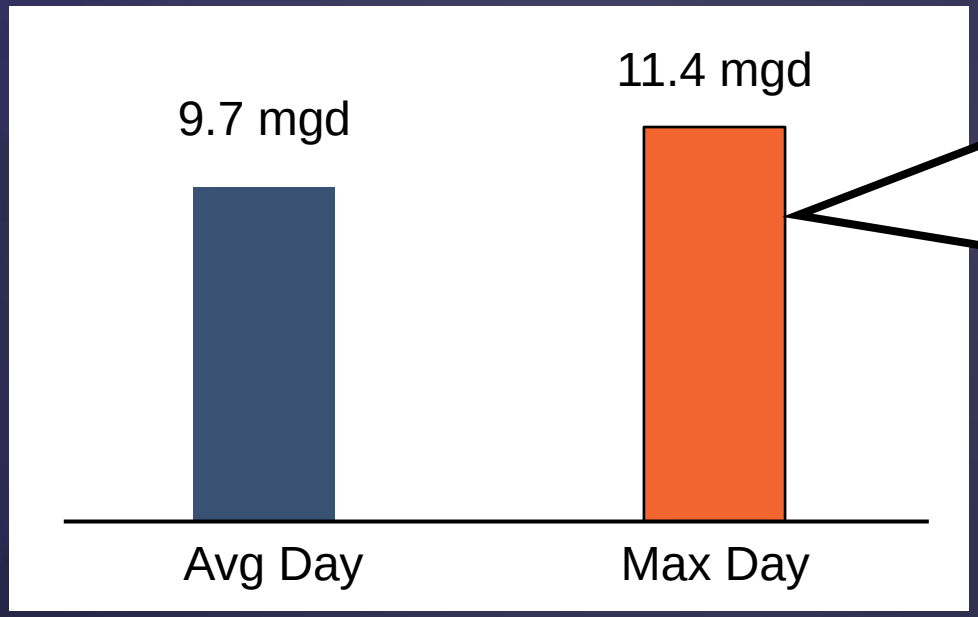
What treatment capacity do we need to meet the year 2050 demand for the buildout population of 60,569?

2050 Demand Estimate



Minimum capacity is 12 mgd (11.4 mgd rounded up)

The City has developed an investment plan to deliver the above capacity.

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There are two other factors that require the City to invest in water treatment and supply infrastructure

Lime Softening

1. The lime softening treatment infrastructure is at the end of its useful life.
2. PFAS Rule (compliance required by late 2028*)

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* The EPA has announced plans to extend the PFAS Rule compliance deadline (possibly to 2031) but has not yet issued a rule.

The lime softening treatment infrastructure is at the end of its useful life

Treatment Infrastructure: The lime softening treatment infrastructure age ranges from 58 to 75 years old. Many elements are near the end of their useful life. Certain infrastructure, for example filters 7-10, are no longer operational.

Support Infrastructure: The City has made significant investments in its support infrastructure in recent years. For example, it replaced its high service pump station which will serve the City for many decades to come.

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What is the PFAS Rule?

PFAS are chemicals that are present in thousands of products

Examples

Non-stick Coatings

Fire Fighting Foam

Food Wrappers

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PFAS chemicals do not easily decompose and are persistent in the environment. PFAS have been linked to kidney, testicular, and liver cancers.

EPA's "Forever Chemical" Rule Issued April 2024

The City must invest in treatment changes to comply with the PFAS rule by late 2028

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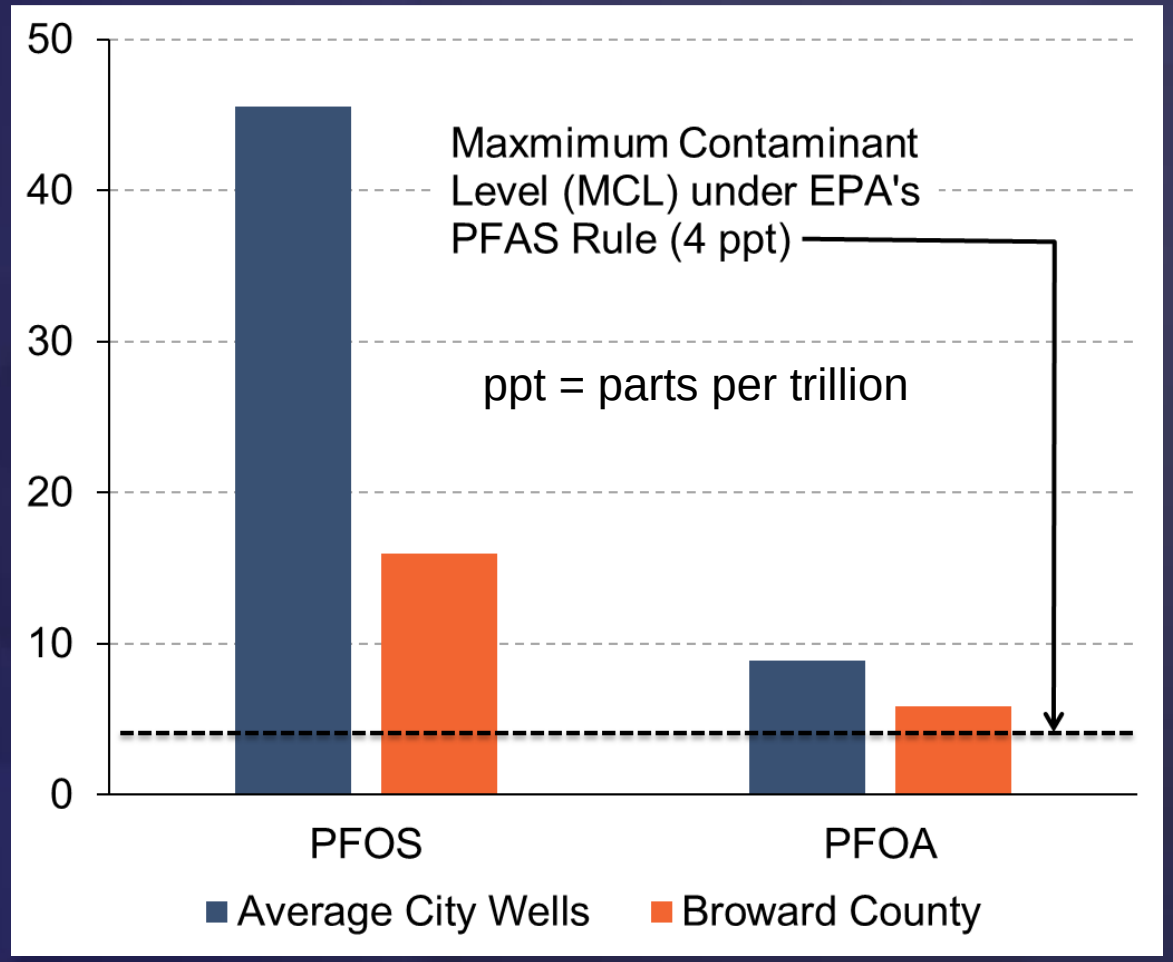
The City's water supply exceeds the "Forever Chemicals" (a.k.a., PFAS) drinking water standard



PFAS in City's Water Supply

City must comply with PFAS Rule by late 2028

1 ppt = Imagine one drop of ink in a volume of water equivalent to 20 Olympic-sized swimming pools

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What does the City need to do to comply with the PFAS Rule?

Lime Softening

Lime softening must be discontinued

Does not remove PFAS

Membrane Treatment

Removes PFAS

…the City has decided to transition to 100% membrane treatment to comply with the PFAS Rule.

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The City has developed a comprehensive plan for PFAS compliance

Planning

The City has completed a study to determine its options

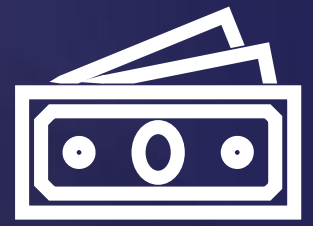
Design

The City will engage its consultants to design treatment and supply improvements

Permitting

Extensive permitting will be required

Construction



The City's CIP includes appropriate budget to fund PFAS compliance

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How will transitioning to 100% membrane treatment impact the City's ability to meet water demand?

100% Membrane Treatment

Removes PFAS

Current Average Day Drinking Water Demand

6.5 to 6.9 mgd

How much drinking water can the existing membrane plant produce?

