



# DROUGHT-PROOF

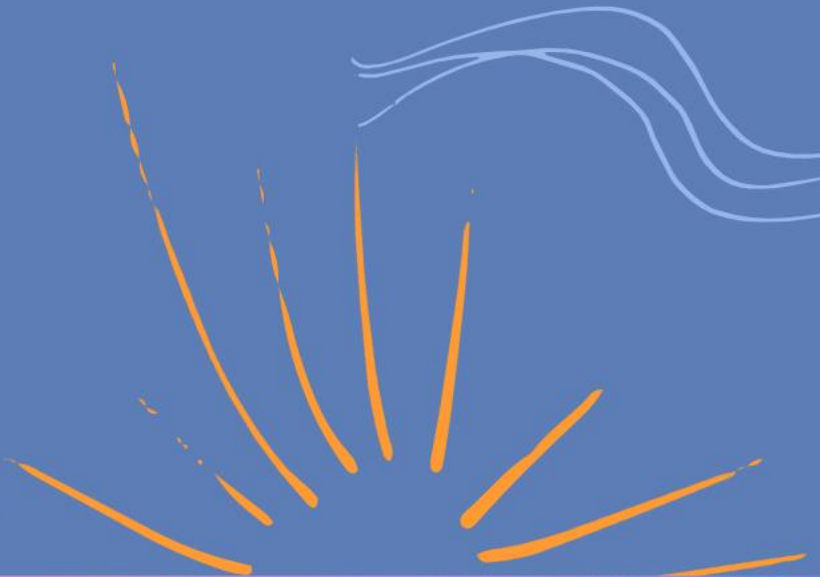
MAYOR & COUNCIL SEAWATER DESALINATION WORKSHOP



July 21, 2021



From  
twenty-one  
*the approach* to two



# Site selection strategy

## POTENTIAL

- **ECONOMICS and ENVIRONMENT**
- Property characteristics
- Source water quality
- Intake
- Concentrate discharge
- Water delivery
- Power
- Social impact

## CANDIDATE

- **ECONOMICS and ENVIRONMENT**
- Site size, condition, access
- Discharge conditions, constraints
- Permitting
- Water delivery + integration
- Use of existing infrastructure

## PREFERRED

- **ECONOMICS and ENVIRONMENT**

&

POTENTIAL

criteria

&

POTENTIAL

criteria

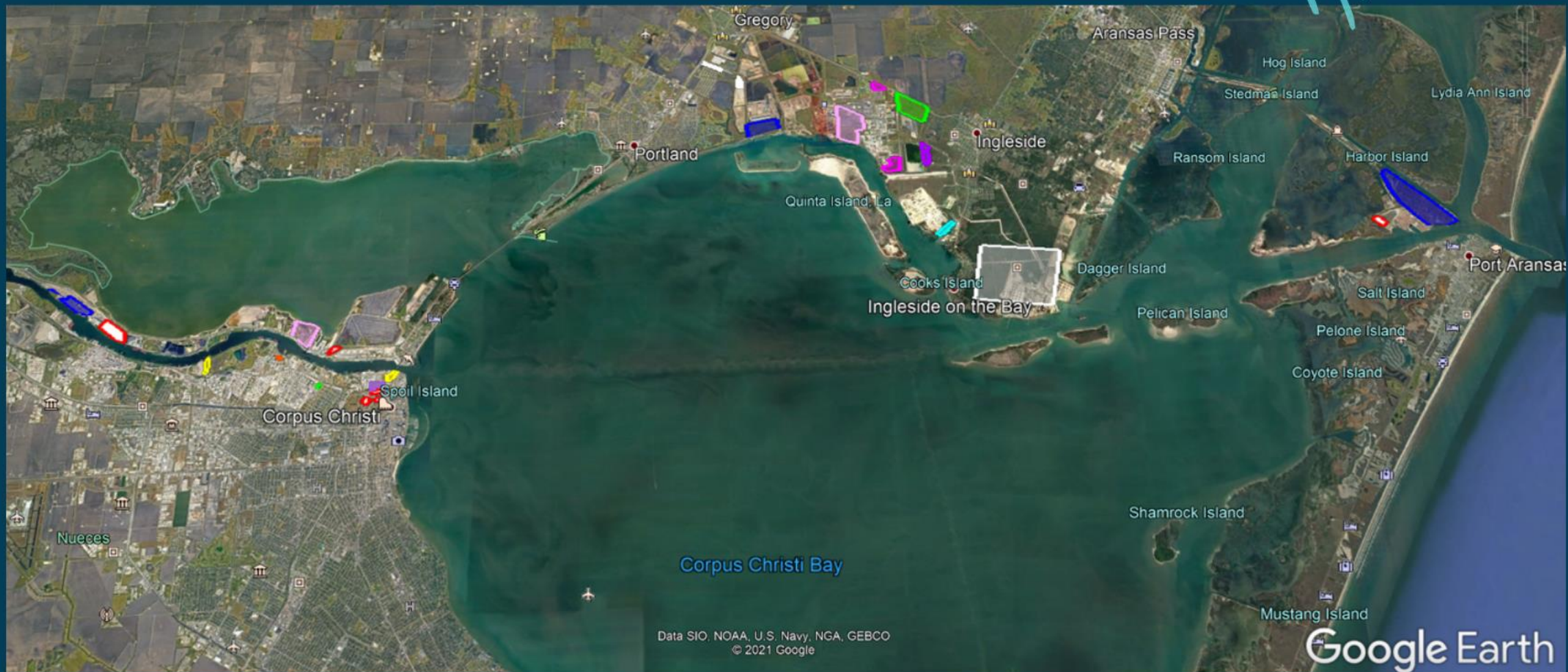
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CANDIDATE

