PORT CORPUS CHRISTI®

February 10, 2023

Brooke McGregor
Texas Commission on Environmental Quality
Water Availability Division, MC-160
Building F, Ste. 3101
12100 Park 35 Circle
Austin, TX 78753

Subject: **Water Rights Application**
Proposed Harbor Island Desalination Facility
Port of Corpus Christi Authority of Nueces County
CN: 600885248

Dear Ms. McGregor,

The Port of Corpus Christi Authority of Nueces County (Port Corpus Christi) formally submits this water rights application, for a proposed desalination facility on Harbor Island adjacent to the Corpus Christi Ship Channel across from Port Aransas, Texas.

The purpose of this project is to develop a sustainable water supply in an area reliant entirely on surface water which is vulnerable to persistent drought. To meet this purpose, Port Corpus Christi proposes to provide 50 million gallons per day (mgd) in a manner that is both consistent with the Texas Water Development Board State Water Plan and minimizes environmental impacts. This application requests authorization to divert up to 350,000 acre-feet/year at a maximum diversion rate of 109,000 gallons per minute (gpm) of State Water to initially produce 50mgd of treated water that may expand to 100 mgd in the future. The treated water will be distributed on wholesale basis to municipal and industrial entities per the State Water Plan. Port Corpus Christi is submitting a Submerged Lands Lease to the Texas General Land Office for this project, concurrently with this application.

Thank you for your time and attention to this important matter. If you have any questions or need additional information for this request, please contact me at (361) 885-6163 or by email at sarah@pocca.com.

Sincerely,
PORT OF CORPUS CHRISTI AUTHORITY

Sarah L. Garza
Director of Environmental
Planning and Compliance

cc: Sean Strawbridge, Chief Executive Officer, Port of Corpus Christi Authority
Jeffrey Pollack, Chief Strategy and Sustainability Officer, Port of Corpus Christi Authority
Harrison McNeil, Supervisor of Environmental Permitting, Port of Corpus Christi Authority
Yvonne Dives-Gomez, Environmental Permitting Specialist, Port of Corpus Christi Authority

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

TCEQ WATER RIGHTS PERMITTING APPLICATION

ADMINISTRATIVE INFORMATION CHECKLIST

Complete and submit this checklist for each application. See Instructions Page. 5.

APPLICANT(S): Port of Corpus Christi Authority of Nueces County, Texas

Indicate whether the following items are included in your application by writing either Y (for yes) or N (for no) next to each item (all items are <u>not</u> required for every application).

Y/N		Y/N	
Y	**Administrative Information Report**	Y	**Worksheet 3.0**
N	Additional Co-Applicant Information	N	Additional W.S 3.0 for each Point
N	Additional Co-Applicant Signature Pages	N	Recorded Deeds for Diversion Points
Y	Written Evidence of Signature Authority	N	Consent For Diversion Access
Y	**Technical Information Report**	N	**Worksheet 4.0**
Y	USGS Map (or equivalent)	N	TPDES Permit(s)
Y	Map Showing Project Details	N	WWTP Discharge Data
Y	Original Photographs	N	Groundwater Well Permit
Y	Water Availability Analysis	N	Signed Water Supply Contract
Y	**Worksheet 1.0**	N	**Worksheet 4.1**
N	Recorded Deeds for Irrigated Land	Y	**Worksheet 5.0**
N	Consent For Irrigation Land	N	Addendum to Worksheet 5.0
N	**Worksheet 1.1**	Y	**Worksheet 6.0**
N	Addendum to Worksheet 1.1	Y	Water Conservation Plan(s)
N	**Worksheet 1.2**	Y	Drought Contingency Plan(s)
N	Additional W.S 2.0 for Each Reservoir	Y	Documentation of Adoption
N	Dam Safety Documents	N	**Worksheet 7.0**
N	Notice(s) to Governing Bodies	N	Accounting Plan
N	Recorded Deeds for Inundated Land	Y	**Worksheet 8.0**
N	Consent For Inundation Land	Y	Fees

ADMINISTRATIVE INFORMATION REPORT

The following information **is required** for **all** new applications and amendments.

******Applicants are strongly encouraged to schedule a pre-application meeting with TCEQ Staff to discuss Applicant's needs prior to submitting an application. Call the Water Rights Permitting Team to schedule a meeting at* **(512) 239-4600.**

1. TYPE OF APPLICATION (Instructions, Page. 6)

Indicate, by marking X, next to the following authorizations you are seeking.

__X__ New Appropriation of State Water

_____ Amendment to a Water Right *

_____ Bed and Banks

If you are seeking an amendment to an existing water rights authorization, you must be the owner of record of the authorization. If the name of the Applicant in Section 2, does not match the name of the current owner(s) of record for the permit or certificate or if any of the co-owners is not included as an applicant in this amendment request, your application could be returned. If you or a co-applicant are a new owner, but ownership is not reflected in the records of the TCEQ, submit a change of ownership request (Form TCEQ-10204) prior to submitting the application for an amendment. See Instructions page. 6. Please note that an amendment application may be returned, and the Applicant may resubmit once the change of ownership is complete.

Please summarize the authorizations or amendments you are seeking in the space below or attach a narrative description entitled "Summary of Request."

The Port of Corpus Christi Authority of Nueces County, Texas (Port Authority or Applicant) requests authorization to divert and use State Water from the Gulf of Mexico ("State Water") to supply a desalination facility on Harbor Island near Port Aransas, Texas (the "Facility"). Applicant requests authorization to divert up to 350,000 acre-feet/year at a maximum diversion rate of 217,000 gallons/minute (gpm) of State Water to the Facility. The Facility will initially use 175,000 acre-feet/year at a maximum diversion rate of 109,000 gpm of State Water to produce 50 million gallons per day (mgd) (56,000 acre-feet/year) of treated water. The treated water will be distributed on wholesale basis to municipal and industrial entities. Applicant's request for a new appropriation of 350,000 acre-feet/year allows for the Facility to produce 100 mgd (112,000 acre-feet/year) of treated water for potential future water supply needs of the region.

2. APPLICANT INFORMATION (Instructions, Page. 6)

a. Applicant

Indicate the number of Applicants/Co-Applicants 1
(Include a copy of this section for each Co-Applicant, if any)

What is the Full Legal Name of the individual or entity (applicant) applying for this permit?

Port of Corpus Christi Authority of Nueces County, Texas

(If the Applicant is an entity, the legal name must be spelled exactly as filed with the Texas Secretary of State, County, or in the legal documents forming the entity.)

If the applicant is currently a customer with the TCEQ, what is the Customer Number (CN)? You may search for your CN on the TCEQ website at http://www15.tceq.texas.gov/crpub/index.cfm?fuseaction=cust.CustSearch

CN : 600885248 (leave blank if you do not yet have a CN).

What is the name and title of the person or persons signing the application? Unless an application is signed by an individual applicant, the person or persons must submit written evidence that they meet the signatory requirements in *30 TAC § 295.14*.

First/Last Name: Sean Strawbridge

Title: Chief Executive Officer

See Attachment A - Evidence of Signatory

Have you provided written evidence meeting the signatory requirements in 30 TAC § 295.14, as an attachment to this application? **Y/N** Y

What is the applicant's mailing address as recognized by the US Postal Service (USPS)? You may verify the address on the USPS website at https://tools.usps.com/go/ZipLookupAction!input.action.

Name: Port of Corpus Christi Authority of Nueces County, Texas

Mailing Address: 400 Harbor Dr

City: Corpus Christi State: TX ZIP Code: 78401

Indicate an X next to the type of Applicant:

___Individual	___Sole Proprietorship-D.B.A.
___Partnership	___Corporation
___Trust	___Estate
___Federal Government	___State Government
___County Government	___City Government
X Other Government	___Other_____

For Corporations or Limited Partnerships, provide:
State Franchise Tax ID Number: NA SOS Charter (filing) Number: NA

3. APPLICATION CONTACT INFORMATION (Instructions, Page. 9)

If the TCEQ needs additional information during the review of the application, who should be contacted? Applicant may submit their own contact information if Applicant wishes to be the point of contact.

First and Last Name: Sarah Garza

Title: Director of Environmental Planning & Compliance

Organization Name: Port of Corpus Christi Authority of Nueces County, Texas

Mailing Address: 400 Harbor Drive

City: Corpus Christi State: TX ZIP Code: 78401

Phone Number: (361) 885-6163

Fax Number: NA

E-mail Address: sarah@pocca.com

4. WATER RIGHT CONSOLIDATED CONTACT INFORMATION (Instructions, Page. 9)

This section applies only if there are multiple Owners of the same authorization. Unless otherwise requested, Co-Owners will each receive future correspondence from the Commission regarding this water right (after a permit has been issued), such as notices and water use reports. Multiple copies will be sent to the same address if Co-Owners share the same address. Complete this section if there will be multiple owners and **all** owners agree to let one owner receive correspondence from the Commission. Leave this section blank if you would like all future notices to be sent to the address of each of the applicants listed in section 2 above.

I/We authorize all future notices be received on my/our behalf at the following:

First and Last Name: NA

Title: NA

Organization Name: NA

Mailing Address: NA

City: NA State: NA ZIP Code: NA

Phone Number: NA

Fax Number: NA

E-mail Address: NA

5. MISCELLANEOUS INFORMATION (Instructions, Page. 9)

a. The application will not be processed unless all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ are paid in accordance with the Delinquent Fee and Penalty Protocol by all applicants/co-applicants. If you need assistance determining whether you owe delinquent penalties or fees, please call the Water Rights Permitting Team at (512) 239-4600, prior to submitting your application.

1. Does Applicant or Co-Applicant owe any fees to the TCEQ? **Yes / No** No

   If **yes**, provide the following information:

   Account number: NA Amount past due: NA

2. Does Applicant or Co-Applicant owe any penalties to the TCEQ? **Yes / No** NA

   If **yes**, please provide the following information:

   Enforcement order number: NA Amount past due: NA

b. If the Applicant is a taxable entity (corporation or limited partnership), the Applicant must be in good standing with the Comptroller or the right of the entity to transact business in the State may be forfeited. See Texas Tax Code, Subchapter F. Applicants may check their status with the Comptroller at https://mycpa.cpa.state.tx.us/coa/

   Is the Applicant or Co-Applicant in good standing with the Comptroller? **Yes / No** YES

c. The commission will not grant an application for a water right unless the applicant has submitted all Texas Water Development Board (TWDB) surveys of groundwater and surface water use – if required. See TWC §16.012(m) and 30 TAC § 297.41(a)(5). Applicants should check survey status on the TWDB website prior to filing: https://www3.twdb.texas.gov/apps/reports/WU/SurveyStatus_PriorThreeYears

   Applicant has submitted all required TWDB surveys of groundwater and surface water? **Yes / No** NA

6. SIGNATURE PAGE (Instructions, Page. 11)

Applicant:

I, Sean Strawbridge Chief Executive Officer

(Typed or printed name) (Title)

certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I further certify that I am authorized under Title 30 Texas Administrative Code §295.14 to sign and submit this document and I have submitted written evidence of my signature authority.

Signature: _____ Date: 2-10-2023

(Use blue ink)

Subscribed and Sworn to before me by the said

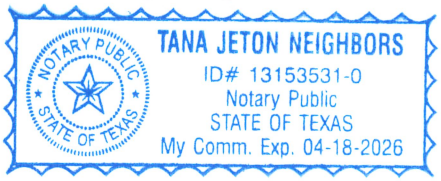
on this 10th day of February, 2023.

My commission expires on the 18th day of April, 2026.

Notary Public Tana Jeton Neighbors

County, Texas Nueces

[SEAL]



If the Application includes Co-Applicants, each Applicant and Co-Applicant must submit an original, separate signature page

TCEQ Core Data Form

TCEQ Use Only

For detailed instructions regarding completion of this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission (*If other is checked please describe in space provided.*)

☒ New Permit, Registration or Authorization (*Core Data Form should be submitted with the program application.*)

☐ Renewal (*Core Data Form should be submitted with the renewal form*) ☐ Other

2. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	3. Regulated Entity Reference Number *(if issued)*
CN 600885248		RN 105622112

SECTION II: Customer Information

4. General Customer Information | **5. Effective Date for Customer Information Updates** (mm/dd/yyyy)

☐ New Customer ☒ Update to Customer Information ☐ Change in Regulated Entity Ownership

☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)

The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).

6. Customer Legal Name (*If an individual, print last name first: eg: Doe, John*) *If new Customer, enter previous Customer below:*

Port of Corpus Christi Authority of Nueces County, Texas

7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number (if applicable)
NA	746000609	NA	063069835

11. Type of Customer: ☐ Corporation ☐ Individual Partnership: ☐ General ☐ Limited

Government: ☐ City ☐ County ☐ Federal ☐ State ☒ Other ☐ Sole Proprietorship ☐ Other:

12. Number of Employees

☐ 0-20 ☐ 21-100 ☐ 101-250 ☒ 251-500 ☐ 501 and higher

13. Independently Owned and Operated?

☒ **Yes** ☐ **No**

14. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check one of the following*

☐ Owner ☐ Operator ☒ Owner & Operator

☐ Occupational Licensee ☐ Responsible Party ☐ Voluntary Cleanup Applicant ☐ Other:

15. Mailing Address:

400 Harbor Drive

City	State	ZIP	ZIP + 4
Corpus Christi	TX	78401	

16. Country Mailing Information (if outside USA)	17. E-Mail Address (if applicable)
NA	sarah@pocca.com

18. Telephone Number	19. Extension or Code	20. Fax Number (if applicable)
(361) 885-6163		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information (*If 'New Regulated Entity" is selected below this form should be accompanied by a permit application*)

☐ New Regulated Entity ☐ Update to Regulated Entity Name ☒ Update to Regulated Entity Information

The Regulated Entity Name submitted may be updated in order to meet TCEQ Agency Data Standards (removal of organizational endings such as Inc, LP, or LLC).

22. Regulated Entity Name (*Enter name of the site where the regulated action is taking place.*)

Harbor Island Property

23. Street Address of the Regulated Entity: *(No PO Boxes)*	225 Hwy 361							
	City	Port Aransas	State	TX	ZIP	78373	ZIP + 4	
24. County								

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:	From the intersection of HWY 361 and Harbor Island Drive, head south appoximately 0.8 miles. The location is on the east of HWY 361.

26. Nearest City	State	Nearest ZIP Code
Port Aransas	TX	78373

27. Latitude (N) In Decimal:	27.848611	28. Longitude (W) In Decimal:	97.072778

Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
27	50	55	97	04	22

29. Primary SIC Code (4 digits)	30. Secondary SIC Code (4 digits)	31. Primary NAICS Code (5 or 6 digits)	32. Secondary NAICS Code (5 or 6 digits)
4491			

33. What is the Primary Business of this entity? *(Do not repeat the SIC or NAICS description.)*

Loading and unloading cargo to and from vessels.

34. Mailing Address:	400 Harbor Drive							
	City	Corpus Christi	State	TX	ZIP	78401	ZIP + 4	

35. E-Mail Address:	sarah@pocca.com

36. Telephone Number	37. Extension or Code	38. Fax Number *(if applicable)*
(361) 885-6163		( ) -

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☐ Edwards Aquifer	☐ Emissions Inventory Air	☐ Industrial Hazardous Waste
☐ Municipal Solid Waste	☐ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
☐ Sludge	☐ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☐ Waste Water	☐ Wastewater Agriculture	☒ Water Rights	☐ Other:
			New Permit Application	

SECTION IV: Preparer Information

40. Name:	Sarah Garza	41. Title:	Director of Environmental Planning & Compliance

42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
(361) 885-6163		( ) -	sarah@pocca.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

Company:	Port of Corpus Christi Authority of Nueces County, Texas	**Job Title:**	Director of Environmental Planning & Compliance
Name *(In Print):*	Sarah Garza	**Phone:**	(361) 885- **6163**
Signature:	Sarah Garza	**Date:**	2/10/2023

TECHNICAL INFORMATION REPORT
WATER RIGHTS PERMITTING

This Report is required for applications for new or amended water rights. Based on the Applicant's responses below, Applicants are directed to submit additional Worksheets (provided herein). A completed Administrative Information Report is also required for each application.

Applicants are REQUIRED to schedule a pre-application meeting with TCEQ Permitting Staff to discuss Applicant's needs and to confirm information necessary for an application prior to submitting such application. Please contact the Water Availability Division at (512) 239-4600 or WRPT@tceq.texas.gov to schedule a meeting.

Date of pre-application meeting: Feb. 9, 2023

1. New or Additional Appropriations of State Water. Texas Water Code (TWC) § 11.121 (Instructions, Page. 12)

State Water is: *The water of the ordinary flow, underflow, and tides of every flowing river, natural stream, and lake, and of every bay or arm of the Gulf of Mexico, and the storm water, floodwater, and rainwater of every river, natural stream, canyon, ravine, depression, and watershed in the state. TWC § 11.021.*

a. Applicant requests a new appropriation (diversion or impoundment) of State Water? **Y / N** Y

b. Applicant requests an amendment to an existing water right requesting an increase in the appropriation of State Water or an increase of the overall or maximum combined diversion rate? **Y / N** N (If yes, indicate the Certificate or Permit number: NA)

If Applicant answered yes to (a) or (b) above, does Applicant also wish to be considered for a term permit pursuant to TWC § 11.1381? **Y / N** N

c. Applicant requests to extend an existing Term authorization or to make the right permanent? **Y / N** N (If yes, indicate the Term Certificate or Permit number: NA)

If Applicant answered yes to (a), (b) or (c), the following worksheets and documents are required:

- **Worksheet 1.0 – Quantity, Purpose, and Place of Use Information Worksheet**
- **Worksheet 2.0 - Impoundment/Dam Information Worksheet** (submit one worksheet for each impoundment or reservoir requested in the application)
- **Worksheet 3.0 - Diversion Point Information Worksheet** (submit one worksheet for each diversion point and/or one worksheet for the upstream limit and one worksheet for the downstream limit of each diversion reach requested in the application)
- **Worksheet 5.0 – Environmental Information Worksheet**
- **Worksheet 6.0 – Water Conservation Information Worksheet**
- **Worksheet 7.0 – Accounting Plan Information Worksheet**
- **Worksheet 8.0 – Calculation of Fees**
- **Fees calculated on Worksheet 8.0 –** see instructions **Page. 34.**
- **Maps –** See instructions **Page. 15**.
- **Photographs** - See instructions **Page. 30**.

Additionally, if Applicant wishes to submit an alternate source of water for the project/authorization, see Section 3, Page 3 for Bed and Banks Authorizations (Alternate sources may include groundwater, imported water, contract water or other sources).

Additional Documents and Worksheets may be required (see within).

2. Amendments to Water Rights. TWC § 11.122 (Instructions, Page. 12)

This section should be completed if Applicant owns an existing water right and Applicant requests to amend the water right. ***If Applicant is not currently the Owner of Record in the TCEQ Records, Applicant must submit a Change of Ownership Application (TCEQ-10204) prior to submitting the amendment Application or provide consent from the current owner to make the requested amendment. If the application does not contain consent from the current owner to make the requested amendment, TCEQ will not begin processing the amendment application until the Change of Ownership has been completed and will consider the Received Date for the application to be the date the Change of Ownership is completed.*** **See instructions page. 6.**

Water Right (Certificate or Permit) number you are requesting to amend: NA

Applicant requests to sever and combine existing water rights from one or more Permits or Certificates into another Permit or Certificate? **Y / N** N (if yes, complete chart below):

List of water rights to sever	Combine into this ONE water right
NA	NA

a. Applicant requests an amendment to an existing water right to increase the amount of the appropriation of State Water (diversion and/or impoundment)? **Y / N** N

If yes, application is a new appropriation for the increased amount, complete ***Section 1 of this Report (PAGE. 1) regarding New or Additional Appropriations of State Water****.*

b. Applicant requests to amend existing Term authorization to extend the term or make the water right permanent (remove conditions restricting water right to a term of years)? **Y / N** N

If yes, application is a new appropriation for the entire amount, complete ***Section 1 of this Report (PAGE. 1) regarding New or Additional Appropriations of State Water****.*

c. Applicant requests an amendment to change the purpose or place of use or to add an additional purpose or place of use to an existing Permit or Certificate? **Y / N** N
If yes, submit:

- **Worksheet 1.0 – Quantity, Purpose, and Place of Use Information Worksheet**
- **Worksheet 1.2 - Notice: "Marshall Criteria"**

d. Applicant requests to change: diversion point(s); or reach(es); or diversion rate? **Y / N** N
If yes, submit:

- **Worksheet 3.0 - Diversion Point Information Worksheet** (submit one worksheet for each diversion point or one worksheet for the upstream limit and one worksheet for the downstream limit of each diversion reach)
- **Worksheet 5.0 – Environmental Information** (Required for <u>any</u> new diversion points that are not already authorized in a water right)

e. Applicant requests amendment to add or modify an impoundment, reservoir, or dam? **Y / N** N

If yes, submit: **Worksheet 2.0 - Impoundment/Dam Information Worksheet** (submit one worksheet for each impoundment or reservoir)

f. Other - Applicant requests to change any provision of an authorization not mentioned above? **Y / N** N *If yes, call the Water Availability Division at (512) 239-4600 to discuss.*

Additionally, all amendments require:

- **Worksheet 8.0 – Calculation of Fees; and Fees calculated – see instructions Page. 34**
- **Maps – See instructions Page. 15.**
- **Additional Documents and Worksheets may be required (see within).**

3. Bed and Banks. TWC § 11.042 (Instructions, Page 13)

a. Pursuant to contract, Applicant requests authorization to convey, stored or conserved water to the place of use or diversion point of purchaser(s) using the bed and banks of a watercourse? TWC § 11.042(a). **Y/N** N

If yes, submit a signed copy of the Water Supply Contract pursuant to 30 TAC §§ 295.101 and 297.101. Further, if the underlying Permit or Authorization upon which the Contract is based does not authorize Purchaser's requested Quantity, Purpose or Place of Use, or Purchaser's diversion point(s), then either:

1. *Purchaser must submit the worksheets required under Section 1 above with the Contract Water identified as an alternate source; or*
2. *Seller must amend its underlying water right under Section 2.*

b. Applicant requests to convey water imported into the state from a source located wholly outside the state using the bed and banks of a watercourse? TWC § 11.042(a-1). **Y / N** N

If yes, submit worksheets 1.0, 2.0, 3.0, 4.0, 5.0, 7.0, 8.0, Maps and fees from the list below.

c. Applicant requests to convey Applicant's own return flows derived from privately owned groundwater using the bed and banks of a watercourse? TWC § 11.042(b). **Y / N** N

If yes, submit worksheets 1.0, 2.0, 3.0, 4.0, 5.0, 7.0, 8.0, Maps, and fees from the list below.

d. Applicant requests to convey Applicant's own return flows derived from surface water using the bed and banks of a watercourse? TWC § 11.042(c). **Y / N** N

If yes, submit worksheets 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, Maps, and fees from the list below.

****Please note, if Applicant requests the reuse of return flows belonging to others, the Applicant will need to submit the worksheets and documents under Section 1 above, as the application will be treated as a new appropriation subject to termination upon direct or indirect reuse by the return flow discharger/owner.***

e. Applicant requests to convey water from any other source, other than (a)-(d) above, using the bed and banks of a watercourse? TWC § 11.042(c). **Y / N** N

If yes, submit worksheets 1.0, 2.0, 3.0, 4.0, 5.0, 7.0, 8.0, Maps, and fees from the list below.

Worksheets and information:

- **Worksheet 1.0 – Quantity, Purpose, and Place of Use Information Worksheet**
- **Worksheet 2.0 - Impoundment/Dam Information Worksheet** (submit one worksheet for each impoundment or reservoir owned by the applicant through which water will be conveyed or diverted)
- **Worksheet 3.0 - Diversion Point Information Worksheet** (submit one worksheet for the downstream limit of each diversion reach for the proposed conveyances)

- **Worksheet 4.0 – Discharge Information Worksheet** (for each discharge point)
- **Worksheet 5.0 – Environmental Information Worksheet**
- **Worksheet 6.0 – Water Conservation Information Worksheet**
- **Worksheet 7.0 – Accounting Plan Information Worksheet**
- **Worksheet 8.0 – Calculation of Fees; and Fees calculated – see instructions Page. 34**
- **Maps** – See instructions **Page. 15**.
- **Additional Documents and Worksheets may be required (see within).**

4. General Information, Response Required for all Water Right Applications (Instructions, Page 15)

a. Provide information describing how this application addresses a water supply need in a manner that is consistent with the state water plan or the applicable approved regional water plan for any area in which the proposed appropriation is located or, in the alternative, describe conditions that warrant a waiver of this requirement (*not required for applications to use groundwater-based return flows*). Include citations or page numbers for the State and Regional Water Plans, if applicable. Provide the information in the space below or submit a supplemental sheet entitled "Addendum Regarding the State and Regional Water Plans":

"Since 1957, the Texas Water Development Board ('TWDB') has been charged with preparing a comprehensive and flexible long-term plan for the development, conservation, and management of the State's water resources." See Coastal Bend Regional Water Planning Area, Region N, by Coastal Bend Regional Water Planning Group, "2021 Regional Water Plan" at p. 1 (hereinafter " Regional Plan"). The Coastal Bend Region (Region N) of Texas includes Aransas, Nueces, and San Patricio Counties. (Regional Plan at pp. 1-2, 5, including Figure ES 1). Chapter 5 of the Regional Plan entitled "Water Management Strategies," and subchapter 5D.10 fully discuss "Seawater Desalination" as a specific water management strategy and Section 5D.10.7 specifically discusses the applicant's proposed Facility as a management strategy. (Regional Plan at pp. 5.10-1 to 5.10-46). "If projected future water needs are not met, the TWDB has forecast that Region N will suffer combined lost income of $1.9 billion by 2030 and $6.9 billion by 2070; a loss of 13,000 jobs by 2030 and loss of 48,000 jobs by 2070; and consumer surplus losses of $163 million by 2030 and $172 million by 2070 (and related population losses and school enrollment losses)". (Regional Plan at p. 30, and Appendix B at p. 2).

Accordingly, this application addresses a known "water supply need in a manner that is consistent with the state water plan . . . ;" and addresses a "water supply need" specific to the Region N plan. Seawater desalination is expressly addressed in the Regional Plan as a water management strategy. Diversion of State Water from the Gulf of Mexico for purposes of desalination is expressly considered in the Regional Plan for the proposed Facility (at Harbor Island). The requested diversion of 156 MGD (175,000 acre-feet/year) is appropriately scaled to the 50 MGD potable water production fully discussed in the Regional Plan while the requested diversion of 312 MGD (350,000 acre-feet/year) is scaled to address potential growth given more recent trends.

b. Did the Applicant perform its own Water Availability Analysis? **Y** / **N** N

If the Applicant performed its own Water Availability Analysis, provide electronic copies of any modeling files and reports.

c. Does the application include required Maps? (**Instructions Page. 15**) **Y** / **N** Y

See Attachment B - USGS Map

WORKSHEET 1.0
Quantity, Purpose and Place of Use

1. New Authorizations (Instructions, Page. 16)

Submit the following information regarding quantity, purpose and place of use for requests for new or additional appropriations of State Water or Bed and Banks authorizations:

Quantity (acre-feet) (*Include losses for Bed and Banks*)	**State Water Source (River Basin) or Alternate Source** *each *alternate source* (*and new appropriation based on return flows of others*) *also requires completion of Worksheet 4.0*	**Purpose(s) of Use**	**Place(s) of Use** **requests to move state water out of basin also require completion of Worksheet 1.1 Interbasin Transfer*
350,000	Gulf of Mexico	Wholesale supply for municipal & industrial use	Those portions of Aransas, Nueces, and San Patricio Counties in the San Antonio-Nueces Coastal Basin

350,000 Total amount of water (in acre-feet) to be used annually (*include losses for Bed and Banks applications*)

If the Purpose of Use is Agricultural/Irrigation for any amount of water, provide:

a. Location Information Regarding the Lands to be Irrigated

i) Applicant proposes to irrigate a total of NA acres in any one year. This acreage is all of or part of a larger tract(s) which is described in a supplement attached to this application and contains a total of NA acres in NA County, TX.

ii) Location of land to be irrigated: In the NA Original Survey No. NA, Abstract No. NA.

A copy of the deed(s) or other acceptable instrument describing the overall tract(s) with the recording information from the county records must be submitted. Applicant's name must match deeds.

If the Applicant is not currently the sole owner of the lands to be irrigated, Applicant must submit documentation evidencing consent or other documentation supporting Applicant's right to use the land described.

Water Rights for Irrigation may be appurtenant to the land irrigated and convey with the land unless reserved in the conveyance. 30 TAC § 297.81.

2. Amendments - Purpose or Place of Use (Instructions, Page. 12)

a. Complete this section for each requested amendment changing, adding, or removing Purpose(s) or Place(s) of Use, complete the following:

Quantity (acre-feet)	Existing Purpose(s) of Use	Proposed Purpose(s) of Use*	Existing Place(s) of Use	Proposed Place(s) of Use**
NA	NA	NA	NA	NA

**If the request is to add additional purpose(s) of use, include the existing and new purposes of use under "Proposed Purpose(s) of Use."*

***If the request is to add additional place(s) of use, include the existing and new places of use under "Proposed Place(s) of Use."*

Changes to the purpose of use in the Rio Grande Basin may require conversion. 30 TAC § 303.43.

b. For any request which adds Agricultural purpose of use or changes the place of use for Agricultural rights, provide the following location information regarding the lands to be irrigated:

i. Applicant proposes to irrigate a total of NA acres in any one year. This acreage is all of or part of a larger tract(s) which is described in a supplement attached to this application and contains a total of NA acres in _____ County, TX.

ii. Location of land to be irrigated: In the NA Original Survey No. NA, Abstract No. NA.

A copy of the deed(s) describing the overall tract(s) with the recording information from the county records must be submitted. Applicant's name must match deeds. If the Applicant is not currently the sole owner of the lands to be irrigated, Applicant must submit documentation evidencing consent or other legal right for Applicant to use the land described.

Water Rights for Irrigation may be appurtenant to the land irrigated and convey with the land unless reserved in the conveyance. 30 TAC § 297.81.

c. Submit Worksheet 1.1, Interbasin Transfers, for any request to change the place of use which moves State Water to another river basin.

d. See Worksheet 1.2, Marshall Criteria, and submit if required.

e. See Worksheet 6.0, Water Conservation/Drought Contingency, and submit if required.

WORKSHEET 1.1
INTERBASIN TRANSFERS, TWC § 11.085

Not Applicable

Submit this worksheet for an application for a new or amended water right which requests to transfer State Water from its river basin of origin to use in a different river basin. A river basin is defined and designated by the Texas Water Development Board by rule pursuant to TWC § 16.051.

Applicant requests to transfer State Water to another river basin within the State? **Y / N** N

1. Interbasin Transfer Request (Instructions, Page. 20)

a. Provide the Basin of Origin. NA

b. Provide the quantity of water to be transferred (acre-feet). NA

c. Provide the Basin(s) and count(y/ies) where use will occur in the space below:

NA

2. Exemptions (Instructions, Page. 20), TWC § 11.085(v)

Certain interbasin transfers are exempt from further requirements. Answer the following:

a. The proposed transfer, which in combination with any existing transfers, totals less than 3,000 acre-feet of water per annum from the same water right. **Y/N** NA

b. The proposed transfer is from a basin to an adjoining coastal basin? **Y/N** NA

c. The proposed transfer from the part of the geographic area of a county or municipality, or the part of the retail service area of a retail public utility as defined by Section 13.002, that is within the basin of origin for use in that part of the geographic area of the county or municipality, or that contiguous part of the retail service area of the utility, not within the basin of origin? **Y/N** NA

d. The proposed transfer is for water that is imported from a source located wholly outside the boundaries of Texas, except water that is imported from a source located in the United Mexican States? **Y/N** NA

3. Interbasin Transfer Requirements (Instructions, Page. 20)

For each Interbasin Transfer request that is not exempt under any of the exemptions listed above Section 2, provide the following information in a supplemental attachment titled "Addendum to Worksheet 1.1, Interbasin Transfer":

a. the contract price of the water to be transferred (if applicable) (also include a copy of the contract or adopted rate for contract water);

b. a statement of each general category of proposed use of the water to be transferred and a detailed description of the proposed uses and users under each category;

c. the cost of diverting, conveying, distributing, and supplying the water to, and treating the water for, the proposed users (example - expert plans and/or reports documents may be provided to show the cost);

d. describe the need for the water in the basin of origin and in the proposed receiving basin based on the period for which the water supply is requested, but not to exceed 50 years (the need can be identified in the most recently approved regional water plans. The state and regional water plans are available for download at this website: (http://www.twdb.texas.gov/waterplanning/swp/index.asp);

e. address the factors identified in the applicable most recently approved regional water plans which address the following:

(i) the availability of feasible and practicable alternative supplies in the receiving basin to the water proposed for transfer;
(ii) the amount and purposes of use in the receiving basin for which water is needed;

(iii) proposed methods and efforts by the receiving basin to avoid waste and implement water conservation and drought contingency measures;

(iv) proposed methods and efforts by the receiving basin to put the water proposed for transfer to beneficial use;

(v) the projected economic impact that is reasonably expected to occur in each basin as a result of the transfer; and

(vi) the projected impacts of the proposed transfer that are reasonably expected to occur on existing water rights, instream uses, water quality, aquatic and riparian habitat, and bays and estuaries that must be assessed under Sections 11.147, 11.150, and 11.152 in each basin *(if applicable*). If the water sought to be transferred is currently authorized to be used under an existing permit, certified filing, or certificate of adjudication, such impacts shall only be considered in relation to that portion of the permit, certified filing, or certificate of adjudication proposed for transfer and shall be based on historical uses of the permit, certified filing, or certificate of adjudication for which amendment is sought;

f. proposed mitigation or compensation, if any, to the basin of origin by the applicant; and

g. the continued need to use the water for the purposes authorized under the existing Permit, Certified Filing, or Certificate of Adjudication, if an amendment to an existing water right is sought.

WORKSHEET 1.2
NOTICE. "THE MARSHALL CRITERIA"

Not Applicable

This worksheet assists the Commission in determining notice required for certain **amendments** that do not already have a specific notice requirement in a rule for that type of amendment, and *that do not change the amount of water to be taken or the diversion rate*. The worksheet provides information that Applicant **is required** to submit for amendments such as certain amendments to special conditions or changes to off-channel storage. These criteria address whether the proposed amendment will impact other water right holders or the on- stream environment beyond and irrespective of the fact that the water right can be used to its full authorized amount.