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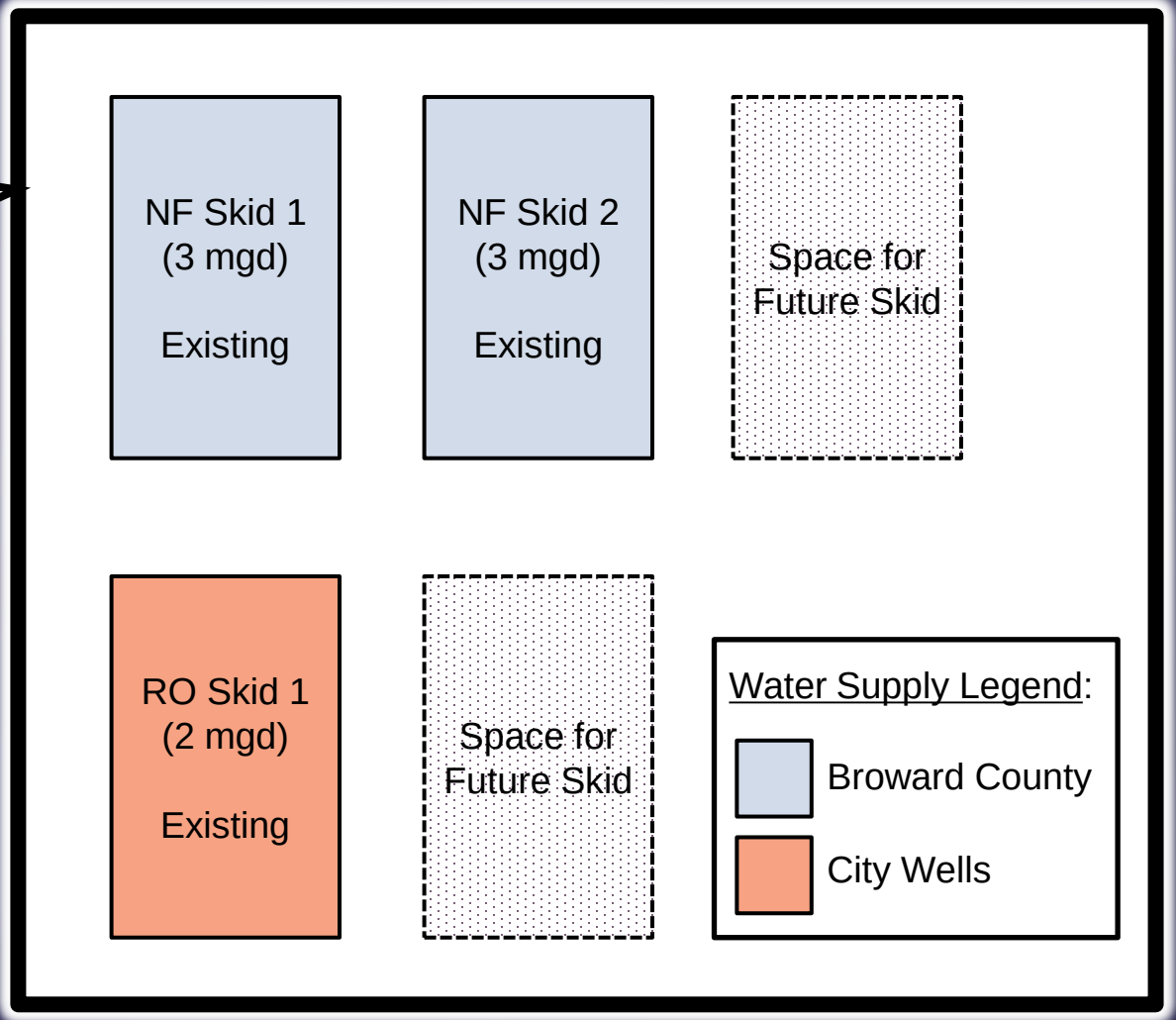
How much drinking water can the existing membrane plant produce?

Existing Membrane Building Floor Plan



Skid	Design Capacity (mgd)
NF Skid 1	3
NF Skid 2	3
RO Skid 1	2
Total	8

Can the City produce this much?

On any single day yes. However, our annual average must comply with our water use permit.

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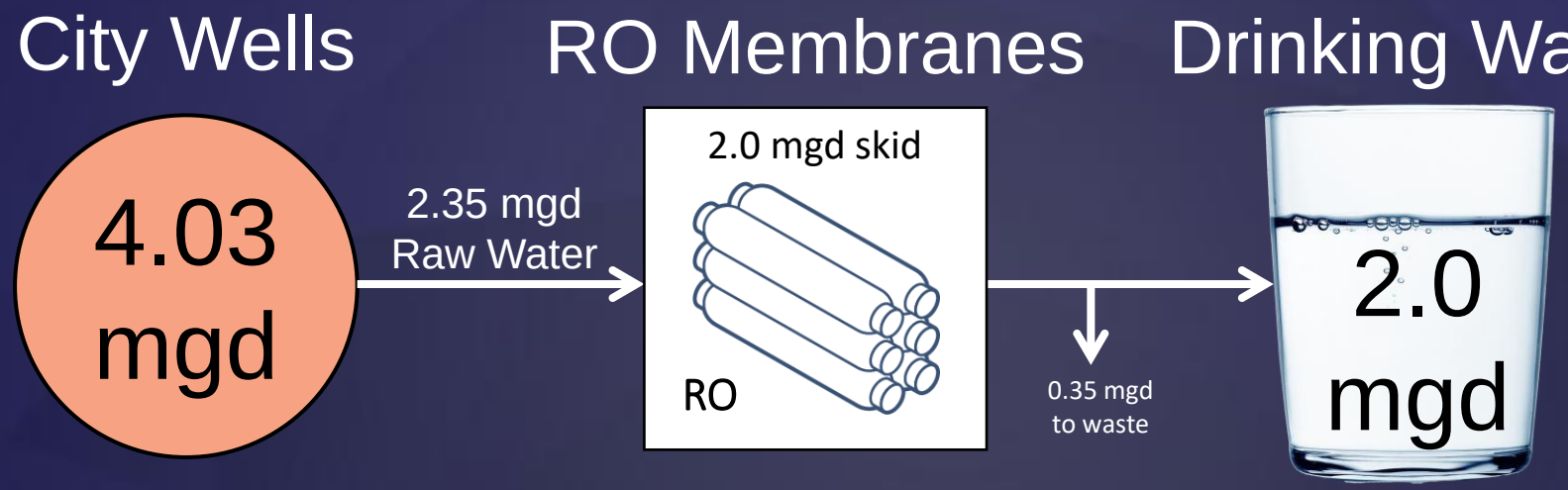
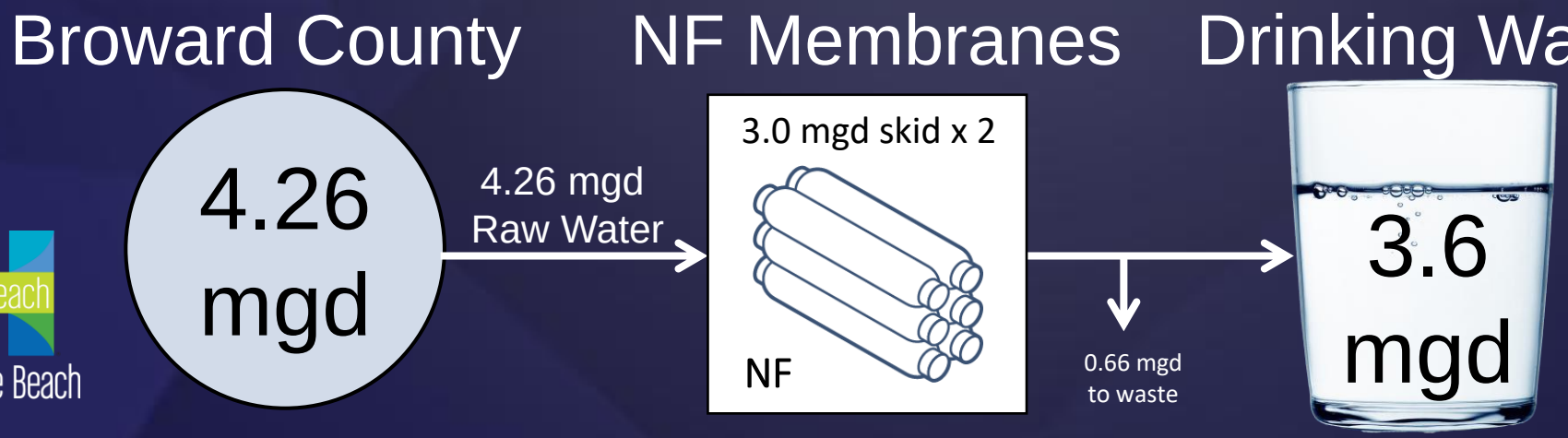
The amount of drinking water that can be produced from the existing WTP depends on the treatment technology and our water use permit





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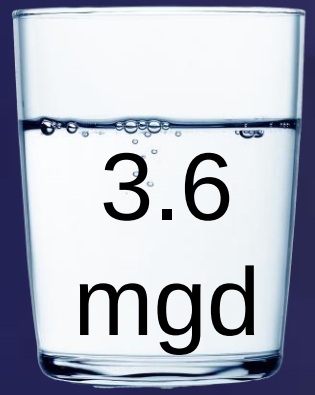
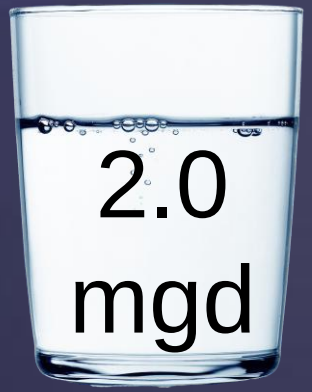
The annual average production capacity of the existing membrane plant is 5.6 mgd

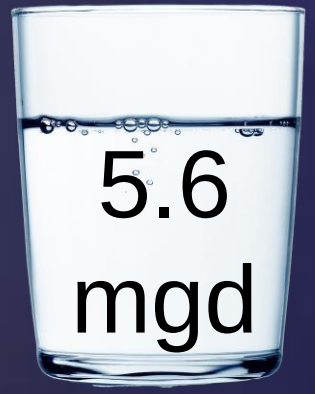
Drinking Water from NF Membranes



Drinking Water from RO Membranes



Total Drinking Water

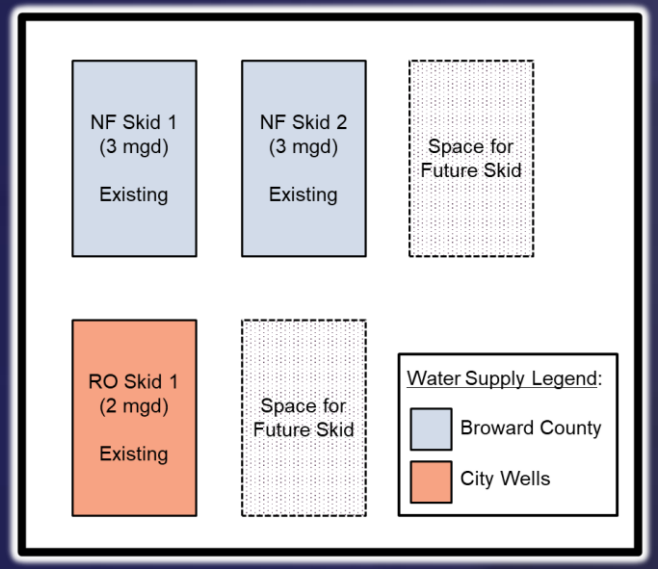


Annual average demand is 6.5 to 6.9 mgd. Hence, two things need to happen:

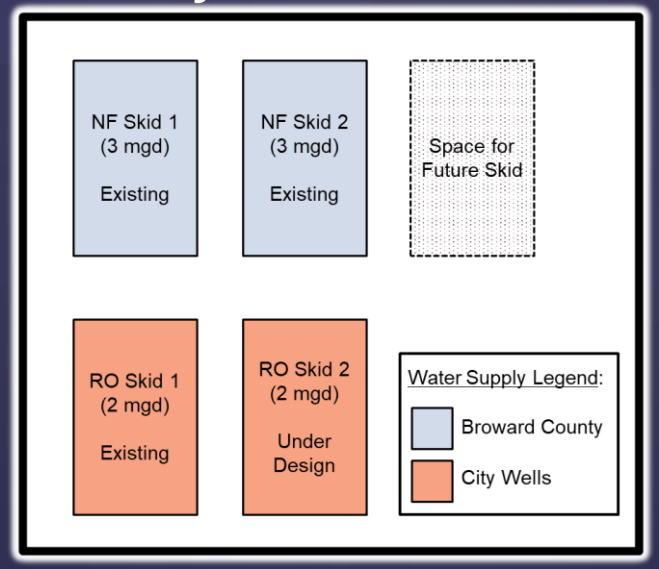
1. Expand WTP
2. Coordinate with NMB for supplemental water

The City's membrane plant expansion includes multiple phases

Existing Membrane Plant Floor Plan

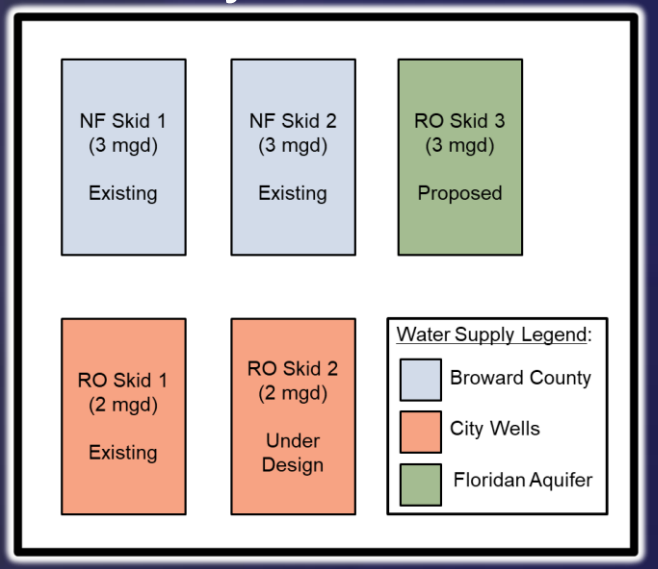


Phase 1: RO Skid 2 by late 2028



Phase 1 ensures compliance with PFAS Rule

Phase 2: RO Skid 3 by ≈ 2030



Phase 2 ensures adequate water to meet demand for the year 2050 buildout population

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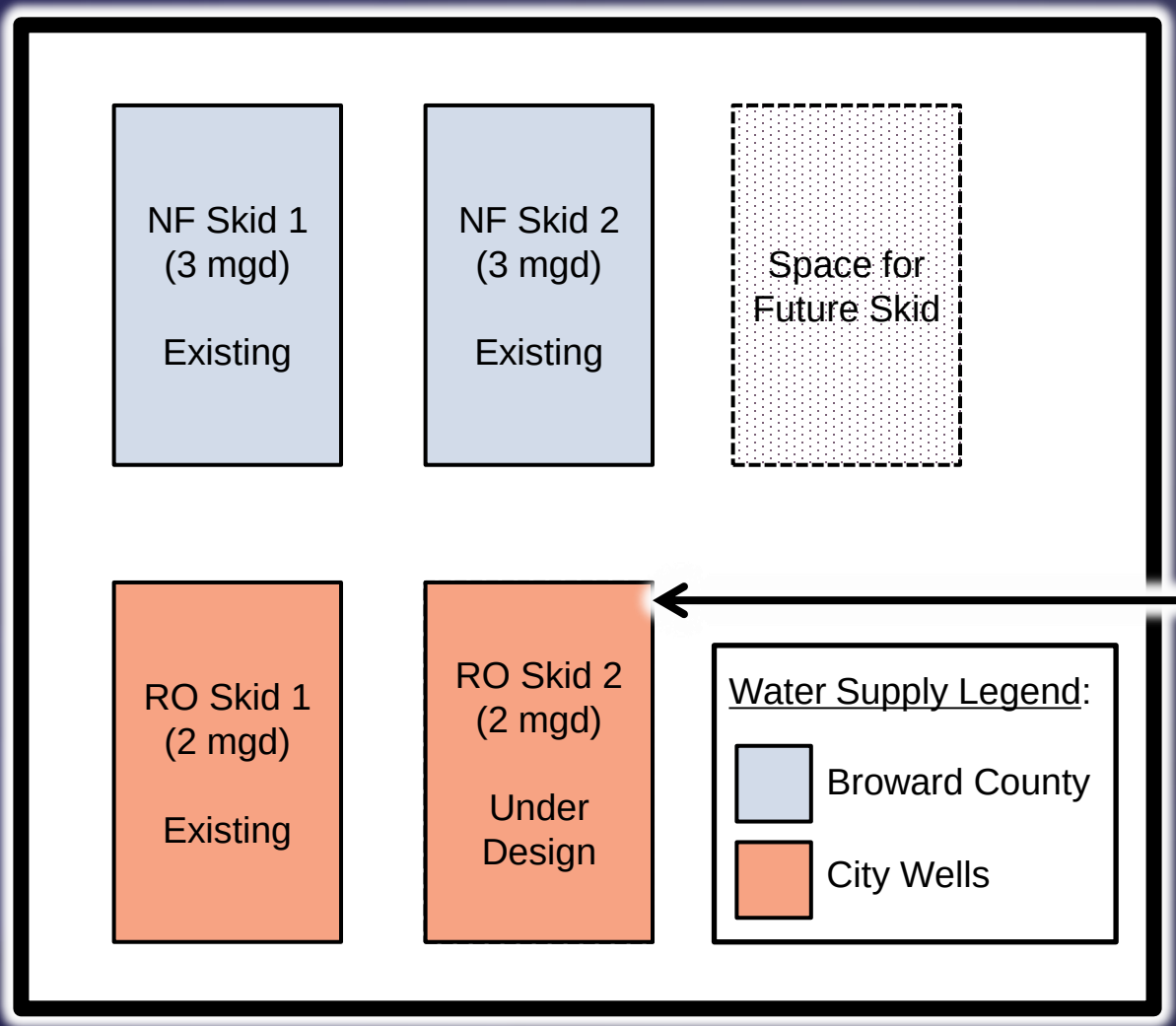
The City's membrane plant expansion includes multiple phases
Phase 1: RO Skid 2



Phase 1 ensures compliance with the PFAS Rule

Phase 1: Addition of RO Skid 2 (currently being designed)