criteria



# All sites considered





# *Project site selection*

## Screening criteria

- Environmental
- Social
- Tract characteristics
- Water quality
- Intake
- Outfall
- Distribution
- Power

## Evaluation criteria

- Environmental
- Cost
- Diffusion modeling
- Water quality
- Surveys
- Permitting considerations



**ECONOMICS, ENVIRONMENT, AND SUSTAINABILITY**

# Permit application status

## INNER HARBOR

### TCEQ Water right application

- pending TCEQ commission agenda

### TCEQ Discharge application

- modeling information submitted as of 7/20/2021

## LA QUINTA

### TCEQ Water right application

- pending TCEQ public meeting

### TCEQ Discharge application

- modeling information submitted as of 7/20/2021



# May Council Retreat

"We're taking too long to get desalination in my opinion."  
-Councilmember Hunter

"This is a top-priority project. I get it. We should be moving forward. But I want to see more options."  
-Councilmember Lerma

"We're the catalyst for the region."  
-Councilmember Barrera

"I just don't want us to go down this path of it's 'design-build-or-nothing'. Because that's a false-choice."  
-Councilmember Hernandez

"I would like to see Council come to some sort of consensus about the direction we're going to take. I don't feel we have that direction now."  
-Councilmember Pusley

# Under Mayor and Council's Direction



**UNANIMOUS APPROVAL TO PURSUE**



**75% trigger point**



**Staff's recommendation of two sites**

- ① Inner Harbor Channel
- ② La Quinta Channel



**Permitting**



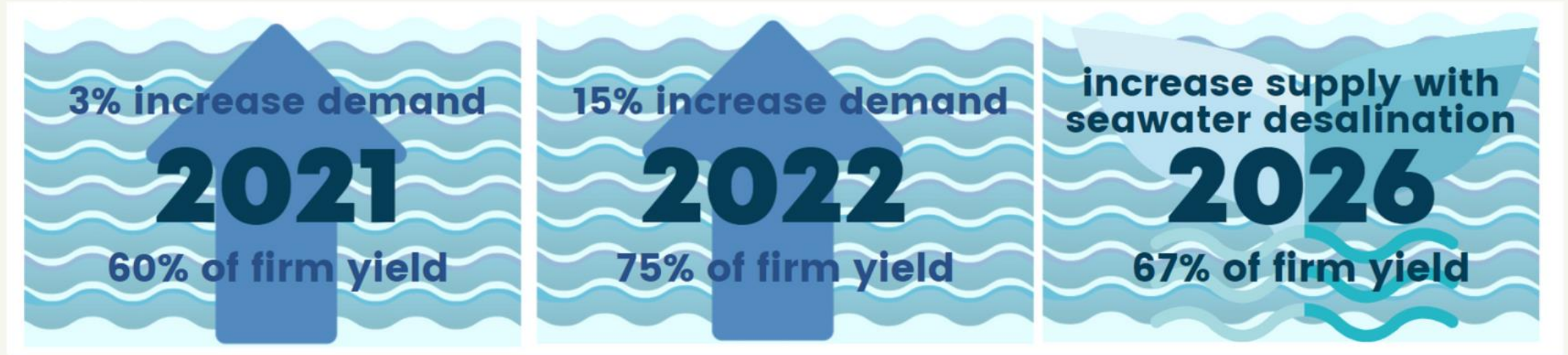
**Financing**



**Phased approach**



# Supply versus demand



- In 2019, City Council established when 75% of water supplies are used, a **new water source** should be added.
- The 75% threshold is called the "**trigger point**".
- In 2022, **growth** is projected to bring us to the **trigger point**.
- Adding seawater desalination as an alternative water supply brings us under the **trigger point**.







137  
Inner Harbor Site

La Quinta Site

Nueces County

# The two sites



Nueces Bay

Pros

Cons

# Inner Harbor

Total project cost = \$222.4M

Estimated O&M cost = \$16M/year

Estimated cost per 1,000gals. = \$3.73

Meets trigger point demand.

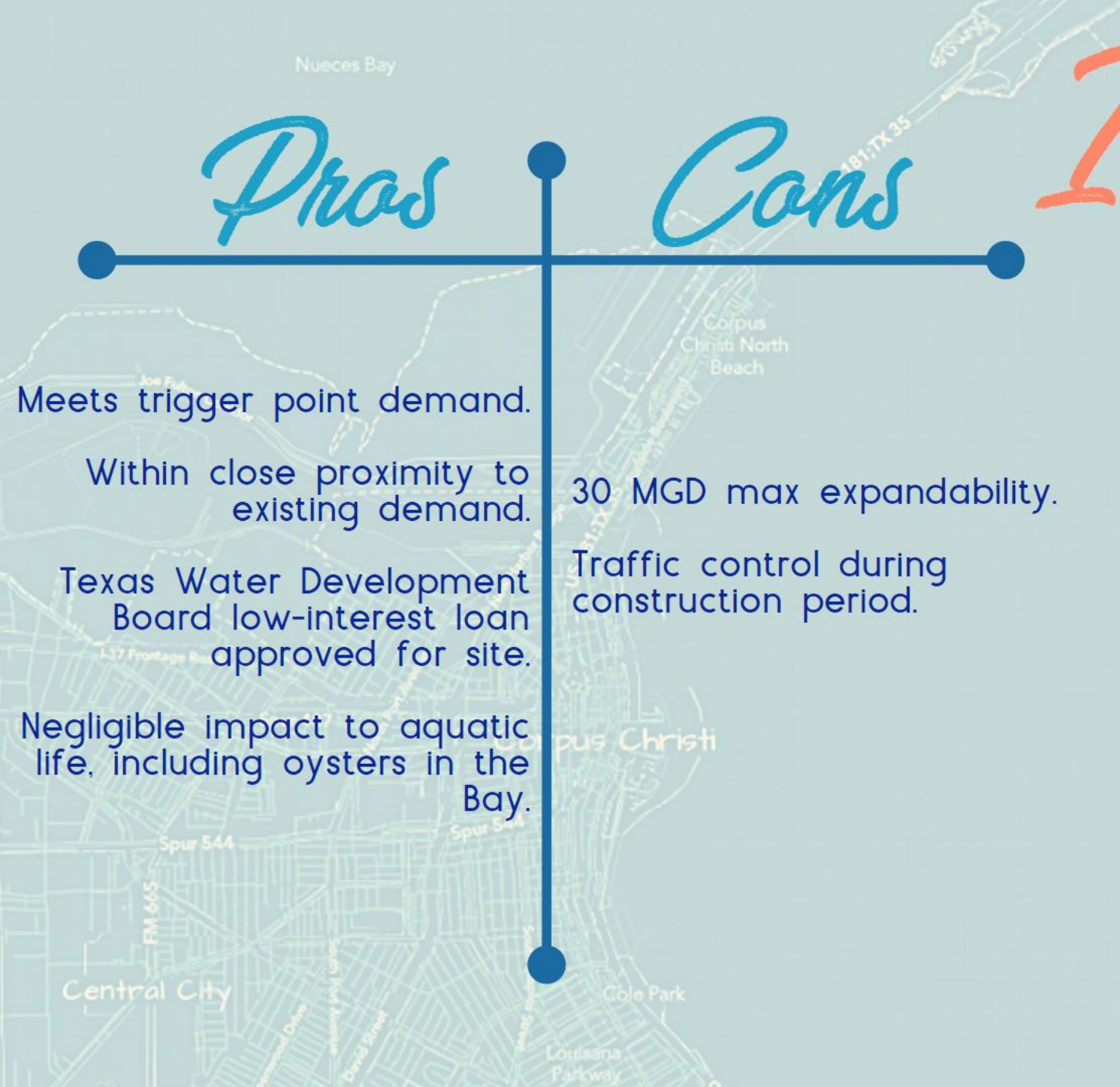
Within close proximity to existing demand.

