Update on Inner Harbor Water Treatment Campus Project

City Council Meeting

July 15, 2025

Presentation Overview

- Council Action Review
- Current Project Status Update
- Project Timeline
- Demonstration Plant
- Near and Far Field Modeling
- Future Project Topics

Current Treatment Campus Layout

6/24/25 Council Action Review

City Council Resolution:

On June 24, 2025 City Council authorized an amendment to Resolution 033396 instructing the City Manager to follow normal procurement procedures for all future purchases, contracts, and amendments for the Inner Harbor Desalination Treatment Plant Project.

Intent: All future contracts and amendments exceeding $50,000 must receive City Council authorization prior to execution

Upcoming Amendments:

• 60% Design Development + GMP		July 2025
• Early Work Packages:	Utility Relocation/Demo	September 2025
	Site Grading	October 2025
	Underground Utilities	November 2025
	Foundations/Pipeline	December 2025

6/24/25 Council Action Review

Process Change Considerations

No Project Impact:

- If proposed amendments are approved at scheduled City Council meetings

The following impacts are likely if timely approval of future amendments do not occur:

- Loss of key technical personnel and quality control measures
- Additional cost associated with inflation and escalation
- Contractor will include contingency to cover risk to their future amendments
- Delay in final project delivery

Current Project Status Update

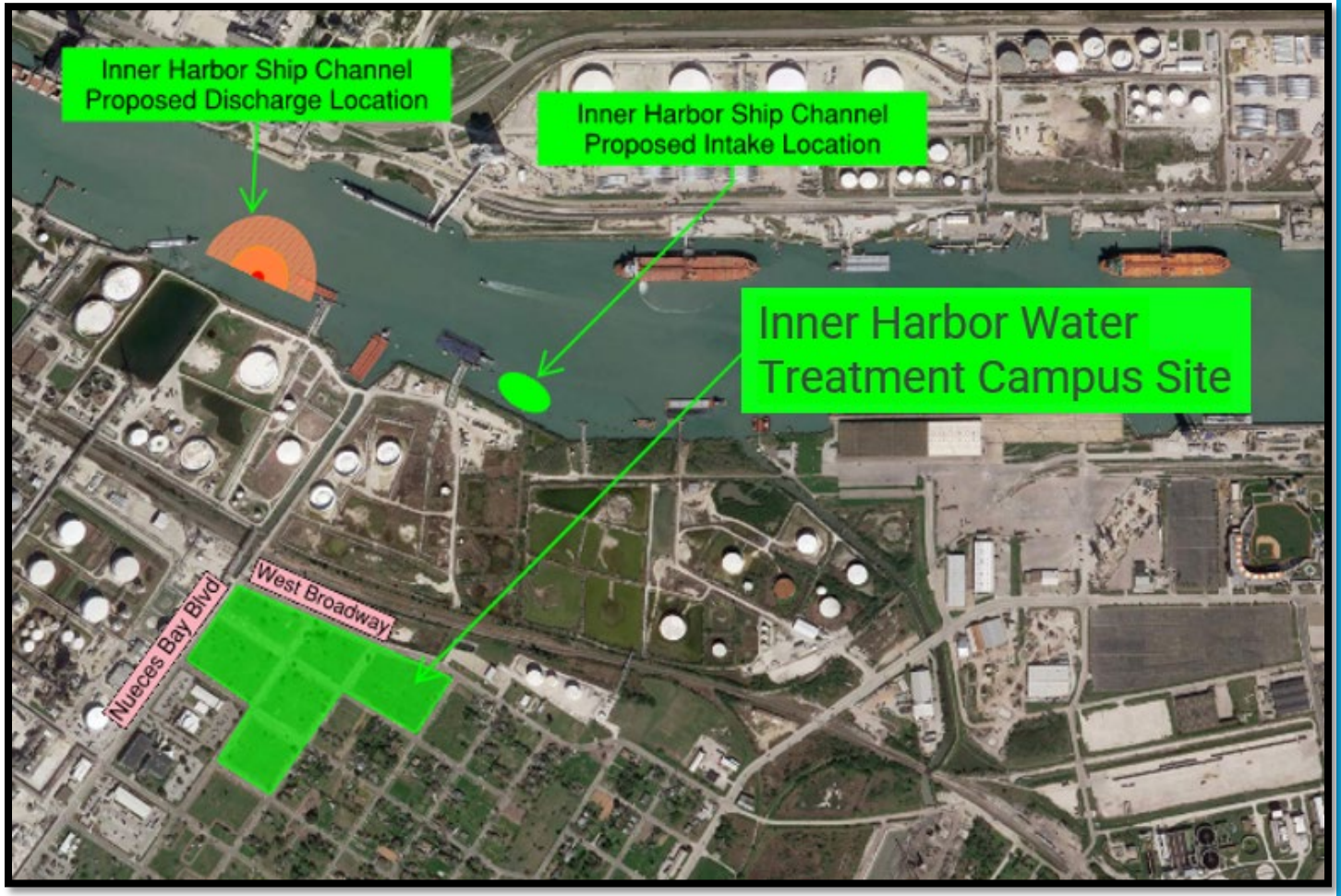
Project Overview:

Phase 1A – Complete

Phase 1B – Design, Early Works, and Guaranteed Maximum Price (GMP)