*This worksheet is **not required for Applications in the Rio Grande Basin** requesting changes in the purpose of use, rate of diversion, point of diversion, and place of use for water rights held in and transferred within and between the mainstems of the Lower Rio Grande, Middle Rio Grande, and Amistad Reservoir. See 30 TAC § 303.42.*

*This worksheet is **not required for amendments which are only changing or adding diversion points, or request only a bed and banks authorization or an IBT authorization**. However, Applicants may wish to submit the Marshall Criteria to ensure that the administrative record includes information supporting each of these criteria*

1. The "Marshall Criteria" (Instructions, Page. 21)

Submit responses on a supplemental attachment titled "Marshall Criteria" in a manner that conforms to the paragraphs (a) – (g) below:

a. Administrative Requirements and Fees. Confirm whether application meets the administrative requirements for an amendment to a water use permit pursuant to TWC Chapter 11 and Title 30 Texas Administrative Code (TAC) Chapters 281, 295, and 297. An amendment application should include, but is not limited to, a sworn application, maps, completed conservation plan, fees, etc.

b. Beneficial Use. Discuss how proposed amendment is a beneficial use of the water as defined in TWC § 11.002 and listed in TWC § 11.023. Identify the specific proposed use of the water (e.g., road construction, hydrostatic testing, etc.) for which the amendment is requested.

c. Public Welfare. Explain how proposed amendment is not detrimental to the public welfare. Consider any public welfare matters that might be relevant to a decision on the application. Examples could include concerns related to the well-being of humans and the environment.

d. Groundwater Effects. Discuss effects of proposed amendment on groundwater or groundwater recharge.

e. State Water Plan. Describe how proposed amendment addresses a water supply need in a manner that is consistent with the state water plan or the applicable approved regional water plan for any area in which the proposed appropriation is located or, in the alternative, describe conditions that warrant a waiver of this requirement. The state and regional water plans are available for download at: http://www.twdb.texas.gov/waterplanning/swp/index.asp.

f. Waste Avoidance. Provide evidence that reasonable diligence will be used to avoid waste and achieve water conservation as defined in TWC § 11.002. Examples of evidence could include, but are not limited to, a water conservation plan or, if required, a drought contingency plan, meeting the requirements of 30 TAC Chapter 288.

g. Impacts on Water Rights or On-stream Environment. Explain how the proposed amendment will not impact other water right holders or the on-stream environment beyond and irrespectiveof the fact that the water right can be used to its full authorized amount.

WORKSHEET 2.0
Impoundment/Dam Information
Not Applicable

This worksheet **is required** for any impoundment, reservoir and/or dam. Submit an additional Worksheet 2.0 for each impoundment or reservoir requested in this application.

If there is more than one structure, the numbering/naming of structures should be consistent throughout the application and on any supplemental documents (e.g., maps).

1. Storage Information (Instructions, Page. 21)

a. Official USGS name of reservoir, if applicable: NA

b. Provide amount of water (in acre-feet) impounded by structure at normal maximum operating level: NA.

c. The impoundment is on-channel NA or off-channel NA (mark one)

i. Applicant has verified on-channel or off-channel determination by contacting Surface Water Availability Team at (512) 239-4600? **Y / N** NA

ii. If on-channel, will the structure have the ability to pass all State Water inflows that Applicant does not have authorization to impound? **Y / N** NA

d. Is the impoundment structure already constructed? **Y / N** NA

i. For already constructed **on-channel** structures:

1. Date of Construction: NA

2. Was it constructed to be an exempt structure under TWC § 11.142? **Y / N** NA
   a. If Yes, is Applicant requesting to proceed under TWC § 11.143? **Y / N** NA
   b. If No, has the structure been issued a notice of violation by TCEQ? **Y / N** NA

3. Is it a U.S. Natural Resources Conservation Service (NRCS) (formerly Soil Conservation Service (SCS)) floodwater-retarding structure? **Y / N** NA
   a. If yes, provide the Site No. NA and watershed project name NA;
   b. Authorization to close "ports" in the service spillway requested? **Y / N** NA

ii. For **any** proposed new structures or modifications to structures:

1. Applicant **must** contact TCEQ Dam Safety Section at (512) 239-0326, *prior to submitting an Application.* Applicant has contacted the TCEQ Dam Safety Section regarding the submission requirements of 30 TAC, Ch. 299? **Y / N** NA
   Provide the date and the name of the Staff Person NA

2. As a result of Applicant's consultation with the TCEQ Dam Safety Section, TCEQ has confirmed that:
   a. No additional dam safety documents required with the Application. **Y / N** NA
   b. Plans (with engineer's seal) for the structure required. **Y / N** NA
   c. Engineer's signed and sealed hazard classification required. **Y / N** NA
   d. Engineer's statement that structure complies with 30 TAC, Ch. 299 Rules required. **Y / N** NA

3. Applicants **shall** give notice by certified mail to each member of the governing body of each county and municipality in which the reservoir, or any part of the reservoir to be constructed, will be located. (30 TAC § 295.42). Applicant must submit a copy of all the notices and certified mailing cards with this Application. Notices and cards are included? **Y / N** NA

iii. Additional information required for **on-channel** storage:

1. Surface area (in acres) of on-channel reservoir at normal maximum operating level: NA.

2. Based on the Application information provided, Staff will calculate the drainage area above the on-channel dam or reservoir. If Applicant wishes to also calculate the drainage area they may do so at their option.
Applicant has calculated the drainage area. **Y/N** NA
If yes, the drainage area is NA sq. miles.
(*If assistance is needed, call the Surface Water Availability Team prior to submitting the application, (512) 239-4600).*

2. Structure Location (Instructions, Page. 23)

a. On Watercourse (if on-channel) (USGS name): NA

b. Zip Code: NA

c. In the NA Original Survey No. NA, Abstract No. NA, NA County, Texas.

* ***A copy of the deed(s) with the recording information from the county records must be submitted describing the tract(s) that include the structure and all lands to be inundated.***

*****If the Applicant is not currently the sole owner of the land on which the structure is or will be built and sole owner of all lands to be inundated, Applicant must submit documentation evidencing consent or other documentation supporting Applicant's right to use the land described.***

d. A point on the centerline of the dam (on-channel) or anywhere within the impoundment (off-channel) is:

Latitude NA °N, Longitude NA °W.

****Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places***

i. Indicate the method used to calculate the location (examples: Handheld GPS Device, GIS, Mapping Program): NA

ii. Map submitted which clearly identifies the Impoundment, dam (where applicable), andthe lands to be inundated. See instructions Page. 15. **Y / N** NA

WORKSHEET 3.0
DIVERSION POINT (OR DIVERSION REACH) INFORMATION

This worksheet **is required** for each diversion point or diversion reach. Submit one Worksheet 3.0 for **each** diversion point and two Worksheets for **each** diversion reach (one for the upstream limit and one for the downstream limit of each diversion reach).

The numbering of any points or reach limits should be consistent throughout the application and on supplemental documents (e.g., maps).

1. Diversion Information (Instructions, Page. 24)

a. This Worksheet is to add new (select 1 of 3 below):

1. X Diversion Point No.
2. ____ Upstream Limit of Diversion Reach No.
3. ____ Downstream Limit of Diversion Reach No.

b. Maximum Rate of Diversion for **this new point** 484 cfs (cubic feet per second) or 217,000 gpm (gallons per minute)

c. Does this point share a diversion rate with other points? **Y / N** N
*If yes, submit Maximum **Combined** Rate of Diversion for all points/reaches* NA cfs or NA gpm

d. For amendments, is Applicant seeking to increase combined diversion rate? **Y / N** NA

*** An increase in diversion rate is considered a new appropriation and would require completion of Section 1, New or Additional Appropriation of State Water.*

e. Check (√) the appropriate box to indicate diversion location and indicate whether the diversion location is existing or proposed):

Check one		Write: Existing or Proposed
☐	Directly from stream	
☐	From an on-channel reservoir	
☐	From a stream to an on-channel reservoir	
☑	Other method (explain fully, use additional sheets if necessary)	Proposed. See Attachment E

f. Based on the Application information provided, Staff will calculate the drainage area above the diversion point (or reach limit). If Applicant wishes to also calculate the drainage area, you may do so at their option.

Applicant has calculated the drainage area. **Y / N** NA

If yes, the drainage area is NA sq. miles.
(*If assistance is needed, call the Surface Water Availability Team at (512) 239-4600, prior to submitting application*)

2. Diversion Location (Instructions, Page 25)

a. On watercourse (USGS name): Gulf of Mexico

b. Zip Code: NA

c. Location of point: In the NA Original Survey No. NA, Abstract No. NA, NA County, Texas.

A copy of the deed(s) with the recording information from the county records must be submitted describing tract(s) that include the diversion structure.

For diversion reaches, the Commission cannot grant an Applicant access to property that the Applicant does not own or have consent or a legal right to access, the Applicant will be required to provide deeds, or consent, or other documents supporting a legal right to use the specific points when specific diversion points within the reach are utilized. Other documents may include, but are not limited to a recorded easement, a land lease, a contract, or a citation to the Applicant's right to exercise eminent domain to acquire access.

d. Point is at:
Latitude 27.850873 °N, Longitude 97.017401 °W.
Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places

e. Indicate the method used to calculate the location (examples: Handheld GPS Device, GIS, Mapping Program): GPS-RTK mounted on bathymetric survey boat

f. Map submitted must clearly identify each diversion point and/or reach. See instructions Page. 15.

g. If the Plan of Diversion is complicated and not readily discernable from looking at the map, attach additional sheets that fully explain the plan of diversion.

WORKSHEET 4.0
DISCHARGE INFORMATION
Not Applicable

This worksheet required for any requested authorization to discharge water into a State Watercourse for conveyance and later withdrawal or in-place use. Worksheet 4.1 is also required for each Discharge point location requested. **Instructions Page. 26.** ***Applicant is responsible for obtaining any separate water quality authorizations which may be required and for insuring compliance with TWC, Chapter 26 or any other applicable law.***

a. The purpose of use for the water being discharged will be NA.

b. Provide the amount of water that will be lost to transportation, evaporation, seepage, channel or other associated carriage losses NA (% or amount) and explain the method of calculation: NA

c. Is the source of the discharged water return flows? **Y / N** NA If yes, provide the following information:

1. The TPDES Permit Number(s). NA (attach a copy of the **current** TPDES permit(s))
2. Applicant is the owner/holder of each TPDES permit listed above? **Y / N** NA

PLEASE NOTE: If Applicant is not the discharger of the return flows, or the Applicant is not the water right owner of the underlying surface water right, or the Applicant does not have a contract with the discharger, the application should be submitted under Section 1, New or Additional Appropriation of State Water, as a request for a new appropriation of state water. If Applicant is the discharger, the surface water right holder, or the contract holder, then the application should be submitted under Section 3, Bed and Banks.

3. Monthly WWTP discharge data for the past 5 years in electronic format. (Attach and label as "Supplement to Worksheet 4.0").
4. The percentage of return flows from groundwater NA, surface water NA?
5. If any percentage is surface water, provide the base water right number(s) NA.

d. Is the source of the water being discharged groundwater? **Y / N** NA If yes, provide the following information:

1. Source aquifer(s) from which water will be pumped: NA
2. If the well has not been constructed, provide production information for wells in the same aquifer in the area of the application. See http://www.twdb.texas.gov/groundwater/data/gwdbrpt.asp. Additionally, provide well numbers or identifiers NA.
3. Indicate how the groundwater will be conveyed to the stream or reservoir.

   NA
4. A copy of the groundwater well permit if it is located in a Groundwater Conservation District (GCD) or evidence that a groundwater well permit is not required.

di. Is the source of the water being discharged a surface water supply contract? **Y / N** NA If yes, provide the signed contract(s).

dii. Identify any other source of the water NA

WORKSHEET 4.1
DISCHARGE POINT INFORMATION

This worksheet is required for **each** discharge point. Submit one Worksheet 4.1 for each discharge point. If there is more than one discharge point, the numbering of the points should be consistent throughout the application and on any supplemental documents (e.g., maps). **Instructions, Page 27.**

For water discharged at this location provide:

a. The amount of water that will be discharged at this point is NA acre-feet per year. The discharged amount should include the amount needed for use and to compensate for any losses.

b. Water will be discharged at this point at a maximum rate of NA cfs or NA gpm.

c. Name of Watercourse as shown on Official USGS maps: NA

d. Zip Code NA

e. Location of point: In the NA Original Survey No. NA, Abstract No. NA, NA County, Texas.

f. Point is at:
Latitude NA °N, Longitude NA °W.
Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places

g. Indicate the method used to calculate the discharge point location (examples: Handheld GPS Device, GIS, Mapping Program): NA

Map submitted must clearly identify each discharge point. See instructions Page. 15.

WORKSHEET 5.0
ENVIRONMENTAL INFORMATION

1. Impingement and Entrainment

This section is required for any new diversion point that is not already authorized. Indicate the measures the applicant will take to avoid impingement and entrainment of aquatic organisms (ex. Screens on any new diversion structure that is not already authorized in a water right). **Instructions, Page 28.**

Measures minimizing impingement and entrainment: 1) move intake structure offshore; 2) place intake in deeper water to lessen draw of eggs/larvae near the surface; 3) raise intake above sea bed to lessen intake of and impacts to benthic organisms; 4) utilize velocity caps to assure intake flow velocity less than or equal to 0.5 ft/s; and 5) utilize traveling water screens with marine life handling features to support return of marine life to natural habitat. See Attachments E and F.

2. New Appropriations of Water (Canadian, Red, Sulphur, and Cypress Creek Basins only) and Changes in Diversion Point(s)

This section is required for new appropriations of water in the Canadian, Red, Sulphur, and Cypress Creek Basins and in all basins for requests to change a diversion point. **Instructions, Page 30.**

Description of the Water Body at each Diversion Point or Dam Location. (Provide an Environmental Information Sheet for each location),

a. Identify the appropriate description of the water body.

☐ Stream

☐ Reservoir

Average depth of the entire water body, in feet: NA

■ Other, specify: NA

b. Flow characteristics

If a stream, was checked above, provide the following. For new diversion locations, check one of the following that best characterize the area downstream of the diversion (check one).

☐ Intermittent – dry for at least one week during most years

☐ Intermittent with Perennial Pools – enduring pools

☐ Perennial – normally flowing

Check the method used to characterize the area downstream of the new diversion location.

☐ USGS flow records

☐ Historical observation by adjacent landowners

☐ Personal observation

☒ Other, specify: NA

c. Waterbody aesthetics

Check one of the following that best describes the aesthetics of the stream segments affected by the application and the area surrounding those stream segments.

☐ Wilderness: outstanding natural beauty; usually wooded or unpastured area; water clarity exceptional

☐ Natural Area: trees and/or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity discolored

☐ Common Setting: not offensive; developed but uncluttered; water may be colored or turbid

☐ Offensive: stream does not enhance aesthetics; cluttered; highly developed; dumping areas; water discolored

d. Waterbody Recreational Uses

Are there any known recreational uses of the stream segments affected by the application?

☐ Primary contact recreation (swimming or direct contact with water)

☐ Secondary contact recreation (fishing, canoeing, or limited contact with water)

☐ Non-contact recreation

e. Submit the following information in a Supplemental Attachment, labeled Addendum to Worksheet 5.0:

1. Photographs of the stream at the diversion point or dam location. Photographs should be in color and show the proposed point or reservoir and upstream and downstream views of the stream, including riparian vegetation along the banks. Include a description of each photograph and reference the photograph to the mapsubmitted with the application indicating the location of the photograph and the direction of the shot.

2. If the application includes a proposed reservoir, also include:

   i. A brief description of the area that will be inundated by the reservoir.

   ii. If a United States Army Corps of Engineers (USACE) 404 permit is required, provide the project number and USACE project manager.

   iii. A description of how any impacts to wetland habitat, if any, will be mitigated if the reservoir is greater than 5,000 acre-feet.

3. Alternate Sources of Water and/or Bed and Banks Applications

This section is required for applications using an alternate source of water and bed and banks applications in any basins. **Instructions, page 31.**

a. For all bed and banks applications:

NA i. Submit an assessment of the adequacy of the quantity and quality of flows remaining after the proposed diversion to meet instream uses and bay and estuary freshwater inflow requirements.

b. For all alternate source applications:

i. If the alternate source is treated return flows, provide the TPDES permit number NA

ii. If groundwater is the alternate source, or groundwater or other surface water will be discharged into a watercourse provide:
Reasonably current water chemistry information including but not limited to the following parameters in the table below. Additional parameters may be requested if there is a specific water quality concern associated with the aquifer from which water is withdrawn. If data for onsite wells are unavailable; historical data collected from similar sized wells drawing water from the same aquifer may be provided. However, onsite data may still be required when it becomes available. Provide the well number or well identifier. Complete the information below for each well and provide the Well Number or identifier.

Table Not Applicable

Parameter	Average Conc.	Max Conc.	No. of Samples	Sample Type	Sample Date/Time
Sulfate, mg/L					
Chloride, mg/L					
Total Dissolved Solids, mg/L					
pH, standard units					
Temperature*, degrees Celsius					

* Temperature must be measured onsite at the time the groundwater sample is collected.

iii. If groundwater will be used, provide the depth of the well NA and the name of the aquifer from which water is withdrawn NA.

WORKSHEET 6.0
Water Conservation/Drought Contingency Plans

This form is intended to assist applicants in determining whether a Water Conservation Plan and/or Drought Contingency Plans is required and to specify the requirements for plans. **Instructions, Page 31.**

The TCEQ has developed guidance and model plans to help applicants prepare plans. Applicants may use the model plan with pertinent information filled in. For assistance submitting a plan call the Resource Protection Team (Water Conservation staff) at 512-239-4600, or e-mail wras@tceq.texas.gov. The model plans can also be downloaded from the TCEQ webpage. ***Please use the most up-to-date plan documents available on the webpage.***

1. Water Conservation Plans

a. The following applications must include a completed Water Conservation Plan (30 TAC § 295.9) for each use specified in 30 TAC, Chapter 288 (municipal, industrial or mining, agriculture – including irrigation, wholesale):

1. Request for a new appropriation or use of State Water.

2. Request to amend water right to increase appropriation of State Water.

3. Request to amend water right to extend a term.

4. Request to amend water right to change a place of use.
   **does not apply to a request to expand irrigation acreage to adjacent tracts.*

5. Request to amend water right to change the purpose of use.
   **applicant need only address new uses.*

6. Request for bed and banks under TWC § 11.042(c), when the source water is State Water.
   **including return flows, contract water, or other State Water.*

b. If Applicant is requesting any authorization in section (1)(a) above, indicate each use for which Applicant is submitting a Water Conservation Plan as an attachment:

1. _____Municipal Use. See 30 TAC § 288.2. **

2. _____Industrial or Mining Use. See 30 TAC § 288.3.

3. _____Agricultural Use, including irrigation. See 30 TAC § 288.4.

4. __X__Wholesale Water Suppliers. See 30 TAC § 288.5. **

If Applicant is a water supplier, Applicant must also submit documentation of adoption of the plan. Documentation may include an ordinance, resolution, or tariff, etc. See 30 TAC §§ 288.2(a)(1)(J)(i) and 288.5(1)(H). Applicant has submitted such documentation with each water conservation plan? **Y / N__Y__ See Attachment C

c. Water conservation plans submitted with an application must also include data and information which: supports applicant's proposed use with consideration of the plan's water conservation goals; evaluates conservation as an alternative to the proposed

appropriation; and evaluates any other feasible alternative to new water development. See 30 TAC § 288.7.
Applicant has included this information in each applicable plan? **Y** / **N** Y

2. Drought Contingency Plans

a. A drought contingency plan is also required for the following entities if Applicant is requesting any of the authorizations in section (1) (a) above – indicate each that applies:

1. NA Municipal Uses by public water suppliers. See 30 TAC § 288.20.
2. NA Irrigation Use/ Irrigation water suppliers. See 30 TAC § 288.21.
3. Y Wholesale Water Suppliers. See 30 TAC § 288.22.

b. If Applicant must submit a plan under section 2(a) above, Applicant has also submitted documentation of adoption of drought contingency plan (*ordinance, resolution, or tariff, etc. See 30 TAC § 288.30*) **Y** / **N** Y Pending Commission approval. See Attachment D

WORKSHEET 7.0
ACCOUNTING PLAN INFORMATION WORKSHEET
Not Applicable

The following information provides guidance on when an Accounting Plan may be required for certain applications and if so, what information should be provided. An accounting plan can either be very simple such as keeping records of gage flows, discharges, and diversions; or, more complex depending on the requests in the application. Contact the Surface Water Availability Team at 512-239-4600 for information about accounting plan requirements, if any, for your application. **Instructions, Page 34.**

1. Is Accounting Plan Required

Accounting Plans are generally required:

- For applications that request authorization to divert large amounts of water from a single point where multiple diversion rates, priority dates, and water rights can also divert from that point;
- For applications for new major water supply reservoirs;
- For applications that amend a water right where an accounting plan is already required, if the amendment would require changes to the accounting plan;
- For applications with complex environmental flow requirements;
- For applications with an alternate source of water where the water is conveyed and diverted; and
- For reuse applications.

2. Accounting Plan Requirements

a. A **text file** that includes:
   1. an introduction explaining the water rights and what they authorize;
   2. an explanation of the fields in the accounting plan spreadsheet including how they are calculated and the source of the data;
   3. for accounting plans that include multiple priority dates and authorizations, a section that discusses how water is accounted for by priority date and which water is subject to a priority call by whom; and
   4. Should provide a summary of all sources of water.

b. A **spreadsheet** that includes:
   1. Basic daily data such as diversions, deliveries, compliance with any instream flow requirements, return flows discharged and diverted and reservoir content;
   2. Method for accounting for inflows if needed;
   3. Reporting of all water use from all authorizations, both existing and proposed;
   4. An accounting for all sources of water;
   5. An accounting of water by priority date;
   6. For bed and banks applications, the accounting plan must track the discharged water from the point of delivery to the final point of diversion;
   7. Accounting for conveyance losses;
   8. Evaporation losses if the water will be stored in or transported through a reservoir. Include changes in evaporation losses and a method for measuring reservoir content resulting from the discharge of additional water into the reservoir;
   9. An accounting for spills of other water added to the reservoir; and
   10. Calculation of the amount of drawdown resulting from diversion by junior rights or diversions of other water discharged into and then stored in the reservoir.

WORKSHEET 8.0
CALCULATION OF FEES

This worksheet is for calculating required application fees. Applications are not Administratively Complete until all required fees are received. **Instructions, Page. 34**

1. NEW APPROPRIATION

	Description	Amount ($)
Filing Fee	Circle fee correlating to the total amount of water* requested for any new appropriation and/or impoundment. Amount should match total on Worksheet 1, Section 1. Enter corresponding fee under **Amount ($).** In Acre-Feet a. Less than 100 $100.00 b. 100 - 5,000 $250.00 c. 5,001 - 10,000 $500.00 d. 10,001 - 250,000 $1,000.00 e. More than 250,000 $2,000.00	$2,000.00
Recording Fee		$25.00
Agriculture Use Fee	*Only for those with an Irrigation Use.* Multiply 50¢ x NA Number of acres that will be irrigated with State Water. **	NA
Use Fee	*Required for all Use Types, **excluding Irrigation Use.*** Multiply $1.00 x 350,000 Maximum annual diversion of State Water in acre-feet. **	$55,000.00
Recreational Storage Fee	*Only for those with Recreational Storage.* Multiply $1.00 x NA acre-feet of in-place Recreational Use State Water to be stored at normal max operating level.	NA
Storage Fee	*Only for those with Storage, **excluding Recreational Storage.*** Multiply 50¢ x NA acre-feet of State Water to be stored at normal max operating level.	NA
Mailed Notice	Cost of mailed notice to all water rights in the basin. Contact Staff to determine the amount (512) 239-4600.	
	TOTAL	$ 57,025.00

2. AMENDMENT *OR* SEVER AND COMBINE

	Description	Amount ($)
Filing Fee	Amendment: $100	NA
	OR Sever and Combine: $100 x ___ of water rights to combine	NA
Recording Fee		$12.50
Mailed Notice	Additional notice fee to be determined once application is submitted.	
	TOTAL INCLUDED	$

3. BED AND BANKS

	Description	Amount ($)
Filing Fee		$100.00
Recording Fee		$12.50
Mailed Notice	Additional notice fee to be determined once application is submitted.	
	TOTAL INCLUDED	$

See Attachment G for proof of payment

ATTACHMENT A

EVIDENCE OF SIGNATURE AUTHORITY

OFFICIAL MINUTES OF PORT COMMISSION MEETING
May 2, 2019

The Port Commissioners of the Port of Corpus Christi Authority convened at the Solomon P. Ortiz International Center, located at 402 North Harbor Drive, Corpus Christi, Texas, on Thursday, May 2, 2019, at 1:30 p.m., for a special called meeting of the Port Commission.

Present:	Mr. Charles Zahn Mr. Wayne Squires Mr. Richard Valls Mr. Richard L. Bowers Mr. Wes Hoskins Ms. Catherine Hilliard
Absent:	Mr. David P. Engel
Present:	Mr. Sean Strawbridge Mr. Kent Britton Mr. Omar Garcia Mr. Jarl Pedersen Ms. Rosie Collin Ms. Tana Neighbors
Others Present:	Mr. Leo J. Welder, Jr. Mr. Dane Bruun

1. **Meeting called to order.**

2. **Safety Briefing.**

3. **Pledge of Allegiance.**

4. **Conflict of Interest Affidavits.** None were received.

5. **Recess Open Meeting and Convene Executive Session:** At 1:36 p.m.., Mr. Zahn announced that the Commission would go into executive session pursuant to §551.071 and §551.074 of the Texas Government Code to deliberate agenda items 5a and 5b which were described in the agenda of the meeting as follows:

   *5***a.** Receive legal advice from PCCA's counsel on the governance and ethics policies requested by members of the local legislative delegation. (§551.071)

   5b. Deliberate the employment of the Chief Executive Officer (§551.074)

6. **Reconvene Open Session and take action the following agenda items:** The Chairman reconvened the meeting in open session at 2:03 p.m. to act on the following agenda items.

6a. ***Amend the Commission's Operating Rules and PCCA's Code of Ethics;* adopt a Misconduct Reporting Policy, and approve a Community Feedback Form and Hotline:**

Action: On motion made by Ms. Hilliard and seconded by Mr. Squires, the Commission

(1) Approved Amendment No. 3 to the Operating Rules of the Port Commission of the Port of Corpus Christi Authority of Nueces County, Texas, in the form presented to the meeting, a copy of which is attached hereto as Attachment One;

(2) Approve Amendment No.1 to the Amended and Restated Code of Ethics of the Port of Corpus Christi Authority of Nueces County, Texas, in the form presented to the meeting, a copy of which is attached hereto as Attachment Two;

(3) Approved The Port of Corpus Christi Authority Misconduct Reporting Policy in the form presented to the meeting, a copy of which is attached hereto as Attachment Three; and

(4) Approve the Community Feedback Form and Hotline in the form presented to the meeting, a copy of which is attached hereto as Attachment Four.

Further Action: On motion made by Mr. Valls and seconded by Mr. Squires, the Commission adopted a resolution, in the form presented to the meeting, changing PCCA's authorized representatives to the Texas Local Government Investment Pool. A copy of the resolution is attached to these minutes as Attachment Five.

6b. ***Employment Contract Amendment for the Chief Executive Officer:***

Action: On motion made by Ms. Hilliard and seconded by Mr. Squires, the Commission approved, effective as of May 2, 2019, the First Amendment to the CEO's Amended and Restated Employment Agreement in the form presented to the meeting. Mr. Hoskins voted against the motion.

7. ***Adjourn:*** On motion duly made and seconded, the meeting was adjourned at 2:10 p.m.

PORT CORPUS CHRISTI

PORT OF CORPUS CHRISTI AUTHORITY OF NUECES COUNTY, TEXAS

GOVERNANCE

AND

ETHICS POLICIES

AS OF MAY 2, 2019

TABLE OF CONTENTS

OPERATING RULES OF THE PORT COMMISSION OF THE PORT OF CORPUS CHRISTI AUTHORITY OF NUECES COUNTY, TEXAS

Section 1. Officers; Terms of Office.

The officers of the Port Commission of the Port of Corpus Christi Authority of Nueces County, Texas ("PCCA") are Chair, Vice Chair and Secretary. The officers of the Port Commission will be elected by the Port Commission each calendar year at the first meeting of the Port Commission held during such calendar year. A vacancy in any office will be filled by a vote of the Port Commission. Election of officers and filling of vacancies will be by a vote of a majority of the Port Commissioners then serving. Each officer shall hold office until his or her successor has been elected, or until the officer is no longer a Port Commissioner.

Section 2. Meetings.

The Port Commission's regular monthly meeting will be on the third Tuesday of each month. The Chair may change the date of a regular Port Commission meeting for a particular month when circumstances necessitate a change of date.

The Chair or any four (4) Port Commissioners may schedule a special meeting or an emergency meeting of the Port Commission by providing the Executive Director with written instructions concerning the date, time, place and primary purpose of the meeting.

The Chair and the Executive Director will establish the agenda for each Port Commission meeting. Any two Port Commissioners may request in writing that a matter be placed on the agenda for a particular Port Commission meeting, and such request will be carried out by the Executive Director. The Executive Director will send a draft of the agenda for each Port Commission meeting to the Port Commissioners by the close of business on the sixth day before such meeting.

All meetings of the Port Commission shall be conducted in accordance with the statutes and laws of the State of Texas applicable to governmental bodies in Texas, and in particular the Texas Open Meetings Act as codified in Chapter 551, Texas Government Code.

Notice of and the agenda for all regular or specially called meetings of the Port Commission shall be posted in compliance with the Texas Open Meetings Act, and in the manner applicable to a district or political subdivision extending into fewer than four counties.

All materials, including but not limited to memorandums, agreements, financial information, recommendations and correspondence, provided by PCCA's staff or professional advisors to the members of the Port Commission to be used by the members of the Port Commission in addressing or taking action on an agenda item at a Port Commission meeting (collectively referred to herein as the "Supporting Materials") shall be provided to the members of the Port Commission electronically by the close of business on the fifth day prior to the day of the meeting at which the agenda item will be considered (the "Supporting Materials Deadline").

If the Supporting Materials for a posted agenda item are provided to the members of the Port Commission after the Supporting Materials Deadline for that agenda item, then, in that event, the agenda item shall be tabled for consideration at a subsequent regular or specially called meeting of the Port Commission.

Should the Supporting Materials for a properly posted agenda item be provided to the members of the Port Commission after the Supporting Materials Deadline for that agenda item, but PCCA's staff or professional advisors, advise the members of the Port Commission that consideration of the agenda item is an emergency, or that failure to act on the agenda item at that time will cause material harm to PCCA or its customers, then, in that event, with the approval of at least five members of the Port Commission, the members of the Port Commission may consider and take action on the agenda item.

At or before the commencement of each Port Commission meeting, any Port Commissioner who intends to abstain from participating in the discussion of, and voting on, an agenda item in accordance with Section 1.04 of the Amended and Restated Code of Ethics of Port of Corpus Christi Authority of Nueces County, Texas ("PCCA Code of Ethics") shall file the required affidavit with PCCA's official record keeper and abstain from participating in, or voting on, such agenda item.

At any meeting of the Port Commission the presiding officer may permit the public to comment with respect to an agenda item during its consideration or during the Public Comment section of the agenda. Comments by the public are encouraged, but will be limited to three minutes per speaker. When there are several persons who wish to speak for or against a matter, the presiding officer may limit the total amount of time allocated to each side and the respective sides will decide who among them will speak.

At each meeting of the Port Commission a staff person designated by the Executive Director will provide a sign-in sheet near the main entrance to the meeting room for those members of the public wishing to speak at the meeting. Any person wishing to speak at a Port Commission meeting shall write the following information on the sign-in sheet: his or her name, address and the subject about which the person wishes to speak.

Section 3. Closed Meetings.

Closed meetings of the Port Commission shall be held in accordance with Subchapter E of Chapter 551 of the Texas Government Code, as amended. Closed meetings are confidential and it is the desire of the Port Commission that neither Port Commissioners, staff members nor any other person attending such meetings should reveal to others the nature or content of such meetings.

If a Port Commissioner determines that he or she has a conflict of interest with respect to any matter to be discussed at a closed meeting, the Commissioner shall announce that he or she has a conflict of interest with respect to such matter and shall excuse himself or herself from the meeting while that matter is being discussed.

Section 4. Port Commission Committees. (Amended May 9, 2017)

As of May 9, 2017, the Port Commission has three standing committees – the Audit Committee, the Security Committee, and the Long Range Planning Committee. The Port Commission may establish additional standing committees from time to time by an amendment to these Operating Rules.

The functions of the Audit Committee are to review the financial affairs of PCCA, to make recommendations with respect to the selection of PCCA's auditors, to meet with PCCA's auditors to

review their annual audit report of PCCA's activities, and to act as a designated investment committee advising the investment officer of PCCA pursuant to Section 2256.0005(e), Texas Government Code, and PCCA's Investment Policy, as amended from time to time. The Audit Committee shall consist of three Port Commissioners.

The functions of the Security Committee are to periodically review and make recommendations regarding the security of PCCA and the Port of Corpus Christi and to consult with PCCA's Chief of Police or a regular basis concerning these matters. The Security Committee shall consist of three Port Commissioners.

The functions of the Long Range Planning Committee are to assist the Port Commission in fulfilling its responsibilities with respect to oversight of PCCA's Strategic Plan 2014-2020 ("Strategic Plan"), including the Property Planning Guide described in the Strategic Plan, and evaluation of strategic transactions and significant capital projects for consistency with the Strategic Plan. The Long Range Planning Committee shall consist of three Port Commissioners.

The Chair may establish or abolish special committees from time to time in the Chair's sole discretion. The Chair will appoint the members and the chairperson of each standing or special committee as soon as practicable after the Chair's election or the establishment of such committee, as the case may be.

The Chair will also appoint PCCA's representatives on the governing boards or committees of any outside organizations to which PCCA has the right to appoint representatives. The Port Commission will elect the directors of PCCA's Industrial Development Corporation in accordance with the bylaws of the corporation.

Section 5. Duties and Authority of Officers.

The Chair will preside at all meetings of the Port Commission and decide the order in which the agenda items will be acted upon. The Chair will put to a vote all questions which are properly moved or necessarily arise in the course of the proceedings and announce the result of each vote. The Chair will

decide all questions of parliamentary procedure, and there is no appeal from the decision of the Chair. Counsel for the Port Commission may advise the Chair on matters of parliamentary procedure.