Texas Water Development Board low-interest loan approved for site.

Negligible impact to aquatic life, including oysters in the Bay.

30 MGD max expandability.

Traffic control during construction period.





# La Quinta

Total project cost = \$243M (20-30MGD)

Estimated O&M cost = \$16M/year

Estimated cost per 1,000gals. = ~\$4.00

**\*estimated cost is not inclusive of pipeline construction and maintenance\***

## Pros

Meets trigger point demand curve.

Proximity to San Patricio Municipal Water District.

20 MGD to 40 MGD max expandability.

Larger body of water with naturally higher velocities.

Negligible impact to aquatic life, including oysters in the Bay.

## Cons

Additional cost for construction of pipeline to Corpus Christi

Land is leased instead of owned outright.



# Pipeline potential for La Quinta





# Environmental discharge study

TECHNICAL MEMORANDUM

City of Corpus Christi Desalination Study Concentrate Modeling  
at Inner Harbor and La Quinta Channels



**NEGLIGIBLE IMPACT TO AQUATIC LIFE,  
INCLUDING OYSTERS**

LEVERAGING NEW TECHNOLOGY

**TWELVE MONTHS OF CUMULATIVE DATA**

OVER TWO-HUNDRED AND FORTY REFERENCES

**WE HAVE SET THE STANDARD**



City of Corpus Christi  
Seawater Desalination Program

Inner Harbor Area Site Map

Approximate Distances

- Discharge Location to Harbor Bridge - 1.46 miles
- Discharge Location to Texas State Aquarium Intake - 1.70 miles
- Discharge Location to North Beach - 2 miles



North Beach

DRAFT  
JULY 9, 2021

Approx.  
Aquarium Intake  
Location

Texas State  
Aquarium

Harbor Bridge

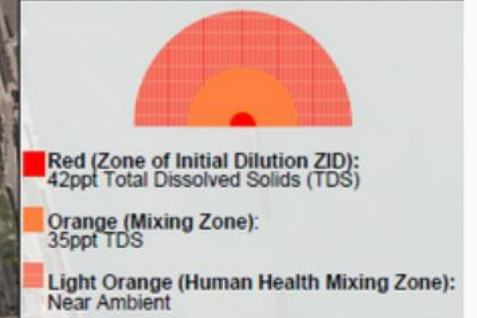
Inner Harbor Ship Channel  
Proposed Discharge Location