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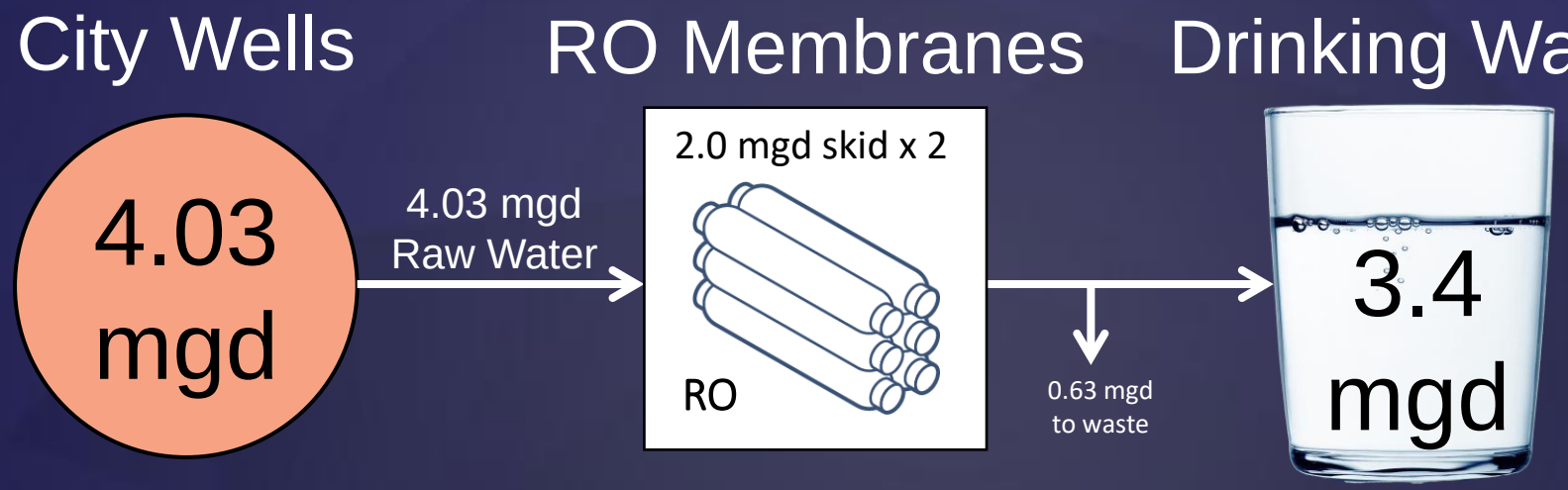
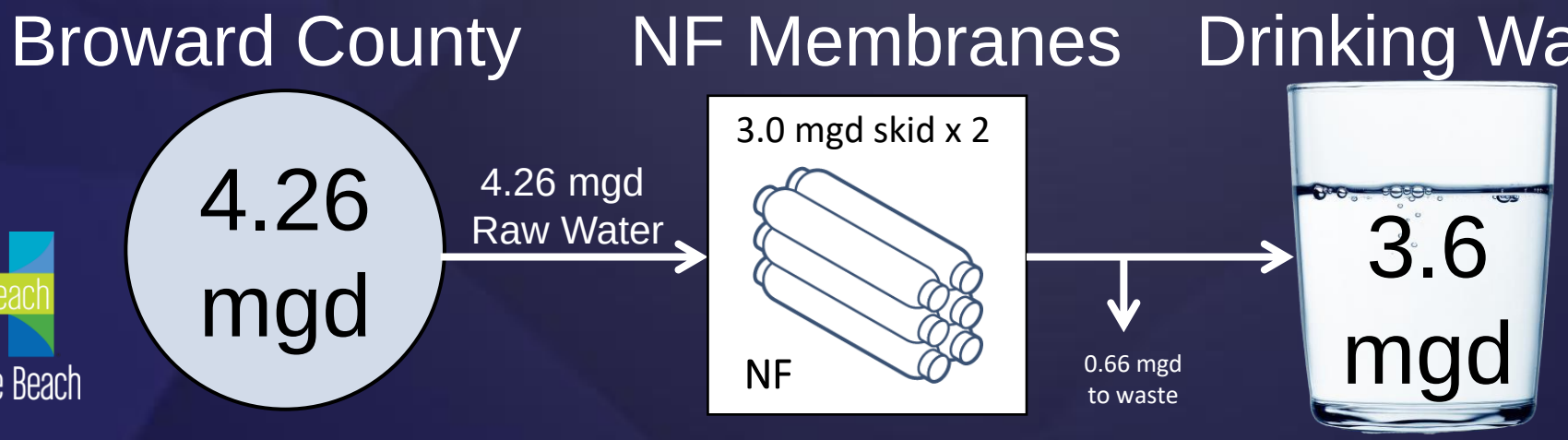
Phase 1 Results: annual average production capacity increased to 7.0 mgd





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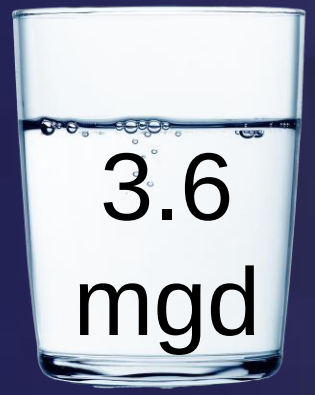
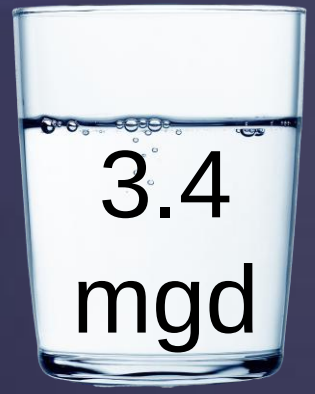
Phase 1 will allow the City to meet current average day and maximum day demand conditions and comply with the PFAS Rule

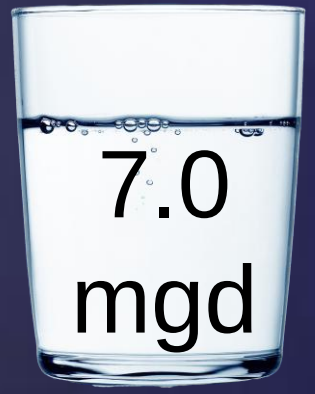
Drinking Water from NF Membranes



Drinking Water from RO Membranes



Total Drinking Water



Meets PFAS Rule? Yes

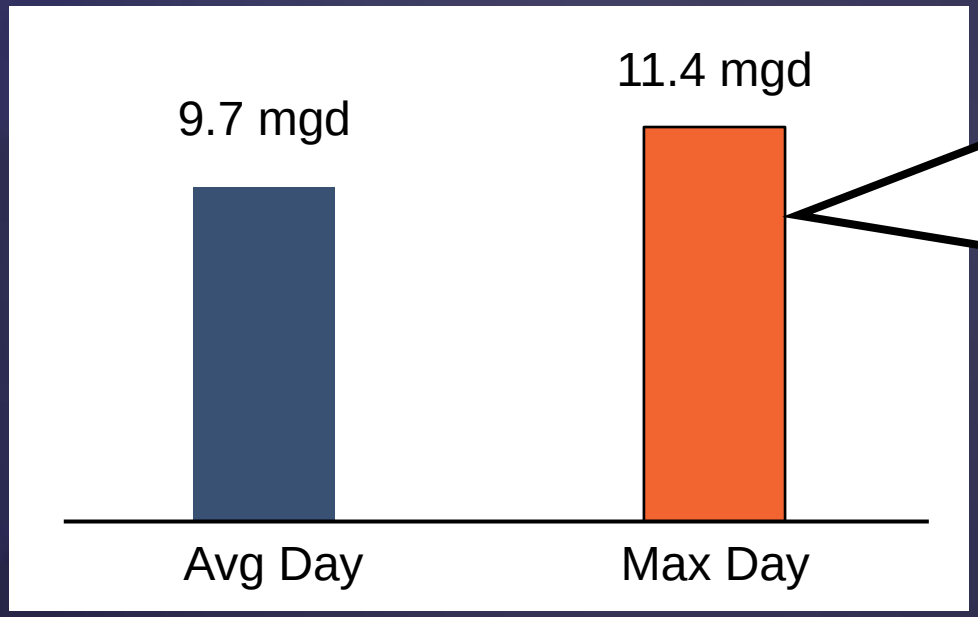
Meets Current Demand?

Yes

Supplemental Water Needed? No

What treatment capacity do we need to meet the year 2050 demand for the buildout population of 60,569?

2050 Demand Estimate



Minimum capacity is 12 mgd (11.4 mgd rounded up)

The City plans to invest in the Upper Floridan Aquifer (UFA) to ensure it can meet the year 2050 water demand.

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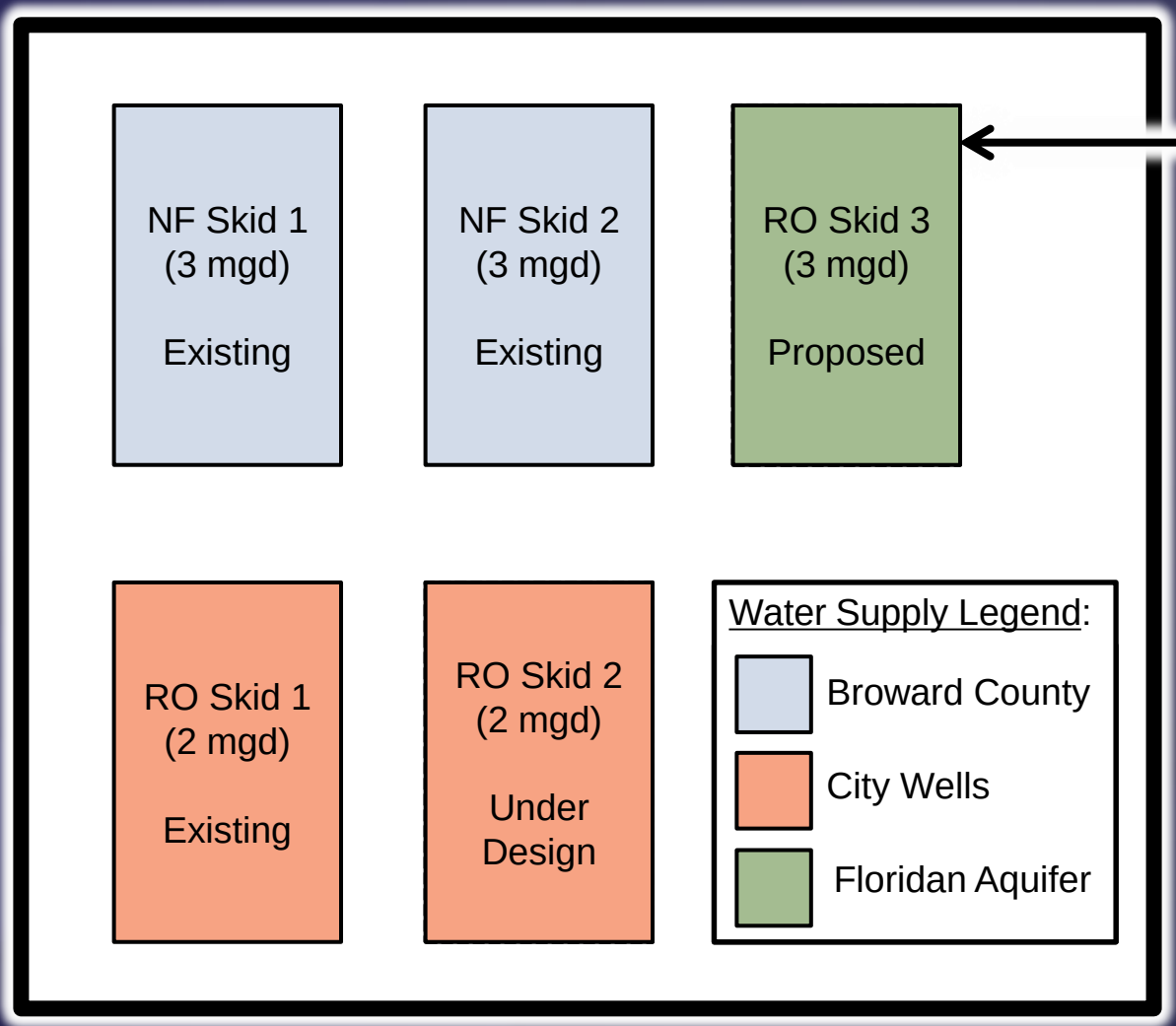
The City's membrane plant expansion includes multiple phases
Phase 2: RO Skid 3