Phase 2 – Final Design and Construction

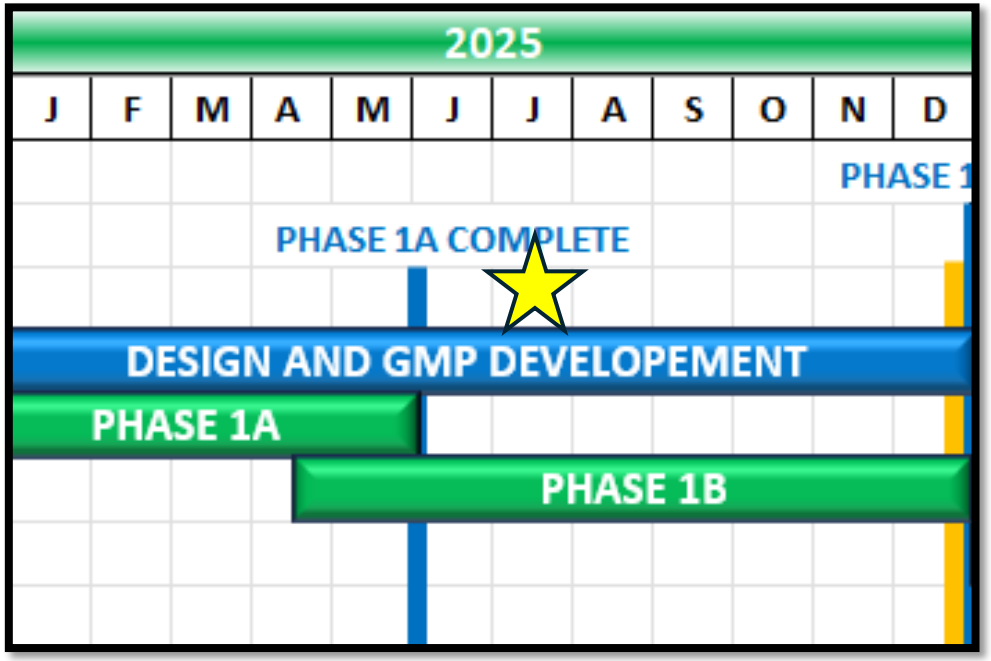
Phase 3 – Operating and Maintenance Services

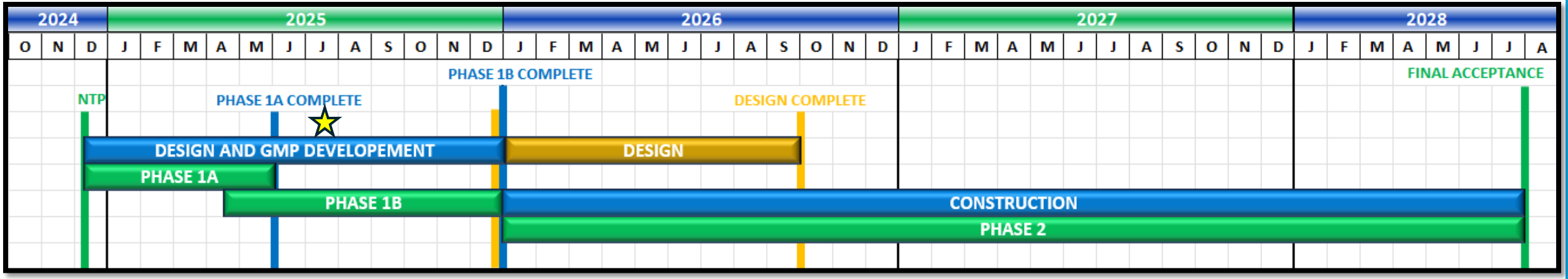


Project Timeline

Current Status (★):

- Demonstration Plant in construction – 10% Complete
- Design development in progress
  - Amendment planned for July 29 City Council
  - 30% Submittal – September 2025



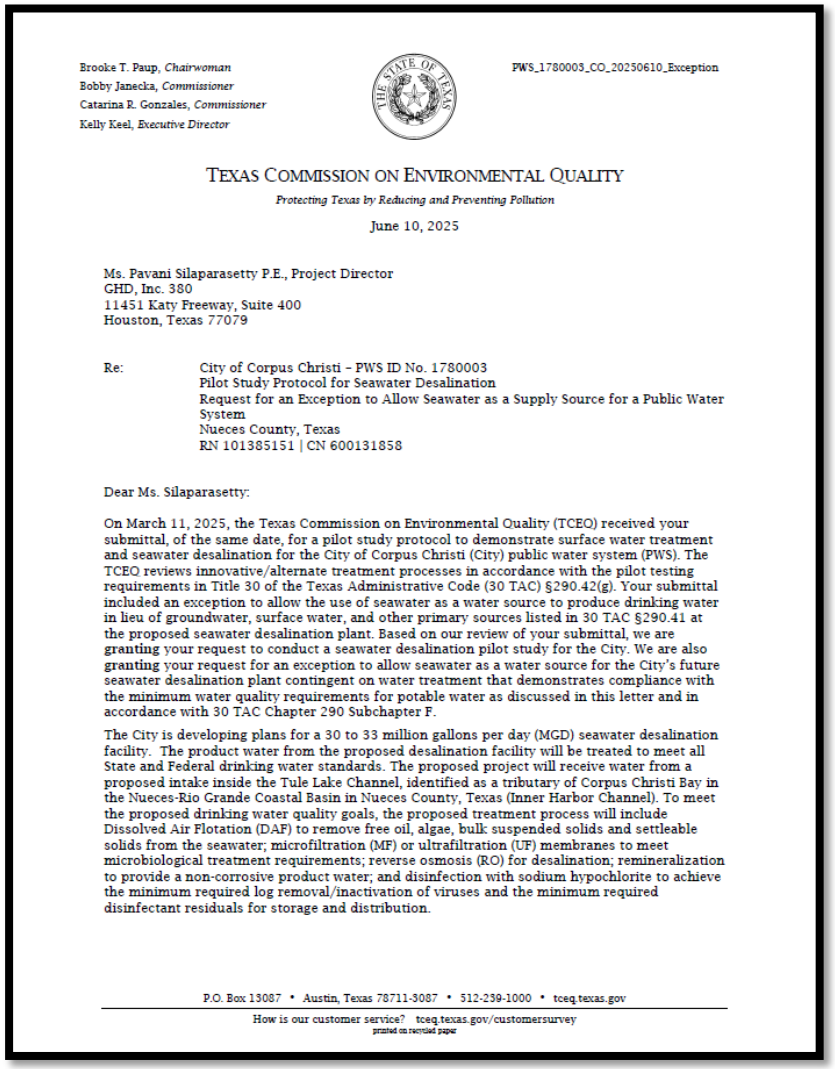


Demonstration Plant

Pilot Plant Purpose:

The pilot plant study "will be used to optimize the pilot equipment, operate the pilot equipment and collect sufficient data to support the minimum pilot study requirements of the approved Pilot Study Protocol…"

"demonstrates compliance with the minimum water quality requirements for potable water…"



Brooke T. Paup, *Chairwoman*
Bobby Janecka, *Commissioner*
Catarina R. Gonzales, *Commissioner*
Kelly Keel, *Executive Director*

PWS_1780003_CO_20250610_Exception

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

June 10, 2025

Ms. Pavani Silaparasetty P.E., Project Director
GHD, Inc. 380
11451 Katy Freeway, Suite 400
Houston, Texas 77079

Re: City of Corpus Christi – PWS ID No. 1780003
Pilot Study Protocol for Seawater Desalination
Request for an Exception to Allow Seawater as a Supply Source for a Public Water System
Nueces County, Texas
RN 101385151 | CN 600131858

Dear Ms. Silaparasetty:

On March 11, 2025, the Texas Commission on Environmental Quality (TCEQ) received your submittal, of the same date, for a pilot study protocol to demonstrate surface water treatment and seawater desalination for the City of Corpus Christi (City) public water system (PWS). The TCEQ reviews innovative/alternate treatment processes in accordance with the pilot testing requirements in Title 30 of the Texas Administrative Code (30 TAC) §290.42(g). Your submittal included an exception to allow the use of seawater as a water source to produce drinking water in lieu of groundwater, surface water, and other primary sources listed in 30 TAC §290.41 at the proposed seawater desalination plant. Based on our review of your submittal, we are granting your request to conduct a seawater desalination pilot study for the City. We are also granting your request for an exception to allow seawater as a water source for the City's future seawater desalination plant contingent on water treatment that demonstrates compliance with the minimum water quality requirements for potable water as discussed in this letter and in accordance with 30 TAC Chapter 290 Subchapter F.

The City is developing plans for a 30 to 33 million gallons per day (MGD) seawater desalination facility. The product water from the proposed desalination facility will be treated to meet all State and Federal drinking water standards. The proposed project will receive water from a proposed intake inside the Tule Lake Channel, identified as a tributary of Corpus Christi Bay in the Nueces-Rio Grande Coastal Basin in Nueces County, Texas (Inner Harbor Channel). To meet the proposed drinking water quality goals, the proposed treatment process will include Dissolved Air Flotation (DAF) to remove free oil, algae, bulk suspended solids and settleable solids from the seawater; microfiltration (MF) or ultrafiltration (UF) membranes to meet microbiological treatment requirements; reverse osmosis (RO) for desalination; remineralization to provide a non-corrosive product water; and disinfection with sodium hypochlorite to achieve the minimum required log removal/inactivation of viruses and the minimum required disinfectant residuals for storage and distribution.

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Demonstration Plant

Demonstration Plant Schedule:

- Construction Start: June 2025
- Operation Startup: August/September 2025
- TCEQ 30-Day Start: September/October 2025

Construction Progress:

- Erosion control installation in progress
- Equipment deliveries in progress
- Discharge water line installation in progress
- Site prep at plant site in progress

Future Council Topics

Upcoming Briefings and Meeting:

- City Council Briefings
  - At least twice per month through 2025
  - Next briefing July 22, 2025

Upcoming Topics:

- Cost Model
- Design Amendment
- Demonstration Plant Construction Update

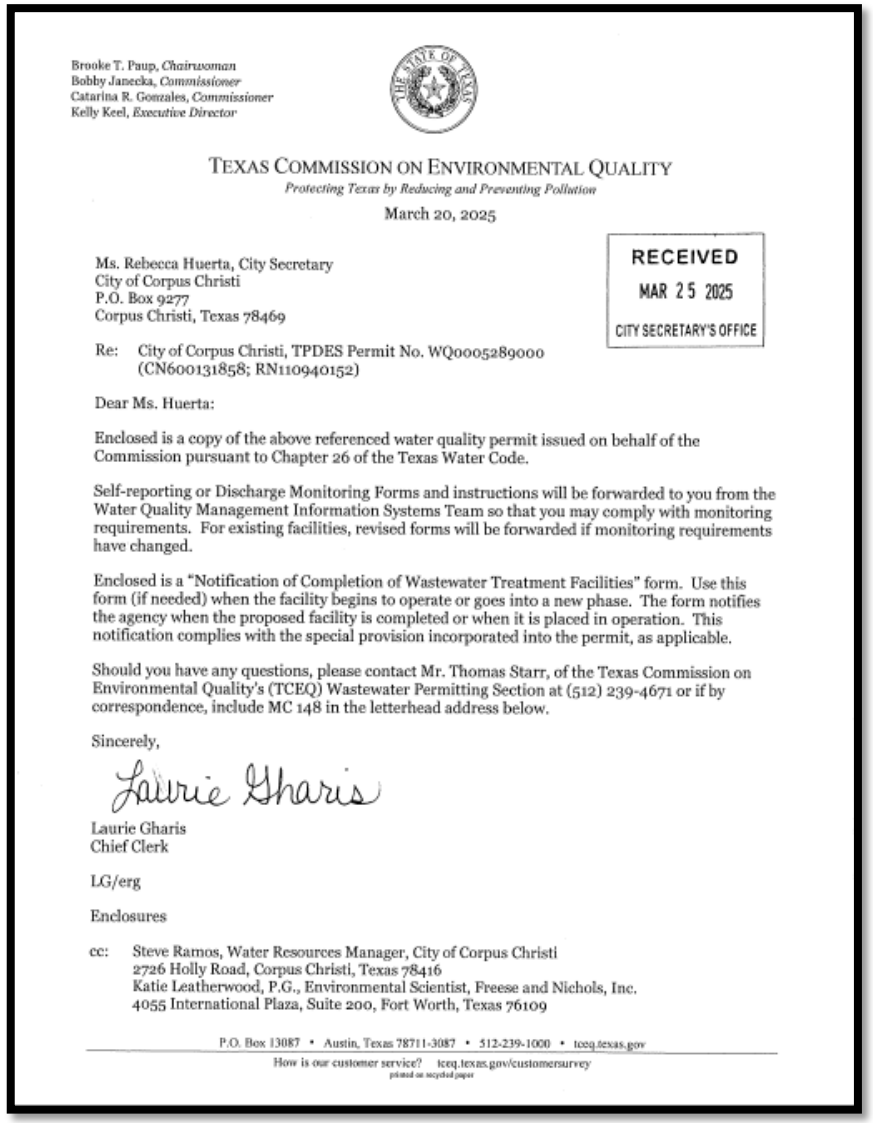
Near and Far Field Modeling

Meeting TCEQ Permit Requirements:

MODELING OBJECTIVES

Near Field – Optimization of diffuser design to be compliant with TCEQ discharge permit requirements

Far Field – Prediction of intake characteristics for IHWTC process design



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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Protecting Texas by Reducing and Preventing Pollution

March 20, 2025

RECEIVED
MAR 25 2025
CITY SECRETARY'S OFFICE

Ms. Rebecca Huerta, City Secretary
City of Corpus Christi
P.O. Box 9277
Corpus Christi, Texas 78469

Re: City of Corpus Christi, TPDES Permit No. WQ0005289000
(CN600131858; RN110940152)

Dear Ms. Huerta:

Enclosed is a copy of the above referenced water quality permit issued on behalf of the Commission pursuant to Chapter 26 of the Texas Water Code.

Self-reporting or Discharge Monitoring Forms and instructions will be forwarded to you from the Water Quality Management Information Systems Team so that you may comply with monitoring requirements. For existing facilities, revised forms will be forwarded if monitoring requirements have changed.

Enclosed is a "Notification of Completion of Wastewater Treatment Facilities" form. Use this form (if needed) when the facility begins to operate or goes into a new phase. The form notifies the agency when the proposed facility is completed or when it is placed in operation. This notification complies with the special provision incorporated into the permit, as applicable.

Should you have any questions, please contact Mr. Thomas Starr, of the Texas Commission on Environmental Quality's (TCEQ) Wastewater Permitting Section at (512) 239-4671 or if by correspondence, include MC 148 in the letterhead address below.

Sincerely,

Laurie Gharis

Laurie Gharis
Chief Clerk

LG/erg

Enclosures

cc: Steve Ramos, Water Resources Manager, City of Corpus Christi
2726 Holly Road, Corpus Christi, Texas 78416
Katie Leatherwood, P.G., Environmental Scientist, Freese and Nichols, Inc.
4055 International Plaza, Suite 200, Fort Worth, Texas 76109