Inner Harbor Ship Channel  
Proposed Intake Location

Inner Harbor Ship Channel  
Seawater Desalination Site

Nueces Bay Blvd  
West Broadway

23.8 ACRES





City of Corpus Christi  
Seawater Desalination Program  
La Quinta Area Site Map



La Quinta Channel  
Seawater Desalination Site

HWY 361

Occidental Chemical Corp

Portland

La Quinta Channel  
Proposed Intake Location

La Quinta Channel  
Proposed Discharge Location

Ingleside

La Quinta Island

**Red (Zone of Initial Dilution ZID):**  
42ppt Total Dissolved Solids (TDS)

**Orange (Mixing Zone):**  
35ppt TDS

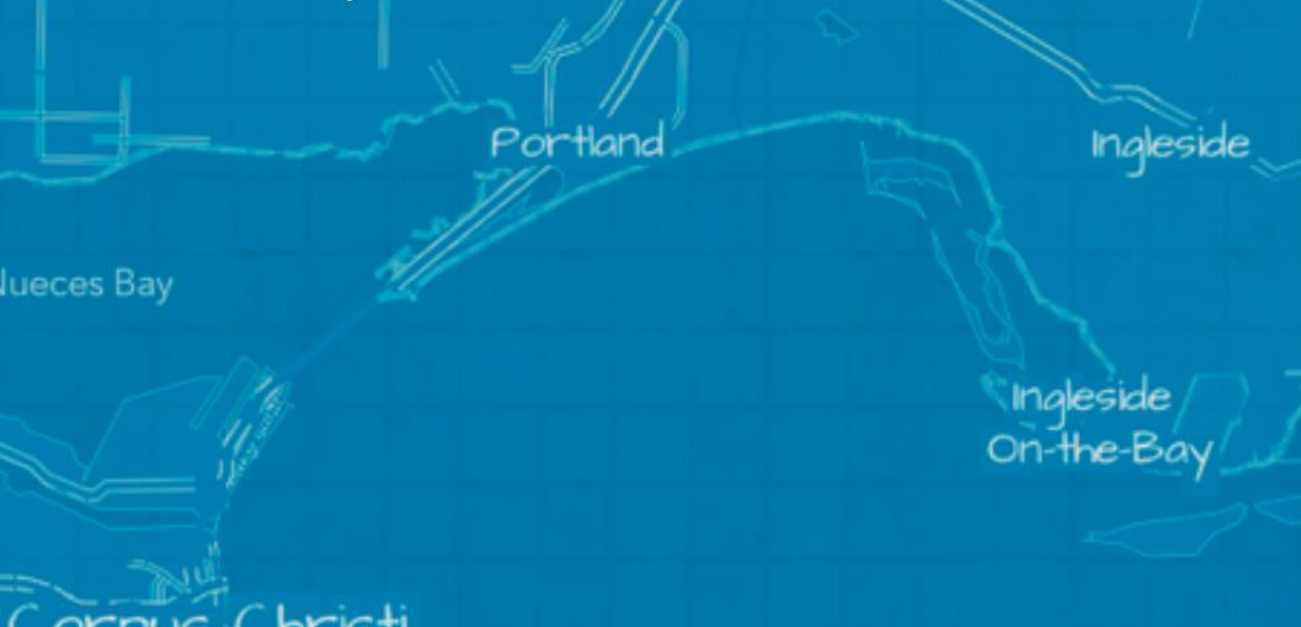
**Light Orange (Human Health Mixing Zone):**  
Near Ambient

DRAFT  
JULY 9, 2021  
**45.6 ACRES**

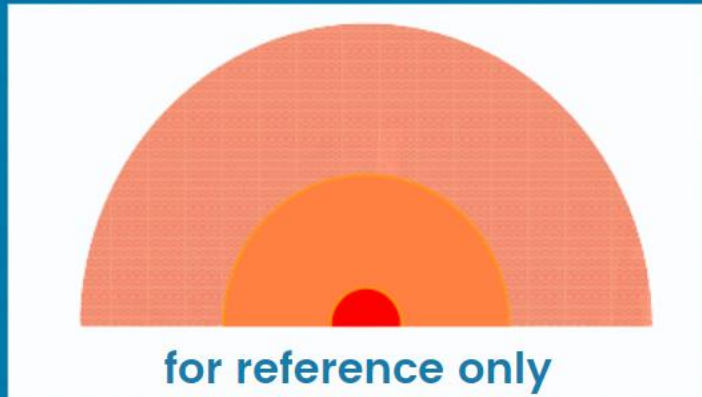
Approximate Distances  
Discharge Location to Ingleside on the Bay - 2.7 miles  
Discharge Location to Green Channel / North Shore - 2.9 miles