If the office of Chair is vacant, the Vice Chair shall perform the duties and have the authority to exercise the powers of the Chair. The Vice Chair will act as the presiding officer of any Port Commission meeting at which the Chair is absent or whenever the Chair chooses not to act as the presiding officer.

The Secretary will review and sign the minutes of the meetings of the Port Commission and will, when appropriate, attest the execution of documents by PCCA's officers or the Executive Director.

The Chair, Vice Chair, Secretary, or Executive Director may execute agreements and other documents approved by the Port Commission and approved as to legal form by Counsel for the Port Commission.

Section 6. Quorum; Voting.

Four (4) Port Commissioners constitute a quorum for the purpose of conducting business at any meeting of the Port Commission. The affirmative vote of a majority of the Port Commissioners present and voting at any meeting at which a quorum is present, but not less than the affirmative vote of three Port Commissioners, is sufficient for the adoption of any motion or resolution except where a vote of greater than a majority of Port Commissioners present and voting at the meeting is required by law, statute or these rules. Each Port Commissioner present at a meeting shall be entitled to vote on any issue put to a vote of the Port Commission at such meeting, except as provided in PCCA's Code of Ethics, or Chapter 171 of the Texas Local Government Code. When a Port Commissioner present at a meeting abstains from voting on a matter taken up by the Port Commission, the record will reflect the Port Commissioner's abstention, and any certifications regarding the voting record on such matter shall reflect the Port Commissioner's abstention. If a Port Commissioner is absent from a meeting of the Port Commission, the minutes of the meeting shall reflect the Port Commissioner's absence.

Section 7. Robert's Rules of Order.

The rules contained in the current edition of Robert's Rules of Order Newly Revised shall govern the Port Commission in all cases to which they are applicable and in which they are not inconsistent with any law, statute, or rule of the Port Commission.

Section 8. Contact with Staff.

The Port Commissioners shall not give directives to any members of PCCA's staff other than the Executive Director.

Section 9. Amendments.

These Operating Rules may only be amended by a vote of two-thirds of all Port Commissioners.

Section 10. Indemnification of Port Commissioners. (Added July 17, 2018)

a. It is the intent of the Port Authority to protect its Port Commissioners from defense expense and legal liability through the purchase of appropriate public officials liability insurance, and such other liability insurance as the Port Authority obtains and maintains in force and effect. The Executive Director shall periodically report to the Port Commission on the liability insurance coverage maintained in force covering Port Commissioners as insureds and on proposed changes thereto.

b. To the extent that the Port Authority's liability insurance does not afford coverage with respect to a matter involving a Port Commissioner, it is the express intent of the Port Authority to indemnify its Port Commissioners to the fullest extent allowed by Texas law for liabilities or legal expense arising from conduct (including acts or omissions) that reasonably appears to be within the scope of a Port Commissioner's authority as such.

c. Absent a conflict of interest, a Port Commissioner named as a defendant along with the Port Authority shall be defended by the Port Authority's counsel. Otherwise, in view of the importance of a capable defense, an individual Commissioner's legal expense related to a civil or criminal action, proceeding, subpoena, investigation, or demand is intended to be funded

on a current basis. However, in the event a criminal conviction of a Port Commissioner, or finding of breach of the duty of loyalty to the Port Authority or official misconduct, on the part of a Port Commissioner, results from any such matter, all legal expense paid by the Port Authority in connection therewith shall be reimbursed by such Port Commissioner.

d. Port Commissioners who receive notice of a suit, proceeding, subpoena, investigation, or demand related to their service as a Port Commissioner shall promptly inform the General Counsel, who shall determine the applicability of the Port Authority's insurance coverage and oversee and review requests for funding of any legal expense in connection therewith.

e. Inasmuch as this section is not intended to foreclose any future Port Commission's judgment as to the public interest, all payments under this Section 10 indemnifying for the liability of a Port Commissioner, or funding the legal expense of Port Commissioner, are subject to Port Commission approval. This Section 10 is a non-binding statement of intent and does not create a property interest or a contract and does not waive any of the Port Authority's immunities under law.

f. Any right of indemnification granted by this Section 10 is in addition to and not in lieu of any other such right to which any Port Commissioner of the Port Authority may at any time be entitled under the laws of the State of Texas or as otherwise provided for by the Port Authority. If any indemnification which would otherwise be granted by this Section 10 is disallowed by any competent court or administrative body as illegal or against public policy, then any Port Commissioner with respect to whom such adjudication was made, and any other Port Commissioner, shall be indemnified to the fullest extent permitted by the laws of the State of Texas and public policy.

g. Any Port Commissioner requesting indemnification hereunder shall regularly report to the Port Commission regarding the matters that may be subject to such

indemnification, as necessary to keep the Port Commission reasonably informed as to such matters.

h. The Port Authority may purchase and maintain insurance on behalf of any person who is or was a Port Commissioner of the Port Authority, against any liability asserted against such person and incurred by such person in any such capacity, or arising out of such person's status or former status as Port Commissioner.

i. The indemnification provided herein shall inure to the benefit of the heirs, executors, and administrators of Port Commissioners.

Section 11. General Powers, Authority, Duties, and Responsibilities of the Port Commission. (Added May 2, 2019)

The Port Commission is vested with all powers, authority, duties, and responsibilities permitted by law for the governance, policymaking, and performance oversight of PCCA and its properties. The Port Commission's powers, authority, duties, and responsibilities include:

a. the framing and adoption of matters of policy including but not limited to budget, goals, vision, and plans;

b. the responsibility to approve the purchase of services (other than employee services), materials, supplies, machinery, equipment, other personal property, real property, and other items to be purchased costing more than $50,000; and

c. the authority to approve all expenditures from PCCA's Promotion and Development Fund, which authority may be delegated to the CEO;

d. the power, authority, duty, and responsibility to select, compensate, retain, and remove PCCA's CEO, and to delegate to the CEO the full authority to manage and operate PCCA's affairs, subject only to orders of the Port Commission;

e. the duty and responsibility to monitor the performance of the CEO for compliance with all applicable federal, state, and local laws, PCCA's budget, and for the CEO's implementation of the Port Commission's policies, standards, regulations, and stated objectives;

f. the duty and responsibility to adopt a budget annually for PCCA in an open meeting, and to ensure by and through PCCA's CEO that each annual budget is made available to the public on PCCA's website;

g. the duty and responsibility to adopt detailed policies in open meetings that document the Port Commission's governance practices, and to ensure by and through PCCA's CEO that such detailed policies are made available to the public on PCCA's website;

h. the duty and responsibility to ensure that a copy of all policies adopted by the Port Commission are distributed to each Commissioner and each PCCA employee not later than the third business day after the date the person begins a term as Port Commissioner or employee;

i. the continuing duty and responsibility to develop and implement policies that clearly separate the governance, policymaking, and performance oversight responsibilities of the Port Commission from the management and operational responsibilities of the CEO and other PCCA employees;

j. except as otherwise expressly set forth herein, the power and authority by general or special rule, regulation, order, resolution, or other direction to authorize the CEO or another person authorized to act instead of the CEO to perform any act on behalf of the Port Commission; and

k. all the powers, authority, duties, and responsibilities reserved to the Port Commission by the laws of the State of Texas.

Section 12. Powers and Duties of the Chief Executive Officer. (Added May 2, 2019)

a. The terms "Executive Director," "Chief Executive Officer," and "CEO" are used interchangeably in these Operating Rules and all mean the senior-most staff executive of PCCA. The CEO shall be an employee of PCCA employed by the Port Commission pursuant to

the terms and conditions of a mutually-agreeable employment contract. The CEO has full authority to manage and operate the affairs of PCCA, subject only to orders of the Port Commission and these Operating Rules.

b. The CEO has the duty and responsibility to implement PCCA's policies, standards, regulations, and stated objectives.

c. The delegation of powers, authority, duties and responsibilities from the Port Commission to the CEO shall not include those specifically reserved to the Port Commission under the laws of the State of Texas or these Operating Rules.

d. The CEO has the powers, authority, duties and responsibilities listed below, subject to the provision of Section 12(c) above:

i. subject to the budgetary constraints and policy directives of the Port Commission, to employ, supervise, manage, direct, and establish positions, titles, and salaries of PCCA employees, and to discharge these employees;

ii. collect revenues and monies due PCCA and deposit them to PCCA's accounts;

iii. make purchases and enter into contracts in accordance with Port Commission policies, orders, directives, and/or these Operating Rules;

iv. administer the PCCA's relations with public and private bodies, agencies, and associations, and serve such entities in such capacity as may be directed by the Port Commission;

v. make such reports to the Port Commission and other authorities as the Port Commission directs, or as required in connection with discharge of the CEO's duties and/or responsibilities, or as required by any federal, state, or local law;

vi. keep and maintain all records, accounts, books, files, and papers of PCCA (in such manner as directed by a document retention policy adopted by the Port Commission);

vii. sign, attest, certify, or deliver, on behalf of PCCA, agreements, deeds, leases, month-to-month rental agreements, easements, licenses, franchises, permits, minutes, notices, accounts, receipts, invoices, warrants, requisitions, vouchers, checks, records, and other instruments, as required in the lawful and proper discharge of the CEO's duties and responsibilities or otherwise pursuant to applicable law, or as may be approved or as directed by the Port Commission; and

viii. perform all other duties and responsibilities of the CEO of PCCA, or as required by law.

e. The CEO may formally delegate his/her powers, duties, and related powers and authority to one or more PCCA employees.

f. The CEO may travel as deemed appropriate or necessary to execute the duties and responsibilities of the CEO, but any such travel is subject to the same rules, regulations, and oversight as those established for Port Commissioners.

g. The CEO shall perform such other duties and responsibilities and discharge such other tasks as the Port Commission may specify from time-to-time.

h. Any or all of the duties and responsibilities of the CEO as specified above or later prescribed by the Port Commission are subject to change or cancellation by the Port Commission at any time.

Section 13. Commission Decisions and Public Dissent. (Added May 2, 2019)

Many Port Commission decisions are not unanimous. Port Commissioners contribute varying, sometimes controversial, and at times conflicting perspectives to a deliberation. New and different ideas assist the Port Commission in reaching an objective and balanced decision. Most Port Commission decisions are based on majority rule, which automatically creates compromises and occasionally dissenting opinions. However, consensus building and healthy debate are ways to improve governance and make better decisions.

If a Port Commissioner strongly disagrees with a motion and votes against it or abstains from voting, that vote will be recorded in the meeting minutes. Before publicly dissenting to a motion passed at a meeting of the Port Commission, dissenting Commissioners should weigh their freedom of speech against their duties of loyalty and confidentiality and acting in the best interests of the Port Authority. Port Commissioners who dissent in public about a particular Port Commission decision or organizational direction should qualify such dissent by stating it is their own viewpoint and, if true, that the Port Commission decision was made following proper procedures.

AMENDED AND RESTATED CODE OF ETHICS OF PORT OF CORPUS CHRISTI AUTHORITY OF NUECES COUNTY, TEXAS

Section 1.01. Definitions. In this Code:

(a) "Business entity" means a sole proprietorship, partnership, firm, corporation, holding company, joint-stock company, receivership, trust, or any other entity recognized by law.

(b) "Code" means this Amended and Restated Code of Ethics of Port of Corpus Christi Authority of Nueces County, Texas.

(c) "Commissioner" means any member of the Port Commission of PCCA.

(d) "Employee" means any full-time employee of the PCCA.

(e) "First degree" relation means an individual's spouse, parents and children, as well as the spouse of each of these relatives.

(f) "PCCA" means Port of Corpus Christi Authority of Nueces County, Texas.

(g) "Port Commission" means the governing body of PCCA.

Section 1.02. Substantial Interest in Business Entity.

(a) For purposes of this Code, a person has a substantial interest in a Business Entity if:

(1) the person owns 10 percent or more of the voting stock or shares of the Business Entity or owns either 10 percent or more or $15,000 or more of the fair market value of the Business Entity; or

(2) funds received by the person from the Business Entity exceed 10 percent of the person's gross income for the previous year.

(b) A person has a substantial interest in real property if the interest is an equitable or legal ownership with a fair market value of $2,500 or more.

(c) A Commissioner is considered to have a substantial interest under this section if a person related to the Commissioner in the first degree has a substantial interest under this section.

(d) An Employee is considered to have a substantial interest under this section if a person related to the Employee in the first degree has a substantial interest under this section.

Section 1.03. Prohibited Acts. No Commissioner or Employee may:

(1) act as surety for a Business Entity that has work, business, or a contract with PCCA;

(2) act as surety on any official bond required of a Commissioner or Employee;

(3) accept or solicit any gift, favor, or service that might reasonably tend to influence the Commissioner or Employee in the discharge of official duties, or that the Commissioner or Employee knows or should know is being offered with the intent to influence the Commissioner's or Employee's official conduct; (Added May 2, 2019)

(4) disclose confidential information acquired by reason of the Commissioner's or Employee's position with PCCA; or (Added May 2, 2019)

(5) intentionally or knowingly solicit, accept, or agree to accept any benefit for having exercised the Commissioner's or Employee's official powers or performed the Commissioner's or Employee's official duties in favor of another. (Added May 2, 2019)

Section 1.04. Commissioner's Affidavit and Abstention from Voting Required.

(a) If a Commissioner has a substantial interest in a Business Entity or in real property, the Commissioner shall file, before a vote or decision on any matter involving the

Business Entity or the real property, an affidavit stating the nature and extent of the interest and shall abstain from further participation in the matter if:

(1) in the case of a substantial interest in a Business Entity the action on the matter will have a special economic effect on the Business Entity that is distinguishable from the effect on the public; or

(2) in the case of a substantial interest in real property, it is reasonably foreseeable that an action on the matter will have a special economic effect on the value of the property, distinguishable from its effect on the public.

(b) The affidavit must be filed with PCCA's official record keeper.

(c) If a Commissioner is required to file and does file an affidavit under Subsection (a) with respect to a matter, the Commissioner is not required to abstain from further participation in the matter if a majority of the members of Port Commission are likewise required to file and do file affidavits of similar interests on the same matter.

Section 1.05. Voting on Budget.

(a) The Port Commission shall take a separate vote on any budget item specifically dedicated to a contract with a Business Entity in which a Commissioner has a substantial interest.

(b) Except as provided by Section 1.04(c), above, the affected Commissioner may not participate in that separate vote. The Commissioner may vote on a final budget if:

(1) the Commissioner has complied with this Code; and

(2) the matter in which the Commissioner is concerned has been resolved.

Section 1.06. Prohibited Actions by Employees on Certain Matters.

(a) If an Employee has a substantial interest in a Business Entity, the Employee shall not take any action involving the Business Entity, in his or her capacity as a PCCA employee, that will have a special economic effect on the Business Entity that is distinguishable from the effect on the public.

(b) If an Employee has a substantial interest in real property, the Employee shall not take any action involving the real property, in his or her capacity as a PCCA Employee, that is reasonably likely to have a special economic effect on the value of the property, distinguishable from its effect on the public.

CONFLICT OF INTEREST AFFIDAVIT

THE STATE OF TEXAS §
COUNTY OF NUECES §

I, _____, as a member of the Port Commission of the
(Name)
Port of Corpus Christi Authority, make this affidavit and hereby under oath state the following:

I have reviewed the Agenda for the Port Commission meeting to be held on the ____ day of _____, 201__, and I will abstain from any discussion, vote, or decision involving Agenda Item Number ____ because [*please complete Part One or Part Two*]:

PART ONE

(Part One must be completed if it is applicable)

□ I have a substantial interest in a business entity or real property that may receive a special economic effect by a vote or decision of the Port Commission on this Agenda Item and the economic effect on my business entity or the value of my real property is distinguishable from its effect on the general public.

□ My spouse, parent, step-father, step-mother, child, son-in-law or daughter-in-law has a substantial interest in a business entity or real property that may receive a special economic effect by a vote or decision of the Port Commission on this Agenda Item and the economic effect on this business entity or the value of this real property is distinguishable from its effect on the general public.

I affirm that the name of the business entity or the location of the real property referred to above is: _____.

The nature of the substantial interest in this business entity or real property is:

□ an ownership interest of 10 percent or more of the voting stock or shares of the business entity;

□ an ownership interest of 10 percent or $15,000 or more of the fair market value of the business entity;

□ funds received from the business entity exceed 10 percent of _____ (my, his, her) gross income for the previous year;

□ real property is involved and _____ (I, he, she) have/has an equitable or legal ownership with a fair market value of at least $2,500.

PART TWO

(If Part One is not applicable, please state your reason for abstaining here)

_____

_____

_____.

Signed this the _____ day of _____, 201__.

_____

Signature of Port Commissioner

BEFORE ME, the undersigned authority, this day personally appeared _____ and by oath swore that the facts herein above stated are true and correct to the best of his/her knowledge or belief.

Sworn to and subscribed before me on this the _____ day of _____, 201__.

_____

Notary Public, State of Texas

PORT OF CORPUS CHRISTI AUTHORITY
MISCONDUCT REPORTING POLICY
(APPROVED MAY 2, 2019)

A. Objectives. The Port of Corpus Christi Authority ("PCCA") is committed to lawful and ethical behavior in all of its activities and requires Port Commissioners and PCCA employees to act in accordance with all applicable laws, regulations and policies and observe high standards of ethics in the conduct of their duties and responsibilities. The objectives of this Port of Corpus Christi Authority Misconduct Reporting Policy (the "Whistleblower Policy"), are to establish policies, procedures, and protections for Whistleblowers, in order to:

1. Prevent, or detect and correct, improper activities.

2. Encourage each Port Commissioner and employee to report what he or she in good faith believes to be a violation of law or a questionable accounting or auditing matter by the PCCA.

3. Ensure the receipt, documentation, retention of records, and resolution of reports received under this Whistleblower Policy.

4. Protect Whistleblowers from retaliatory action.

B. Definitions. For the purposes of this Whistleblower Policy, capitalized terms used herein shall have the following meanings:

1. "Complaint" means a complaint under the Whistleblower Act.

2. "Chief Executive Officer" ("CEO") means the senior-most staff executive of the PCCA.

3. "Investigator" means, with respect to each report of alleged Misconduct, the Director of Human Resources (or other person appointed by the Port Commission Chairman, only in the event that the Director of Human Resources is the subject of the report of alleged Misconduct) who is tasked with the duty and responsibility to undertake the investigation of a report of alleged Misconduct.

4. "Investigator's Report" means the oral or written report prepared by the Investigator upon the conclusion of his/her investigation of a report of alleged Misconduct.

5. "Misconduct" means a violation of law or PCCA policy, by a Port Commissioner, employee, or third-party acting in connection with the PCCA, except for (i) violations that are subject to the PCCA's employee grievance procedures, such as harassment, and (ii) routine workplace grievances. For the purposes of the Whistleblower Policy, "Misconduct" also includes (i) the failure to take an action in order for the PCCA to be in compliance with law or policy or with generally accepted accounting practices, (ii) retaliation

towards anyone who reports Misconduct, and (iii) a violation subject to the PCCA's employee grievance procedures, following the conclusion of a grievance procedure with respect to such violation.

6. "PCCA" means the Port of Corpus Christi Authority of Nueces County, Texas.

7. "Port Commission" means the Port Commission of the Port of Corpus Christi Authority of Nueces County, Texas.

8. "Substantial Evidence" means evidence sufficient for a reasonable person to conclude that Misconduct has occurred.

9. "Whistleblower" means the Port Commissioner or PCCA employee reporting alleged Misconduct under this Whistleblower Policy.

10. "Whistleblower Act" means Chapter 554 of the Texas Government Code, attached as Exhibit A.

C. Reporting and Investigation of Misconduct.

1. Responsibility to Report. A Port Commissioner or PCCA employee who believes in good faith that Misconduct has occurred or is occurring should report the facts or circumstances giving rise to this belief, as provided in this Whistleblower Policy.

a. A Whistleblower shall submit a written report of alleged Misconduct to the Investigator as promptly as possible, but no later than thirty (30) days after the Whistleblower becomes aware of facts or circumstances that appear to constitute Misconduct.

b. The Investigator shall promptly deliver such report to PCCA's CEO (or to the Port Commission Chairman, only in the event that the CEO is the subject of the report of alleged Misconduct).

c. The Investigator shall provide the PCCA's CEO and Port Commission Chairman with a verbal or written report following each quarter summarizing all reports of alleged Misconduct during the previous quarter.

d. If any facts or circumstances contained in a Whistleblower's report of alleged Misconduct are later determined to be false or misleading, the Whistleblower shall be deemed to have committed no wrong and breached no rule under this Whistleblower Policy, provided that the report was made in good faith. However, a Whistleblower who makes allegations that, after a thorough investigation, prove to be unsubstantiated, and that prove to have been made maliciously, recklessly, with gross negligence, or with the knowledge that the allegations were false, shall subject a PCCA employee to disciplinary action, up to and including termination of employment.

e. In the event a report of alleged Misconduct claims that any person who may participate in the investigation or decision-making process provided by this Whistleblower Policy was a participant in or was aware of the alleged Misconduct, such person shall recuse himself/herself from the procedures set out herein.

2. Anonymity.

a. The Investigator shall not provide the identity of the Whistleblower when reporting alleged Misconduct.

b. Notwithstanding the foregoing, if the Whistleblower voluntarily discloses his/her identity to any Port Commissioner or PCCA employee (other than the Investigator) during or after the submission of a report of alleged Misconduct, the PCCA has no responsibility to limit further dissemination or disclosure of the Whistleblower's identity, in connection with the investigation of the Whistleblower's report.

3. Determination of Further Action.

a. Upon receiving any report of alleged Misconduct, the Investigator shall promptly consider what action should be taken in response to the report of alleged Misconduct, provided that in the event the Investigator recuses himself/herself, the CEO shall appoint a replacement to carry out the duties of and role of the Investigator under the procedures set out herein.

b. Following such consideration, the Investigator shall notify the CEO regarding the report, provide a summary of the relevant facts and circumstances contained in the report, and set forth his/her recommended classification of the report.

c. The Investigator may recommend any of the following classifications:

i. The report does not describe Misconduct, or a violation subject to the PCCA's employee grievance procedures, or a routine workplace grievance;

ii. The report does not describe Misconduct, but instead describes a violation subject to the PCCA's employee grievance procedures, or a routine workplace grievance; or

iii. The report describes Misconduct.

d. If the Investigator determines that:

i. The report does not describe Misconduct, or a violation subject to the PCCA's employee grievance procedures, or a routine workplace grievance, then no further action shall be taken.

ii. The report does not describe Misconduct, but instead describes a violation subject to the PCCA's employee grievance procedures, or a routine workplace grievance, then the CEO (or the Port Commission Chairman, only in the event that the CEO is the subject of the report of alleged Misconduct) shall refer the report to the Director of Human Resources for handling.

iii. The report describes Misconduct, then the CEO (or the Port Commission Chairman, only in the event that the CEO is the subject of the report of alleged Misconduct) shall thereupon refer the report to PCCA's legal counsel for further investigation or handling.

4. Conduct of Investigation. The Investigator shall promptly investigate the report of alleged Misconduct to determine whether the report is supported by Substantial Evidence. Substantial Evidence need not be admissible in a court of law.

a. Provided doing so serves the objectives of this Whistleblower Policy, the Investigator may inform any other PCCA employee, including the Whistleblower, regarding the status of the investigation.

b. The CEO (or the Port Commission Chairman, only in the event that the CEO is the subject of the report of alleged Misconduct) may: (i) attend and participate in all interviews and meetings between the Investigator and any Port Commissioner or PCCA employee, and (ii) request and receive regular updates and reports concerning the progress of the investigation and the information obtained by the Investigator. The CEO may request and receive regular updates and reports concerning the progress of the investigation and the information obtained by the Investigator.

c. PCCA employees and Port Commissioners shall cooperate fully with any investigation hereunder and provide truthful information, written statements, documents, and related materials upon the request of the Investigator. Any Port Commissioner or PCCA employee who fails to cooperate fully with any investigation hereunder is subject to disciplinary action.

d. Unless authorized by the Investigator, or as otherwise provided by law, no Port Commissioner or PCCA employee may disclose to any person other than the Investigator the substance of any communication (whether verbal, electronic, or in writing) to or from the Investigator relating to the investigation.

5. Interference by PCCA Employees or Port Commissioners.

a. Except as provided in Section C(4)(a) or (b) above, no Port Commissioner or PCCA employee may request and/or obtain verbal or written statements or reports pertaining to the subject matter of any alleged Misconduct investigation from any person alleged to be involved with the investigation as a Whistleblower, respondent, or witness, until such investigation is disposed of as

provided herein.

b. No Port Commissioner or PCCA employee shall interfere with the investigation of alleged Misconduct.

c. No Port Commissioner or PCCA employee shall retaliate or take any adverse employment action against any person as a result of that person's cooperation with any investigation of alleged Misconduct.

6. Disposition of Criminal Matters.

a. Upon the Investigator's conclusion that Substantial Evidence supports an allegation of Misconduct that would violate state or federal criminal law, the Investigator shall discontinue his or her investigation and deliver a copy of the report of such Misconduct, together with any related documents, to the CEO (or the Port Commission Chairman, only in the event that the CEO is the subject of the report of alleged Misconduct).

b. If the CEO (or the Port Commission Chairman, only in the event that the CEO is the subject of the report of alleged Misconduct) does not concur with the Investigator's assessment, the CEO (or the Port Commission Chairman, only in the event that the CEO is the subject of the report of alleged Misconduct) shall thereupon deliver such materials provided by the Investigator, in an envelope or other sealed package prominently marked "Confidential Sensitive Information" to the PCCA's legal counsel who shall report on the matter to the Port Commissioners at the next regularly or specially called meeting. If a majority of the PCCA's Commissioners conclude that Substantial Evidence supports of allegation of Misconduct, then the CEO (or the Port Commission Chairman, only in the event that the CEO is the subject of the report of alleged Misconduct) shall thereupon deliver such materials provided by the Investigator, in an envelope or other sealed package prominently marked "Confidential Sensitive Information" to the appropriate criminal law authorities.

c. Notwithstanding the foregoing procedures, if the Investigator, CEO, or Port Commission concludes that a report alleging Misconduct is of such a nature that immediate referral is warranted, such person may refer such matter to criminal law authorities prior to a determination of whether Substantial Evidence supports it. If any such party refers the matter to criminal law authorities, within twenty-four (24) hours thereafter, such party shall notify the others listed above of such referral.

7. Disposition of Non-Criminal Misconduct. If the Investigator determines that Substantial Evidence supports an allegation of Misconduct, but the Misconduct does not violate a state or federal criminal law (or that the violation is of such a *de minimis* nature that it is not reasonably likely to lead to criminal prosecution), the Investigator shall inform the CEO (or the Port Commission Chairman, only in the event that the CEO is the subject of the report of alleged Misconduct). The Investigator may prepare a verbal or written report on the allegation of Misconduct and deliver the report to the CEO.

a. Upon receipt of the Investigator's Report, further action, whether disciplinary, remedial, or otherwise, regarding the alleged Misconduct by a PCCA employee shall be taken at the sole discretion and direction of the CEO (or the Port Commission Chairman, only in the event that the CEO is the subject of the report of alleged Misconduct).

b. If the Investigator's Report contains evidence of alleged Misconduct by the CEO or any person who is not an employee of the PCCA, all further action shall be taken at the sole discretion of the Port Commission.

c. The CEO or the Port Commission Chairman, as applicable, shall send notice of the disposition of a report of alleged Misconduct, describing the nature of any actions taken in response to the Investigator's Report, to the Port Commission Chairman or the CEO, as applicable. Provided doing so serves the objectives of this Whistleblower Policy, the CEO may inform any other PCCA employee regarding the disposition of the report.

8. Conflict with Laws. This Whistleblower Policy does not relieve any Port Commissioner or employee of any duty to comply with state and federal laws, administrative procedures, or other applicable governmental regulations regarding the reporting of legal Misconduct.

9. Penalties for Violation. Violation of this Whistleblower Policy may subject a PCCA employee to disciplinary action up to and including termination of employment.

D. Whistleblower Retaliation Complaints.

1. Filing a Whistleblower Retaliation Complaint. An employee or former employee who believes that the PCCA has taken an adverse personnel action against him or her because of reporting alleged Misconduct under this Whistleblower Policy may file a Complaint under the Whistleblower Act.

2. Anonymity. The procedures governing the anonymity of the Port Commissioner or PCCA employee filing the Complaint shall be identical to those described in Section C(3) above.

3. Determination of Further Action. The procedures governing the determination of whether further action shall be taken in response to a Complaint are identical to those described in Section C(4) above.

4. Investigation. The procedures governing investigation of Complaints shall be identical to those described in Sections C(5) and C(6), above.

5. Referral of Criminal Matters. Although retaliation claims generally do not constitute criminal conduct, the Investigator may, in the course of his investigation, find Substantial Evidence of criminal Misconduct. In that event, the procedures for referring

criminal matters discovered during the investigation shall be identical to those described in Section C(7) above.

6. Disposition of Retaliation Complaints.

a. Upon receipt of the Investigator's Report, further action regarding a PCCA employee, whether disciplinary, remedial, or otherwise, shall be taken at the sole discretion and direction of the CEO.

b. If the Investigator's Report contains evidence that the CEO, or any person who is not an employee of the PCCA, violated the Whistleblower Act, or committed any other Misconduct, all further action shall be taken at the sole discretion of the Port Commission.

c. The CEO or Port Commission, as applicable, may provide any remedy provided for in the Whistleblower Act to an employee whose employment is suspended or terminated or who has been subject to an adverse personnel action in violation of the Whistleblower Act.

d. The CEO or the Port Commission Chairman, as applicable, shall send notice of the disposition of a Complaint, describing the nature of the actions, if any, taken in response to the Investigator's Report, to the Port Commission, as applicable.

EXHIBIT A

WHISTLEBLOWER ACT

GOVERNMENT CODE
TITLE 5. OPEN GOVERNMENT; ETHICS
SUBTITLE A. OPEN GOVERNMENT
CHAPTER 554. PROTECTION FOR REPORTING VIOLATIONS OF LAW

Sec. 554.001. DEFINITIONS. In this chapter:

(1) "Law" means:

(A) a state or federal statute;

(B) an ordinance of a local governmental entity; or

(C) a rule adopted under a statute or ordinance.

(2) "Local governmental entity" means a political subdivision of the state, including a:

(A) county;

(B) municipality;

(C) public school district; or

(D) special-purpose district or authority.

(3) "Personnel action" means an action that affects a public employee's compensation, promotion, demotion, transfer, work assignment, or performance evaluation.

(4) "Public employee" means an employee or appointed officer other than an independent contractor who is paid to perform services for a state or local governmental entity.

(5) "State governmental entity" means:

(A) a board, commission, department, office, or other agency in the executive branch of state government, created under the constitution or a statute of the state, including an institution of higher education, as defined by Section 61.003, Education Code;

(B) the legislature or a legislative agency; or

(C) the Texas Supreme Court, the Texas Court of Criminal Appeals, a court of appeals, a state judicial agency, or the State Bar of Texas.

Sec. 554.002. RETALIATION PROHIBITED FOR REPORTING VIOLATION OF LAW. (a) A state or local governmental entity may not suspend or terminate the employment of, or take other adverse personnel action against, a public employee who in good faith reports a violation of law by the employing governmental entity or another public employee to an appropriate law enforcement authority.

(b) In this section, a report is made to an appropriate law enforcement authority if the authority is a part of a state or local governmental entity or of the federal government that the employee in good faith believes is authorized to:

(1) regulate under or enforce the law alleged to be violated in the report; or

(2) investigate or prosecute a violation of criminal law.

Sec. 554.003. RELIEF AVAILABLE TO PUBLIC EMPLOYEE. (a) A public employee whose employment is suspended or terminated or who is subjected to an adverse personnel action in violation of Section 554.002 is entitled to sue for:

(1) injunctive relief;

(2) actual damages;

(3) court costs; and

(4) reasonable attorney fees.

(b) In addition to relief under Subsection (a), a public employee whose employment is suspended or terminated in violation of this chapter is entitled to:

(1) reinstatement to the employee's former position or an equivalent position;

(2) compensation for wages lost during the period of suspension or termination; and

(3) reinstatement of fringe benefits and seniority rights lost because of the suspension or termination.

(c) In a suit under this chapter against an employing state or local governmental entity, a public employee may not recover compensatory damages for future pecuniary losses, emotional pain, suffering, inconvenience, mental anguish, loss of enjoyment of life, and other nonpecuniary losses in an amount that exceeds:

(1) $50,000, if the employing state or local governmental entity has fewer than 101 employees in each of 20 or more calendar weeks in the calendar year in which the suit is filed or in the preceding year;

(2) $100,000, if the employing state or local governmental entity has more than 100 and fewer than 201 employees in each of 20 or more calendar weeks in the calendar year in which the suit is filed or in the preceding year;

(3) $200,000, if the employing state or local governmental entity has more than 200 and fewer than 501 employees in each of 20 or more calendar weeks in the calendar year in which the suit is filed or in the preceding year; and

(4) $250,000, if the employing state or local governmental entity has more than 500 employees in each of 20 or more calendar weeks in the calendar year in which the suit is filed or in the preceding year.

(d) If more than one subdivision of Subsection (c) applies to an employing state or local governmental entity, the amount of monetary damages that may be recovered from the entity in a suit brought under this chapter is governed by the applicable provision that provides the highest damage award.

Sec. 554.0035. WAIVER OF IMMUNITY. A public employee who alleges a violation of this chapter may sue the employing state or local governmental entity for the relief provided by this chapter. Sovereign immunity is waived and abolished to the extent of liability for the relief allowed under this chapter for a violation of this chapter.

Sec. 554.004. BURDEN OF PROOF; PRESUMPTION; AFFIRMATIVE DEFENSE. (a) A public employee who sues under this chapter has the burden of proof, except that if the suspension or termination of, or adverse personnel action against, a public employee occurs not later than the 90th day after the date on which the employee reports a violation of law, the suspension, termination, or adverse personnel action is presumed, subject to rebuttal, to be because the employee made the report.

(b) It is an affirmative defense to a suit under this chapter that the employing state or local governmental entity would have taken the action against the employee that forms the basis of the suit based solely on information, observation, or evidence that is not related to the fact that the employee made a report protected under this chapter of a violation of law.

Sec. 554.005. LIMITATION PERIOD. Except as provided by Section 554.006, a public employee who seeks relief under this chapter must sue not later than the 90th day after the date on which the alleged violation of this chapter:

(1) occurred; or

(2) was discovered by the employee through reasonable diligence.

Sec. 554.006. USE OF GRIEVANCE OR APPEAL PROCEDURES. (a) A public employee must initiate action under the grievance or appeal procedures of the employing state or local governmental entity relating to suspension or termination of employment or adverse personnel action before suing under this chapter.