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Modeling Results

1. The Inner Harbor WTC will meet the TCEQ Permit Requirements

2. Modeled intake conditions are within treatment plant design tolerances

3. Inner Harbor Ship Channel far field modeling demonstrates no adverse impacts to the Corpus Christi Bay

Modeling Basis – Software Comparison

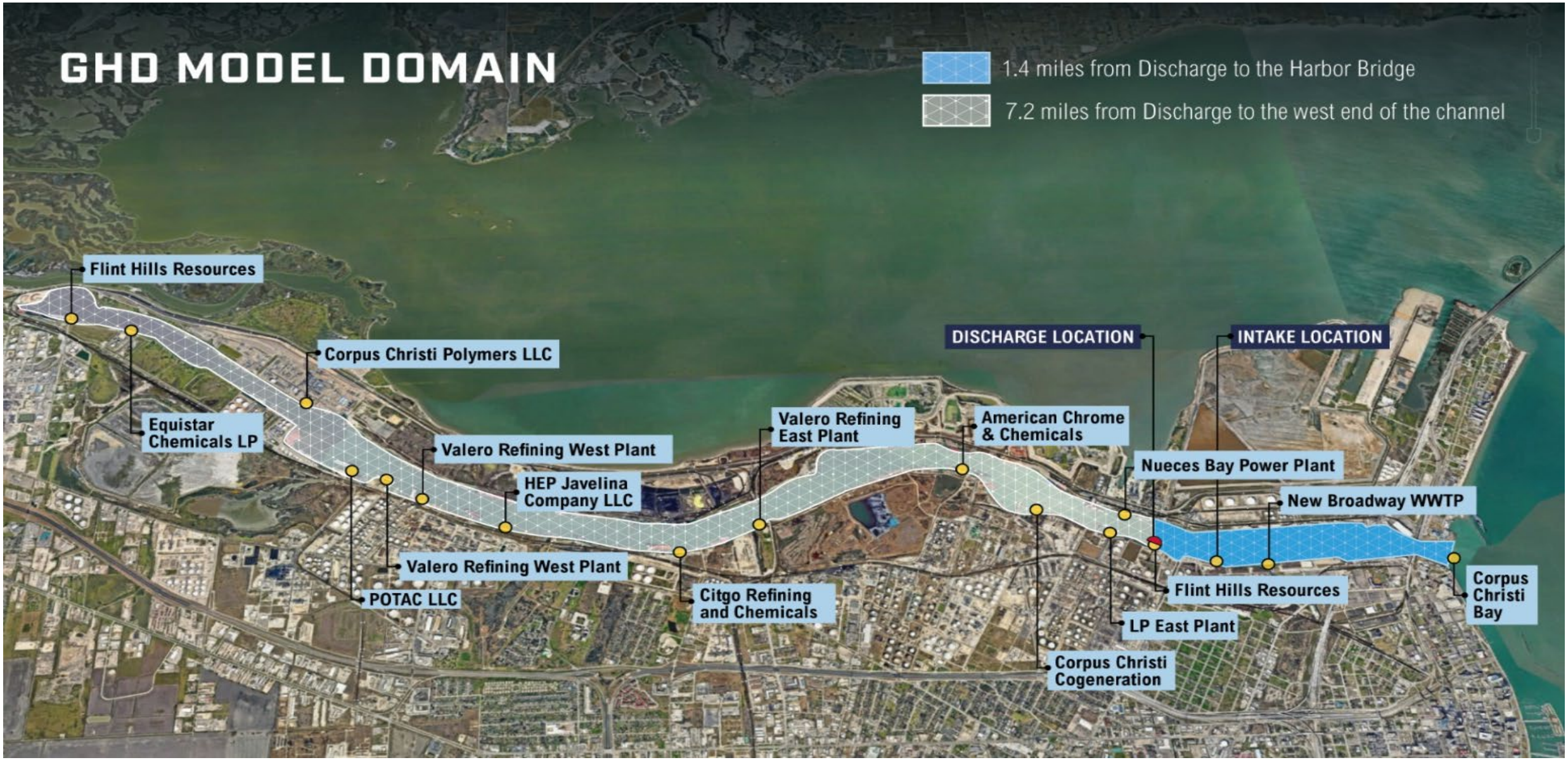
CORMIX

- Established discharge permit criteria
- Modeling required by the TCEQ
- Established suitable diffuser design concept

MIKE 3

- Focused on design optimization
- Model that predicts channel conditions
- Advances diffuser design

Modeling Basis – Facility List



Modeling Basis

Model Inputs

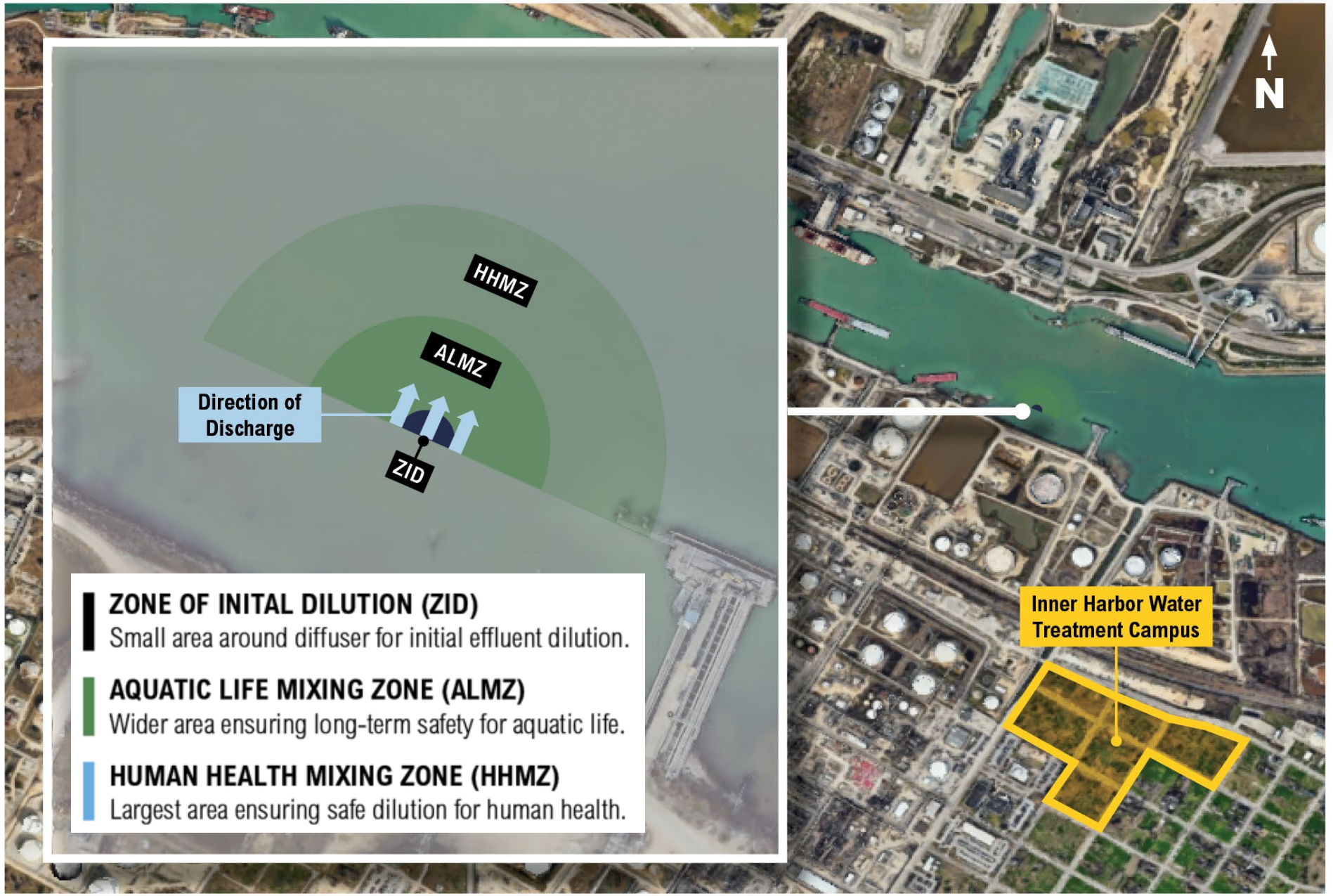
IHWTC 30 MGD Production
Known TCEQ Permitted Discharges
Future Discharges
Diversions
Velocity
Tidal Levels
Salinity
Bathymetry
Currents
Weather

Model Outputs

1. Discharge diffuser design optimization
2. Predicted salinity within the Inner Harbor Ship Channel (water column)
3. Predicted salinity at the IHWTC seawater intake & other fixed sampling points