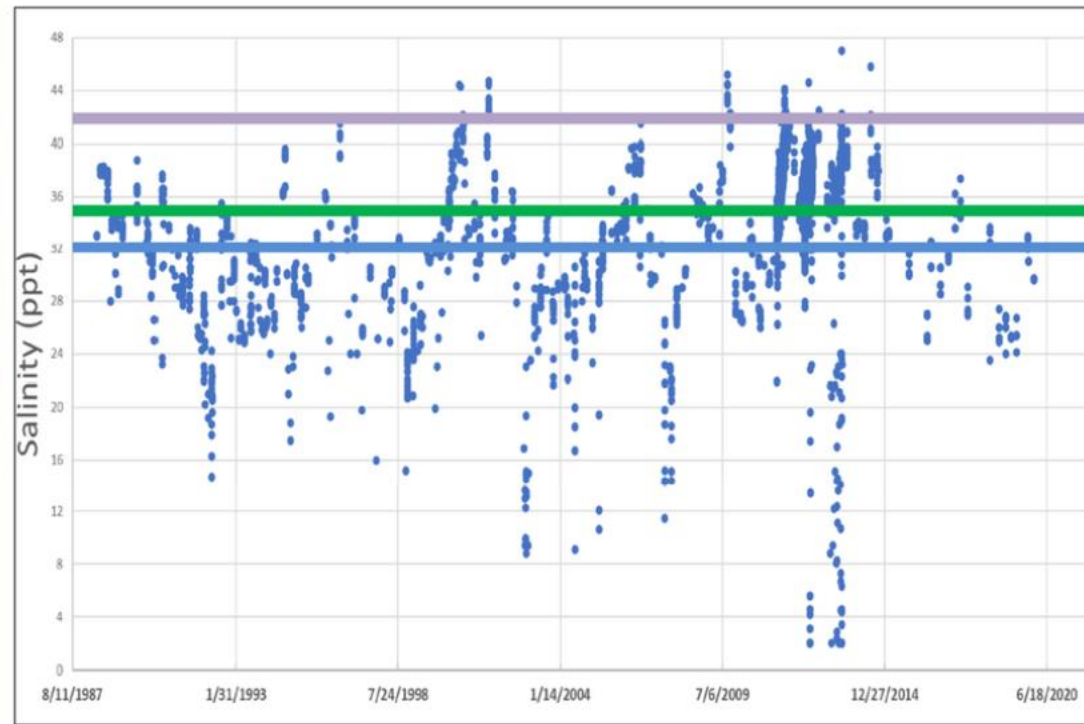
# Corpus Christi Bay salinity



Corpus Christi



for reference only



Average natural salinity is approximately 32 parts-per-thousand (blue line).

At 50-feet from the discharge location, the salinity will be less than 42 parts-per-thousand (purple line). 50-feet is about half the distance from home plate to first base at Whataburger Field.

At 200-feet from the discharge location, the salinity will be less than 35 parts-per-thousand (green line). 200-feet is approximately twice the distance from home plate to first base at Whataburger Field.



# What will be put back into the Bay?

## TWO SIMPLE INGREDIENTS



Silt, sediment, and other solids removed during intake (sludge) are taken to an approved, offsite landfill for proper disposal.

**JET DIFFUSION**

*water quality*





# WHAT ABOUT MARY RHODES PIPELINE

*status, purpose, and future*



# How Mary Rhodes supplies the Coastal Bend

## • Lake Texana

- 1998–Mary Rhodes I, 101 miles, \$116M
- 10.2 billion gallons annual water contract.
- An additional 3.8 billion gallons **if** available.
- Cost per 1,000 gallons = **\$2.23**