Phase 2: Addition of RO Skid 3 (currently being planned)

Phase 2 ensures the City can meet the year 2050 buildout demand

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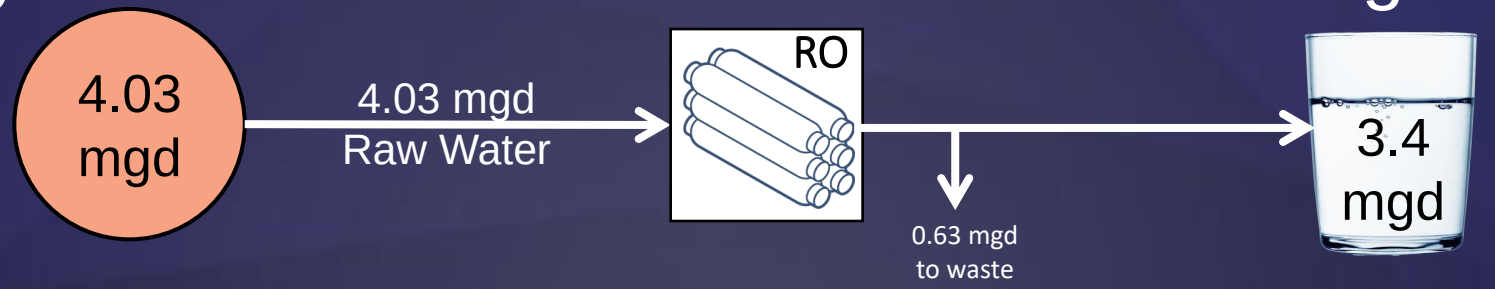
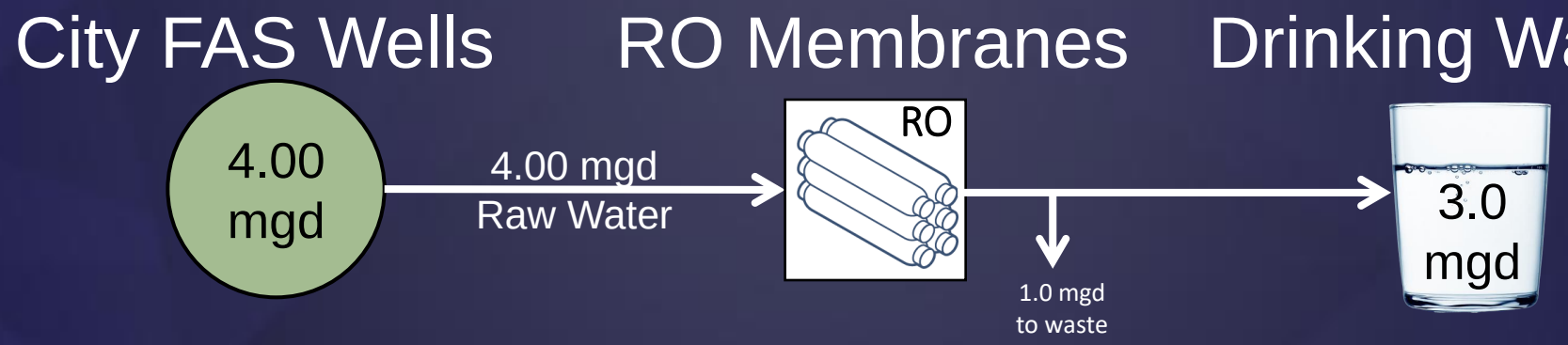
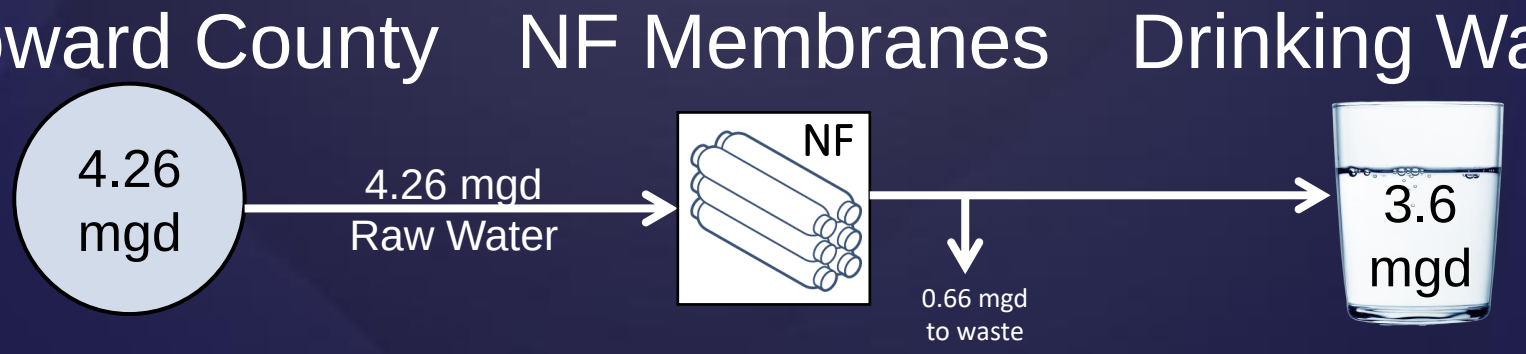
Phase 2 Results: annual average production capacity increased to 10.0 mgd

BA: Biscayne Aquifer

FAS: Floridan Aquifer







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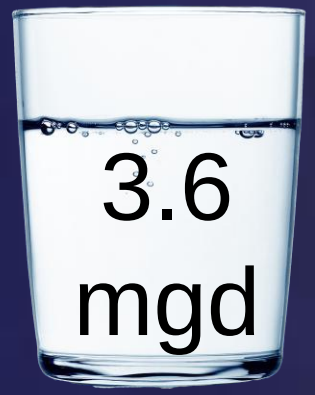
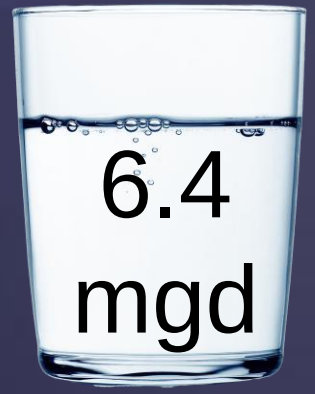
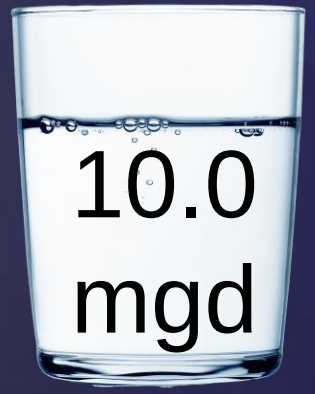
Phase 2 will allow the City to meet the year 2050 buildout water demand

Drinking Water from NF Membranes		Drinking Water from RO Membranes		Total Drinking Water
	+		=	

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Meets PFAS Rule?

Yes

Meets Year 2050 Demand?

Yes

Supplemental Water Needed?

No

Final Summary of Demand vs Production Capacity

Average Day Demand		Finished Water Average Day Production Capacity			
Description	**Value**	**Existing WTP Using Lime Softening and Membranes**	**Existing WTP After Transition to 100% Membranes**	**After Membrane Plant Expansion Phase 1**	**After Membrane Plant Expansion Phase 2**
Current Average	6.9 mgd	7.5 mgd	5.6 mgd	7.0 mgd	10.0 mgd
Planned Development	1.2 mgd				
Additional for 2050 Buildout Population	1.6 mgd				
TOTAL (year 2050)	**9.7 mgd**				