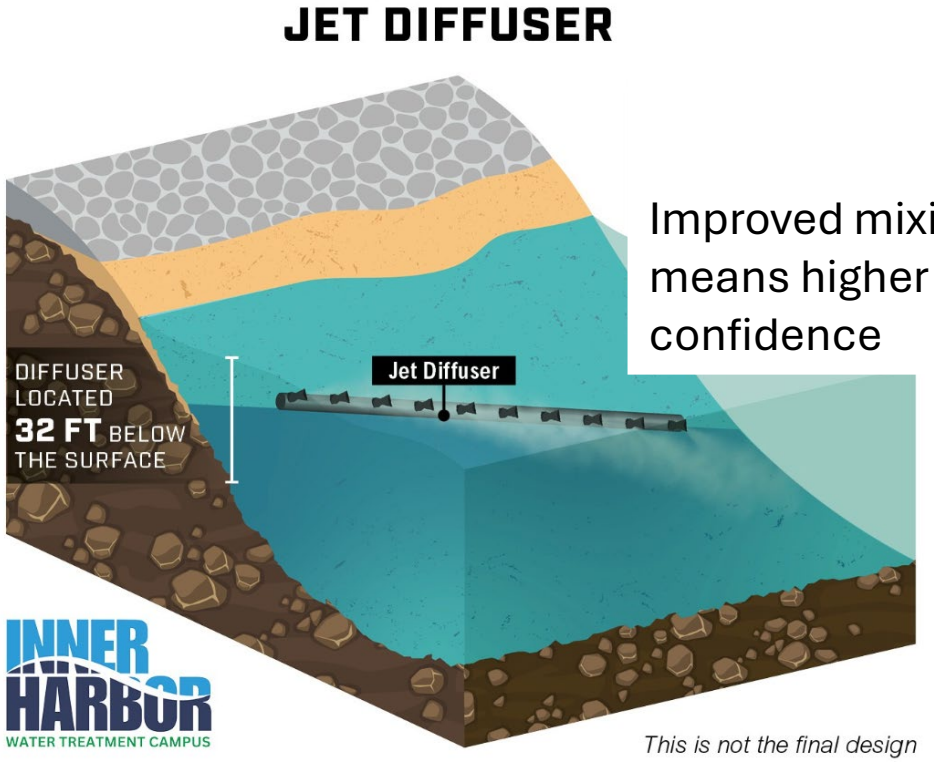
Over *400 million iterations* run to date

INNER HARBOR PERMITTED MIXING ZONES



Near Field – Diffuser Design Optimization

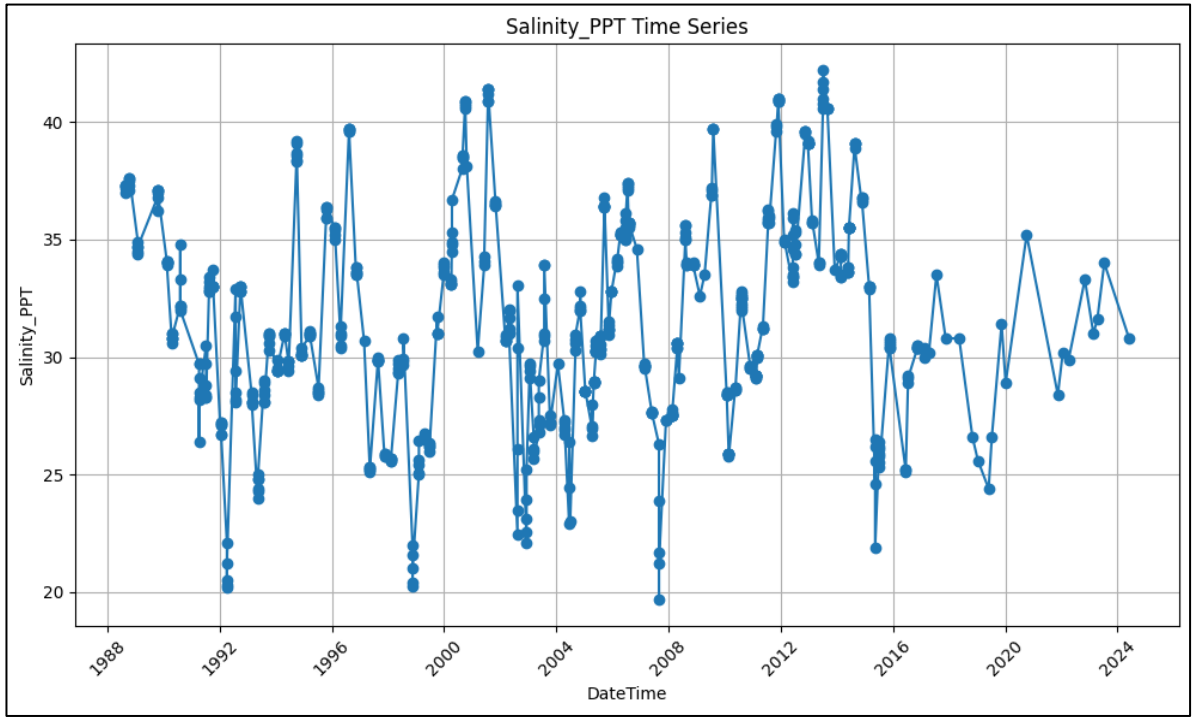
Optimized diffuser design achieves a 50% improvement in discharge mixing compared with TCEQ permit criteria.