## • Lower Colorado River

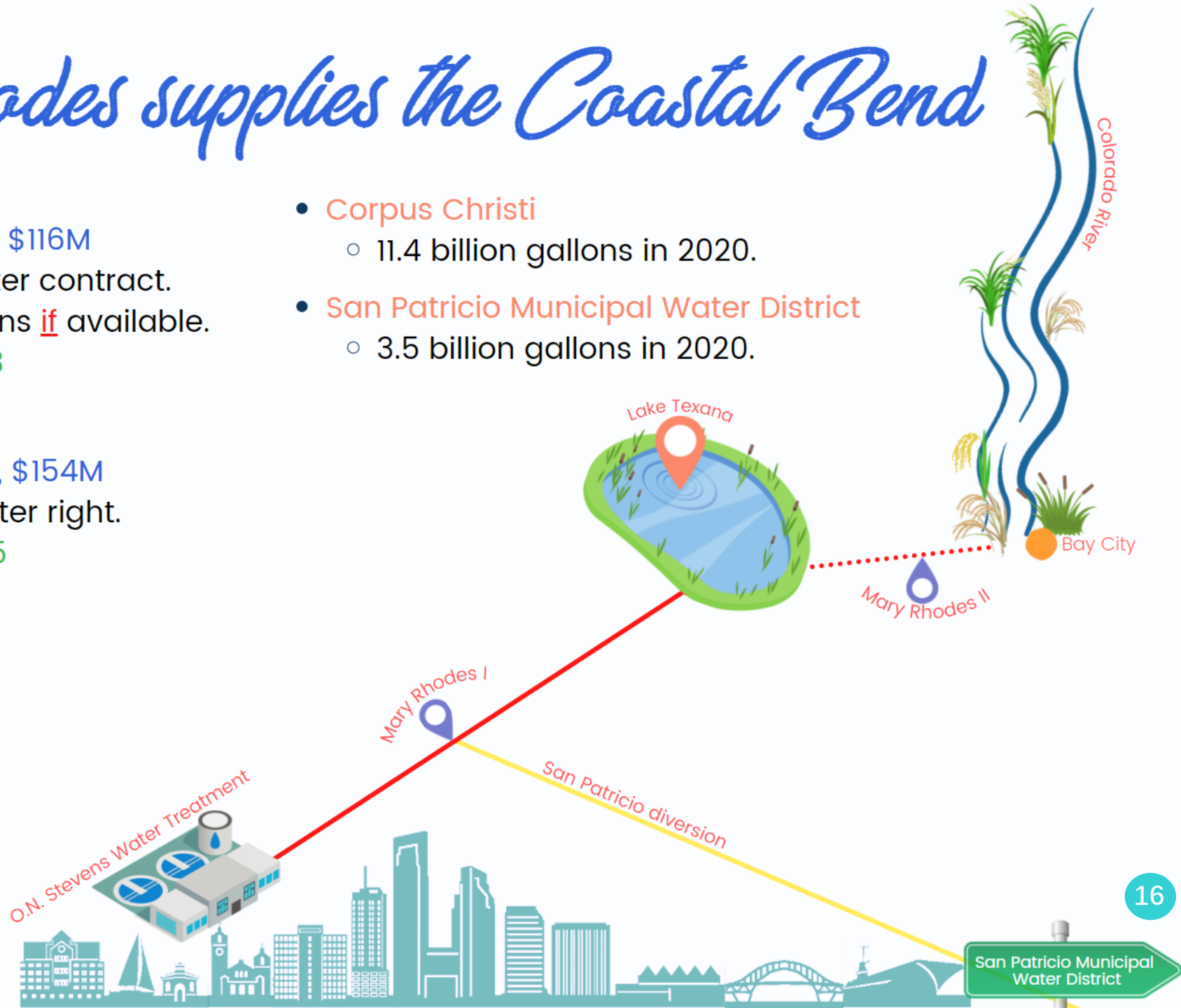
- 2016–Mary Rhodes II, 42 miles, \$154M
- 11.4 billions gallons annual water right.
- Cost per 1,000 gallons = **\$3.05**

## • Corpus Christi

- 11.4 billion gallons in 2020.

## • San Patricio Municipal Water District

- 3.5 billion gallons in 2020.