(b) The employee must invoke the applicable grievance or appeal procedures not later than the 90th day after the date on which the alleged violation of this chapter:

(1) occurred; or

(2) was discovered by the employee through reasonable diligence.

(c) Time used by the employee in acting under the grievance or appeal procedures is excluded, except as provided by Subsection (d), from the period established by Section 554.005.

(d) If a final decision is not rendered before the 61st day after the date procedures are initiated under Subsection (a), the employee may elect to:

(1) exhaust the applicable procedures under Subsection (a), in which event the employee must sue not later than the 30th day after the date those procedures are exhausted to obtain relief under this chapter; or

(2) terminate procedures under Subsection (a), in which event the employee must sue within the time remaining under Section 554.005 to obtain relief under this chapter.

Sec. 554.007. WHERE SUIT BROUGHT. (a) A public employee of a state governmental entity may sue under this chapter in a district court of the county in which the cause of action arises or in a district court of Travis County.

(b) A public employee of a local governmental entity may sue under this chapter in a district court of the county in which the cause of action arises or in a district court of any county in the same geographic area that has established with the county in which the cause of action arises a council of governments or other regional commission under Chapter 391, Local Government Code.

Sec. 554.008. CIVIL PENALTY. (a) A supervisor who in violation of this chapter suspends or terminates the employment of a public employee or takes an adverse personnel action against the employee is liable for a civil penalty not to exceed $15,000.

(b) The attorney general or appropriate prosecuting attorney may sue to collect a civil penalty under this section.

(c) A civil penalty collected under this section shall be deposited in the state treasury.

(d) A civil penalty assessed under this section shall be paid by the supervisor and may not be paid by the employing governmental entity.

(e) The personal liability of a supervisor or other individual under this chapter is limited to the civil penalty that may be assessed under this section.

Sec. 554.009. NOTICE TO EMPLOYEES. (a) A state or local governmental entity shall inform its employees of their rights under this chapter by posting a sign in a prominent location in the workplace.

(b) The attorney general shall prescribe the design and content of the sign required by this section.

Sec. 554.010. AUDIT OF STATE GOVERNMENTAL ENTITY AFTER SUIT. (a) At the conclusion of a suit that is brought under this chapter against a state governmental entity subject to audit under Section 321.013 and in which the entity is required to pay $10,000 or more under the terms of a settlement agreement or final judgment, the attorney general shall provide to the state auditor's office a brief memorandum describing the facts and disposition of the suit.

(b) Not later than the 90th day after the date on which the state auditor's office receives the memorandum required by Subsection (a), the auditor may audit or investigate the state governmental entity to determine any changes necessary to correct the problems that gave rise to the whistleblower suit and shall recommend such changes to the Legislative Audit Committee, the Legislative Budget Board, and the governing board or chief executive officer of the entity involved. In conducting the audit or investigation, the auditor shall have access to all records pertaining to the suit.

COMMUNITY FEEDBACK FORM AND HOTLINE

The following information and feedback form shall be posted on PCCA's website:

Comments, Compliments, Suggestions or Complaints
Thank you for providing your feedback to the Port of Corpus Christi Authority ("PCCA"). Public input is important and helpful for our organization to be a better member of the community and in support of those communities located near port facilities.

Please submit any comments, compliments, suggestions, or complaints in the feedback form below or you may provide us with that information by calling our Community Information Line at 361-885-XXXX. (TBD)

You may also call the Community Information Line, anonymously or not anonymously, to report alleged fraud, waste, environmental concerns, abuse, and/or any alleged wrongdoing related to PCCA's ethics policies and/or related to any other complaints about PCCA, the Port Commission, any Port Commissioner, and/or PCCA employees.

If you are filing a complaint, please provide us with specific details, including the date and time of any particular incidents, sights, sounds and smells, so we can best investigate and resolve the issue.

Once a complaint is received, PCCA will:

- Promptly assess the information provided; and
- Make every reasonable effort to investigate and take possible action to resolve your complaint.

Please include your contact information when providing feedback, so we can provide you follow-up information. If you would prefer to remain anonymous, you can do that too -- but we will not be able to provide you with any follow-up information.

Thank you again for providing your feedback.

FEEDBACK/COMPLAINT FORM

Name:

Email:

Phone:

Comment or complaint:

ATTACHMENT B

USGS MAP SHOWING DIVERSION LOCATION

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

PORT ARANSAS QUADRANGLE
TEXAS
7.5-MINUTE SERIES

-97.1250° 685000mE 86 87 88 89 90 91 92 93 94 95 96 -97.0000°
27.8750° 3084000mN 83 82 81 80 79 78 77 76 75 74 73 72 71 27.7500°

Aransas Channel
Lydia Ann Channel
Harbor Island
CEMETERY RD
361
East Shore
ARANSAS PASS
HARBOR ISLAND RD
NUECES CO
ARANSAS CO
San Jose Island
Intake Pipeline
Intake Location
Turtle Cove
Cline Point
JC BARR BLVD
PORT ST
W COTTER AVE
CHANNELVIEW DR
HABRANT AVE
COTTER AVE
Aransas Pass
W AVE A
OLEANDER ST
MUSTER ST
N STATION ST
BEACH ST
Corpus Christi Channel
S GULF ST
W AVE C
W AVE E
W AVE G
S MUSTER ST
E AVE C
E AVE E
LANTANA DR
TROJAN ST
ROSS AVE
6TH ST
8TH ST
S STATION ST
Trinity-By-The Sea-Episcopal Church Columbarium
E AVE G
AVE J
SEA BREEZE LN
SEASECRET ST
PORT ARANSAS BEACH RD
Holiday Beach
ARANSAS CO
NUECES CO
Salt Island
East Flats
PARADISE POINTE DR
S 11TH ST
Royal Palm Cem
ON THE BEACH
Mustang Beach Airport
Pelone Island
Littles Flats
Port Aransas
PIPER BLVD
North Trl
MARINA DR
BAHIA MAR
BAYSIDE DR
MUSTANG BLVD
BLUE HERON
Corpus Christi Bay
Coyote Island
Mustang Beach
ISLAND MOORINGS PKWY
BEACH ACCESS RD 1A
CORPUS CHRISTI
SPICE ISLAND DR
PADRE ISLAND DR
ACCESS RD 1
GULF OF MEXICO
North Trl
Flato Cut
KEEWAYDIN LN
EL CORTEZ
BENT GRASS DR

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 14R

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, September 2016 - December 2016
Roads..... U.S. Census Bureau, 2015 - 2018
Names.....GNIS, 1979 - 2022
Hydrography.....National Hydrography Dataset, 2004 - 2018
Contours.....National Elevation Dataset, 2019
Boundaries.....Multiple sources; see metadata file 2019 - 2021

Wetlands.....FWS National Wetlands Inventory Not Available

MN
GN
3°22'
60 MILS
0°54'
16 MILS
UTM GRID AND 2019 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000-m Square ID
PR
Grid Zone Designation
14R

SCALE 1:24 000
1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 MILES 1
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 5 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard.

TEXAS
QUADRANGLE LOCATION

1	2	3
4		
5	6	

ADJOINING QUADRANGLES
1 Aransas Pass
2 Estes
3 Allyns Bight
4 Port Ingleside
5 Crane Islands NW
6 Crane Islands NW OE E

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

PORT ARANSAS, TX
2022

ATTACHMENT C

ADOPTED WATER CONSERVATION PLAN

Texas Commission on Environmental Quality

Water Availability Division
MC-160, P.O. Box 13087 Austin, Texas 78711-3087
Telephone (512) 239-4600, FAX (512) 239-2214

Utility Profile and Water Conservation Plan Requirements for Wholesale Public Water Suppliers

This form is provided to assist wholesale public water suppliers in water conservation plan development. If you need assistance in completing this form or in developing your plan, please contact the Conservation staff of the Resource Protection Team in the Water Availability Division at (512) 239-4600.

Water users can find best management practices (BMPs) at the Texas Water Development Board's website http://www.twdb.texas.gov/conservation/BMPs/index.asp. The practices are broken out into sectors such as Agriculture, Commercial and Institutional, Industrial, Municipal and Wholesale. BMPs are voluntary measures that water users use to develop the required components of Title 30, Texas Administrative Code, Chapter 288. BMPs can also be implemented in addition to the rule requirements to achieve water conservation goals.

Contact Information

Name:	Port of Corpus Christi Authority of Nueces County, Texas	
Address:	400 Harbor Drive	
Telephone Number:	(361) 882-5633	Fax: (361) 882-7110
Water Right No.(s):	13630	
Regional Water Planning Group:	Coastal Bend Regional Water Planning Group Region N	
Person responsible for implementing conservation program:	Sarah L. Garza	Phone: (361) 885-6163
Form Completed By:	Sarah L. Garza	
Title:	Director of Environmental Planning & Compliance	
Signature:		Date: 07/14/2022

A water conservation plan for wholesale public water suppliers must include the following requirements (as detailed in 30 TAC Section 288.5). If the plan does not provide information for each requirement, you must include in the plan an explanation of why the requirement is not applicable.

Utility Profile

I. WHOLESALE SERVICE AREA POPULATION AND CUSTOMER DATA

A. Population and Service Area Data:

1. Service area size (in square miles):

   (Please attach a copy of service-area map)

   Water generated by two desalination facilities will serve new and existing industrial developments and residential populations in San Patricio and Nueces Counties. A map is provided in **Attachment A**.

2. Current population of service area:

   442,917

3. Current population served for:

   a. Water 0

   b. Wastewater 0

4. Population served for previous five years:

Year	*Population*
2021	0
2020	0
2019	0
2018	0
2017	0

5. Projected population for service area in the following decades:

Year	*Population*
2020	442,917
2030	479,648
2040	502,556
2050	516,248
2060	526,341

6. List source or method for the calculation of current and projected population size.

Coastal Bend Regional Water Planning Area Region N, 2021 Regional Water Plan, October 2020.

B. Customer Data

List (or attach) the names of all wholesale customers, amount of annual contract, and amount of annual use for each customer for the previous year:

Wholesale Customer	*Contracted Amount (Acre-feet)*	*Previous Year Amount of Water Delivered (acre-feet)*
None.		

II. WATER USE DATA FOR SERVICE AREA

A. Water Delivery

Indicate if the water provided under wholesale contracts is treated or raw water and the annual amounts for the previous five years (in acre feet):

Year	*Treated Water*	*Raw Water*
2021	0	0
2020	0	0
2019	0	0
2018	0	0
2017	0	0
Totals	0	0

B. *Water Accounting Data*

1. Total amount of water diverted at the point of diversion(s) for the previous five years (in acre-feet) for all water uses:

Year	*2021*	*2020*	*2019*	*2018*	*2017*
Month					
January	0	0	0	0	0
February	0	0	0	0	0
March	0	0	0	0	0
April	0	0	0	0	0
May	0	0	0	0	0
June	0	0	0	0	0
July	0	0	0	0	0
August	0	0	0	0	0
September	0	0	0	0	0
October	0	0	0	0	0

November	0	0	0	0	0
December	0	0	0	0	0
Totals	0	0	0	0	0

2. Wholesale population served and total amount of water diverted for **municipal use** for the previous five years (in acre-feet):

Year	*Total Population Served*	*Total Annual Water Diverted for Municipal Use*
2021	0	0
2020	0	0
2019	0	0
2018	0	0
2017	0	0

C. Projected Water Demands

If applicable, project and attach water supply demands for the next ten years using information such as population trends, historical water use, and economic growth in the service area over the next ten years and any additional water supply requirements from such growth.

III. WATER SUPPLY SYSTEM DATA

A. Projected Water Demands

List all current water supply sources and the amounts authorized (in acre feet) with each.

Water Type	*Source*	*Amount Authorized*
Surface Water	Corpus Christi Bay and Gulf of Mexico	102,000acre-feet and 168,805 acre-feet
Groundwater	N/A	0
Other	N/A	0

B. Treatment and Distribution System (if providing treated water)

1. Design daily capacity of system (MGD):

   30 MGD (San Patricio County) and 50 MGD (Nueces County)

2. Storage capacity (MGD):

   a. Elevated – Not yet determined / designed.

b. Ground – Not yet determined / designed.

3. Please attach a description of the water system. Include the number of treatment plants, wells, and storage tanks

   See figure in **Attachment B**.

IV. WASTEWATER SYSTEM DATA

A. Wastewater System Data (if applicable)

1. Design capacity of wastewater treatment plant(s) (MGD):

   NA

2. Briefly describe the wastewater system(s) of the area serviced by the wholesale public water supplier. Describe how treated wastewater is disposed. Where applicable, identify treatment plant(s) with the TCEQ name and number, the operator, owner, and the receiving stream if wastewater is discharged.

   NA

B. Wastewater Data for Service Area (if applicable)

1. Percent of water service area served by wastewater system: NA

2. Monthly volume treated for previous five years (in 1,000 gallons):

Year					
Month					
January	NA				
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					
Totals					

Water Conservation Plan

In addition to the description of the wholesaler's service area (profile from above), a water conservation plan for a wholesale public water supplier must include, at a minimum, additional information as required by Title 30, Texas Administrative Code, Chapter 288.5. Note: If the water conservation plan does not provide information for each requirement an explanation must be included as to why the requirement is not applicable.

A. Specific, Quantified 5 & 10-Year Targets

The water conservation plan must include specific, quantified 5-year and 10-year targets for water savings including, where appropriate, target goals for municipal use in gallons per capita per day for the wholesaler's service area, maximum acceptable water loss, and the basis for the development of these goals. Note that the goals established by a wholesale water supplier under this subparagraph are not enforceable. These goals must be updated during the 5-year review and submittal.

The 5-year goal is to increase water returned to the Bay and the Gulf of Mexico by 0.01% through system or technology improvements and optimizations and implementation of leak prevention programs.

The 10-year goal is an increase in water returned to the Bay and Gulf of Mexico by 0.001% through system or technology improvements and optimizations and implementation of leak prevention programs.

B. Measuring and Accounting for Diversions

The water conservation plan must include a description as to which practice(s) and/or device(s) will be utilized to measure and account for the amount of water diverted from the source(s) of supply.

A meter with an accuracy of + / - 5% will be installed to accurately measure the flow diverted from the Bay or the Gulf of Mexico.

C. Record Management Program

The water conservation plan must include a monitoring and record management program for determining water deliveries, sales, and losses.

When contracts and users are established, the water conservation plan will be updated with an appropriate monitoring and record management program to track water deliveries, sales, and losses.

D. Metering/Leak-Detection and Repair Program

The water conservation plan must include a program of metering and leak detection and repair for the wholesaler's water storage, delivery, and distribution system.

Within six months after startup and yearly thereafter, the data of water intake verses water returned will be reviewed. Machinery, piping and processes will be monitored to determine if any leaks are found, or increased efficiencies might be possible. Daily visual inspections will be performed and if any leaks are noted, a work order will be prepared for repair of the deficient item.

E. Contract Requirements for Successive Customer Conservation

The water conservation plan must include a requirement in every water supply contract entered into or renewed after official adoption of the water conservation plan, and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements of Title 30 TAC Chapter 288. If the customer intends to resell the water, then the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with the provisions of this chapter.

Successive customer conservation will be required in all water supply contracts in accordance with the requirements specified in this section.

F. Reservoir Systems Operations Plan

The water conservation plan must include a reservoir systems operations plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin. The reservoir systems operations plan shall include optimization of water supplies as one of the significant goals of the plan.

Not applicable.

G. Enforcement Procedure and Official Adoption

The water conservation plan must include a means for implementation and enforcement, which shall be evidenced by a copy of the ordinance, rule, resolution, or tariff, indicating official adoption of the water conservation plan by the water supplier; and a description of the authority by which the water supplier will implement and enforce the conservation plan.

A Water Conservation Plan with a supporting resolution was approved by the Port Commission at the September 15, 2020, Commission Meeting. This updated Water Conservation Plan will be presented for approval by the Port Commission at the July 19, 2022, Commission Meeting. Subsequent updates to the plan will be presented to the Port Commission for approval as needed.

H. Coordination with the Regional Water Planning Group(s)

The water conservation plan must include documentation of coordination with the regional water planning groups for the service area of the wholesale water supplier in order to ensure consistency with the appropriate approved regional water plans.

Example statement to be included within the water conservation plan:

The service area of the _____ (name of water supplier) is located within the _____ (name of regional water planning area or areas) and _____ (name of water supplier) has provided a copy of this water conservation plan to the _____ (name of regional water planning group or groups).

Provided in Attachment C is a letter from the Coastal Bend Regional Water Planning Group stating that the Water Conservation Plan is consistent with the Regions 2016 Water Plan. Attachment C was submitted to TCEQ on April 20, 2019. This updated Water Conservation Plan includes an updated address, minor formatting updates, and text edits to clarify that it applies diversions made for two desalination facilities. This updated Water Conservation Plan is not substantively different from the plan referenced in Attachment C. Additionally, the Region N Water Plan was approved as part of the 2022 State Water Plan and includes both desalination projects.

I. Plan Review and Update

A wholesale water supplier shall review and update its water conservation plan, as appropriate based on an assessment of previous 5-year and 10-year targets and any other new or updated information. A wholesale water supplier shall review and update the next revision of its water conservation plan no later than May 1, 2009, and every five years after that date to coincide with the regional water planning group. The revised plan must also include an implementation report.

This Water Conservation Plan will be reviewed and updated at a minimum of every five years. At the time of construction of either desalination facility, the Water Conservation Plan will be updated to include an implementation plan.

V. ADDITIONAL CONSERVATION STRATEGIES

Any combination of the following strategies shall be selected by the water wholesaler, in addition to the minimum requirements of 30 TAC §288.5(1), if they are necessary in order to achieve the stated water conservation goals of the plan. The commission may require by commission order that any of the following strategies be implemented by the water supplier if the commission determines that the strategies are necessary in order for the conservation plan to be achieved:

1. Conservation-oriented water rates and water rate structures such as uniform or increasing block rate schedules, and/or seasonal rates, but not flat rate or decreasing block rates;

If appropriate for industrial customers, this strategy will be employed.

2. A program to assist agricultural customers in the development of conservation, pollution prevention and abatement plans;

Not applicable as water produced is not anticipated to be provided for agricultural customers.

3. A program for reuse and/or recycling of wastewater and/or graywater;

Wastewater generated at the desalination plant will be treated and returned to the bay in accordance with the rules and regulations regarding discharges.

4. Any other water conservation practice, method, or technique which the wholesaler shows to be appropriate for achieving the stated goal or goals of the water conservation plan.

The desalination plants will utilize current technology at the time of construction.

VI. WATER CONSERVATION PLANS SUBMITTED WITH A WATER RIGHT APPLICATION FOR NEW OR ADDITIONAL STATE WATER

Water Conservation Plans submitted with a water right application for New or Additional State Water must include data and information which:

1. support the applicant's proposed use of water with consideration of the water conservation goals of the water conservation plan;

The practice of utilizing desalination technology to establish alternate water supply sources is supported under the Texas Administrative Code (TAC) Title 30 Part 1 Chapter 288 Subchapter A rule 30 TAC 288.1 definition number (4) for conservation. Converting a water source of lower quality to a form having

greater usability and commercial value is supported by 30 TAC 288.1 definition numbers (7) and (12) which can then be provided for use.

2. evaluates conservation as an alternative to the proposed appropriation; and

The practice of utilizing desalination technology to establish an alternate water supply source is supported under the 30 TAC 288.1 definition number (4) for conservation.

3. evaluates any other feasible alternative to new water development including, but not limited to, waste prevention, recycling and reuse, water transfer and marketing, regionalization, and optimum water management practices and procedures.

Additionally, it shall be the burden of proof of the applicant to demonstrate that no feasible alternative to the proposed appropriation exists and that the requested amount of appropriation is necessary and reasonable for the proposed use.

Currently, the region is 100% dependent on surface water. Developing an alternate supply of water from sea water desalination ensures a 100% unlimited and reliable source of water long into the future. The proposed desalination plants will be designed to be scalable so that the plants can be built and expanded to accommodate additional water needs as they come on-line.

OFFICIAL MINUTES OF PORT COMMISSION MEETING
July 19, 2022

The Port Commissioners of the Port of Corpus Christi Authority convened at the Solomon P. Ortiz International Center, 402 Harbor Drive, Corpus Christi, Texas, on Tuesday, July 19, 2022 at 9:00 a.m., for the regular monthly meeting of the Port Commission.

Present:
Mr. Charles Zahn
Ms. Catherine Hilliard
Mr. David P. Engel
Mr. Wes Hoskins
Dr. Bryan Gulley
Mr. Gabe Guerra
Mr. Rajan Ahuja

Present:
Mr. Sean Strawbridge
Mr. Kent Britton
Mr. Omar Garcia
Mr. Jeff Pollack
Mr. Clark Robertson
Ms. Brenda Reed
Ms. Rosie Collin
Mr. Tony MacDonald
Mr. Tom Mylett
Ms. Rosaura Bailey
Mr. Sam Esquivel
Ms. Natasha Fudge
Ms. Sarah Garza
Mr. Mark Gutierrez
Mr. Dan Koesema
Mr. Jacob Morales
Ms. Lynn Angerstein
Ms. Sonya Sosa Lopez
Ms. Bryana Garza
Ms. Criselda Aguirre
Ms. Leslie Ruta
Mr. Brooks Lobingier, II
Mr. Bennie Benavidez
Mr. Richard Hernandez
Mr. Daniel Villesca
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Ms. Cynthia Gonzalez
Ms. Monique Lerma
Mr. Eric Battersby
Ms. Nelda Olivo
Mr. Eric Giannamore
Mr. Fernando Quintanilla

Ms. Sarah Collins
Ms. Adrianna Escamilla

Others Present: Mr. Leo J. Welder, Jr.
Mr. Dane Bruun

Others Present:

Mr. John Williams
ACC Pilots
Ms. Carol Wirth
BCW Global
Mr. Xavier F. Valverde, Sr.
G&H Towing
Mr. BJ Schulze
Bay Houston Towing Co.
Ms. Becky Gallagher
SPCEDC
Mr. Jalyn Stineman
Del Mar College
Mr. John Green
City of Portland
Mr. Adam T. Carrington
Brooks Worship Center
Mr. Dennis Wade
News of San Patricio
Mr. Adam Gawarecki
SPCEDC
Ms. Lucy Nix
ABC – TX Coastal Bend
Ms. Jane Gimler
ABC – TX Coastal Bend
Mr. Luis Klusmeyer
Jacobs
Mr. Tom Barker
Terracon
Mr. Jesse Gilbert
Texas State Aquarium
Ms. Kara Hahn
Texas State Aquarium
Ms. Sarah Zigmond
Texas State Aquarium
Mr. Justin Sefcik
Texas State Aquarium
Mr. Anthony Garcfalo
USCG
Mr. Terry Arnold
Seven Seas Water
Mr. Mark Roach
ABC – TX Coastal Bend, GPISD

1. Meeting called to order

2. Safety briefing presented

3. Pledge of Allegiance recited

4. Invocation given

5. Conflict of Interest Affidavits: Mr. Hoskins submitted a Conflict of Interest Affidavit for item 11.c.2.

6. Minutes

6a. ***Action:*** On motion made by Mr. Guerra and seconded by Ms. Hilliard, the Commission approved the revised minutes of the May 2, 2022, Special Commission meeting in the form presented at the meeting.

6b. ***Action:*** On motion made by Ms. Hilliard and seconded by Dr. Gulley, the Commission approved the minutes of the June14, 2022, Port Commission meeting in the form presented at the meeting.

7. Public Comments: Mr. Thomas Mack addressed the Commission.

8. Committee Reports:

Audit Committee: Mr. Engel reported on the committee's activities since the last regular Commission meeting.

Long-Range Planning Committee: Dr. Gulley reported on the committee's activities since the last regular Commission meeting.

Security Committee: Ms. Hilliard reported on the committee's activities since the last regular Commission meeting.

Facilities Committee: No meeting occurred since the last regular Commission meeting.

9. Presentations

9a. The Commission received a presentation from Adam Gawarecki, Executive Director, San Patricio County Economic Development Corporation.

9b. The Commission received an update on the Aquarium Rescue Center from Jesse Gilbert, President and Chief Executive Officer, Texas State Aquarium.

9c. The Commission received a presentation from Carol Wirth, Executive Vice President of Corporate Affairs, BCW – Global.

9d. The Commission received an update on the Port of Corpus Christi's Semi-annual Strategic Plan 2023 Implementation.

10. Open Agenda

Point of order: The Commission waived the Zahn Rule for agenda items 10a, 10b, and 10c.

10a. ***Resolution of appreciation, honoring the exemplary leadership of Colonel Timothy R. Vail, U.S. Army Corps of Engineers:*** On motion made by Mr. Hoskins and seconded by Ms. Hilliard, the Commission adopted the following resolution:

RESOLUTION OF APPRECIATION, RECOGNIZING THE EXEMPLARY LEADERSHIP OF COLONEL TIMOTHY R. VAIL, FORMER COMMANDER OF THE U.S. ARMY CORPS OF ENGINEERS GALVESTON DISTRICT

WHEREAS, Colonel Timothy R. Vail was commissioned in the U.S. Army in May 1997; and

WHEREAS, Colonel Vail assumed command of the U.S. Army Corps of Engineers Galveston District on July 3, 2019; and

WHEREAS, Colonel Vail has been a strategic partner and facilitator in the construction and maintenance of the Port of Corpus Christi's waterways; and

WHEREAS, During his tenure as commander of the U.S. Army Corps of Engineers Galveston District and with his invaluable leadership and participation, significant progress was achieved in the design and construction of the Corpus Christi Ship Channel Improvement Project (CIP); and

WHEREAS, Milestones of the CIP achieved under Colonel Vail's tenure included completing construction of Phase 1 from the Gulf of Mexico to Harbor Island, completing design and awarding a construction contract for Phase 2 from Harbor Island to Ingleside, completing design and awarding a construction for Phase 3 from Ingleside to the Chemical Turning Basin and substantially completing design for the final phase of the CIP from the Chemical Turning Basin to the Viola Turning Basin; and

WHEREAS, The Port of Corpus Christi is honored to recognize its partnership and strong working relationship with Colonel Vail during his time as commander of the U.S. Army Corps of Engineers Galveston District; and

WHEREAS, The Port of Corpus Christi expresses its most sincere gratitude to Colonel Vail for his exemplary leadership and his outstanding contributions to the success of the Port of Corpus Christi's mission;

NOW, THEREFORE, BE IT RESOLVED BY THE PORT COMMISSION OF THE PORT OF CORPUS CHRISTI AUTHORITY OF NUECES COUNTY, TEXAS, THAT: We hereby extend our best wishes to Colonel Vail as he embarks on the next chapter of his life's journey; and

BE IT FURTHER RESOLVED that this Resolution be included in the permanent minutes of this Port Commission meeting, July 19, 2022, and that a signed original of this Resolution be presented to Colonel Timothy R. Vail.

10b. ***Resolution of appreciation, recognizing the distinguished career of Iain Vasey, former President and CEO of the Corpus Christi Regional Economic Development Corporation:*** On motion made by Ms. Hilliard and seconded by Mr. Engel, the Commission adopted the following resolution:

RESOLUTION OF APPRECIATION, RECOGNIZING THE DISTINGUISHED CAREER OF IAIN VASEY, FORMER PRESIDENT & CEO OF THE CORPUS CHRISTI REGIONAL ECONOMIC DEVELOPMENT CORPORATION

WHEREAS, Iain Vasey has been a strong proponent for economic development in the Coastal Bend region; and

WHEREAS, Iain Vasey became President and CEO of the Corpus Christi Regional Economic Development Corporation (CCREDC) in March 2015; and

WHEREAS, Under Iain Vasey's leadership, the CCREDC completely realigned its business retention, business recruitment and investor relations/communications programs, developing the organization into a world-class operation that has become a model for others around the nation; and

WHEREAS, During Iain Vasey's tenure, the CCREDC fostered unprecedented economic growth for the Coastal Bend region, securing more than 3,000 jobs that added over $210 million in new annual payroll, as well as $54 billion in private sector capital investments; and

WHEREAS, Iain Vasey has been a valuable and professional ally of the Port of Corpus Christi in promoting maritime commerce and regional economic development for the benefit of the South Texas Region; and

WHEREAS, Iain Vasey and the CCREDC led efforts to identify and secure the $9.5 billion, 750-plus jobs Gulf Coast Growth Ventures project, a world-scale plastics manufacturing facility, after a national site selection competition; and

WHEREAS, Iain Vasey and his team helped secure the new $2 billion Steel Dynamics flat roll steel mill, which now sits on an electric arc steel campus that will support more than 2,000 jobs on-site and eight additional manufacturing operations; and

WHEREAS, Iain Vasey led the CCREDC in attaining the prestigious Accredited Economic Development Organization designation from the International Economic Development Council; and

WHEREAS, Under Iain Vasey's leadership, the CCREDC was recognized for its work during the COVID-19 pandemic in gathering accurate economic data and recommending key incentive policies to save small businesses, a model that was replicated across Texas and provided invaluable information to the White House Office of Economic Advisors; and

WHEREAS, Iain Vasey has assisted the Port of Corpus Christi in becoming the dominant national and global player in a number of diverse industry sectors, including the ongoing global energy transition***;*** and

WHEREAS, The positive impact that Iain Vasey has had on the Coastal Bend region is impossible to fully calculate, but will be felt and appreciated for generations to come;

NOW, THEREFORE, BE IT RESOLVED BY THE PORT COMMISSION OF THE PORT OF CORPUS CHRISTI AUTHORITY OF NUECES COUNTY, TEXAS, THAT: We hereby recognize Iain Vasey for his unwavering commitment to improving the quality of life for the Coastal Bend Region and its citizens through economic development as President and CEO of the Corpus Christi Regional Economic Development Corporation; and

BE IT FURTHER RESOLVED that this Resolution be included in the permanent minutes of this Port Commission meeting, July 19, 2022, and that a signed original of this Resolution be presented to Iain Vasey.

10c. ***Resolution opposing Texas Windstorm Insurance Association rate hike:*** On motion made by Mr. Hoskins and seconded by Dr. Gulley, the Commission adopted the following resolution:

RESOLUTION OPPOSING TEXAS WINDSTORM INSURANCE ASSOCIATION RATE INCREASE

WHEREAS*,* the Port of Corpus Christi Authority of Nueces County, Texas (PCCA), accounts for nearly 100,000 jobs from port-related activities in the Coastal Bend and is responsible for $6.2 billion in personal income for Texas: and

WHEREAS, currently, our Coastal Bend community has over $54 billion of infrastructure investments by both the PCCA and private industry underway in and around the Corpus Christi Ship Channel. As economic activity continues to grow on a state and national level, new businesses, additional jobs, and new partnerships will sustain the recovery of our state; and

WHEREAS**,** our Coastal Bend community continues to struggle with the COVID-19 pandemic and U.S. inflation triggering economic distress; therefore, prospective industry investment to our region will be affected by increased

construction costs and higher insurance premiums making it difficult for new developments to commit to the area; and

***WHEREAS*,** higher insurance premiums add unnecessary cost of living expenses to our employees and current residents and affect our ability to attract a highly skilled workforce considering relocating to the area; and

***WHEREAS*,** Texas Windstorm Insurance Association's rapidly rising rates are also creating a serious hindrance to economic development along the Texas Gulf Coast; and

WHEREAS, the Texas Windstorm Insurance Association should consider the overall economic impact on coastal policyholders who must bear these additional financial mandates in addition to having separate wind and hail policies; and

WHEREAS*,* such a rate increase during an unprecedented season of economic distress causes undue and excessive financial burdens on coastal policyholders and business owners; and

WHEREAS, given the severe negative impact an increase in the cost of insurance will have on coastal communities and business owners, the Texas Windstorm Insurance Association Board of Directors should not approve yet another rate increase; and

NOW THEREFORE BE IT RESOLVED, that the Port Commission opposes any rate increase proposed by the Texas Windstorm Insurance Association Board of Directors for residents in our coastal communities and business owners.

ADOPTED this the 19th day of July 2022, by the Port Commission of the Port of Corpus Christi Authority of Nueces County, Texas.

10d. ***Award a Services Contract to DRC Emergency Services, LLC, for debris management services for hurricane response or other similar catastrophic disaster event:*** Staff recommended the approval of a Services Provider Services Contract with DRC Emergency Services, LLC for debris management services for indefinite deliverable/indefinite quantity for a two and a half (2 ½) year term.

Action: On motion made by Mr. Engel and seconded by Mr. Ahuja, the Commission approved Staff's recommendation.

10e. ***Approve a Consulting Services Contract with Tetra Tech, Inc., for debris monitoring services for hurricane response or other similar catastrophic disaster event:*** Staff recommended the approval of a Consulting Services Contract with Tetra Tech for on call debris management monitoring services for indefinite deliverable/indefinite quantity over a two and a half (2 ½) year term.

Action: On motion made by Dr. Gulley and seconded by Ms. Hilliard, the

Commission approved Staff's recommendation.

10f. ***Award construction contract to J E Construction Services, LLC, in the amount of $5,076,064, the lowest and best bid based on bids received on June 23, 2022, for construction of the Bulk Materials Terminal east access control project under FY2020 Port Security Program and Rider 37- Port Access Program:*** Staff recommended award of a construction contract to J E Construction Services, LLC, in the amount of $5,076,064 for construction of the Bulk Materials Terminal facility east access control point under Port Security Grant Program FY2020.

Action: On motion made by Mr. Guerra and seconded by Mr. Ahuja, the Commission approved Staff's recommendation.

10g. ***1) Approve a Maintenance Dredging Agreement with Buckeye South Texas Gateway Terminal to incorporate maintenance dredging of Buckeye South Texas Gateway Terminal Docks 1&2 in the PCCA's 2022 Annual Dredging Services Program;*** Staff recommended approval of a Maintenance Dredging Agreement with Buckeye South Texas Gateway Terminal, LLC to incorporate maintenance dredging of Buckeye South Texas Gateway Terminal, LLC Docks 1 & 2 into the PCCA's 2022 Annual Dredging Services Program.

Action: On motion made by Mr. Guerra and seconded by Dr. Gulley, the Commission approved Staff's recommendation.

2) Approve an Amendment to Task Order No.2 under Master Services Agreement No. 21-01, in the amount of $565,477.55 with Callan Marine LTD to perform maintenance dredging of Buckeye South Texas Gateway Terminal Docks 1 & 2 associated with the PCCA's 2022 Annual Dredging Services Program: Staff recommended approval of an Amendment to Task Order No.2, under Master Services Agreement No. 21-01, in the amount of $565,477.55 with Callan Marine, LTD to perform maintenance dredging of Buckeye South Texas Gateway Terminal, LLC Docks 1 & 2 associated with the PCCA's 2022 Annual Dredging Services Program.