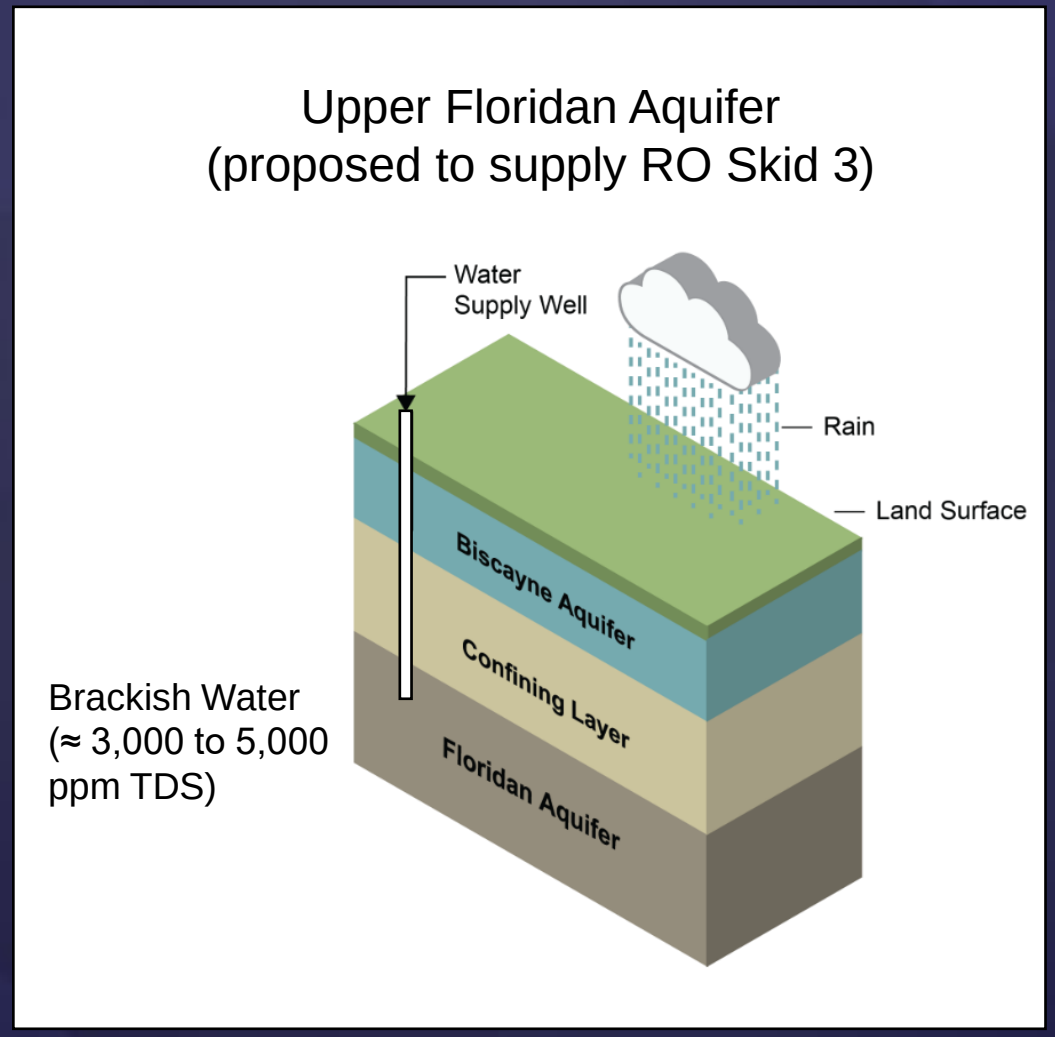
City's plan meets the year 2050 demand? Yes

What is the Upper Floridan Aquifer?

The Upper Floridan Aquifer (UFA) is 1,000 to 1,500 feet below ground that contains brackish water

Brackish ≈ 3,000 to 5,000 part per million dissolved solids (TDS)

For comparison, ocean water salinity ≈ 35,000 ppm TDS



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South Florida utilities that use the Upper Floridan Aquifer for water supply, for example:

Current UFA Users

Others not shown for brevity

Future UFA Users

CITY OF FORT LAUDERDALE

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This transition requires investing in two Floridan Aquifer water supply wells

The City investigated eight potential site. These two are the most cost-effective.

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What does a water supply well look like?

Photo of Hallandale Beach Well PW-9 (Biscayne Aquifer Well)

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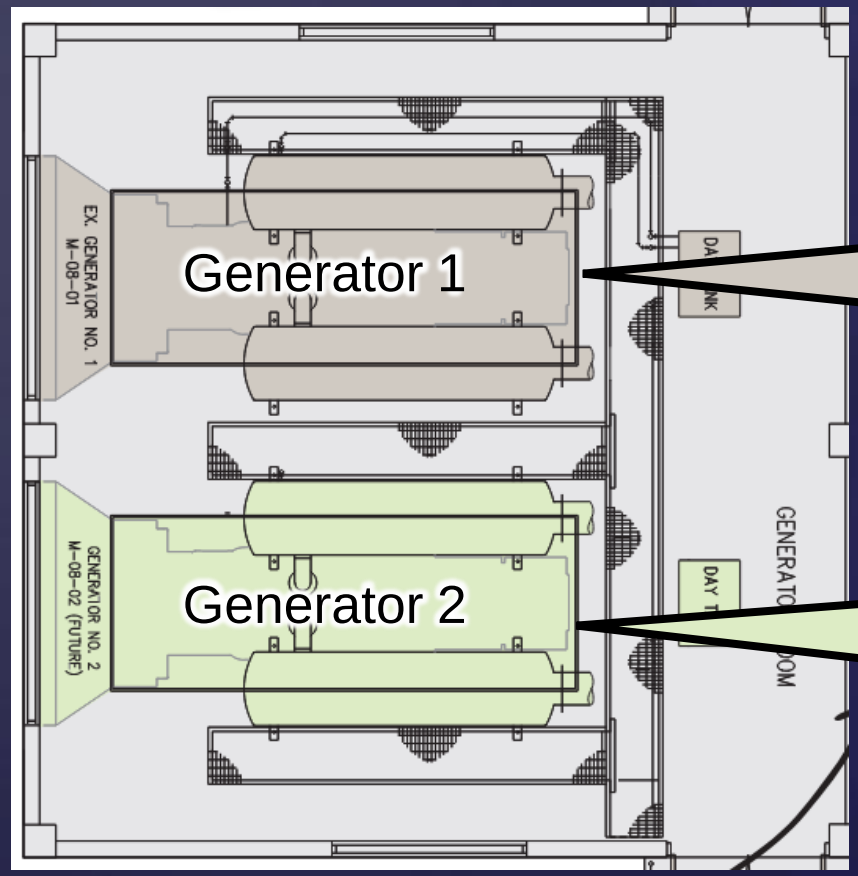
Addition of Generator 2 is also planned to support the treatment capacity expansion

Location Map

Generator Building

Floor Plan



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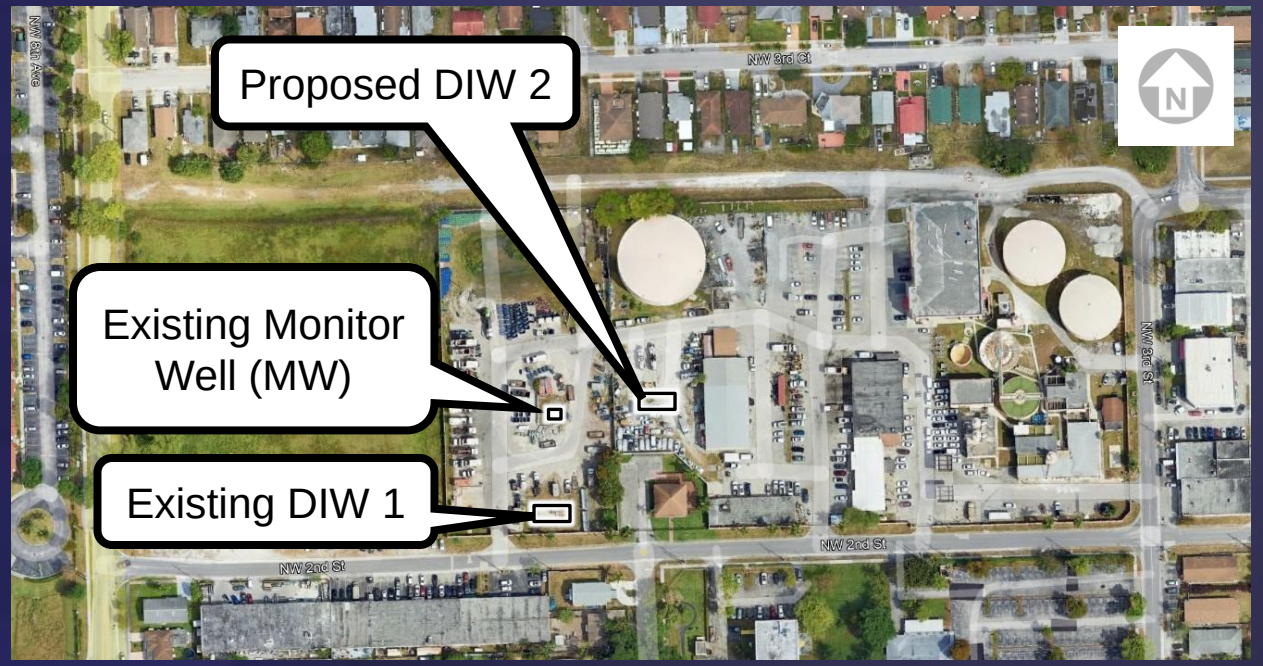
Construction of Deep Injection Well 2 may also be needed to support the planned treatment capacity expansion

Location Map



Deep Injection Well 1

The deep injection well (DIW) is used to dispose of the “concentrate” (brine) produced by the membrane treatment process

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The City is actively developing work authorizations with its consultants to deliver designs to enable the treatment capacity increase

Work Authorization	Project	Reason this Work is Necessary
1	Optimal Corrosion Control Treatment Pilot Test	PFAS compliance, discontinuation of LS requires adjustments to stabilization chemicals
2	Water Treatment Plant Master Plan	PFAS compliance, capacity increase
3	Chemical Stabilization Improvements Design through CMS	PFAS compliance, discontinuation of LS requires adjustments to stabilization chemicals
4	Floridan Aquifer Wells Design through CMS	Capacity increase
5	Equip Floridan Aquifer Wells	Capacity increase
6	Floridan Aquifer Pipeline	Capacity increase
7	Reverse Osmosis (RO) Pilot Test	Capacity increase
8	RO Skid 3 Design through CMS	Capacity increase
9	Emergency Power - Generator 2 Addition	Capacity increase
10	Deep Injection Well No. 2 and/or SS Forcemain	City is limited to operating one skid during mechanical integrity testing of the DIW every five years