Improved mixing means higher confidence

Modeling Salinity

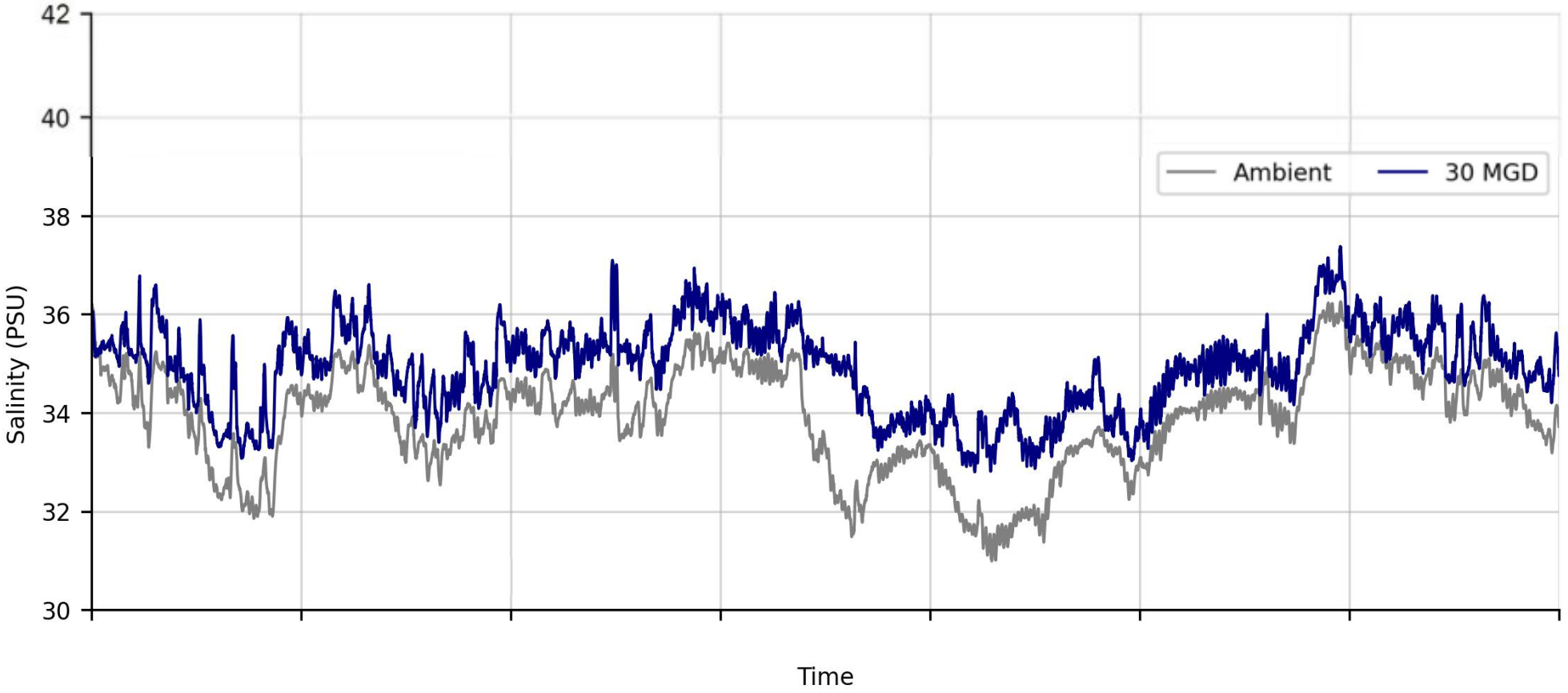
1. Salinity has implications for all three project requirements
   i. Environmental Responsibility
   ii. Water Supply Reliability
   iii. Affordability
2. It's important for the ecosystem.
3. It's important for the desalination process.
4. It's important for the cost of water production.



NATURAL RANGE OF SALINITY
CORPUS CHRISTI BAY
20 TO 42 ppt

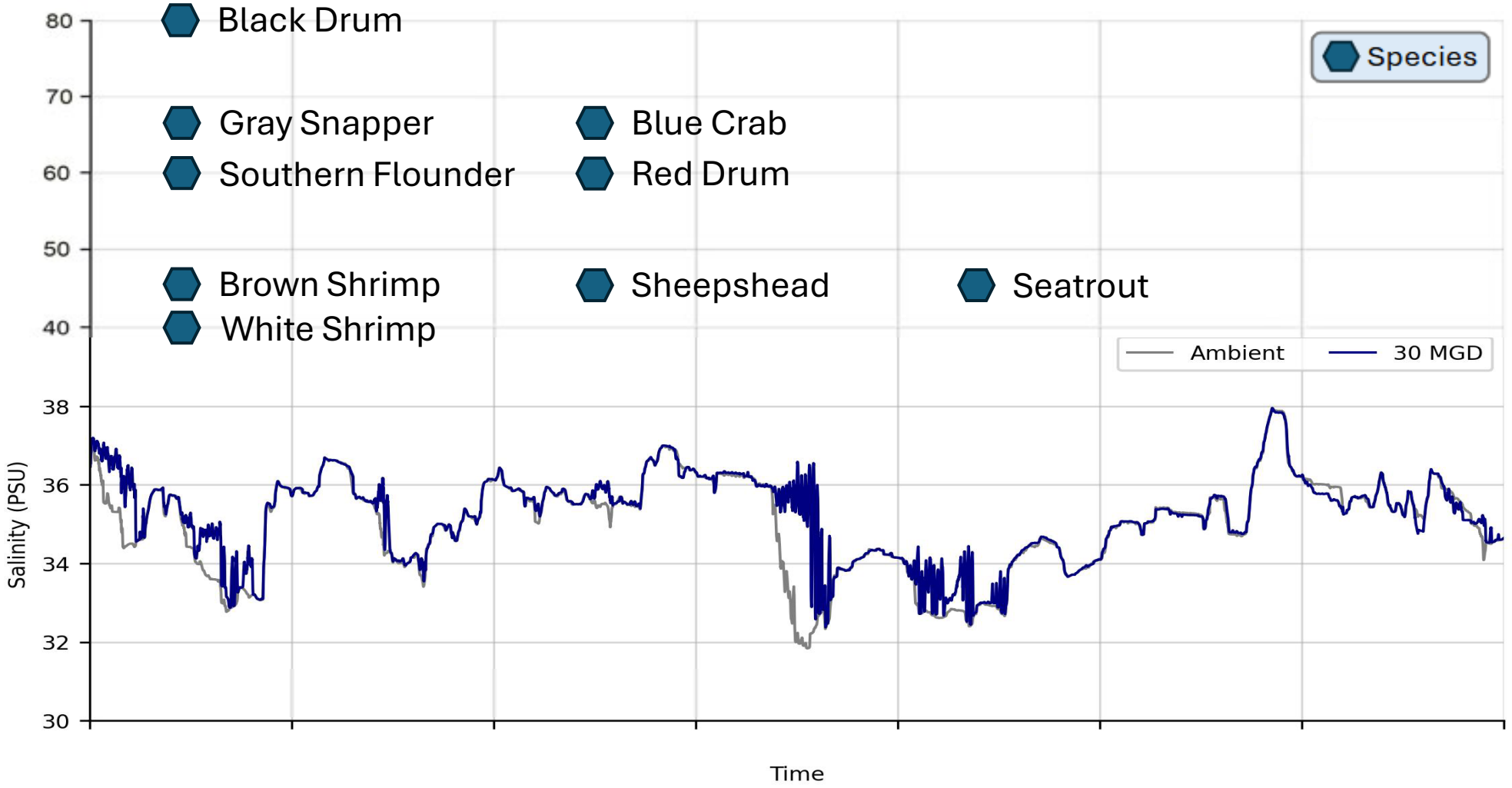
- Modeled salinity levels align with TCEQ background data collected over 36+ years.
- The model confirms operational salinity remains within expected, natural ranges.