Action: On motion made by Mr. Guerra and seconded by Dr. Gulley, the Commission approved Staff's recommendation.

10h. ***Approve staff to apply for $6 million through United States Department of Energy (USDOE) Carbon Storage Assurance Facility Enterprise (CarbonSAFE) Phase II Storage Complex Feasibility program for offshore sequestration:*** Staff recommended approval to apply for $6 million through the United States Department of Energy (DOE) Carbon Storage Assurance Facility Enterprise (CarbonSAFE) Phase II Storage Complex Feasibility program for an offshore storage complex for CO_2 sequestration.

Action: On motion made by Ms. Hilliard and seconded by Mr. Engel, the Commission approved Staff's recommendation.

10i. Approve Fire Protection Services Agreement with RTFC for staffing of PCCA's 70' fire boat: Staff recommended approval of the RTFC Fire Protection Services Agreement as presented.

Action: On motion made by Ms. Hilliard and seconded by Mr. Hoskins, the Commission approved Staff's recommendation.

10j. Approve the purchase of eight (8) Vehicles from Silsbee Ford in the amount of $456,911.62 using Government Pricing from the State of Texas GoodBuy Cooperative Program: Staff recommended the purchase of eight (8) vehicles from Silsbee Ford in the amount of $456,311.92.

Action: On motion made by Mr. Engel and seconded by Dr. Gulley, the Commission approved Staff's recommendation.

10k. Authorize purchase, installation, commissioning, software integration and three years extended warranty of Security Equipment from TSSi in the amount of $287,367 utilizing the General Services Administration (GSA) Cooperative Purchasing Program: Staff recommended authorization to purchase replacement warning system device and software from TSSi and ARES.

Action: On motion made by Mr. Engel and seconded by Ms. Hilliard, the Commission approved Staff's recommendation.

11. Consent Agenda: Commissioners requested that Consent Agenda Items 11c.2. and 11g. be removed from the agenda with no action being taken. Then Mr. Engel moved to approve the remaining Consent Agenda Items by one vote (the "Consent Agenda Motion"), in accordance with the respective staff recommendations and agreements furnished to the Commission at the meeting. Ms. Hilliard seconded the motion and the motion passed without objection.

11a. By approval of the Consent Agenda motion, the Commission approved a change order with Haas-Anderson Construction, Ltd., in the net amount of $43,041.75, due to height conflicts with the intersection mast arms and the overhead electrical lines associated with the west Bulk Materials Terminal access road project.

11b. By approval of the Consent Agenda motion, the Commission approved a service order with Hatch Associates Consultants, Inc. under Master Services Agreement No. 21-08, in the amount of $198,046 for engineering design services associated with the new west-end security entrance at Bulk Materials Terminal.

11c. The following agenda item addresses approval of two amendments to contracts associated with the Bulk Materials Terminal facility east access control point under Port Security Grant Program FY2020:

1) By approval of the Consent Agenda motion, the Commission approved a service order with Hatch Associates Consultants, Inc., under Master Services Agreement No. 21-08 in the amount of $30,433 for construction

administration services associated with the Bulk Materials Terminal facility east access control project under FY2020 Port Security Grant Program.

2) Staff recommended approval of an amendment to a service order with Freese and Nichols, Inc. under Master Services Agreement No. 21-05, in the amount of $22,264 for construction administration services associated with the Bulk Materials Terminal facility east access control project under Port Access Program-Rider 37 Grant. On motion made by Mr. Engel and seconded by Mr. Guerra, the Commission approved Staff's recommendation. Mr. Hoskins abstained from voting on this item.

11d. By approval of the Consent Agenda motion, the Commission approved an amendment to NuStar Logistics 9.36-acre Lease Agreement to add 4.32-acres for the continued operation of a crude shortage terminal located north of Public Oil Dock 1, Nueces County, Texas.

11e. By approval of the Consent Agenda motion, the Commission approved a First Amendment of Lease Agreement with Corpus Christi Polymers to reduce the 9.065-acre lease premise to 6.915-acres, located at the Viola Turning Basin, Nueces County, TX.

11f. By approval of the Consent Agenda motion, the Commission approved an Amendment to Service Order No. 5 under Master Services Agreement No. 21-06, in the amount of $46,400 with George Butler Associates, Inc. to perform underwater pre-and post-dredge inspections at Buckeye South Texas Gateway Terminal Docks 1 & 2 associated with the PCCA's 2022 Annual Dredging Services Program.

11g. Staff recommend adoption of a resolution approving an updated Water Conservation Plan for Proposed Desalination Facilities. On motion made by Mr. Engel and seconded by Ms. Hilliard, the Commission approved Staff's recommendation. The resolution, in its entirety, is attached to these minutes as **ATTACHMENT ONE**.

11h. By approval of the Consent Agenda motion, the Commission approved a Purchase Order with Intelex in an amount not to exceed $165,108.74 for a 3-year renewal of the Intelex Software License.

12. Chief Executive Officer's Report and Commissioners' Comments:

12a. The Chief Executive Officer submitted his report on upcoming community events, PCCA events, and activities of the following PCCA departments during the preceding month: Trade Development, External Affairs, Operations and Finance.

12b. Mr. Zahn asked for comments from the Commissioners.

13. **Recess Open Meeting and Convene Executive Session:** At 12:40 p.m. Chairman Zahn announced that the Commission would go into executive session pursuant to Sections 418.183, 551.071, 551.072, 551.074, and 551.076 of the Texas Government Code to deliberate agenda items 13a., 13b., 13c.,13d., 13e., 13f., and 13g. which were described in the agenda as follows:

13a. Legal advice from counsel in connection with State Office of Administrative Hearings Docket No. 582-20-1895. (§551.071)

13b. Legal advice from PCCA's counsel in connection with PCCA's Water Rights Permit No. 13630. (§551.071)

13c. Legal advice from counsel in connection with Cause No. 2018CCV-60780-4, PCCA, Plaintiff vs. The Port of Corpus Christi, LP, Defendant, and The Port of Corpus Christi, LP, Counter Claimant vs. PCCA, and in their Official Capacities as Commissioners of the Port Authority, the following Commissioners: Charles W. Zahn, Jr., Wayne Squires, Richard Ralph Valls, Jr., Richard Bowers, David P. Engel, Wes Hoskins, Catherine Tobin Hilliard, And As-Yet Unnamed Co-Conspirators, Counterclaim Defendants, in Nueces County Court at Law No. 4. (§551.071)

13d. Deliberate the acquisition of real property in Nueces County and San Patricio County. (§551.0712)

13e. Receive legal advice from counsel regarding the Texas Public information Act. (§551.071)

13f. Deliberate (i) the deployment of security personnel and devices and (ii) the risk and vulnerability of persons and property within PCCA's jurisdiction to acts of terrorism and related criminal activity and operating procedures to prevent such acts. (§551.076 and §418.183)

13g. Evaluate the performance of the Chief Executive Officer. (§551.074)

14. **Reconvene in Open Session.** At 2:56 p.m., the Commission reconvened into Open Session.

15. **Adjourn:** On motion duly made and seconded, the meeting adjourned at 2:56 p.m.

ATTACHMENT ONE

RESOLUTION APPROVING UPDATED WATER CONSERVATION PLAN FOR DESALINATION FACILITY WATER RIGHTS PERMITS

WHEREAS, the Port of Corpus Christi of Nueces County, Texas ("Port Authority"), has endeavored to obtain the long lead permits for a desalination plant to bring a sustainable water supply to Nueces and San Patricio Counties in order to promote a healthy local economy and environment and support access to drinking water to areas that have suffered repeated drought conditions;

WHEREAS, the Port Authority has determined that its properties at La Quinta and Harbor Island are suitable for locating future desalination plants;

WHEREAS, a permit application was submitted to the Texas Commission on Environmental Quality ("TCEQ") on August 29, 2019, for water rights associated with a proposed 30 million gallon a day desalination plant at La Quinta for production of industrial water supply (TCEQ Water Rights No. 13630) and which is on the July 20, 2022 TCEQ Commission Meeting agenda for consideration by the TCEQ Commissioners;

WHEREAS, on May 19, 2020, the Port Commission adopted a Resolution for the intake for the Harbor Island Facility to be placed in the Gulf of Mexico and for which a water rights permit application is also required prior to diverting water;

WHEREAS, water rights permit applications require development of a Water Conservation Plan for Wholesale Public Water Suppliers, and such plan must include a means for implementation and enforcement, which shall be evidenced by a copy of the ordinance, rule, resolution, or tariff, indicating official adoption of the water conservation plan by the Port Authority; and

WHEREAS, this Water Conservation Plan for Wholesale Public Water Suppliers may be updated from time to time which requires approval by the Port Commission.

NOW, THEREFORE, BE IT RESOLVED BY THE PORT COMMISSION OF THE PORT OF CORPUS CHRISTI AUTHORITY OF NUECES COUNTY, TEXAS, THAT:

Section 1. The Port Commission hereby officially adopts the updated Water Conservation Plan dated July 11, 2022, for water that will be produced at future desalination plants and authorizes Port Authority staff to implement and enforce the requirements of the Water Conservation Plan.

Section 2. The Chairman, the Vice Chairman, the Secretary, and the Chief Executive Officer are each hereby severally authorized and directed to execute, attest, seal and deliver any and all additional certificates, documents or other papers and to do any and all things deemed necessary to carry out the intent and purpose of this Resolution.

Section 3. This Resolution is hereby adopted by the Port Commission on July 19, 2022.

ATTACHMENT D

DROUGHT CONTINGENCY PLAN

Port of Corpus Christi Authority
Drought Contingency Plan for Wholesale Public Water Suppliers

Plan Date: February 10, 2023

This Drought Contingency Plan (DCP) was developed in accordance with 30 Texas Administrative Code §288.22which provides for certain elements which must be included in a DCP. The DCP elements are provided in italics followed by the Port of Corpus Christi Authority's (Port or Port Commission) plan provisions. The Port's water rights application, which requires this DCP be prepared, requests approval for the Port to use State Water from the Gulf of Mexico. Importantly, the Gulf of Mexico is not subject to the type of low-flow conditions that occur in a watercourse during drought conditions. This DCP will be triggered in the unlikely event that low-flow conditions result in the Port's demand for intake water exceeding capacity from the Gulf of Mexico.

(1) Preparation of the plan shall include provisions to actively inform the public and to affirmatively provide opportunity for user input in the preparation of the plan and for informing wholesale customers about the plan. Such acts may include, but are not limited to, having a public meeting at a time and location convenient to the public and providing written notice to the public concerning the proposed plan and meeting.

This DCP and supporting resolution will be presented for Port Commission consideration and approval during one of its regularly scheduled Commission Meetings. Subsequent updates to the plan will be presented to the Port Commission for approval as warranted. Port Commission Meetings are open to the public with an agenda notice posted 72 hours in advance of each meeting. There is an opportunity for public comment.

(2) The drought contingency plan must document coordination with the regional water planning groups for the service area of the wholesale public water supplier to ensure consistency with the appropriate approved regional water plans.

The Port regularly participates in Coastal Bend Regional Water Planning Group meetings. Documentation of the meetings is maintained in Port files. When information from the regional water plan meetings warrant, the Port will update this Drought Contingency Plan accordingly.

(3) The drought contingency plan must include a description of the information to be monitored by the water supplier and specific criteria for the initiation and termination of drought response stages, accompanied by an explanation of the rationale or basis for such triggering criteria.

If, as a result of drought conditions, Port customer demand for state water from the Gulf of Mexico exceeds capacity, the Port will initiate drought curtailment measures. The Port will monitor water usage and the Coastal Bend regional water supply entities, which rely on freshwater, and each entity's respective implementation of DCP triggering criteria.

(4) The drought contingency plan must include a minimum of three drought or emergency response stages providing for the implementation of measures in response to water supply conditions during a repeat of the drought-of-record.

If, as a result of drought conditions, Port customer demand for State Water from the Gulf of Mexico exceeds capacity, the Port will initiate drought curtailment measures.

Additionally, the Port will monitor Coastal Bend regional water supply entities drought or emergency response stages – Stage 1, Stage 2 and Stage 3 -- as established in each respective regional entity's DCP. The Port will continue to operate consistent with the applicable permit conditions to produce water that will supplement the reduction in available fresh water due to drought and coordinate with the affected regional entity(ies) to supplement additional water in order to offset that entity's freshwater use.

(5) The drought contingency plan must include the procedures to be followed for the initiation or termination of drought response stages, including procedures for notification of wholesale customers regarding the initiation or termination of drought response stages.

If, as a result of drought conditions, Port customer demand for State Water from the Gulf of Mexico exceeds capacity, the Port will identify notification procedures for initiation or termination of drought response stages. The Port will also monitor Coastal Bend regional water supply entities' initiation and termination of drought response triggers for each stage.

(6) The drought contingency plan must include specific, quantified targets for water use reductions to be achieved during periods of water shortage and drought. The entity preparing the plan shall establish the targets. The goals established by the entity under this paragraph are not enforceable.

Successive customer drought minimization measures, consistent with applicable regional water supply entities, will be required in all Port water supply contracts as it relates to consumption of the State Water from the Gulf of Mexico.

(7) The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following:

(A) pro rata curtailment of water deliveries to or diversions by wholesale water customers as provided in Texas Water Code, §11.039; and

If, as a result of drought conditions, Port customer demand for State Water from the Gulf of Mexico exceeds capacity, the Port will initiate pro-rata curtailment of water deliveries. The Port will continue to operate consistent with the applicable permit conditions to produce water that will supplement the reduction in available fresh water due to drought.

(B) utilization of alternative water sources with the prior approval of the executive director as appropriate (e.g., interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.).

If, as a result of drought conditions, Port customer demand for State Water from the Gulf of Mexico exceeds capacity, the Port will initiate drought curtailment measures. As an alternative water source, the Port will continue to operate consistent with the applicable permit conditions to produce water to supplement the reduction in available fresh water due to drought.

(8) The drought contingency plan must include a provision in every wholesale water contract entered into or renewed after adoption of the plan, including contract extensions, that in case of a shortage of water resulting from drought, the water to be distributed shall be divided in accordance with Texas Water Code, §11.039.

Successive Port customer contracts will include a provision that in the event of a shortage of State Water from the Gulf of Mexico resulting from drought, the water will be divided in accordance with Texas Water Code, §11.039.

(9) The drought contingency plan must include procedures for granting variances to the plan.

DCP plan variances will be considered and approved on a case-by-case basis by designated members of the Port Executive Team.

(10) The drought contingency plan must include procedures for the enforcement of any mandatory water use restrictions including specification of penalties (e.g., liquidated damages, water rate surcharges, discontinuation of service) for violations of such restrictions.

The Port will identify procedures for compliance with any mandatory water use restrictions required to be initiated if, as a result of drought conditions, Port customer demand for state water from the Gulf of Mexico exceeds capacity.

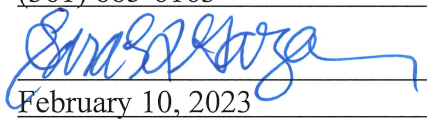
(b) The wholesale public water supplier shall notify the executive director within five business days of the implementation of any mandatory provisions of the drought contingency plan.

The Port will notify the TCEQ Executive Director within five business days of the implementation of any mandatory provisions of this Drought Contingency Plan.

(c) The wholesale public water supplier shall review and update, as appropriate, the drought contingency plan, at least every five years, based on new or updated information, such as adoption or revision of the regional water plan.

This DCP will be reviewed and updated at a minimum of every five years. Upon completion of construction of the desalination facility, the DCP will be updated as appropriate.

Plan Contact Information:

Name:	Port of Corpus Christi Authority of Nueces County, Texas
Address:	400 Harbor Drive
Telephone Number:	(361) 882-5633
Water Right No.(s):	TBD
Regional Water Planning Group:	Coastal Bend Regional Water Planning Group
Person Responsible for Drought Conservation Plan:	Sarah L. Garza
Title:	Director of Environmental Planning & Compliance
Phone:	(361) 885-6163
Signature:	
Date:	February 10, 2023

ATTACHMENT E

BASIS OF DESIGN REPORT

PORT OF CORPUS CHRISTI
PROPOSED INTAKE FOR DESALINATION PLANT
BASIS OF DESIGN REPORT
HARBOR ISLAND, CORPUS CHRISTI, TEXAS

Prepared for:

Port of Corpus Christi

400 Harbor Drive

Corpus Christi, TX 78401

Prepared by:

Parsons Environment & Infrastructure Group Inc.

Texas Registered Engineering Firm F-8008

KIT Professionals Inc.

Texas Registered Engineering Firm F-4991

February 2023

1 Introduction

The Port of Corpus Christi Authority of Nueces County, Texas (Port Authority) intends to construct a desalination facility (the "Facility) on Harbor Island to produce reliable wholesale water for the Coastal Bend region beyond its current freshwater sources. Lake Corpus Christi, Choke Canyon Reservoir, Lake Texana and the Colorado River currently provide raw water to the region. The recent (2021-2022) drought with increased water demand has emphasized the continued need to find additional drought-proof water sources for the Coastal Bend region. The Port Authority requests authorization to divert up to 350,000 acre-ft/year (maximum diversion rate of 217,000 gallons/minute (gpm)) of State Water from the Gulf of Mexico (State Water') to the Facility. The Facility will initially use 175,000 acre-ft/year (maximum diversion rate of 109,000 gpm) of State Water to produce 50 million gallons per day (mgd) (56,000 acre-ft/year) of desalinated product water. Product water will be distributed on a wholesale basis to municipal and industrial entities. The requested authorization allows for expansion of the desalination plant to produce 100 mgd (112,000 acre-ft/year) of desalinated product water if future water requirements justify the additional capacity.

The purpose of this report is to provide a Basis of Design for the water intake structure, pipeline and intake screens in sufficient detail to support the Texas Commission on Environmental Quality (TCEQ) Water Rights Permit Application. Numeric measurements and values referenced in this document rely upon preliminary design considerations which are subject to confirmation or revision during the final engineering-design phase. Specific design, location, and operation inputs (based on the use of the InvisiHead technology and the use of five velocity caps) were used solely for the purposes of assessing potential impingement and entrainment from operation of the intake structure. Other technologies and/or products may be selected during the final engineering-design phase to meet or exceed the referenced performance criteria.

1.1 Water Supply Need and Applicability

The following statements demonstrate the need and applicability for the water right requested in the application and addressed in this report.

- "Since 1957, the Texas Water Development Board ('TWDB') has been charged with preparing a comprehensive and flexible long-term plan for the development, conservation, and management of the State's water resources." *See* Coastal Bend Regional Water Planning Area, Region N, by Coastal Bend Regional Water Planning Group, "2021 Regional Water Plan" at p. 1 (hereinafter "Regional Plan")
- The Coastal Bend Region (Region N) encompasses 11 counties of Texas -- including Aransas, Nueces, and San Patricio Counties. (Regional Plan at pp. 1-2, 5, including Figure ES 1)
- Chapter 5 of the Regional Plan entitled "Water Management Strategies," and subchapter 5D.10 fully discuss "Seawater Desalination" as a specific water management strategy. (Regional Plan at pp. 5.10-1 to 5.10-46)
- Section 5D.10.7 of the Regional Plan specifically discusses the Harbor Island desalination facility as a management strategy (Regional Plan at 5.D.10-33 to 5D.10-39).
- "If projected future water needs are not met, the TWDB has forecast that Region N will suffer combined lost income of $1.9 billion by 2030 and $6.9 billion by 2070; a loss of 13,000 jobs by 2030 and loss of 48,000 jobs by 2070; and consumer surplus losses of $163 million by 2030 and $172 million by 2070 (and related population losses and school enrollment losses)." (Regional Plan at p. 30, and Appendix B at p. 2)

Accordingly, this application addresses a known "water supply need in a manner that is consistent with the state water plan..." and addresses a "water supply need" specific to the Region N plan. Seawater desalination is expressly addressed in the Regional Plan as a water management strategy. Diversion of State Water for purposes of desalination is expressly considered in the Regional Plan for the proposed Facility (at Harbor Island). The requested diversion of 156 mgd (175,000 acre-ft/year) is appropriately scaled to the 50 mgd potable water production fully discussed in the Regional Plan while the requested diversion of 312 mgd (350,000 acre-ft/year) is scaled to address potential growth given more recent trends.

2 Site Selection / Area of Influence

The Port Authority has determined that a possible location for the Harbor Island Facility intake is offshore in the Gulf of Mexico (GOM). Locating the intake in the GOM will require routing the pipeline under the Aransas Pass Channel, the Lydia Ann Channel, and San Jose Island. Siting the intake in the GOM will be a substantial cost; however, the Port Authority concluded that the offshore location could reduce potential environmental impacts from impingement and entrainment of marine life related to the proposed diversion of seawater. It was also determined that the intake will be located at an approximate depth of 35 ft of water (-35 ft NAVD88). This depth allows the entrances to the intake system to be located at least 20 ft below the water surface and approximately 5 to 10 ft above the sea bed. Locating the intake 5 to 10 ft off the sea bed minimizes the potential for sediments or benthic organisms to be drawn into the intake structure. At 20 ft below the water surface, the intake depth is well below depths where marine organisms in the GOM are most abundant, including sensitive stages of eggs and larval fish, such as red drum. It has been documented that viable red drum eggs are buoyant at salinities over 25 parts per thousand (ppt) (Holt et al. 1981). With naturally occurring salinity in the area of the intake of above 31 ppt, red drum eggs float near the surface and thus will not come into the hydraulic zone of influence of the intake. Furthermore, this intake is being located approximately 1.5 miles from the entrance to the Aransas Pass Jetty, which will reduce any potential impact on GOM species which may migrate in and out of the bays through Aransas Pass.

3 Fish Protection Standards

In May 2020, the Port Authority passed a resolution recommending placement of the intake structure for the Harbor Island Facility in the GOM. The Port Authority has also included several additional design features to further minimize any potential adverse environmental effects related to the diversion of state water. This report identifies and describes these design features including: the use of a velocity cap intake system, intake location selected based on available scientific information, and the use of a marine life handling system. Each of these design features are briefly explained below and discussed in further detail throughout this report.

1. The velocity cap intake system will have an entrance velocity of ≤0.5 feet per second (ft/sec). This intake system is described in greater detail below. The United States Environmental Protection Agency (USEPA) considers that offshore water intakes fitted with velocity caps meet the impingement performance requirements of the Clean Water Act 316(b) 2014 Phase II Rule for Existing Facilities, defined as an annual reduction in impingement mortality of 76% or greater (see 40 CFR § 125.94(C)(4)). While not directly applicable to desalination, USEPA's regulatory framework for cooling water intake structures provides useful guidance for evaluating the potential for impingement and entrainment at the proposed desalination facility. The USEPA has determined that most marine organisms can easily swim away from the 0.5 ft/sec intake velocity and thus avoid the intake (40 CFR 125.92(v)). In addition, as distance from the entrance increases, water velocity rapidly declines to less than the typical natural current velocity. The InvisiHead seawater intake velocity cap is referenced in the USEPA 316(b) Technical Document (USEPA 2006) as a system meeting the impingement performance requirement. The manufacturer states that the velocity drops to a maximum of 0.009 ft/sec only 5 meters away from the entrance. The Port Authority expects the final engineering design of the intake to be similar to the performance of the InvisiHead product. Furthermore, a three-inch mesh bar screen will be installed around the velocity caps to exclude larger marine organisms.

2. The intake will be located at an approximate sea bed depth of 35 ft (-35 ft NAVD88) and approximately 1.3 miles offshore; both characteristics will reduce the potential intake of marine organisms that are found in shallower water in more productive environments.

3. The intake opening will be located approximately 5 to 10 ft above the sea bed, which will minimize the potential for sediments or benthic organisms to be drawn into the intake structure.

4. The top of the intake structure will be at least 20 ft below the surface of the water to reduce potential intake of buoyant eggs and larvae that are associated with the upper reaches of the water column.

5. The Port Authority will utilize traveling water screens with marine life handling features to support the return of marine life to its natural habitat. This marine life return system will operate on large rotating screens at the Facility intake bay (immediately adjacent to the exit well of the pipeline), which are designed to catch marine organisms and redirect them into a return trough that transports them into the Aransas Channel.

The Port Authority will use these technologies and design features to minimize potential environmental concerns with the intake for the Harbor Island Facility. These systems are described in greater detail below.

4 Proposed Units

The intake will consist of a system of pipes and protected openings secured to the sea bed. The openings are located approximately 5 to 10 ft above the sea bed, and will be equipped with a velocity cap. The intake system will also include pumps at an intake bay on Harbor Island to draw water by gravity flow through an intake pipeline and deliver seawater to the Facility. Rotating screens will be used at the Harbor Island Facility intake bay to remove any marine life and debris from the system to prevent them from entering the initial treatment works, including pumps, of the Facility. The screens will function as a marine life protection measure that catches marine organisms and returns them to the Aransas Channel.

4.1 Location

The proposed seawater intake structure will be located approximately 1.3 miles offshore in the GOM. The intake pipeline will be routed approximately 3.1 miles from the offshore intake structure in the GOM to the pipeline exit well on Harbor Island, and then through marine life protection screens in the adjacent Facility intake bay. The pipeline exit well, marine life protection screens, and intake bay will be located on the east side of Harbor Island adjacent to the Aransas Channel. Figure 1a presents the plan of the intake pipeline route, and Figure 1b presents a profile view of the intake tunnel.

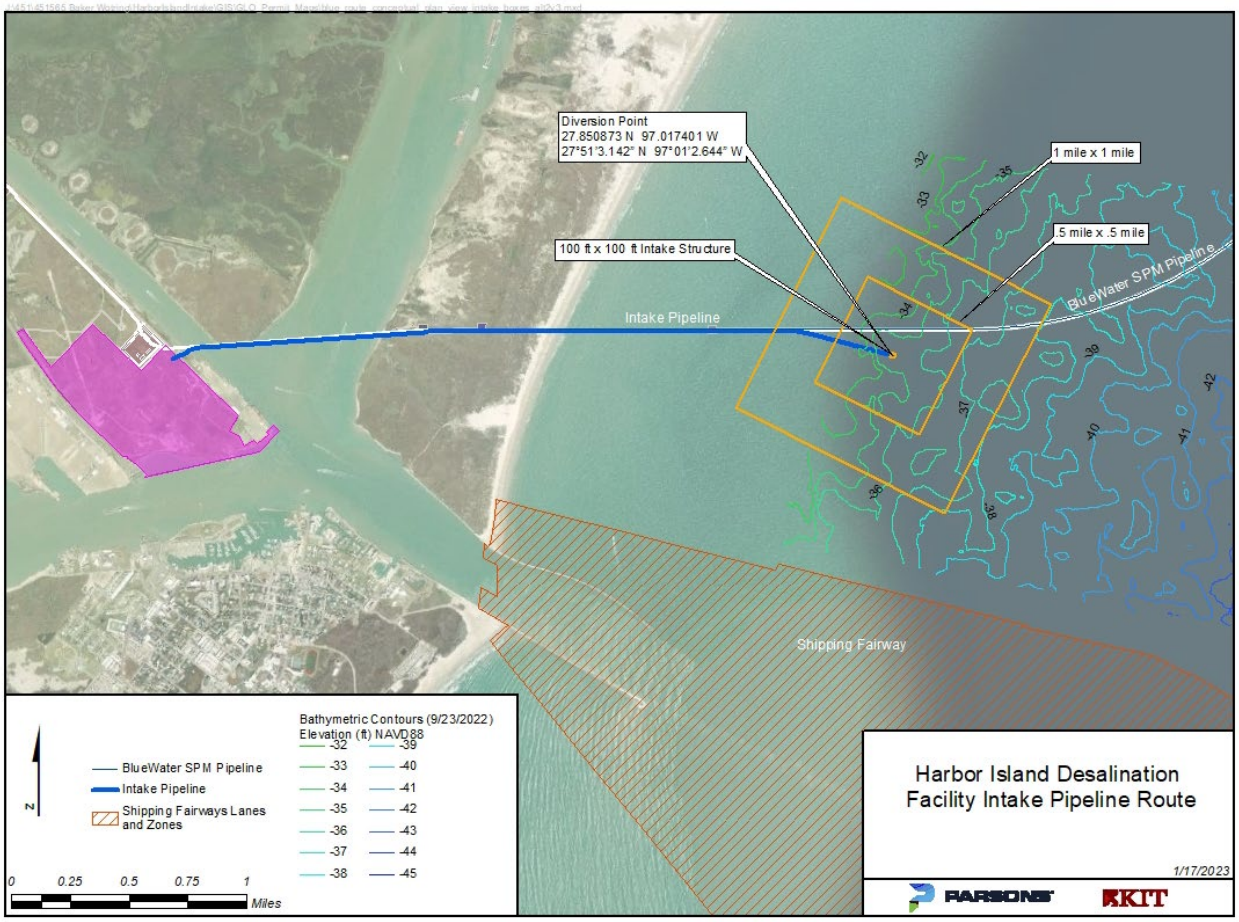


Figure 1a. Proposed Seawater Intake Pipeline Location

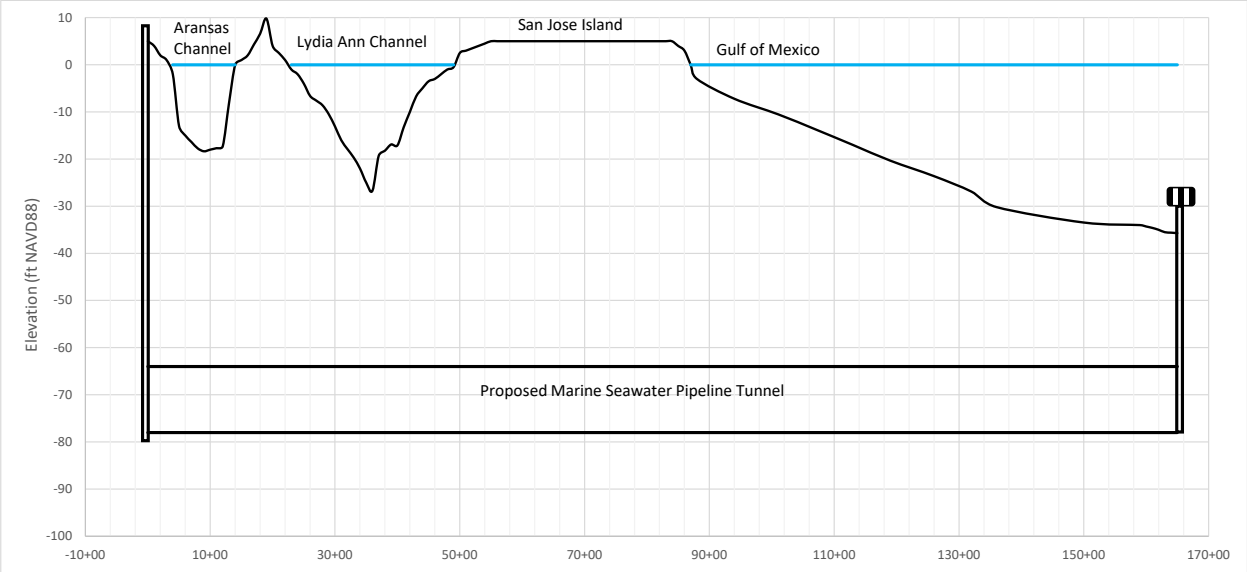


Figure 1b. Profile of Proposed Seawater Intake Pipeline

4.2 Seawater Intake Structure

For an initial production of 50 mgd, the intake structure will have a manifold arrangement with approximately four to five branches[1] to the velocity caps. All the branches will be evenly spread approximately 30 ft apart to obtain even flow distribution without interference from each other. The intake opening will be approximately 5 to 10 ft above the sea bed to minimize the potential for sediments or benthic organisms to be drawn into the intake structure. The velocity cap opening will be designed to have ≤0.5 ft/sec entrance velocity to reduce the intake of fish and other marine organisms into the intake and mitigate impingement. Figure 2 shows the typical structure of a single velocity cap. Figures 3 and 4 show the plan and section of the velocity cap array, respectively. It is anticipated that all intake piping will be placed underground with only the velocity caps and a riser pipe above the sea bed. The riser pipes from each velocity cap tie-in to a common discharge box and convey water flow to Harbor Island through a large-diameter gravity pipeline as explained in Section 4.3.