# Twenty-four million gallons more

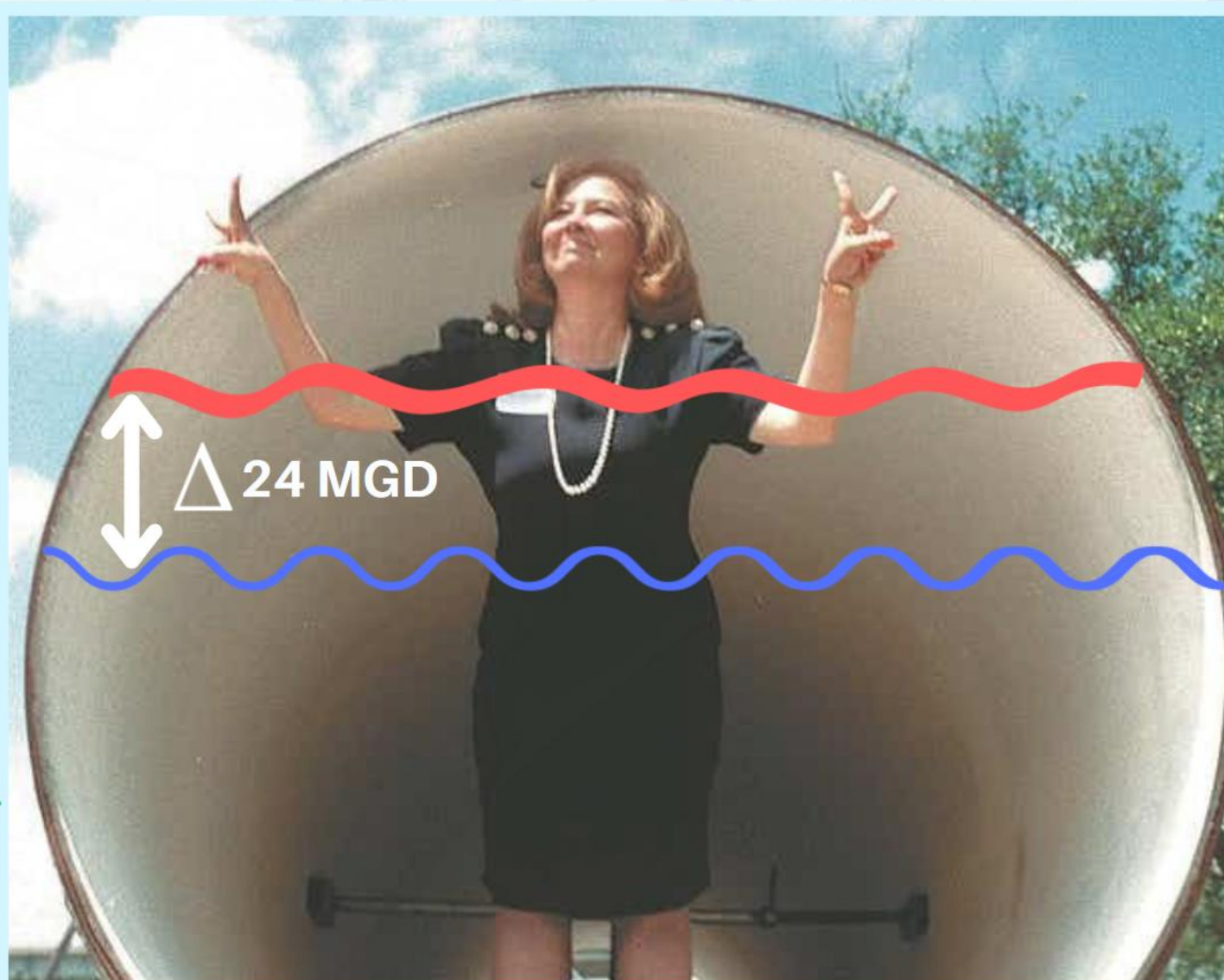
## FIVE YEAR PLAN

- New pumps
- New storage tanks
- Building rehab
- Equipment refurb
- Infrastructure modernization

## FORECASTED INVESTMENT

**\$9.1M**

(for Mary Rhodes I only)



Water rights  
Colorado River  
Lake Texana  
combined = **70 MGD**

66% of capacity = current  
production or **46 MGD**



# Balancing our water quality





# Operations and Maintenance

Comparison of a seawater desalination plant to the O.N. Stevens Water Treatment Plant



City's Seawater Desalination Plant

O.N. Stevens Water Treatment Plant



|                     | City's Seawater Desalination Plant | O.N. Stevens Water Treatment Plant |
|---------------------|------------------------------------|------------------------------------|
| O & M for 12 MONTHS | \$16 MILLION                       | \$20 MILLION                       |
| NUMBER OF EMPLOYEES | 16                                 | 60                                 |
| POWER CONSUMPTION   | 16 MEGAWATTS                       | 5 MEGAWATTS                        |
| POWER COST          | 5 cents/kWh or \$960 per MGD       | 8 cents/kWh or \$128 per MGD       |
| AVERAGE PRODUCTION  | 20 MGD                             | 75 MGD                             |
| NUMBER OF SOURCES   | 1                                  | 4                                  |



# Forward, together



**PROPERTY**



**POWER STUDY**



**PROCUREMENT**  
*all options on the table*



**AWARD  
CONTRACTS**



**CONSTRUCTION**