Far Field – Intake Salinity



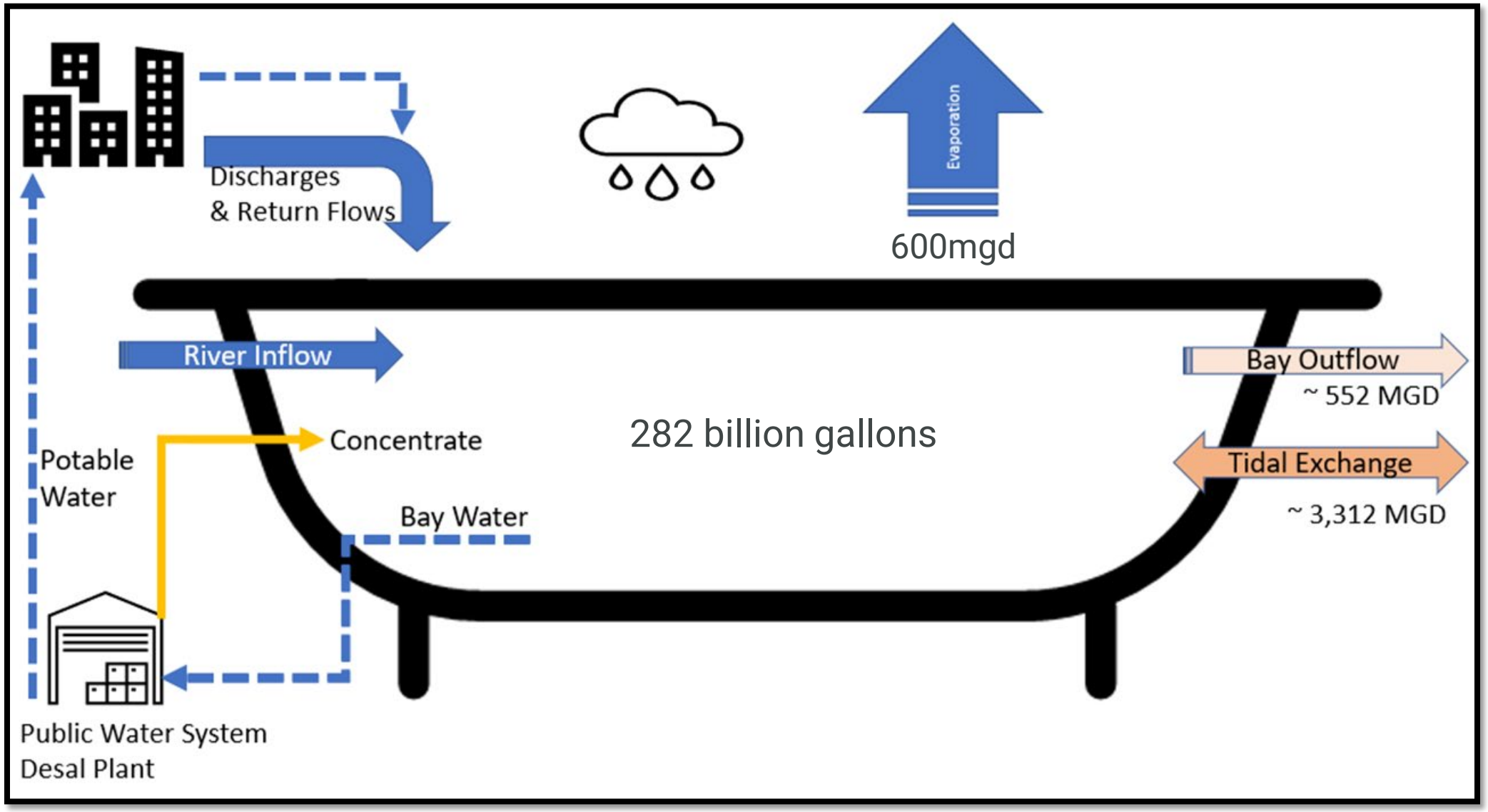
- Treatment process designed to produce 30 MGD capacity with inlet salinity up to 40 ppt. Production capacity to be reduced at > 40 ppt salinity.
- Salinity ranges shown are at the depth of the intake, 32' below the surface

Far Field – Model Results at Harbor Bridge



- Salinity ranges shown are in the bottom 1' of the water column

Modeling Basis – Mass Balance Eval



Far Field Assessments Summary

SUNTANS

Port of CC

- < 1 ppt increase in Corpus Christi Bay

EFDC+

Port of CC

- < 0.6 ppt increase in La Quinta Channel

Mass Balance

Freese and Nichols

- < 0.6 ppt increase in Corpus Christi Bay

MIKE 3

Kiewit/GHD

- < 0.5 ppt increase in Corpus Christi Bay

TCEQ

TCEQ performed multiple analyses – concluded the proposed discharge will comply with water quality standards and antidegradation requirements.

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Modeling Conclusions

1. TCEQ Permit Requirements
   - *Diffuser optimization resulted in 50% more mixing than modeled for TCEQ permit, resulting in improved dispersion*

2. Intake Quality & Treatment Process
   - *Modeled intake salinity below design allowable levels, meaning no impact to treatment process*

3. Salinity Impacts at Harbor Bridge/Bay Interface
   - ***NO** adverse salinity or local ecology impacts*

INNER HARBOR

WATER TREATMENT CAMPUS

Questions?