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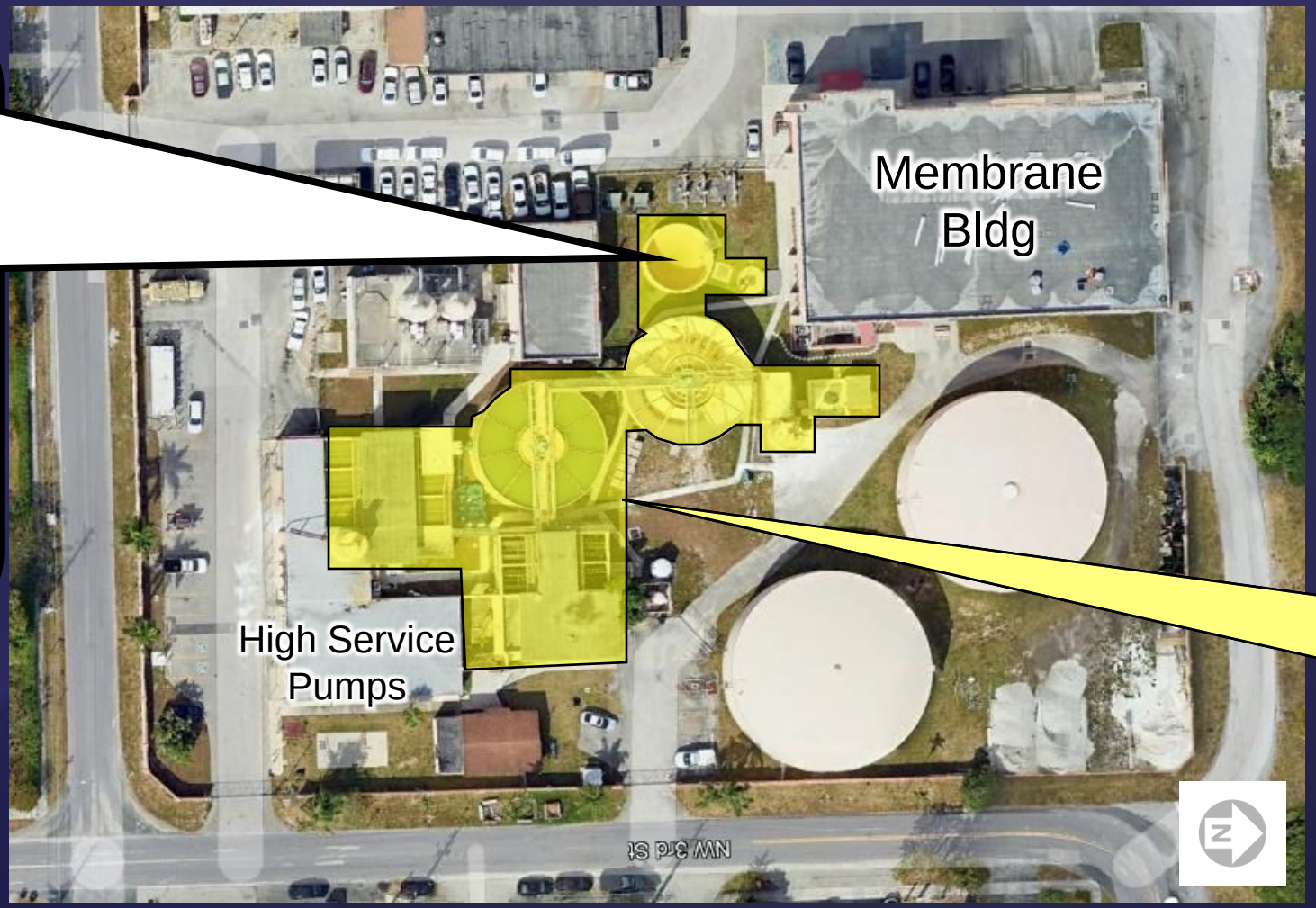
After RO Skid 3 is operational and the chemical upgrades are complete, the City can demolish certain lime softening plant infrastructure to free up space

Lime sludge can be discontinued once the “Optimal Corrosion Control Treatment Pilot Test” is complete and the “Chemical Stabilization Improvements” are constructed



Lime softening infrastructure that can be removed

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Part 2: Wastewater

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City’s wastewater system overview

15 City Owned Lift Stations

12 Miles of Force Mains

57 Miles of Gravity Sewer

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The City collects and pumps wastewater to the City of Hollywood South Regional Wastewater Treatment Plant (SRWWTP) as a "Large User"

SOUTHERN REGIONAL WASTEWATER TREATMENT PLANT
July 2025 Large User Capacity Report (GPD)

Large User	Encumbered Flow*	Annual Average Daily Flow / Last 12 Months	Total Flow AADF + Enc.	Capacity** Allocations	% of Cap Used	% of Cap Used or Encumbered	Available Capacity
Broward County	909,542	3,812,247	4,721,789	5,883,000	64.80%	80.26%	1,161,211
Dania Beach	1,196,955	3,829,545	5,026,500	5,217,000	73.41%	96.35%	190,500
Hallandale Beach	689,518	7,469,408	8,158,927	8,713,500	85.72%	93.64%	554,573
Hollywood	1,562,309	20,695,[illegible]4	22,258,052	21,811,500	94.88%	102.05%	-446,552
Miramar ***	0	143,[illegible]04	143,704	1,665,000	8.63%	8.63%	1,521,296
Pembroke Park	101,475	928,[illegible]00	1,030,375	1,110,000	83.68%	92.83%	79,625
Pembroke Pines	266,401	7,504,[illegible]52	7,770,853	11,100,000	67.61%	70.01%	3,329,147
Total	4,726,200	44,384,[illegible]00	49,110,200	55,500,000			6,389,800

City's current average flow to SRWWTP = 7.5 mgd

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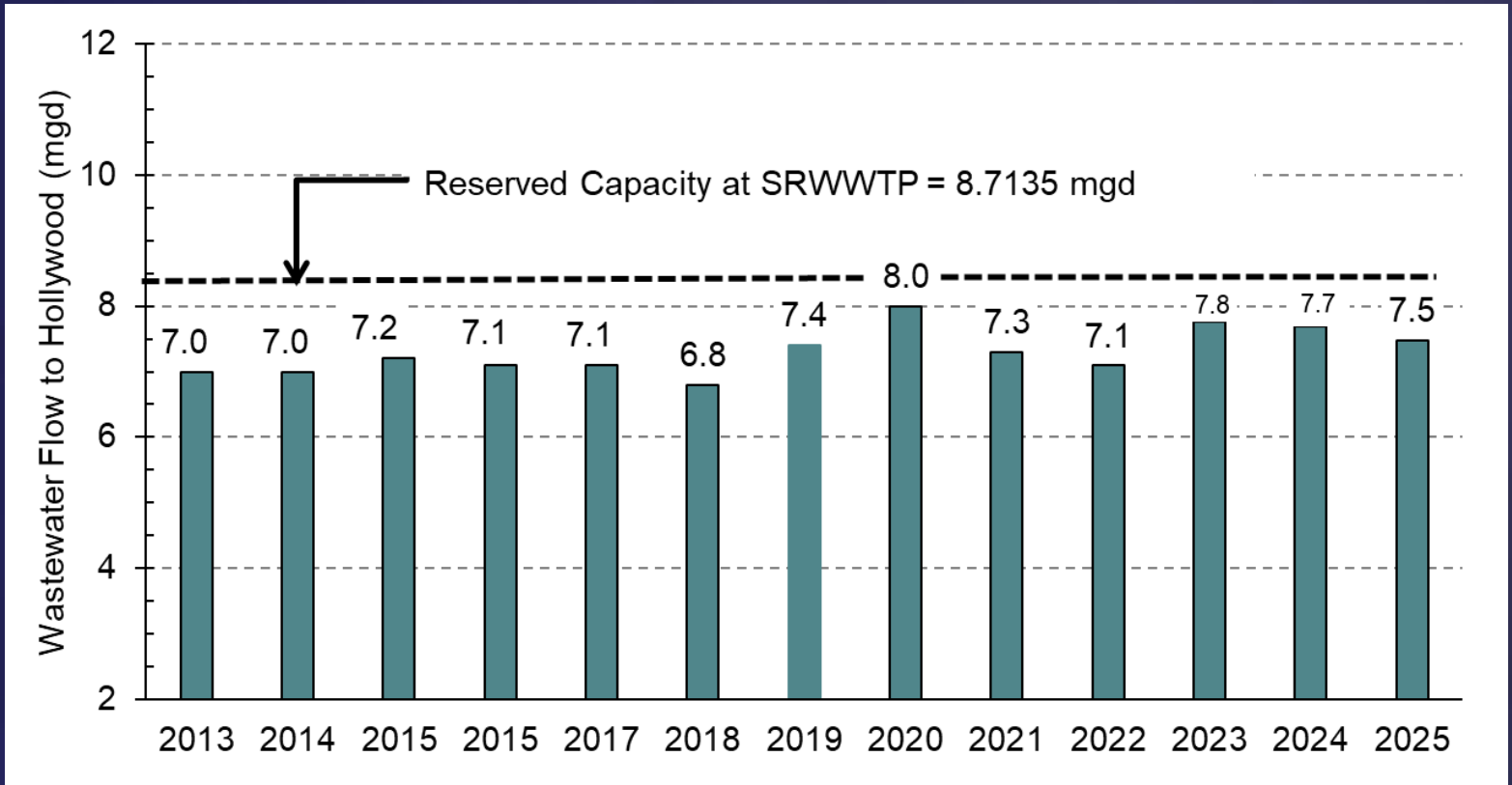
The City's wastewater flows increase as a function of population growth and system deterioration (a.k.a., "inflow / infiltration")



- Flows vary by year based on inflow / infiltration (I/I)
- I/I is influenced by weather – peaks may be due to "wet" years

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The City's reserved capacity at SRWWTP is 8.7135 mgd

City of Hollywood Southern Regional Wastewater Treatment Plant (SRWWTP)

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The City has 1.2 mgd of remaining reserve capacity

Current average flow to SRWWTP (A) : 7.5 mgd

City's reserved capacity at SRWWTP (B): 8.7135 mgd

Current remaining reserve capacity: (B) – (A) = 8.7135 mgd - 7.5 mgd = 1.2 mgd

Current remaining reserve capacity: 1.2 mgd

The City currently has sufficient capacity.
How much will we need to meet future demands?