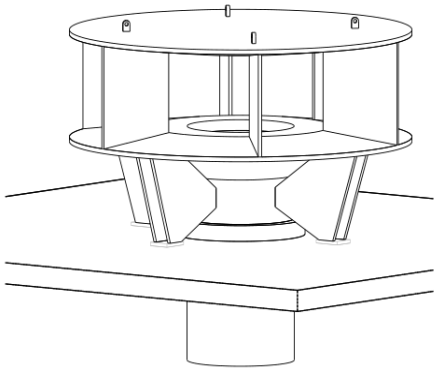


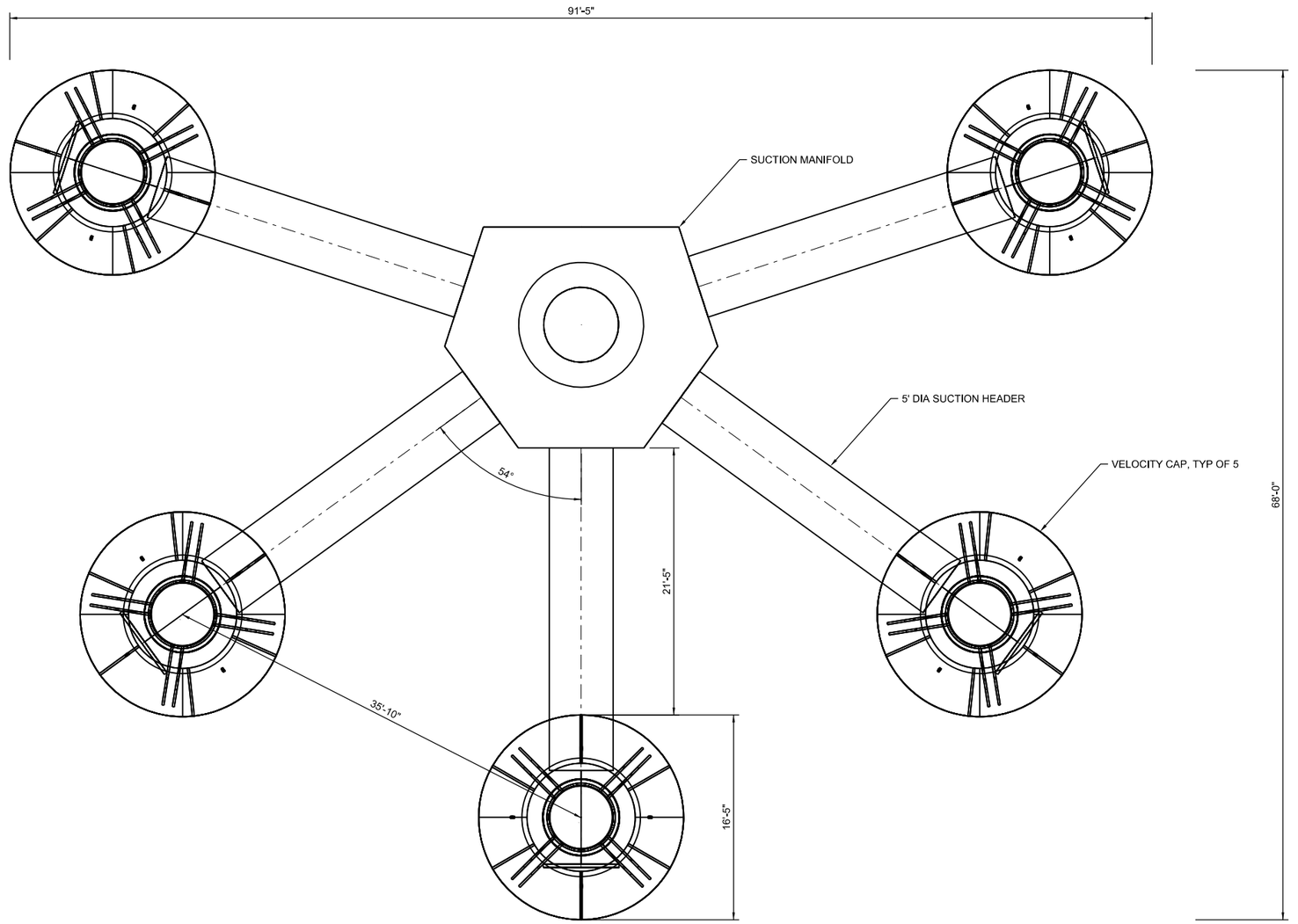
Figure 2. Velocity Cap

For the potential expansion that would increase the intake capacity to 312 mgd, a second manifold structure would be constructed in parallel. Having two intake structures each of approximately 156 mgd capacity will provide redundancy and make maintenance more efficient.

[1] The number, size, and spacing of velocity caps may be adjusted to meet the design velocity requirement and prevent flow interference. The final design will be based on manufacturer's specifications and recommendations.

GENERAL NOTES

1. DIMENSIONS PRESENTED FOR PRELIMINARY LAYOUT AND APPROXIMATE SIZING ONLY. NOT INTENDED FOR CONSTRUCTION.



PLAN
3/16"=1'-0"

WARNING
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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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TBPE Firm Registration No. F-4991

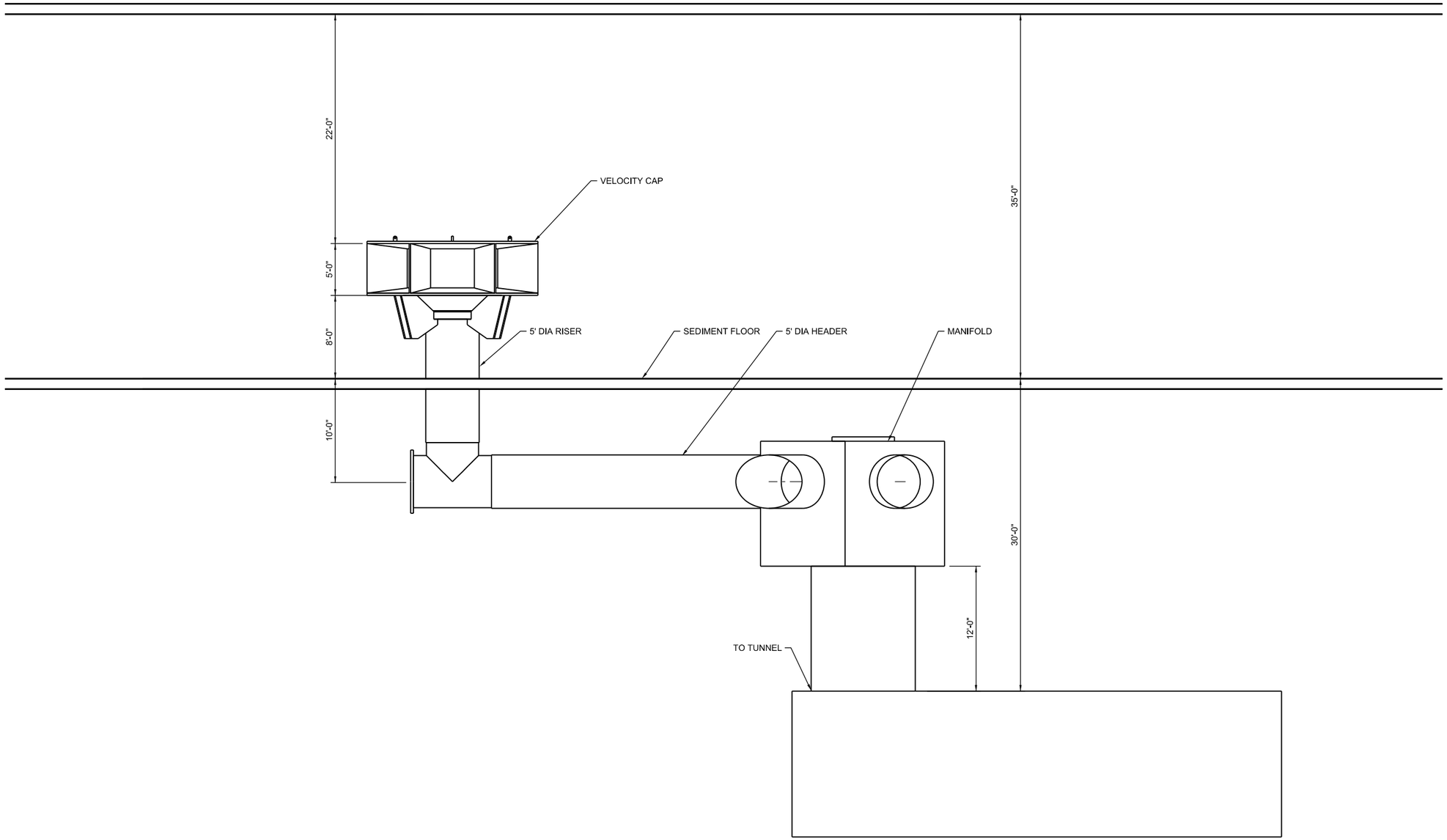
PORT CORPUS CHRISTI

PORT OF CORPUS CHRISTI
PROPOSED INTAKE FOR DESALINATION PLANT
BASIS OF DESIGN REPORT
HARBOR ISLAND, CORPUS CHRISTI, TEXAS

FIGURE 3
INTAKE AND MANIFOLD PLAN
OCT 2022

GENERAL NOTES

1. DIMENSIONS PRESENTED FOR PRELIMINARY LAYOUT AND APPROXIMATE SIZING ONLY. NOT INTENDED FOR CONSTRUCTION.



SECTION
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PORT CORPUS CHRISTI

PORT OF CORPUS CHRISTI
PROPOSED INTAKE FOR DESALINATION PLANT
BASIS OF DESIGN REPORT
HARBOR ISLAND, CORPUS CHRISTI, TEXAS

FIGURE 4
INTAKE AND MANIFOLD SECTION
OCT 2022

4.3 Pipeline

Seawater will be delivered to the Harbor Island Facility by means of a large-diameter pipeline of approximately 14 ft tunnel outer diameter and 12 ft inner diameter.

4.3.1 Pipeline Geometry

The pipeline route and alignment are proposed to follow the alignment of the pipeline project called "Bluewater Texas Terminal" (Bluewater). The Bluewater alignment travels roughly due east from Harbor Island, very near the proposed Facility. The Harbor Island intake pipeline will follow the Bluewater alignment for approximately 2.7 of its total 3.1 miles before the alignments separate approximately 0.4 miles from the intake, as shown in Figure 1a. The proposed alignment runs beneath two maritime channels, a privately owned island, and the GOM sea bed. The pipeline will be constructed by trenchless construction (tunnel boring), a common construction method for large diameter pipelines below the sea bed.

At sea, the trenchless construction method generally recommends that the tunnel be constructed at least two tunnel diameters below the sea bed in potentially unstable substrates. The sea bed elevation at the intake location is approximately -35 ft NAVD88. Pending completion of a geotechnical survey, the top of the 14-ft tunnel is expected to be at approximately –64 ft NAVD88[2]. Additionally, the Army Corps of Engineers recommends a minimum clearance of 20 feet below the authorized project depth of 12 feet below mean lower-low water (MLLW) in the Lydia Ann Channel, a segment of the Gulf Intracoastal Waterway. At the proposed top of tunnel elevation of approximately -64 ft NAVD88, the tunnel will easily meet that clearance.

4.3.2 Flowrate

To produce 50 mgd of desalinated water, the desalination process requires a source water intake flowrate of 150.7 mgd. To produce 100 mgd at 40% recovery, the desalination process requires 301.4 mgd of source water. The tables below illustrate the mass balance calculation utilized to estimate the flowrates of the intake and the discharge.

In addition to the flows required for the desalination processes, additional flow is required to operate the marine life protection screens, return systems and debris removal off the screens. These operations require an additional 5.3 mgd for production of 50 mgd of desalinated water and 10.6 mgd for production of 100 mgd.

Characteristics – 50 mgd product water	Desalination Plant Intake	Desalination Production	Desalination Plant Effluent	Units
Total required intake flowrate:	150.7			mgd
Marine life screening and return	5.3			mgd
Total intake and pipeline flowrate	156			mgd
Production flowrate (desalinated water):		50.0		mgd
Recovery rate of desalination process:		40		%
Reject flowrate:			75.0	mgd
Other waste flows:			20.6	mgd
Permitted Outfall flowrate:			95.6	mgd

[2] If geotechnical sampling along the entire alignment indicates that the substrate does not pose risks, the tunnel elevation may be adjusted to be slightly shallower,

The design flow rate for initial production of 50 mgd is 156 mgd, or 175,000 acre-ft/year. Various units for this flow rate are used for different calculations and in different fields in the water rights permit application. 156 mgd is equivalent to 109,000 gpm which is equal to 242 cubic feet per second (cfs).

An expansion to 100 mgd production would require an intake flow rate double of that described above, as shown below.

Characteristics – 100 mgd product water	Desalination Plant Intake	Desalination Production	Desalination Plant Effluent	Units
Total required intake flowrate:	301.4			mgd
Marine life screening and return	10.6			mgd
Total intake and pipeline flowrate	312			mgd
Production flowrate (desalinated water):		100.0		mgd
Recovery rate of desalination process:		40		%
Reject flowrate:			150.0	mgd
Other waste flows:			41.2	mgd
Permitted Outfall flowrate:			191.2	mgd

The intake flow would be 312 mgd (350,000 acre-ft/year), a flow whose equivalent values are 217,000 gpm and 484 cfs.

4.4 Intake Screen System

The pipeline will convey seawater to the Harbor Island Facility. To protect marine life and minimize impingement and entrainment, a traveling marine life screen and return system will be installed at Harbor Island. The screen and return structure will consist of troughs on the traveling screens and a seawater spray system to gently wash any marine organisms, including fish, off the screens and return them to the Aransas Channel. A schematic of the screens with seawater spray system is shown in Figure 5.

4.4.1 Traveling Screens with Marine Life Handling System

The intake pipeline conveys seawater into the pipeline exit well, from which seawater flows to an intake bay. The intake bay then feeds the seawater to 2 to 4 screen channels. Each screen will be approximately 8 to 10 ft wide and will be equipped with a traveling screen. Figures 6a and 6b show the preliminary configuration of the screening facility. Final design of approach velocity, width, depth, and number of screens will be conducted at a later stage of the project.

The screens will have revolving wire mesh panels with 2 to 6 mm openings to capture larvae along with any juvenile or larger fish as well as debris. The screens collect and remove fish and debris as the wire mesh panels rise out of the seawater. Fish trays are installed on the screens to humanely capture marine organisms as they are lifted from the seawater. The screens will be equipped with low pressure jet sprays to gently discharge the screened marine organisms to a fish trough that returns them back to the Aransas Channel. After the marine organisms are transferred to the fish trough, high-pressure jet sprays eject debris from the screens.

Additional screen channels and equipment will be added as needed for expansion for production of 100 mgd of desalinated water.

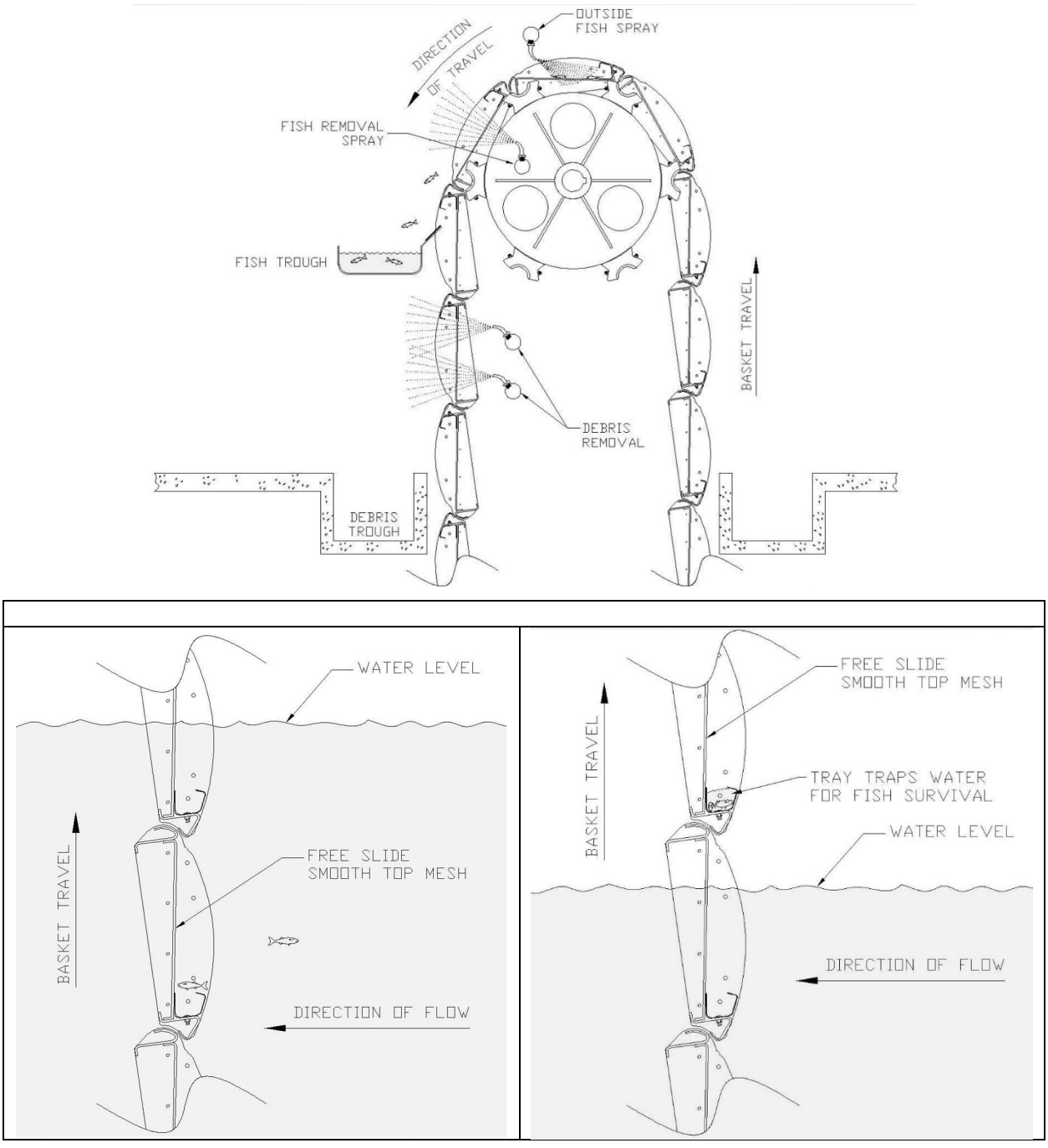

Figure 5. Traveling screen sketch and illustration of fish removal

4.4.2 Transfer Pumps & Controls

A pump station will be installed downstream of the screens to pump the seawater to the Facility. The individual capacity and number of pumps will be selected during the design based on the location, configuration, and any design requirements of the Facility. The pumps will be constructed of materials able to handle seawater. The pumps will discharge to a common force main that will deliver screened seawater to the desalination treatment systems.

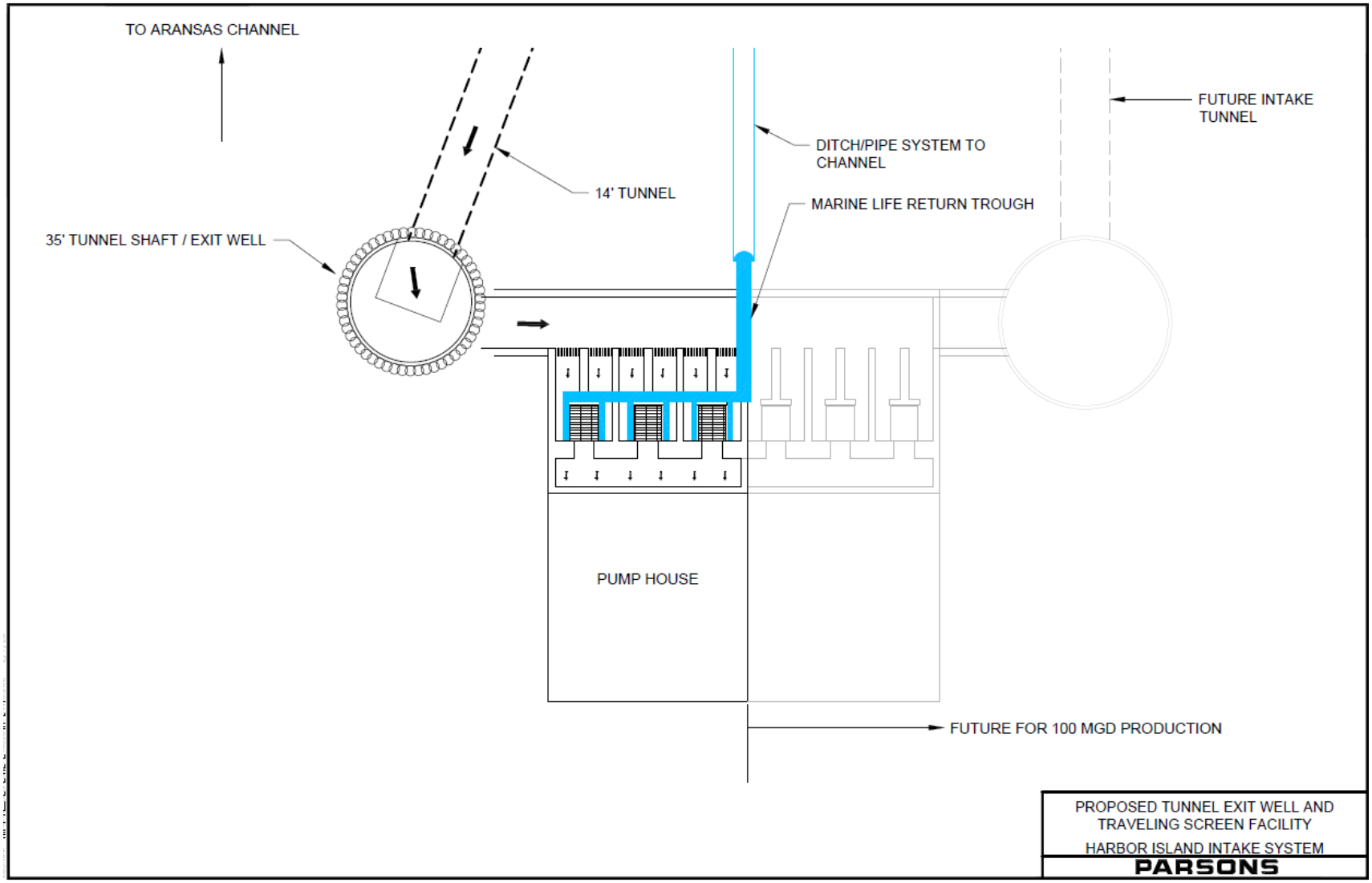

Figure 6a. Plan View of Proposed Marine Life Screening Facility

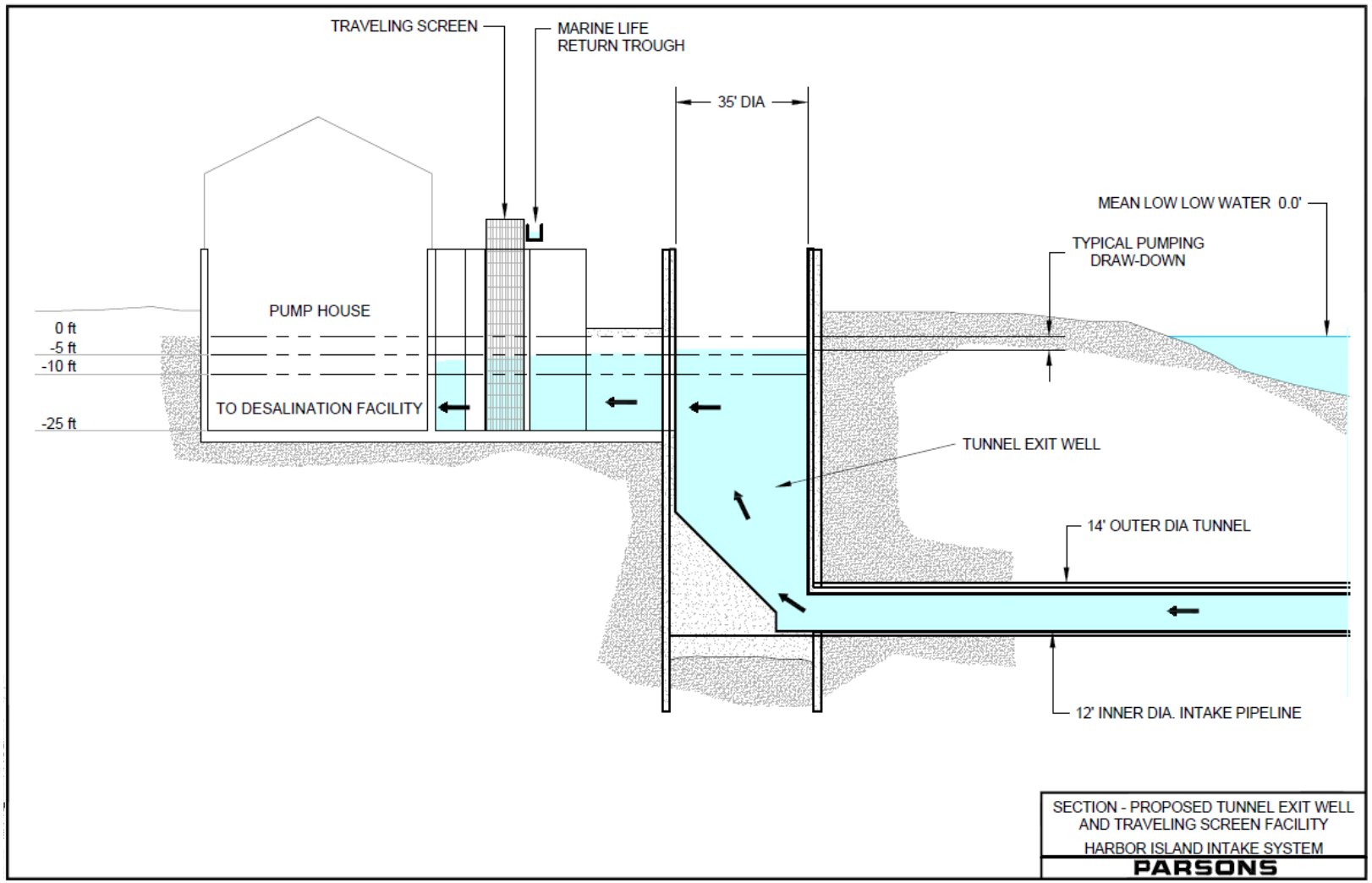

Figure 6b. Cross-Section of Proposed Marine Life Screening Facility

5 Conclusion

The offshore intake system will divert 175,000 acre-ft/year (156 mgd) of State Water to the proposed 50 mgd production capacity desalination Facility on Harbor Island and will be expandable up to 350,000 acre-ft/year (312 mgd). The intake system consists of a manifold of velocity cap intakes, a large diameter gravity pipeline to the on-shore screen structure, traveling screens with marine life return system, and transfer pumps. The intake structure will be designed to minimize impingement and entrainment of marine life. The information provided in this memo is preliminary and intended for planning and permitting purposes. Specific products, dimensions, and materials will be selected in the final design. The final design philosophy plans and specifications will be consistent with the assumptions and descriptions in this report.

6 References

Holt, J., R. Godbout, and C.R. Arnold. 1981a. Effects of temperature and salinity on egg hatching and larval survival of red drum, *Sciaenops ocellata*. Fishery Bulletin United States, National Marine Fisheries Service. (2012) v.79 (3): 569-573.

U.S. Environmental Protection Agency (USEPA). 2006. Technical Development Document for the Final Section 316(b) Phase III Existing Facilities Rule. EPA-821-R-06-003. Office of Water, Washington, DC.

ATTACHMENT F

IMPINGEMENT & ENTRAINMENT REPORT

Evaluation of Potential Impingement and Entrainment Associated with the Intake Structure for the Proposed Harbor Island Desalination Facility

Prepared for

Port of Corpus Christi Authority of Nueces County, Texas

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February 13, 2023

CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

AUF	area use factor
bgd	billion gallons per day
CCSC	Corpus Christi Ship Channel
CWIS	cooling water intake structure
EFH	essential fish habitat
ELS	early life stages
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
GCOOS	Gulf Coast Ocean Observing System
GMFMC	Gulf of Mexico Fishery Management Council
GOM	Gulf of Mexico
HMS	highly migratory species
HYCOM	Hybrid Coordinate Ocean Model
I&E	impingement and entrainment
IPAC	Information for Planning and Consultation
IQR	interquartile range
MFS	managed fish species
mgd	million gallons per day
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
NAVD88	North American Vertical Datum of 1988
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
Port Authority	Port of Corpus Christi Authority of Nueces County, Texas
PINS	Padre Island National Seashore
ppt	part per thousand
SCL	straight carapace length
SEAMAP	Southeast Area Monitoring and Assessment Program
T&E	threatened and endangered

TABS	Texas Automated Buoy System
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TL	total length
TPWD	Texas Parks and Wildlife Department
TXGLO	Texas General Land Office
TXNDD	Texas Natural Diversity Database

EXECUTIVE SUMMARY

This report evaluates the potential for impingement and entrainment (I&E) of marine life due to the operation of an intake structure ("intake structure" or "project area") located in the Gulf of Mexico (GOM) approximately 1.3 miles from San Jose Island in Nueces County, Texas. This intake structure will provide feed water to a proposed desalination facility to be built on Harbor Island adjacent to the Corpus Christi Ship Channel (CCSC). Prior to entering the desalination facility, this feed water will flow through traveling screens designed to collect marine life before returning them to the Aransas Channel. The evaluation of potential I&E for this facility is, by default, qualitative because the facility does not yet exist and site-specific I&E data are not available. The evaluation proceeds as follows:

- Describe the major physical variables and salinities in the GOM Offshore[1] of San Jose Island. These variables consist of depth, substrate composition, seasonal water temperature profiles, and the prevailing direction and intensity of the tidal currents. These features determine the kinds of marine species that may live, feed, migrate, or spawn in the vicinity of the project area. (Note: "the vicinity of the project area" is defined for the purpose of this report as a 1.5- by 1.5-mile square centered on the location of the intake structure).
- Describe the intake structure located in the GOM. This intake structure is comprised of four or five velocity caps, risers and lateral pipes, and a manifold connecting the caps to a sub-sea intake tunnel to Harbor Island. The description covers major operational considerations regarding height of the water intakes, height of the velocity caps above the GOM sea bed and below the GOM surface, volume of State Water to be diverted, velocity of the State Water at the velocity caps' entrances, hydraulic zone of influence, and the proposed screening system at the proposed Harbor Island facility. The evaluation includes a simple volumetric comparison to provide a broader perspective on the potential intake of ichthyoplankton when viewed on a larger spatial scale. The analysis shows that the number of ichthyoplankton in the vicinity of the project area is anticipated to be between 100,000 and 1,000,000 times higher than the ichthyoplankton that may be present within the velocity caps. This analysis should be viewed as conservative for those species with positively buoyant or demersal early life stages that are unlikely to interact with the intake structure due to their position at the top or the bottom of the water column. The conclusion is that any incidental withdrawal of ichthyoplankton by the intake structure should be considered minor relative to the vastly greater numbers of fish eggs and larvae in the vicinity of the project area.

[1] For purposes of this report, the term "Offshore" means the area of the Gulf of Mexico beyond the Texas Gulf shoreline, excluding a bay or arm of the Gulf of Mexico. This term may differ from the same or similar terms as used in the Texas Water Code, Texas Administrative Code, or other laws or rules.

- Identify and describe the species and their life stages likely to be in the GOM Offshore of San Jose Island. This process describes not only what species may occur (over 600), but also particular species of concern; including threatened and endangered species, highly migratory species, managed fish species, commercially important species, and recreationally important species. Eleven target species of fish and invertebrates were selected to provide a more detailed evaluation of the intake structure's potential impacts, if any, upon these selected groups of species. Finally, the information is combined to perform an evaluation on the potential for I&E of these various groups of species.
- The results of this assessment can be summarized as follows:
  - Of the 28 threatened and endangered species that may be in proximity of the velocity caps, the neritic (i.e., residing over the shallow continental shelf) juveniles of the five species of endangered sea turtles have some increased relative potential for I&E in the absence of mitigating measures. This potential is estimated to be minimal based on an area use factor (AUF) approach that considers the relatively large home range of the neritic sea turtles as compared to the small area occupied by the velocity caps.
  - Because of the sea turtles' protected status, the velocity cap openings will be shielded with bar screens to prevent juvenile turtles from entering the intake structure. This solution will also preclude adult sea turtles from entering the intake structure.
  - Only 1 of the 10 highly migratory species (i.e., sailfish) has eggs and larvae that might potentially be drawn into the intake structure, but those early life stages do not occur in the vicinity of the project area. The remaining nine highly migratory species that may be present in the vicinity of the project area are all sharks that give birth to fully formed and strongly swimming pups that are unlikely to experience I&E.
  - The majority of the 17 managed fish species that may potentially be present in the vicinity of the project area, as well as all of the 11 target species of fish and invertebrates, have one or more early life stages that show potential for I&E. However, withdrawals of these life stages into the intake structure will be relatively small compared to the great number of eggs and larvae (several orders of magnitude higher) present in the vicinity of the project area that will not interact at all with the intake structure.

The following components will be implemented based on all these considerations: a) place the water intake structure approximately 1.3 miles in the GOM at 5 to 10 ft above the sea bed in approximately 35 ft of water to limit interaction with marine life, b) set the entrance velocity at the velocity caps to ≤0.5 ft/s to reduce the potential withdrawal of eggs and larvae, c) enclose the velocity caps with 3-in. mesh size bar screens to prevent incidental entrance by juvenile and

adult sea turtles (as well as larger fish), and d) use traveling screens at the proposed desalination facility to support survival.

1 INTRODUCTION

This report describes the potential for impingement and entrainment (I&E) of marine life that may occur due to the operation of a State Water from Gulf of Mexico ("State Water")[2] intake structure ("intake structure" or "project area") located in the Gulf of Mexico (GOM) approximately 1.3 miles Offshore from San Jose Island in Nueces County, Texas. The intake structure will divert State Water to a proposed desalination facility to be built on Harbor Island adjacent to the Corpus Christi Ship Channel (CCSC). The evaluation of the potential for I&E for this proposed facility is, by default, qualitative because the facility does not yet exist and site-specific I&E data are therefore not available.

This report uses the U.S. Environmental Protection Agency (EPA) cooling water intake structure (CWIS) regulatory framework, and the scientific rationale used to develop that framework, to assess the I&E potential at the proposed Harbor Island facility. The reason is the similarities that exist between CWIS in marine environments and the anticipated infrastructure that will be deployed at the facility. It is understood that EPA's CWIS regulations do not apply to the proposed Harbor Island facility, but they provide a useful analytical framework due to similarities in the way the intake structures operate. This report also uses the more generic term "I&E" when addressing the consequences of all fauna that may potentially be withdrawn by the intake structure in the GOM.

Though not directly applicable to the proposed intake structure in the GOM, EPA regulations pertaining to CWIS provide the following definitions for I&E:

- **Impingement**: The entrapment of any life stages of fish and shellfish on the outer part of an intake structure or against a screening device during periods of intake water withdrawal.[3]
- **Entrainment**: Any life stages of fish and shellfish in the intake water flow entering and passing through a CWIS and into a cooling water system, including the condenser or heat exchanger.[4] (Note: this definition calls out specific CWIS infrastructure, but the principles of entrainment—i.e., passage through a screening device—are the same for desalination facilities.)

This section describes the general site location, the overall approach used to assess the potential for I&E by marine life in the GOM, and the report outline.

[2] For purposes of this report, the term "State Water" means water derived from the Gulf of Mexico or a bay or arm of the Gulf of Mexico. This term may differ from the same or similar terms as used in the Texas Water Code, Texas Administrative Code, or other laws or rules.

[3] 40 CFR 125.92(n)

[4] 40 CFR 125.92(h)

1.1 GENERAL SITE LOCATION

The Port of Corpus Christi Authority (Port Authority) is proposing to build a State Water desalination facility on Harbor Island adjacent to the CCSC across from Port Aransas, Nueces County, Texas. The Port Authority is also working to obtain a water rights permit from the Texas Commission on Environmental Quality (TCEQ) to gain permission to divert 156 million gallons per day (mgd) (expandable to 312 mgd in the future) of State Water from an area in the GOM located approximately 1.5 miles to the northeast of the entrance to the Aransas Inlet jetty for use in desalination. **Figure 1-1** shows the general location of the proposed Harbor Island desalination facility, the intake structure (also defined as "the project area"), the vicinity of the project area (note: "the vicinity of the project area" is defined for the purpose of this report as a 1.5- by 1.5-mile square centered on the location of the intake structure), and the intake tunnel that will bring State Water from the intake structure to the desalination facility.

This report characterizes the potential for I&E of marine life that may be present in the vicinity of the project area. Such an evaluation requires detailed information on key components, such as salinity, major physical characteristics of the proposed location (e.g., water temperature, depth, substrate composition, tidal currents), general biological diversity, commercial and recreational fisheries, life stage considerations (e.g., reproductive strategies), and presence of state or federal listed species. An additional line of evidence consists of reviewing I&E data reported by other facilities located in Texas in or near the GOM that withdraw surface water for cooling purposes. All of this information is publicly available online.

The goal of this effort is to describe the potential for and extent of I&E that might occur as a result of the proposed diversion of State Water from the project area for use in desalination. That assessment is based on a review of broad environmental conditions, the life histories of target species with sensitive life stages (e.g., presence of ichthyoplankton in the GOM), and a general understanding of the design and operation of the intake structure itself.

1.2 REPORT OUTLINE

The remainder of the report is organized as follows:

- Section 2 describes the major physical characteristics, salinities, and the prevailing hydrology and geomorphology expected in the GOM Offshore of San Jose Island.
- Section 3 describes the intake structure in terms of its location, various design features, and expected function. It also assesses the hydraulic zone of influence of the intake structure's velocity caps, and evaluates that information in a broader biological context.
- Section 4 describes the major biological characteristics of marine life that may be present in the vicinity of the project area. This information includes a list of expected species of zooplankton, other invertebrates, and fish; the presence of threatened and endangered

(T&E) species and species of special concern; and 11 targeted species of invertebrates and fish specifically selected for a detailed life history analysis to assess their potential for I&E.

- Section 5 evaluates the potential for I&E by the various groups of species presented in the previous section.
- Section 6 lists the references cited in this report.

2 SOURCE WATER DATA

This section describes the physical characteristics, range of salinities, and hydrological and geomorphological conditions of the coastal waters at or near the project area.

The National Oceanic and Atmospheric Administration (NOAA) collects water-level data from monitoring Station 8775241 located in the GOM at the Aransas Inlet. TCEQ collects salinity and water temperature data from monitoring Station 13468, also located in the GOM at the Aransas Inlet. Additional data were obtained from metocean Buoy D of the Texas Automated Buoy System (TABS) maintained by Texas A&M University in partnership with the Texas General Land Office (TXGLO) (see **Figure 2-1** for the buoy locations). Data from the TABS buoy was sourced through the Gulf Coast Ocean Observing System (GCOOS[5]). Aransas Inlet with the NOAA and TCEQ monitoring stations lies approximately 1.5 miles to the southwest of the project area. The TABS Buoy D is found approximately 12 miles to the northeast of the project area and 6.3 miles Offshore in the GOM. Of note, the depth of the salinity sensor on the TABS buoy is unknown, but is assumed to be located at the same depth as the temperature sensor, which is placed 6.6 ft below the surface. Both the salinity and temperature data collected from the TABS buoy are referred to below as surface salinities and surface temperatures.

2.1 PHYSICAL CONDITIONS AND SALINITIES

The following sections outline the range of physical conditions and salinities observed around the project area based on field-collected data.

2.1.1 Depth

The mean depth at the location of the intake structure is approximately 35 ft. Tides and storm events will cause the ocean surface elevations to vary. Stated tidal datums extend +0.49 ft at mean high water to −0.62 ft at mean low water relative to the North American Vertical Datum of 1988 (NAVD88).[6] The graph on the left in **Figure 2-2** shows the available raw water levels from NOAA monitoring Station 8775241 in the GOM at Aransas Inlet relative to the mean surface level for measurements taken every 6 minutes between 2016 and 2022.[7] The measured water elevations highlight the range of water levels experienced in the vicinity of the project area. These data indicate that water levels tend to be above the mean sea level elevation. This apparent deviation from the norm could be due to localized winds creating a water level set-up. The panel on the right in **Figure 2-2** is a box-and-whisker chart showing the median level;

[5] https://data.gcoos.org/

[6] https://tidesandcurrents.noaa.gov/datums.html?datum=MSL&units=0&epoch=0&id=8775241&name=Aransas%2C+Aransas+Pass&state=TX

[7] https://tidesandcurrents.noaa.gov/stationhome.html?id=8775241

elevations of the 25th and 75th quartile, between which 50% of the data fall; outliers; and minimum and maximum values (shown by the whiskers) that are not considered outliers. The difference between the 75th and 25th quartile is called the interquartile range (IQR). Outliers are defined as either greater than 1.5*IQR+75th percentile or less than 25th percentile-1.5*IQR.

2.1.2 Salinity

TCEQ collected 380 salinity measurements from monitoring Station 13468 in the GOM at the Aransas Inlet at uneven time intervals from 1989 through 2022. TCEQ obtained readings both at the surface and as profiles within the water column, depending on the prevailing conditions at the time of measurement. The reported salinities (individual and profile combined) range from a low of 14 parts per thousand (ppt) in February of 2003 to a high of 42.2 ppt in August of 2001. The mean salinity across depth over the 42-year monitoring period is 30.14 ppt, with a median of 30.75 ppt. The large salinity variations may be attributed to the influence of tidally-driven water exchanges between the Corpus Christi Bay/Aransas Bay system and the nearby GOM via the Aransas Inlet. By itself, this salinity profile may not fully reflect the actual conditions at the project area. **Figure 2-3** summarizes the monthly variations in the surface water salinities in the GOM at the Aransas Inlet between 1989 and 2022.

The TABS Buoy D farther out in the GOM measured surface salinities between 2011 and 2019 at 30-minute intervals, but with intermittent disruptions that produced data gaps of various lengths. Surface salinities ranged from below 20 ppt to above 36 ppt (**Figure 2-4**). Low surface salinities that far out in the GOM could be due to periodic heavy rainfalls that temporarily dilute the prevailing salinity levels near the surface. Regardless, the data show marked seasonal fluctuations, with the highest surface salinities systematically measured during the summer months. **Figure 2-5** presents ranges of monthly surface salinities at TABS Buoy D. The box and whiskers are derived from the data for each month across the 10+ year record. Spurious outliers were removed from the data set during the data quality review process.

The salinity data collected in the GOM both at Aransas Inlet and 6.3 miles from shore bound the project area to the north and the south and indicate that salinities could range from below 20 ppt to above 40 ppt, but with average salinities in the low- to mid-30 ppt.

2.1.3 Temperature

TCEQ obtained 536 water temperature readings intermittently between 1969 and 2022 from the same station in the GOM at the Aransas Inlet as the salinity measurements. **Figure 2-6** summarizes the monthly variations in the surface water temperatures over the monitoring period in the GOM at the Aransas Inlet. Depending on site conditions, these values represent a composite of single-point measurements or vertical profiles throughout the water column. Based on the data set, the water temperatures across all depths ranged from a low of 10.1°C in January 2010 to a high of 31.3°C in August 2007. The mean water temperature equals 22.5°C,

with a median temperature of 22.8°C. These large temperature ranges at the Aransas Inlet may not fully reflect the actual conditions around the project area.

TABS Buoy D farther out in the GOM has collected water temperatures at 30-minute intervals since 1995, but with periodic disruptions. The sensor is located about 6.6 ft below the surface. Therefore, for this report, the data are considered to represent water temperatures at the surface. The data show a strong seasonal pattern, with the highest summer temperatures reaching above 30°C (86°F) and the lowest winter temperatures dropping close to or below 10°C (50°F) (**Figures 2-7** and **2-8**). Data are not presented for 2010 and 2011 and were removed along with outliers deemed to be caused by instrument failure or aberrant data patterns identified during the quality control process.

The TCEQ and TABS temperature data sets suggest that the GOM water temperatures experience similar seasonal ranges, with maximum values at both locations exceeding 30°C and minimum values around 10°C.

2.2 HYDROLOGICAL AND GEOMORPHOLOGICAL CONDITIONS IN THE GULF OF MEXICO AROUND THE PROJECT AREA

The prevailing tidal currents and substrate composition are two important variables that can affect the movement of zooplankton through the water column and the presence or absence of certain species of fish or invertebrates that have specific habitat requirements. These two variables are further discussed below.

2.2.1 Hydrology

Researchers from Texas A&M University collected hydrodynamic data from the Bob Hall Pier located in the GOM across from North Padre Island to characterize tidal currents along the coast (Tissott et al. 2015). These researchers deployed acoustic doppler current profilers to capture a range of velocities extending away from the pier. Johnson (2008) also characterized current patterns within the GOM; however, at the time of this writing, access to the data collected and characterized in those studies was not available to make inferences about the project area.

Hydrodynamic conditions are governed by tides and regional circulation patterns. The project area will be located approximately 1.3 miles from the shore. This proximity to the coast limits the direction that currents can travel in that general area and causes the internal mixing processes to produce relatively uniform properties within the water column. Tidal conditions in the project area are predominantly alongshore following the angle of the coast.

Hydrodynamic current data from the TABS Buoy D, located to the northeast of the project site, were analyzed for this study and indicate predominant directions aligning with the coast

northeast (50°) or southwest (217°) (**Figure 2-9**). The TABS Buoy D current data are collected 6.6 ft below the surface and have been reported every 30 minutes over a 27-year period. Velocities ranged in magnitude from 0 m/s during slack tide to greater than 0.8 m/s, and in outlier cases exceed 1 m/s. Median current speeds varied by month (**Figure 2-10**). Median values exceeded the intake velocity in all months but August. **Figure 2-11** shows that current direction also varied by month. The predominant current direction is to the southwest in the winter, transitioning to the northeast in the summer and back to the southwest in the fall. As with the temperature and salinity data, the velocity data went through a quality control process to remove anomalous data prior to analysis.

2.2.2 Geomorphology

The location of the intake structure is approximately 1.3 miles from shore, in an area of the GOM characterized as relatively flat, with gradual bathymetric change as distance from shore increases. Bed sediment is predominantly sand in the vicinity of the project area (**Figure 2-12**). For reference, sand has a nominal grain size of 62.4 to 2,000 microns whereas silts and clays have grain sizes below 62.4 microns. In deeper areas beyond the project area, bed conditions transition to a mixture of sand and finer materials, including silt and clay.

3 STATE WATER INTAKE STRUCTURE

This section describes the intake structure that will be used to divert State Water from the GOM for treatment in the proposed desalination facility on Harbor Island. Even though the final design is not yet available, the performance is expected to be consistent with the following descriptions.

3.1 GENERAL DESCRIPTION

The proposed desalination facility on Harbor Island will require up to 156 mgd of State Water initially, and could be expanded to up to 312 mgd in the future. The intake structure provides entrances for State Water diversion from the GOM. That water is then drawn through an intake tunnel to a pipeline exit well near the Harbor Island desalination facility to serve as feed stock to produce fresh water. As shown in **Figure 1-1**, the project area will be located approximately 1.3 miles from shore, and approximately 1.5 miles to the northeast of the Aransas Inlet jetty. The sea bed at the proposed location is approximately 35 ft deep below mean lower low water, and the intake structure placement will allow for about 20 to 25 ft of water overlying the velocity caps, depending on the final height of the five vertical riser pipes.

EPA considers water intakes placed 410 ft outside of the littoral zone to be a good engineering practice to reduce I&E (USEPA 2000, 2014). The littoral zone extends 600 ft from the shore, resulting in a distance of at least 1,010 ft from the shore available to help reduce environmental impacts (USEPA 2000, 2014; WateReuse Association 2011). Installing intakes to depths that have lower abundance of marine life has also been suggested to decrease environmental impacts associated with intake operations (USEPA 2014; WateReuse Association 2011). The proposed intake structure would be located well beyond 1,010 ft from shore and at depths that will help reduce interaction with marine life.

3.2 OPERATION

Based on available design considerations and calculations, the intake structure is planned to have the following general features.

- Water will be diverted from the GOM via four or five evenly spread, 5-ft-diameter vertical riser pipes (each affixed with a velocity cap), located a minimum of 30 ft apart and organized in a radial arrangement to generate an even flow distribution without interference from each other. All the water will converge via individual 5-ft-diameter suction headers into a common suction manifold (see **Figure 3-1**). From the common manifold, the State Water will flow via a single, large-diameter, 3.1-mile-long intake

tunnel to the proposed desalination facility. All the intake piping is planned to be placed underground with only the velocity caps and 5 to 10 ft of vertical riser above the sea bed.

- The water velocity at the point of entrance into the velocity caps will be ≤0.5 ft/s. The water in the intake tunnel will flow at a maximum volume of approximately 242 ft^3/s and an estimated speed of between 2 and 4 ft/s at full capacity. At these velocities, and based on the 3.1-mile length of the intake tunnel, the State Water will take between 1 hour and 8 minutes and 2 hours and 16 minutes to travel from the location of the velocity caps to the pipeline exit well on Harbor Island.
- The entrances of the velocity caps will be placed from 5 to 10 ft above the sea bed to minimize the withdrawal of sediment particles or benthic marine life from below.
- Each vertical riser pipe will be fitted with a velocity cap approximately 16 ft in diameter and 5 ft in height. This structure is designed to minimize the withdrawal of juvenile and adult life stages of marine life present in the water column. A velocity cap is a horizontal cover placed over an intake pipe that redirects vertical flow into a more horizontal flow (USEPA 2011). Juvenile and adult fish have difficulty detecting, and therefore avoiding, vertically oriented currents but readily perceive horizontal flows. Hence, fish can easily swim away from a horizontal current field, thereby reducing the probability of being withdrawn by a water intake. Early life stages (ELS) of free-floating eggs and larvae cannot distinguish flow characteristics and also lack the swimming ability to avoid being withdrawn by the intake. However, a velocity cap minimizes the withdrawal of eggs and larvae that may be present above or below the entrances by changing the flow direction so that water is not pulled vertically. EPA considers that water intakes located away from shore and fitted with velocity caps meet the impingement performance requirements of the Clean Water Act Section 316(b) 2014 Phase II Rule for Existing Facilities, defined as an annual reduction in impingement mortality of 76% or greater (see 40 CFR § 125.94(C)(4)). While not directly applicable to the proposed desalination facility, EPA's regulatory framework for CWIS provides useful guidance for evaluating the potential for I&E at the proposed desalination facility.
- The withdrawal velocity at each velocity cap entrance will be engineered to be ≤0.5 ft/s in order to be consistent with EPA regulatory requirements for I&E for similar facilities in other contexts.[8]
- Three-inch mesh bar screens will be installed at the velocity cap entrances to prevent neritic juvenile sea turtles from entering the intake structure (see Sections 4 and 5 for more details on this subject). These bars will also prevent adult sea turtles and large fish from entering the velocity caps.

[8] https://www.ecfr.gov/current/title-40/chapter-I/subchapter-D/part-125/subpart-J/section-125.94

- Some of the small marine life entering the intake structure may be carried through the intake tunnel to the pipeline exit well that supplies feed State Water to the proposed Harbor Island desalination facility.
- On Harbor Island, all incoming State Water will pass through a system designed to collect marine life and debris before the State Water is processed for desalination. This system may consist of up to four vertical traveling screens containing revolving wire mesh panels with 2- to 6-mm openings. The screens collect and remove marine life and debris as the wire mesh panels rise out of the water. Fish baskets are installed on the screens to humanely capture marine life as they are lifted from the State Water. The screens will be equipped with low-pressure jet sprays to gently discharge marine life to the fish baskets and troughs from where they are sluiced to Aransas Channel. After the marine life is collected, high-pressure jet sprays remove any debris from the screens in a separate follow-up process.

3.3 HYDRAULIC ZONE OF INFLUENCE

3.3.1 Regional Perspective

It is important to place the intake structure, and the potential withdrawal of eggs and larvae by this structure, in a broader context.

Figure 3-2 shows the location of the intake structure in the GOM at 27.850873 N, 97.017401 W in the form of a 100- by 100-ft square, which generically represents the footprint of this intake structure. To provide scale, this figure includes three larger defined areas centered on the project area, with the following dimensions: a) 0.5- by 0.5-mile, b) 1 by 1-mile, and c) 1.5- by 1.5-mile squares. All four squares are rotated 27° from the state plane grid to run parallel to the shoreline.

At any one point in time, the volume of water (and its associated marine life) available to enter the intake structure is the volume of water present within each of the five velocity caps.[9] In other words, only the water present within the five velocity caps is the volume of interest. Each velocity cap represents a cylinder 5 ft high and 16 ft, 5 in. (= 16.42 ft) in diameter, with a radius of 8.21 ft.[10] The volume of a cylinder is calculated using the following formula:

[9] In support of the calculations presented in this section, it is assumed that the intake structure will consist of five velocity caps.
[10] The size of a velocity cap may change slightly because the final design has not yet been completed.

$$V_{cylinder} = \pi * r^2 * h$$

Where:

π = 3.141593
r = radius (8.21 ft)
h = height (5 ft)

Using this formula, the volume of each velocity cap equals 1,058.7812 ft^3, for a total volume of 5,293.906 ft^3 (rounded to 5,294 ft^3) across the five velocity caps. This calculation represents the volume of water that may contain marine life capable of entering the five intake pipes at any one point in time.

The estimated volume of water associated with the larger squares (referred to here as volumetric boxes 1, 2, and 3 for the 0.5- by 0.5-mile, 1- by 1-mile, and 1.5- by 1.5-mile squares, respectively) around the intake structure was calculated in the ArcGIS software environment using the "Polygon Volume" tool of the 3D Analyst extension. The volumes represent the area enclosed within the plane of the squares, referenced at mean sea level (0.93 ft NAVD88), and the sea bed beneath them, referenced to NOAA's continuously updated digital elevation model bathymetry (accessed in September 2022).[11] These estimated volumes are as follows (see **Table 3-1**): volumetric box 1 = 251,085,200 ft^3, volumetric box 2 = 996,730,233 ft^3, and volumetric box 3 = 2,176,520,647 ft^3.

Based on this information, one can determine how the total static volume of water present in the five velocity caps (i.e., 5,294 ft^3) compares to the volume of water present in volumetric boxes 1, 2, and 3 by dividing the latter into the former. These calculations yield the following ratios (see **Table 3-1**):

- Volume in the velocity caps vs. box 1: 5,294 ft^3 ÷ 251,085,200 ft^3 = 0.000021084
- Volume in the velocity caps vs. box 2: 5,294 ft^3 ÷ 996,730,233 ft^3 = 0.000005311
- Volume in the velocity caps vs. box 3: 5,294 ft^3 ÷ 2,176,520,647 ft^3 = 0.000002432.

These ratios can generically be interpreted as follows: for every one egg or larva that may be present in the velocity caps, the following number of eggs and larvae may be present in the three volumetric boxes (assuming homogeneous distribution of the ichthyoplankton throughout the water column):

- Volumetric box 1: 47,429 eggs or larvae (i.e., 1/0.000021084)

[11] Site-specific bathymetric data are available for the area around the location of the intake structure. However, these data could not be used in the calculations because they did not extend shoreward enough to provide all the required depth readings for the 1- × 1-mile and the 1.5- × 1.5-mile volumetric boxes.

- Volumetric box 2: 188,288 eggs or larvae (i.e., 1/0.000005311)
- Volumetric box 3: 411,184 eggs or larvae (i.e., 1/0.000002432).

In other words, assuming an even distribution of eggs and larvae throughout the water column and strictly based on volumetric proportions, the intake structure would contain 1 egg or larva for every 411,184 eggs or larvae found within volumetric box 3. The conclusion is that the effects of any incidental withdrawal of eggs and larvae by the intake structure will be minor given the vastly larger numbers of ichthyoplankton in the vicinity of the project area.

Measured ichthyoplankton density data are required to put these ratios into a more site-specific context. The ichthyoplankton assessment presented in Appendix U of the Deepwater Port license application for the Bluewater SPM Project (Bluewater Texas Terminals LLC 2021b) uses location-specific ichthyoplankton tow data provided by the NOAA National Marine Fisheries Service's (NMFS) Southeast Area Monitoring and Assessment Program (SEAMAP) to estimate the average number of fish eggs and fish larvae present at Station B233 from June through November. This station, which is represented by a 30- by 30-nautical mile block in the GOM off Port Aransas, includes the proposed location for the intake structure. The summer-fall sampling period broadly corresponds with much spawning activity in this area. Fish egg and larvae catch for each sample were aggregated, and divided by the sample VOL FILT parameter to create the sample catch per cubic meter of water filtered (i.e., catch per unit effort or density). For each taxon, larval densities were estimated as arithmetic means across the 24-year time series (1986 to 2014, excepting years where no sampling occurred at Station B233). A statistical distribution was estimated from which the average, as well as the 2.5 and 97.5 percentiles, were identified as the lower confidence limit and upper confidence limit.

Based on the SEAMAP ichthyoplankton surveys conducted by NMFS between 1986 and 2014, the average density of fish eggs and fish larvae at Station B233 equals 0.1388 eggs/ft^3 and 0.2152 larvae/ft^3, respectively. These numbers compare favorably with values presented by Hernandez et al. (2011) who collected fish eggs and larvae in the GOM approximately 10.6 miles off the coast of Alabama in 66 ft of water between April and August 2005. These authors reported an average fish egg density of 0.0697 eggs/ft^3 and an average fish larvae density of 0.203 larvae/ft^3 (note: both the SEAMAP and the Hernandez et al. 2011 studies used 0.333-mm mesh size).

To quantitatively illustrate relative densities, it is assumed that the Bluewater Texas Terminals LLC (2021b) values represent the average fish egg and larvae densities that may be present throughout the water column during spawning season in the vicinity of the project area. The amount of water in the intake structure, in which ichthyoplankton have the potential to be withdrawn from the water column via the velocity caps at any point in time, equals 5,294 ft^3. As outlined earlier, the amount of water in volumetric boxes 1, 2, and 3 equals 251,085,200 ft^3, 996,730,233 ft^3, and 2,176,520,647 ft^3, respectively. Using the ichthyoplankton density data presented above (i.e., 0.1388 eggs/ft^3 and 0.2152 larvae/ft^3; Bluewater Texas Terminals LLC 2021b), and assuming even distribution of eggs and larvae throughout the water column, one

can estimate the number of ichthyoplankton that may be present in the velocity caps and the three volumetric boxes at a particular point in time.

Table 3-2 summarizes the outcome of the calculations. As an example, at average ichthyoplankton densities between June and November, and assuming an equal distribution throughout the water column in the vicinity of the project area, the number of eggs in volumetric box 3 would equal 302,101,066 (i.e., 0.1388 eggs/ft^3 × 2,176,520,647 ft^3), whereas the number of eggs in the five velocity caps would equal 735 eggs (i.e., 0.1388 eggs/ft^3 × 5,294 ft^3). Hence, the number of eggs in volumetric box 3 will exceed the number of eggs in the five velocity caps by 411,022 to 1 (i.e., 302,101,066 ÷ 735). The same calculations apply for the other volumetric boxes, and for the larvae.

This general approach represents another way to show that withdrawal of ichthyoplankton by the intake structure will be extremely minor compared to the high number of fish eggs and larvae present in the vicinity of the project area that will never encounter this structure. Obviously, the GOM is much larger than the 1.5- by 1.5-mile grid used in this example. Eggs and larvae found within this much larger area move into the Aransas Inlet to support recruitment into the bays.

Of note, this analysis is overly conservative for ichthyoplankton that are not evenly distributed within the water column. For example, eggs of red drum and spotted seatrout are positively buoyant at salinities above >25 ppt (Holt et al. 1981a,b). These eggs are therefore expected to float near the surface of the water column in the higher saline GOM, with little or no interaction with the velocity caps located 20+ ft below the surface.

This simplified analysis also does not consider the fact that not all of the eggs and larvae present in the GOM outside of the Aransas Inlet are expected to move through this inlet and into the estuaries for recruitment (Brown et al. 2000, 2004, 2005). The ichthyoplankton that do not enter the inlet and remain in the GOM are not recruited into their respective populations because they will not survive long term or reach reproductive age. This issue is further addressed in Section 5 of this report.

Consideration of the same general information, but in a more dynamic context, provides an alternative perspective, as outlined below.

The initial volume of State Water flowing through the velocity caps on a daily basis equals 156 mgd (or 20,854,167 ft^3/d). The volume of State Water passing through the CCSC near Harbor Island on a daily basis equals 47,000 mgd (or 6,283,007,000 ft^3/d).[12] The 47,000 mgd represents

[12] See Dr. Craig Jones' testimony filed with the State Office of Administrative Hearings on January 12, 2022 (pertaining to the TPDES effluent permit for the proposed desalination facility on Harbor Island), at p. 10 (" ...the average measured tidal flow from the [CCSC] transects is 47,000 million gallons per day" near Harbor Island).

60% of the total volume of water passing through the Aransas Inlet on a daily basis,[13] which equals 78,333 mgd (or 10,471,633,770 ft^3/d).

The volumetric ratio of the daily flow of water through the velocity caps vs. the daily flow of water passing through the Aransas Inlet is calculated as follows:

$$20{,}854{,}167\ ft^3/d \div 10{,}471{,}633{,}770\ ft^3/d = 0.00199149$$

This ratio can generically be interpreted as follows: on average, for every gallon of water that passes through the intake structure, 502 gallons of water (i.e., 1/0.00199149) will pass through the Aransas Inlet, which represents the recruitment corridor linking the GOM to the seagrass beds in the shallow bays. That ratio represents 0.2% of water that moves through the intake structure compared to the volume passing thru the Aransas Inlet.

3.3.2 Additional Considerations

The hydraulic zone of influence is a loosely defined term, but generally represents an area of the source water body around an intake structure that is directly affected by the water withdrawal or diversion process. Zooplankton, including ichthyoplankton, have minimal swimming abilities and therefore mostly move passively with the prevailing currents. For this marine life, the hydraulic zone of influence represents the area around a water intake with increased likelihood that zooplankton may be withdrawn with the diverted water.

The hydraulic zone of influence for older life stages of invertebrates and fish with stronger swimming capabilities is expected to be substantially smaller than for passively moving life stages. For older non-planktonic life stages, the hydraulic zone of influence represents the point at which an organism will enter the water intake, even if it actively attempts to swim away, because it can no longer overcome the force of the withdrawn water. Even under this general scenario, the hydraulic zone of influence for actively swimming fish and invertebrates will depend on the size/life stage of the marine life (i.e., smaller sizes are less capable swimmers than larger sizes), the species-specific swimming capabilities, and the general health conditions of the marine life.

The intake structure for the proposed Harbor Island desalination facility will be designed such that the velocity at the point of entrance to the velocity caps will be ≤0.5 ft/s, which represents a very slow speed (note 0.5 ft/sec = 0.34 miles per hour). As noted earlier, a facility that reduces its entrance velocity to this speed meets the performance for similar structures in other regulated contexts. Based on earlier studies by Sonnichsen et al. (1973), Christianson et al. (1973), and Boreman (1977), USEPA (2011) reports that 96% of studied fish can avoid an intake structure

[13] See Brown et al. (2000) at p. 24,247 (*approximately 60% of flow entering Aransas Inlet is toward Corpus Christi Bay via CCSC, 30% towards Aransas Bay via Lydia Ann Channel, and 10% towards Redfish Bay via Aransas Channel*); see also Brown et al. (2005) at p. 38 (*division of flow is 60% to CCSC, 30% to Lydia Ann Channel, and 10% to Aransas Channel*).

when the entrance velocity is ≤0.5 ft/s. In addition, USEPA (2014) reports that the impingement mortality is reduced by 96% when the entrance velocity is ≤0.5 ft/s.

The 0.5 ft/s velocity contour (if detectable) represents the outer boundary of the hydraulic zone of influence (EPRI 2007) and would be confined to the edge of the velocity cap. EPRI (2007) also reports that 0.5 ft/s velocity contours generally could not be measured in the field. This suggests that healthy, free-swimming fish may either swim past the intake structure or enter it before sensing the current and turning around. EPRI (2007) concluded that the hydraulic zone of influence concept may have limited biological relevance and that swimming capabilities and health condition of the species, as well as life stage, influence the potential for I&E more than this somewhat amorphous concept.

4 SOURCE WATER BIOLOGICAL CHARACTERIZATION

The following key steps need to be considered to assess the potential for the intake structure to withdraw marine life: a) identify the species of fish, invertebrates, reptiles, and mammals known to be present in the project area; b) select species that should be the focus for further evaluation because they are abundant, have high commercial and/or recreational value, are listed by Texas or the federal government, and/or are considered particularly sensitive to I&E; and c) describe the general life histories of selected target species to identify life stages that may have a higher potential for I&E. These issues are further discussed below.

This section of the report is organized as follows:

- Section 4.1 identifies the species present in the vicinity of the project area in the GOM based on trawl and plankton surveys, occurrence of listed species in the area, benthic survey data, and published data on the presence of phytoplankton and zooplankton.
- Section 4.2 describes the occurrence of highly migratory species (HMS) and managed fish species (MFS) in the vicinity of the project area that are specifically managed by NOAA.
- Section 4.3 describes the process used to select a small subset of target species potentially susceptible to I&E. The criteria used to identify such species consist of T&E species with the potential to be present in the vicinity of the project area, "fragile species" identified in 316(b) regulations as having a low likelihood to survive any form of impingement, species that are abundant in Texas GOM waters, species reported to be frequently impinged at cooling water intake structures elsewhere in coastal Texas, and species of commercial or recreational importance. This section also pays special attention to the five listed sea turtle species.
- Section 4.4 summarizes the life histories of the target species of fish and invertebrate species in terms of reproduction, larval recruitment, and period of peak abundance.
- Section 4.5 documents the correspondence with state and federal agencies in support of this report.

4.1 SPECIES PRESENCE IN THE VICINITY OF THE PROJECT AREA

The following sources were reviewed to prepare a list of marine species that may occur in the vicinity of the project area:

- Bottom trawl survey data collected from the Gulf States Marine Fisheries Commission via NOAA[14]
- Location-specific ichthyoplankton survey data subsets obtained from SEAMAP for Station B233 in the GOM and provided by NMFS in November 2022
- Fisheries survey data provided by the Texas Parks and Wildlife Department (TPWD)[15]
- State and federally threatened, potentially threatened, and endangered species known to occur in the vicinity of the project area
- Benthic species data presented in Appendix L (Benthic Survey Report) of the Deepwater Port License Application for the Bluewater Texas Terminal Project (Bluewater Texas Terminals LLC 2021a)
- Phytoplankton and zooplankton species from Holland et al. (1973, 1974) known to occur in nearby marine and coastal areas.

This analysis yielded 606 species of plankton, invertebrates, and vertebrates (**Appendix A**). This list provides a robust enumeration of marine life identified in the GOM Offshore of San Jose Island.

4.2 SPECIALLY MANAGED FISH SPECIES

This section describes the HMS and MFS managed by NOAA, and the associated fisheries management plans and essential fish habitats (EFHs), in order to determine which of these species may occur in the vicinity of the project area.

The 1976 Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) (NOAA 2007) regulates marine fisheries management in U.S. federal waters**.** The MSFCMA requires federal agencies to consult with the Secretary of Commerce, through NOAA, with respect to "any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat identified under this Act."[16] Each fishery management plan must identify and describe EFHs required by the managed fishery. The MSFCMA defines EFH as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity."[17] NOAA's regulations further define this term by specifying that "necessary" means "the habitat required to support a sustainable fishery and the managed species contribution to a healthy ecosystem."[18]

[14] NOAA Fisheries. 2022. DisMAP data records. Retrieved from apps-st.fisheries.noaa.gov/dismap/DisMAP.html. Accessed August 2022.
[15] TPWD, Coastal Fisheries Division, Correspondence dated August 30, 2022
[16] 16 U.S.C. § 1855(2)
[17] 16 U.S.C. § 1853(a)(7) and § 1802(10)
[18] 50 C.F.R. § 600.10

The Gulf of Mexico Fishery Management Council (GMFMC) is one of eight regional councils established by the MSFCMA and managed by NOAA. The GMFMC has developed fisheries management plans (GMFMC 2016) for the following categories of species of interest: Coastal Migratory Pelagics; Red Drum; Reef Fish; Shrimp; Spiny Lobster; and Corals. The coastal waters in the GOM Offshore of San Jose Island also fall under the Atlantic HMS fisheries management plan administered by NOAA. Atlantic HMS include tunas, swordfishes, sharks, and billfishes. Management of HMS is outlined in the 2006 Consolidated Atlantic HMS Fishery Management Plan and its amendments (NMFS 2017).

Both the GMFMC and NMFS manage fisheries within the federal waters in the vicinity of the project area. TPWD is responsible for managing the marine recreational and commercial fishing in Texas state waters, located within 9 nautical miles [~10 statute-miles] of the coastline. However, because EFH is defined as those waters and substrates needed by fish to spawn, breed, feed, or grow to maturity, the management of federal fish species can extend into state waters. In the estuarine component, EFH encompasses all estuarine waters and substrates (mud, sand, shell, rock, and associated biological communities), including the sub-tidal vegetation (seagrasses and algae) and nearby inter-tidal vegetation (marshes and mangroves). In marine waters, EFH encompasses all marine waters and substrates (mud, sand, shell, rock, hard bottom, and associated biological communities) from the shoreline to the seaward limit of the exclusive economic zone.[19]

Figure 4-1 shows the EFHs in the GOM Offshore of San Jose Island published by NMFS. An apparent inconsistency exists between NMFS and GMFMC in the EFH designation for the red drum: the data layer for the red drum EFH obtained from NMFS only identifies estuarine habitat as EFH for this species, but not the nearby GOM, whereas the GMFMC fisheries management plan states that three life stages of the red drum (specifically, early juveniles, late juveniles, and adults) occur in the nearshore habitats of the GOM (GMFMC 2016; **Table 4-1**). This discrepancy has no impact on the current evaluation because the intake structure will be located in the GOM, and it is assumed that the project area represents EFH for the red drum.

EFH for spiny lobster and corals is absent in the GOM Offshore of San Jose Island and is therefore not considered further in this report.

In the GOM, virtually all marine waters and substrates (mud, sand, shell, rock) and their associated biological communities from the shoreline to the seaward limit of the exclusive economic zone are recognized as EFH. Therefore, the water and substrate in the project area fall under the purview of several federal fisheries management plans.

Managed species are included under the following fisheries management plans:

[19] https://gulfcouncil.org/wp-content/uploads/EFH-5-Year-Revew-plus-App-A-and-B_Final_12-2016.pdf

- Shrimp Fishery of the GOM, U.S. Waters
- Red Drum Fishery of the GOM
- Reef Fish of the GOM
- Coastal Migratory Pelagic Resources in the GOM and South Atlantic
- Atlantic HMS.