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Multiple development projects are in various stages of planning; these projects will increase the City's wastewater flow

Major Development Projects on Review

0.11 mgd

+

Major Development Projects with Approved Site Plans

0.26 mgd

+

Major Development Projects Under Construction or Building Permit Review

0.82 mgd

=

Near-Term Development

1.2 mgd

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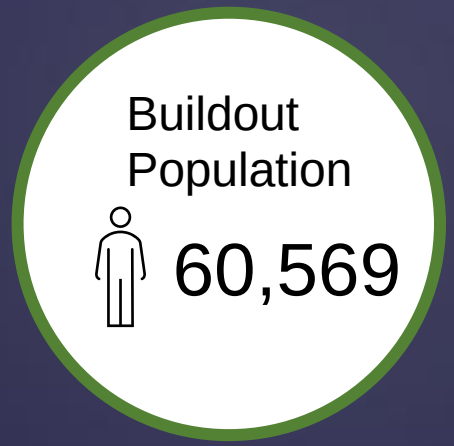
Hence, 1.2 mgd of additional wastewater is forecast to support near-term development.

How much additional wastewater capacity will we need over the long-term (i.e., Year 2050 buildout)?

Near-Term Development		Additional Needed at Year 2050 Buildout		Total Additional Wastewater Capacity Needed to Meet Year 2050 Buildout Population
	+		=	
1.2 mgd	+	2.3 mgd	=	3.5 mgd

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Total wastewater capacity needed at year 2050 buildout population is 11.0 mgd

Current Average Flow to SRWWTP		Total Additional Wastewater Capacity Needed to Meet Year 2050 Buildout Population		Total Wastewater Capacity Needed at Year 2050 Buildout Population
7.5 mgd	+	3.5 mgd	=	11.0 mgd

The City's available reserve capacity of 8.7135 mgd is not sufficient to meet the year 2050 buildout flow

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The City needs to obtain an additional 2.3 mgd of wastewater treatment capacity

Total Wastewater Capacity Needed at Year 2050 Buildout Population		Reserve Capacity at SRWWTP		Treatment Capacity Shortfall
11.0 mgd	−	8.7 mgd	=	2.3 mgd

What is the City's plan to obtain an additional 2.3 mgd of wastewater treatment capacity?

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The City is assessing multiple options for additional wastewater capacity needed to meet its year 2050 buildout population

Negotiate with a large user to access available capacity

Status: Ongoing

Study pumping to other systems (MDWASD)

Status: Ongoing

Construct City owned WWTP

Previously studied; proved infeasible

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Conveyance of wastewater to MDWASD

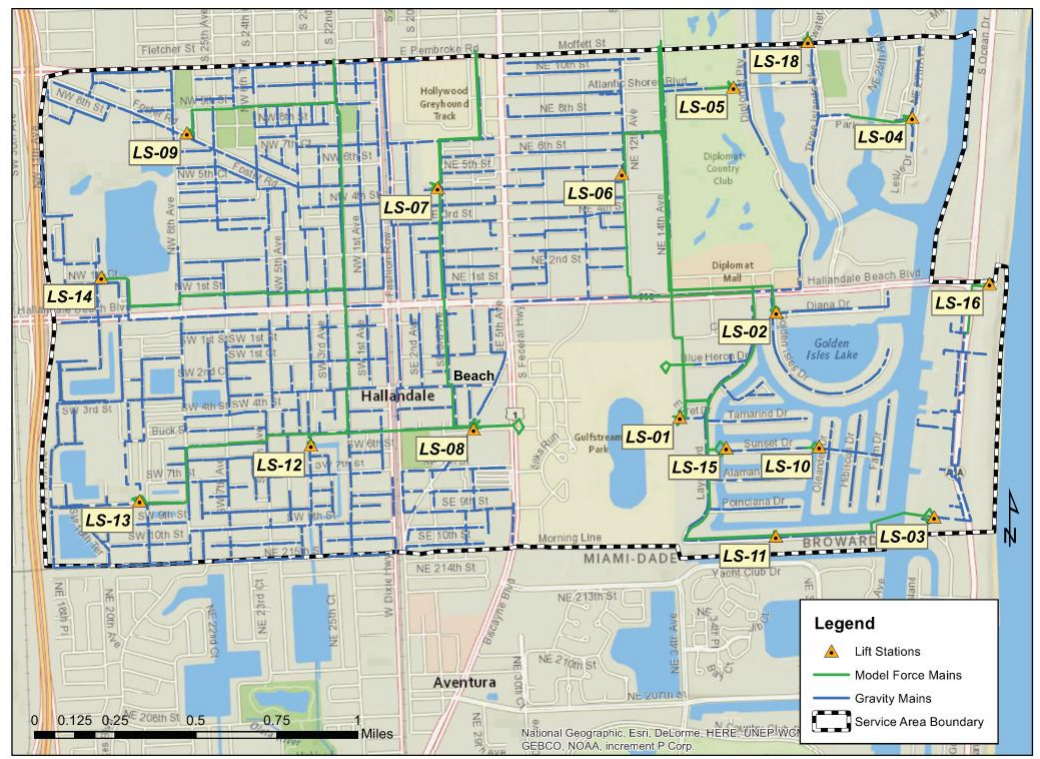

Figure 1 - Wastewater Collection and Transmission System

- Hazen created the City's wastewater hydraulic model in 2007
- The City is retaining Hazen to update the model with the new wastewater forecast and assess the technical feasibility of conveyance of a portion of the City's wastewater to MDWASD

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Partnering with North Miami Beach is also being explored

- The City is in preliminary discussions with the City of North Miami Beach regarding partnering on a new wastewater treatment plant

Final Summary of Wastewater vs Treatment Capacity

Average Day Wastewater Forecast		Wastewater Treatment Capacity		
		Reserve Capacity at SRWWTP [A]	Additional Treatment Capacity Needed [B]	[A] + [B]
Description	**Value**			
Current Average	7.5 mgd	8.7 mgd	2.3 mgd	11.0 mgd
Planned Development	1.2 mgd			
Additional 4,000 units	2.3 mgd			
TOTAL (year 2050)	**11.0 mgd**			

The City is exploring options to provide this additional treatment capacity.

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Thank you for listening

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For more information please visit www.cohb.org

Questions?

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Backup Slides

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Lime Softening operational challenges at WTP

Four filters (7-10) are out of service per Luis Chiguala on 10/2/2025

Current lime softening max capacity = 5.5 mgd per Luis Chiguala on 10/2/2025
(limitation due to the four filters being out of service)

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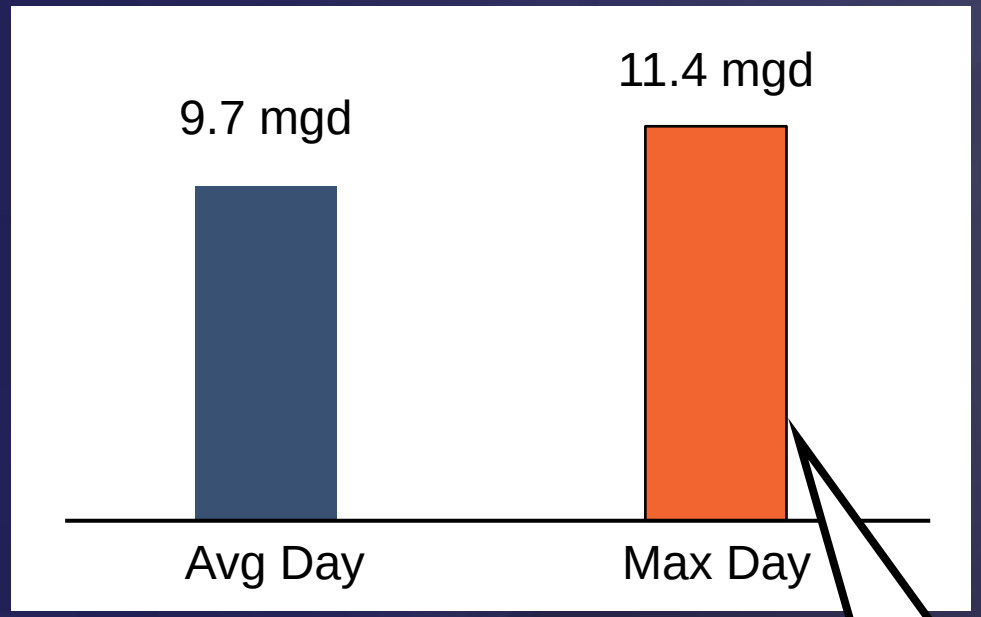
Average Day vs Max Day…what does this mean?

2050 Demand Estimate



Avg Day: The City needs the water supply infrastructure and water use permit that allows it to meet the average day demand.

Max Day: The City needs the water treatment infrastructure that allows it to meet the maximum day demand.

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