The above fisheries management plans, as well as GMFMC's and NMFS' online EFH mappers[20,21] were reviewed to determine which species may occur in the vicinity of the project area. The vicinity of the project area falls within GMFMC Ecoregion 5 in nearshore habitat. Ecoregion 5 encompasses the area from Freeport, Texas, to the U.S./Mexico border. It is understood that this area covers a substantially larger region than the space in the vicinity of the project area. GMFMC defines nearshore habitat as marine waters less than 59.1 ft deep. Excluded from further consideration were any life stage of species that did not occur in less than 35 ft of water, if specific depth intervals were defined for a species' life stage.

EFH for all the above fisheries management plans, except for HMS, is classified in terms of five life stages, namely eggs, larvae, juveniles, adults, and spawning adults. EFH for HMS is classified in terms of three life stage categories, namely spawning adults, eggs, and larvae; juveniles and subadults; and adults.

Tables 4-1 and 4-2 summarize the managed species (MFS and HMS, respectively), and their specific life stages, that may occur in the vicinity of the project area. GMFMC (2016) and NMFS (2017) provide the full life history information for all federally managed species in the GOM. In summary, it was determined that 17 species of MFS and 10 species of HMS may be present in the vicinity of the project area.

Eleven of the 17 MFS included in **Table 4-1** have sensitive life stages (i.e., eggs and larvae). Seven of the 10 HMS included in **Table 4-2** give birth to neonates ("pups"). These characteristics are further evaluated in Section 5 in terms of potential for I&E.

4.3 SELECTING TARGET SPECIES POTENTIALLY SUSCEPTIBLE TO I&E

Over 600 marine and estuarine species live in the GOM Offshore of San Jose Island (**Appendix A**). It would be unwieldy and inefficient to assess the potential for I&E for all of these species. Instead, a smaller subset of target species was identified to better focus the evaluation. The general criteria for selecting these target species, using EPA 316(b) CWIS regulations as general guidance, are as follows:

[20] https://portal.gulfcouncil.org/EFHreview.html Accessed September 7, 2022
[21] https://www.habitat.noaa.gov/apps/efhmapper/?page=page_1 Accessed September 7, 2022

- T&E species with potential to be present in the vicinity of the project area
- Fragile species known to be present in Texas GOM waters[22]
- Species that are abundant in Texas GOM waters
- Species reported to frequently impinge at cooling water intake structures in Texas
- Species that are commercially and/or recreationally important in Texas GOM waters.

This section presents the approach used to identify the target species that may have a potential for I&E.

4.3.1 T&E Species

Species of conservation concern may be listed as T&E under the U.S. Endangered Species Act (ESA) and/or under the authority of state law. Additionally, the Marine Mammal Protection Act of 1972 protects all cetaceans (whales, porpoise, and dolphins) and pinnipeds (seals and sea lions, but excluding walruses). The species of conservation concern that are protected by these regulatory programs were evaluated to determine which may occur in the vicinity of the project area and which may have a potential for I&E.

Texas state regulations are enforced by TPWD under Sections 65.171–65.177 (Threatened and Endangered Nongame Species) of Title 31 of the Texas Administrative Code (TAC) for animal species, and under Sections 69.01–69.09 (Endangered, Threatened, and Protected Native Plants) of Title 31 of the TAC for protected plant species. Under the TAC, TPWD prohibits the take, possession, transportation, or sale of any state-protected species listed as T&E without a permit. The ESA protects species that are T&E throughout all or a significant portion of their range. The ESA also requires the federal government to designate "critical habitat" for listed species. Critical habitat consists of the geographic areas containing the physical or biological features essential to conserve the listed species and therefore may need special management or protection. Critical habitat may also include areas that are not occupied by the species at the time of listing but are considered essential to its protection.

The following steps were taken to determine which T&E species or designated critical habitat may occur in the vicinity of the project area in the GOM:

- Compile all species listed in 31 TAC §65.175–65.176 for animal species, and in 31 TAC §69.8 for plant species.
- Perform a search using the Information for Planning and Consultation (IPAC) website[23] to compile a list of species and critical habitats known or expected to be present in the vicinity of the project area. The area was entered as a polygon of approximately

[22] See Section 4.3.2 in this report for additional details about "fragile species."
[23] https://ipac.ecosphere.fws.gov/

130 square miles centered around the Aransas Inlet, which ran 13 miles along the shore of the barrier beaches to 10 miles Offshore. This large area ensured that the search would identify all of the listed turtle and mammal species, all of which have extensive home ranges, that might be present in this portion of the GOM.

- Compile all species listed as protected by the Southeast Region Office of NOAA. This office maintains lists of protected corals, sea turtles, whales, dolphins and porpoises, fish, shark, and rays that may occur in the southeastern United States. The Southeast Region covers the area from Texas to North Carolina.
- Review each species for its potential to occur in the vicinity of the project area, which was defined as marine habitat occurring across from San Jose Island approximately 1.5 miles to the east from the Aransas Inlet jetty, at a depth of approximately 35 ft and with substrate consisting entirely of sand. This approach eliminated all birds and freshwater fish, as well as all terrestrial species of plants, reptiles, amphibians, and mammals.
- The remaining species of marine and estuarine fish, marine mammals, marine turtles, wetland plants, corals, and critical habitats were each individually assessed to determine if their published habitat characteristics and ranges included the vicinity of the project area. Additionally, the historical trawl data and species occurrence data provided by TPWD were reviewed to determine if a listed species has been observed in the vicinity of the project area.

Table 4-3 identifies the T&E species. This list contains 7 fish species, 16 mammal species, and 5 turtle species, which are further discussed below. **Figure 4-2** shows the locations of reported sightings of T&E species in the area Offshore of San Jose Island.

4.3.1.1 Listed Fish Species

Four of the listed fish species do not occur in the vicinity of the project area. Both the large-tooth sawfish and small-tooth sawfish were historically present, but are now considered extirpated from the region. The Nassau grouper is not known to occur in the region. The current range of the gulf sturgeon does not include the vicinity of the project area. By their absence, these four fish species would not experience I&E and are therefore removed from further consideration.

The oceanic whitetip shark, shortfin mako shark, and the giant ray have populations that may occur in or near the vicinity of the project area. These three species are all viviparous, giving birth to fully-formed pups. These characteristics are further evaluated in Section 5 in terms of potential for I&E.

4.3.1.2 Listed Sea Turtle Species

A generalized life history of sea turtles involves the following stages:

- The life cycle starts with egg laying on coastal nesting beaches. Hatchlings emerge from their nest, crawl towards the water, and quickly swim away from the coast to reach oceanic areas (typically depths greater than 650 ft).
- Post-hatchlings to juveniles remain for several years in the oceanic habitat typically associated with Sargassum (algae mats in open ocean) habitats.
- After growing to a larger body size, several species of sea turtles (Kemp's Ridley, green, hawksbill, and loggerhead; but not leatherback) recruit to shallower habitats throughout the continental shelf (neritic).
- Once the adults reach sexual maturity (the timing of which varies among species), they perform breeding migrations that can be across oceanic habitats to find mates, and often return to the nesting areas where they were born.

The Kemp's Ridley, green, hawksbill, and loggerhead turtles (i.e., all species except for the leatherback) experience an ontological shift, with a distinct post-natal oceanic phase, followed by recruitment as juveniles back over the continental shelf. The leatherback lives in the general pelagic habitat (both neritic and oceanic) and does not experience a distinct ontological shift.

Four of the five T&E sea turtle species that have the potential to occur in the GOM Offshore of San Jose Island (i.e., loggerhead, green, hawksbill, and Kemp's Ridley) have been observed in that area (**Figure 4-2**). **Table 4-4** provides detailed life history information on the five listed sea turtle species. This information is summarized below:

- **Loggerhead sea turtle (*Caretta caretta*)**
  These turtles live in the GOM and are known visitors to the Texas coast. Juveniles and young adults spend their lives in the open ocean before migrating onshore to breed and nest. Some nesting occurs in Texas between April and September, preferably on coarse-grained, narrow, and deeply-sloping sand beaches. Hatchlings depend on floating algae/seaweed for protection and foraging, which eventually transports them into the open ocean (TPWD 2022).[24] Foraging areas for neritic juveniles and adults include shallow continental shelf waters. Nesting in the GOM occurs from Florida to Texas. In Texas, occurrences have been documented at the Padre Island National Seashore (PINS),[25] located south of the project area. Hatchlings of this species may be briefly present in the vicinity of the project area when they enter the water after emerging from their nests and while migrating to oceanic waters away from shore. In addition, neritic juveniles and adults may be present nearshore for longer periods of time.

[24] https://tpwd.texas.gov/huntwild/wild/wildlife_diversity/nongame/listed-species/
[25] National Park Service. 2022. Loggerhead Sea Turtle (*Caretta caretta*) species page. Retrieved from https://www.nps.gov/pais/learn/nature/loggerhead.htm. Accessed September 8, 2022.

- **Green sea turtle (*Chelonia mydas*)**
  The green sea turtle occurs in the GOM. Adults and juveniles occupy inshore and nearshore areas, including bays and lagoons with reefs and seagrass. Green sea turtles are largely herbivorous, consuming seagrasses and algae. The Texas Natural Diversity Database (TXNDD) reported several occurrences within 5 miles of the project area in 2004 and 2008 (TXNDD 2019). Nesting in the GOM occurs from June through September. In 2022, green turtle nests were observed on Mustang Island (approximately 8 miles south of Port Aransas, Texas; 1 nest), North Padre Island north of PINS (8 nests) and PINS (20–25 miles south of Port Aransas; 20 nests) in Texas.[26] It is therefore possible that hatchlings of this species may be briefly present in the vicinity of the project area when they enter the water after emerging from their nests and quickly migrate out to open water away from shore areas. In addition, neritic juveniles and adults may be present in the vicinity of the project area for longer periods of time.
- **Kemp's Ridley sea turtle (*Lepidochelys kempii*)**
  The Kemp's Ridley sea turtle is the smallest and most critically-endangered sea turtle species. In Texas, they occur in nearshore GOM waters, as well as bays and passes, where they feed mostly on crabs, and occasionally fish, sea jellies, and mollusks.[27] Currently, nesting occurs on GOM beaches from Bolivar Peninsula, Texas, to Vera Cruz, Mexico. Ninety-five percent of worldwide nesting occurs in Tamaulipas, Mexico. Each year, a few nests are found in other U.S. states. In the U.S., PINS represents primary nesting grounds for this species, with nesting occurring from April through August. In 2022, 8 nests were reported on San Jose Island (northwest of the project area), 14 nests on Mustang Island, 16 nests on North Padre Island (just south of Mustang Island), and 132 nests at PINS.[28] It is therefore possible that hatchlings from this species may be briefly present in the vicinity of the project area when they enter the water after emerging from their nests and quickly migrate to open oceanic waters away from nearshore areas. In addition, neritic juveniles, as small as 20 cm (7.8 in.) and as young as 1 to 2 years old, may be present in the vicinity of the project area and remain in the neritic habitat until they reach maturity.
- **Hawksbill sea turtle (*Eretmochelys imbricata*)**
  This species is found in the GOM, including Texas. Following the oceanic juvenile life stage, juveniles then migrate to shallower, coastal areas, mainly coral reefs and rocky areas, and also in bays and estuaries near mangroves when reefs are absent, but seldom in water deeper than 65 ft. They feed on sponges, jellyfish, sea urchins, mollusks, and crustaceans. Nesting occurs from April to November high up on the beach where

[26] National Park Service. 2022. Green Sea Turtle (*Chelonia mydas*) species page. Retrieved from https://www.nps.gov/pais/learn/nature/green.htm. Accessed September 8, 2022.
[27] National Park Service. 2022. Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) species page. Retrieved from https://www.nps.gov/pais/learn/nature/kridley.htm. Accessed September 8, 2022.
[28] https://www.nps.gov/pais/learn/nature/current-nesting-season.htm. Accessed September 9, 2022.

vegetation is available for cover. According to TXNDD, the last recorded observation near Port Aransas occurred in 1958 (TXNDD 2019). However, the National Park Service reports that juveniles occur in the nearshore waters of GOM and the waters near the Aransas Inlet jetty.[29] Post-hatchlings (approximately 7.6 cm [3 in.] long) have been found alive washed ashore in Sargassum seaweed, and juveniles (approximately 30.5 cm [12 in.] long) have been found alive washed ashore and entangled in mesh sacs.[29] Only one hawksbill nest has been documented in Texas, specifically at PINS.[29] It appears unlikely that hatchlings from this species would be present in the vicinity of the project area. However, neritic juveniles and adults may be present in the vicinity of the project area for longer periods of time.

- **Leatherback sea turtle (*Dermochelys coriacea*)**
  This species is found in the GOM. It is the most pelagic of the sea turtle species and performs the longest migrations. It is an omnivore that prefers feeding on jellyfish. The leatherback is usually found in the deeper, open ocean rather than closer to shore. This highly mobile turtle is unlikely to be present in the vicinity of the project area even though the area contains habitat that may be used by this species. TXNDD has not recorded the presence of leatherbacks in the GOM Offshore of San Jose Island (TXNDD 2019). Nesting is not common in Texas; however, a leatherback nest was reported in 2008 at PINS.[30]

The possible presence of recently emerged sea turtle hatchlings, juveniles, and adults in the project area is further evaluated in Section 5 in terms of potential for I&E.

4.3.1.3 Listed Marine Mammal Species

Several of the 16 species of T&E marine mammals are not known to occur in the vicinity of the project area. Also, all of these species have large body sizes and give birth to live offspring with strong swimming abilities. Covering the openings of the velocity caps with 3-in. mesh bar screens to prevent entrance by neritic juvenile sea turtles will also preclude any possibility of entrance by marine mammals. Hence, no further evaluation of these species is needed because marine mammals are not expected to be affected by I&E.

4.3.2 Fragile Species

"Fragile species" is a term that EPA defines as follows in 40 CFR 125.92(m)[31]:

[29] National Park Service. 2022. Hawksbill Sea Turtle (*Eretmochelys imbricata*) species page. Retrieved from https://www.nps.gov/pais/learn/nature/hawksbill.htm, Accessed September 9, 2022.
[30] https://www.nps.gov/pais/learn/nature/leatherback.htm
[31] https://www.ecfr.gov/current/title-40/chapter-I/subchapter-D/part-125

> **Fragile species** means those species of fish and shellfish that are least likely to survive any form of impingement. For purposes of this subpart, fragile species are defined as those with an impingement survival rate of less than 30 percent, including but not limited to alewife, American shad, Atlantic herring, Atlantic long-finned squid, Atlantic menhaden, bay anchovy, blueback herring, bluefish, butterfish, gizzard shad, grey snapper, hickory shad, menhaden, rainbow smelt, round herring, and silver anchovy.

Not all the fragile species mentioned above are expected to be present in the GOM Offshore of San Jose Island. This report used a combination of published literature on intake structures (Stunz and Montagna 2015) and I&E (WCM Group Inc. 2020; GBNEP 1993; Shepherd et al. 2016) in coastal Texas to identify the subset of fragile species expected to occur in the vicinity of the project area. The following four species fit this criterion:

- Bay anchovy
- Bluefish
- Gizzard shad
- Gulf menhaden.

Review of the life history information of these four species identified the gizzard shad as primarily a freshwater/brackish species that would be unlikely to occur in the vicinity of the project area out in the GOM. This species was therefore removed from further evaluation.

The three remaining fragile species were retained as target species.

4.3.3 Abundant, Frequently Impinged, and Commercially and/or Recreationally Important Species

The following sources were used to identify a subset of species to evaluate regarding potential to interact with the intake structure:

- The NOAA and TPWD trawl surveys
- Species identified as "potentially impacted" by intake structures in coastal Texas (Stunz and Montagna 2015)
- Species considered in the permit renewal for the Nueces Bay Power Station in Corpus Christi (WCM Group Inc. 2020)
- "Species comprising 1% or more of the total impinged during each study" of coastal Texas power plant intake structures, species frequently impinged, and species considered commercially and recreationally important (GBNEP 1993)

- Species impinged at the Barney M. Davis Power Plant in Corpus Christi (Shepherd et al. 2016)
- Species of commercial and recreational importance in the GOM as identified by the NMFS (2012)
- The three "fragile" species identified in Section 4.3.2 above.

Abundant species from the trawl surveys were determined using data from NOAA (weight catch per unit effort) and TPWD (sum catch per hour) to identify the species that are more likely to be present. The resulting list from the NOAA surveys consisted of 40 invertebrate and 70 vertebrate species (**Appendix B, Table B-1**), and the list from the TPWD surveys consisted of 121 invertebrate and 163 vertebrate species (**Appendix B, Table B-2**). These numbers were further condensed by selecting the 15[32] most-abundant species of invertebrates and vertebrates identified in the NOAA and TPWD surveys, respectively, which yielded the following results:

- **Table 4-5** shows that the 15 most-abundant invertebrate species from the NOAA surveys consist of 2 cnidarian species, 8 decapod species (4 crab and 4 shrimp), 2 echinoderm species, and 3 squid species. The 15 most-abundant vertebrate species from the NOAA data consist of 2 elasmobranch species (1 shark and 1 ray), 4 benthopelagic species of ray-finned fish, 5 species of demersal ray-finned fish, and 4 species of pelagic ray-finned fish.
- **Table 4-6** shows that the 15 most-abundant invertebrate species from the TPWD surveys consist of 3 cephalopod species, 3 cnidarian species, 7 decapod species (2 crab and 5 shrimp), and 2 echinoderm species. The 15 most-abundant vertebrate species from the TPWD surveys are all ray-finned fish and consist of 3 benthopelagic species, 10 demersal species, and 2 pelagic species.

These lists were incorporated into the selection of species susceptible to I&E to highlight those species that are abundant in the GOM Offshore of San Jose Island**.**

Table 4-7 presents an initial list of 63 species based on the criteria and sources outlined above. From this initial list, species were selected that fell into the following categories:

- Representative/target species already identified (WCM Group Inc. 2020)
- Species that are locally abundant (**Tables 4-5 and 4-6)** and/or frequently impinged (Galveston Bay NEP 1993)
- Commercially- and recreationally-important species (Galveston Bay NEP 1993; NMFS 2012)
- The three "fragile" species identified in Section 4.3.2 above.

[32] This number is based on professional judgment and simply represents a smaller set of species available to select the final target species.

This reductive process yielded 14 fish species and 6 invertebrate species. These 20 species are shaded in **Table 4-7**.

This interim list of 20 species was used to select the final 6 target fish species[33] (i.e., bay anchovy, bluefish, Gulf menhaden, Atlantic croaker, red drum and spotted seatrout) and 5 target invertebrate species[34] (i.e., blue crab, lesser blue crab/gulf crab, brown shrimp, pink shrimp, and white shrimp). All fragile species, except for gizzard shad, which is not expected in the GOM, were retained as target species. For the remaining species, preference was given to those species falling into more than one of the aforementioned categories and consideration was given to reflect a variety of life histories. Based on the best available information and the authors' best professional judgment, these 11 target species are broadly representative of the large species assemblages that occur in the GOM around the project area.

4.4 REPRODUCTION, LARVAL RECRUITMENT, AND PERIOD OF PEAK ABUNDANCE FOR TARGET SPECIES

The 11 target species may experience I&E depending on the life history traits of each species. The attributes of the different life stages present different methods of interaction that may occur during one or more critical life stages. For example, adults may occur in the vicinity of the project area, but due to their ability to swim at velocities faster than the proposed intake speed (i.e., ≤0.5 ft/s), the potential for I&E would be lower or non-existent. However, other life stages (planktonic or nektonic) may not have the ability to divert away from the velocity caps and may have a higher potential of entering the intake structures.

Table 4-8 summarizes the general life histories of the 11 target species. This information shows that many of the 11 target species selected for further evaluation have one or more sensitive life stages with a potential for I&E. This issue is further discussed in Section 5.

4.5 DOCUMENTATION OF CORRESPONDENCE WITH STATE AND FEDERAL AGENCIES

The Coastal Fisheries Division of the TPWD was contacted via email to obtain species occurrence data for the vicinity of the project area (**Appendix C**). In an email dated August 30, 2022, TPWD provided lists of vertebrate and invertebrate species that were collected using otter trawls from TPWD Major Area 20, which overlaps with the vicinity of the project area. These data are summarized in **Table 4-6**. In an email dated September 14, 2022, TPWD provided a list of sea

[33] This number represents a manageable set of fish species with various characteristics of interest described earlier in this section.
[34] This number represents a manageable set of invertebrate species with various characteristics of interest described earlier in this section.

turtle occurrences and measured lengths from estuaries, designated as TPWD Major Area 5 (Aransas Bay), Major Area 6 (Corpus Christi Bay), and TPWD Major Area 20 (**Appendix C**).

Ichthyoplankton survey data collected in the GOM around the project area were obtained through direct email with the Southeast Fisheries Science Center of the NMFS. On December 13, 2022, NMFS provided ichthyoplankton trawl data for SEAMAP Station B233, the closest SEAMAP station to the project area. Species present in the ichthyoplankton data set that were absent in the bottom trawl survey data are noted in **Appendix A**, which also describes data use and analysis.

5 EVALUATION OF I&E POTENTIAL

This section evaluates how the physical conditions and salinities that prevail in the vicinity of the project area (Section 2), the general design features of the intake structure (Section 3), and the various species of marine life present in the vicinity of the project area (Section 4) may interact with the velocity caps and result in potential I&E at the proposed desalination facility.

5.1 INTRODUCTION

The main observations about the physical conditions and salinities prevalent in the project area are that it is mostly uniform in terms of bathymetry (approximately 35 ft deep, with minimal variation), has a predictable substrate composition (mostly sand), and the tidal currents are well defined (relatively faster than the intake velocity of ≤0.5 f/sec and typically moving parallel to the shoreline but in opposite directions depending on the seasons). The field-collected salinity and temperature profiles reflect the prevailing conditions in the GOM.

The major observations about the intake structure are that it will be located approximately 1.3 miles in the GOM, will divert 156 mgd (with the ability to expand in the future to 312 mgd) of State Water via four or five velocity caps to ensure an entrance velocity ≤0.5 ft/s and thereby relatively minimize withdrawal of eggs and larvae into the intake tunnel. Another important feature appropriately considered are the traveling fish screens proposed for the intake bay on Harbor Island to help remove marine life that may enter the intake structure from the GOM and be transported to Harbor Island through the intake tunnel.

The major observations about the biology in the GOM across from San Jose Island are that a) some MFS and HMS marine species, along with T&E marine species, may pass in the vicinity of the project area but are not expected to be adversely impacted by the State Water diversion process due to their large size and strong swimming abilities; b) smaller juvenile neritic sea turtles will be prevented from moving into the velocity caps by 3-in. mesh bar screens added at the entrances of these intake structures; and c) multiple species of marine and estuarine fish and invertebrates (including MFS and HMS) may reside and/or spawn in the vicinity of the area during different periods of the year.

The remainder of this section evaluates the sources of information used to determine the potential for I&E of local marine species.

5.2 SPECIFIC POTENTIAL FOR I&E

This section describes the specific potential of I&E for various species groups and life stages that may be present in the vicinity of the project area.

5.2.1 Potential I&E of MFS and HMS

Managed Fish Species

Table 4-1 summarizes the species and life stages of MFS that may be present in the GOM Offshore of San Jose Island. Of note, 4 of the 17 MFS shown in this table (namely, brown shrimp, pink shrimp, white shrimp, and red drum) are also evaluated as part of the 11 target species selected based on other considerations (see **Table 4-7**).

Of the 17 MFS, 8 species may have eggs and 11 species may have larvae in the vicinity of the project area at some time during the year. The velocity caps that define the entrance of the intake structure will minimize the number of juvenile and adult fish that may enter the intake structure because these older life stages are larger and can actively swim away upon sensing any horizontal intake currents. Eggs are passive and larvae have limited swimming capacity. Hence, these younger life stages do not have the ability to actively escape the current moving through the entrance and thus may be withdrawn by the velocity caps. Some plankton can be expected to enter the intake structure, even though the entrance velocity of ≤0.5 ft/s, and the depth of the velocity caps (i.e., 5 to 10 ft above the sea bed in at least 35 ft of water), will minimize this process. Of note, eggs and/or larvae that are positively buoyant (i.e., located close to the surface) or demersal (i.e., located on or close to the sea bed) are not expected to be withdrawn by the velocity caps, and therefore have a limited potential to experience I&E.

Highly Migratory Species

As shown in **Table 4-2**, of the 10 HMS, none are expected to have eggs or larvae in the vicinity of the project area. Although sailfish are an HMS that spawn eggs and form planktonic larvae, available data show that sailfish egg and larvae are not found in the vicinity of the project area. The remaining 9 species listed as HMS in **Table 4-2** are all shark species that have neonates (pups) born viviparously—fully formed swimmers that, unlike larvae, can avoid the intake structure current. Two of the shark species are also not found in the vicinity of the project area. The low entrance velocity of ≤0.5 ft/s at the velocity caps is expected to allow the highly-mobile shark pups, the only early life stage HMS in the vicinity of the project area, to avoid I&E.

In summary, the available information shows that 11 of the 17 MFS may have early life stages in the vicinity of the project area that have a potential to be drawn through the entrance of the velocity caps. Of the 10 HMS that may be present in the vicinity of the project area, only the sailfish spawn eggs and form planktonic larvae, but both of these life stages are not expected to be present in the vicinity of the project area, based on information presented in NMFS (2017). The remaining nine HMS all represent highly migratory shark species that give birth to fully-formed and actively-swimming pups. Two of these shark species are not found in the vicinity of the project area. The potential for shark pups to be captured by the water intakes is estimated to

be minimal because they are capable swimmers and their large body size would prevent passage through the 3-in. mesh bar screen and into the intake tunnel.

5.2.2 Potential I&E of T&E Species

Tables 4-3 and 4-4 summarize the T&E species and their life stages that have the potential to be present in the vicinity of the project area. As indicated by **Table 4-3**, some T&E species are not found in the project area.

Listed Fish Species

The seven listed fish species are either not present in the vicinity of the project area or may be present but give birth to fully-formed neonates with strong swimming abilities. Absent species cannot experience I&E. Species with fully-formed neonates do not have a larval life stage that would be susceptible to I&E. The approach velocity of ≤0.5 ft/s at the entrance of the velocity caps is expected to allow all life stages of sharks and rays to swim away. Additionally, the relatively large body size of shark pups would prevent passage through the 3-in. mesh bar screen covering the velocity caps.

The three listed fish species that have the potential to occur in the area (i.e., the giant manta ray, the shortfin mako shark, and the oceanic whitetip shark) were evaluated for their pup sizes:

- At birth, the width (disc width) of a giant manta ray pup ranges from 91 to 182 cm (35.8 to 71.7 in.) (Miller and Klimovich 2017; Rambahiniarison et al. 2018). Neonates of that size cannot enter velocity caps protected by 3-in. mesh bar screens.
- Sharks are typically measured in total length (TL), which runs from the tip of the nose to the end of tail. Measured pup lengths for shortfin mako sharks ranged from 70 to 80 cm TL (27.6 to 31.5 in. TL) (Miller et al. 2022). To estimate the height of the shortfin mako pup, the ratio of TL to height (top of dorsal fin to bottom of belly) was measured from a scaled image published in Duffy and Francis (2001), and then the ratio (19.32 cm [7.6 in.] width to 74.5 cm [29.3 in.] length) used to calculate height estimates from published data of shortfin pup length published in Miller et al. 2022. Using this approach, shortfin mako shark pups could range from 18.0 to 20.6 cm (7.1 to 8.1 in.) in height (dorsal fin to belly). Pups of that size cannot enter velocity caps protected by 3-in. mesh bar screens.
- Oceanic whitetip sharks inhabit oceanic habitat. Measured pup lengths for this species ranged from 55 to 77 cm TL (21.7 to 30.3 in. TL) (Miller et al. 2022). Published measurements of the height or widths of oceanic whitetip shark pups could not be located. Historically, the oceanic whitetip shark grew up to 350 cm TL (137.8 in.); however, measurements from recent specimens of the shark rarely exceed 200 cm TL (78.7 in.) (Lessa et al. 1999; Young et al. 2017). The oceanic whitetip is a pelagic shark species, generally remaining in the open ocean, on the outer continental shelf, or around oceanic

islands in water over 184 m deep, and occurring from the surface to at least 152 m depth (Compagno 1984; Bonfil et al. 2008; Young et al. 2017). The locations of the nursery grounds are not well known but are believed to be in oceanic areas (Young et al. 2017). Growth rates for this species are reported as 25.2 cm per year (9.9 in.) in the first free-living year (Lessa et al. 1999; Young et al. 2017). Based on published pup TLs, growth rates, and habitat preferences, it is unlikely that this species would be present in the vicinity of the project area or would be able to pass through a 3-in. mesh bar screen.

Based on these considerations, the three listed species of manta ray and shark species will not be affected by I&E.

Listed Mammal Species

The 16 listed mammal species (i.e., whales, dolphin, and manatee) are large, powerful swimmers that are either not present in the vicinity of the project area or give birth to large, fully-formed young with strong swimming abilities. The presence of 3-in. mesh bar screens at the entrance of the velocity caps will preclude the entry of listed mammals into the intake structure. Hence, these species will not be affected by I&E.

Listed Sea Turtle Species

All five listed sea turtle species are present in the vicinity of the project area as juveniles and adults, and three of the five listed sea turtle species are known to have nested recently on nearby beaches. The presence of turtle hatchlings in nearshore waters of the GOM is inferred by this recorded nesting activity.

Table 4-4 summarizes the species-specific lengths of the turtle hatchlings, which vary from 3.8 to 9.9 cm (1.5 to 3.8 in.).

A review shows that the marine turtle nesting season can start as early as April and continues through September, with hatching occurring as late as November. The hatchlings usually come out of their nests in early evening, although they have also been documented to emerge at daybreak or during daytime. Nests can contain up to 170 eggs, and 20 to 120 hatchlings can emerge all at once (Witherington 1992, as cited in Lutz and Musick 1997).

The "hatchling frenzy" period starts right after emergence. It represents a period of high activity during which the hatchlings will enter the GOM and quickly swim away from shore. They begin to swim vigorously as soon as their flippers no longer contact the sand or substrate. Diving behavior during the initial swim has been observed, where the hatchlings dive under breaking waves, position in the undertow, and guide themselves seaward (Wyneken et al. 1990; Lohmann et al. 1995; Wang et al. 1998). The hatchlings continue to swim away from shore, resurfacing from the shallow short dives under the shore breakers, and with brief paddling near

the surface for air (1 to 5 seconds), alternating with power stroking (2 to 10 seconds) below the surface (Salmon and Wyneken 1987; Witherington 1995). Green sea turtles were observed to power stroke for 10 to 40 minutes to cross a 2,000 ft wide, nearshore reef habitat (Booth 2009). The frenzied green sea turtle hatchlings reached speeds up to 1 mile per hour (1.47 ft/s) (Booth 2009).

The frenzy period is believed to increase survival as hatchlings cross predator-rich nearshore habitat. The continuous and direct swimming can last for 20 to 30 hours (Carr and Ogren 1960; Carr 1962, 1982; Wyneken and Salmon 1992; Witherington 1995). Swimming effort declines as time increases since entering the water (Wyneken 1997; Booth et al. 2004; Burgess et al. 2006). Booth (2009) showed that the green sea turtles put maximum effort into the first few minutes of swimming, and once beyond the nearshore reef habitat and into deeper water, the swimming effort eases. The residual egg yolk supplies enough energy for continuous swimming without feeding for at least 10 days. Following the frenzied phase, post-hatchlings likely become passive migrants in oceanic currents and use the Sargassum community as developmental habitat (Shaver 1991; NMFS et al. 2011).

Listed sea turtle hatchlings have only a minimal potential for interaction with the intake structure. Hatchlings swim directly and continuously towards the pelagic habitat past the continental shelf. They do not linger close to shore. Furthermore, observations of the initial swimming phase show that following their diving behavior from breaking shore waves, sea turtle hatchlings swim near the surface as they head seaward. Therefore, hatchlings will not occur 20 to 25 ft deep approximatively 1.3 miles Offshore.

The juvenile to adult life stages may occur in the vicinity of the project area for longer periods of time. Some juvenile and adult turtles may therefore interact with the entrances of the velocity caps. Recruitment to neritic habitat occurs at the juvenile life stage and is associated with the following straight carapace length (SCL): loggerhead = 41.6 to 79.7 cm (16.4 to 31.4 in.); Kemp's Ridley = 20 to 60 cm (7.9 to 23.6 in.); green turtle = 26.6 to 52 cm (10.5 to 20.5 in.); and hawksbill = 20 to 69 cm (7.9 to 27.2 in.) (**Table 4-4)**. Based on the data presented in **Table 4-4**, the smallest neritic juveniles would measure 7.9 in. (Kemp's Ridley and hawksbill). The foraging grounds for these species include the entire water column and benthic habitats. All juvenile and adult sea turtles are highly mobile and strong swimmers.

Sea turtle uptake is documented at the Port St. Lucie Nuclear Power Plant, located on Hutchinson Island on the east coast of Florida. The information presented below was obtained from NMFS (2016). The plant has operated since 1976, and maintains detailed records of captured sea turtles. Cooling water is obtained via three submerged intake structures: two measuring 12 ft in diameter and one measuring 16 ft in diameter. The intake structures are found in shallow water approximately 1,200 ft from shore, with the tops of the intake structures located about 7 ft below the surface at mean low water. Each intake structure is equipped with a velocity cap that restricts flow to less than 1 ft/s without any bar screens. The intake pipes are

buried under the beach. They convey cooling water into an open intake canal approximately 1 mile long. The facility has installed barrier nets (5-, 8-, and 9-in. mesh) at the end of the canal to reduce impingement. This water intake arrangement (e.g., relatively close to shore, shallow), and the surrounding environmental setting, is quite different from the proposed water intake in the GOM for the Harbor Island desalination facility. However, the turtle uptake at the Port St. Lucie Nuclear Power Plant is included in the discussion as a point of reference.

Sea turtles at the Port St. Lucie Nuclear Power Plant enter the intake structure through the intake pipes and become entrapped in the open intake canal. Travel time through the pipes is approximately 5 minutes. This power plant entrapped 16,619 sea turtles between 2001 and 2016. The facility uses observers to capture and release the turtles. All five listed sea turtle species have been found in the intake canal, with loggerheads making up more than half of the total, green sea turtles making up slightly less than half of the total, and Kemp's Ridleys, hawksbills, and leatherbacks combined making up less than 1% of the total. From earlier records (1976 to 1985), the smallest turtle recorded was a 7.8-in. green sea turtle (NRC 1985). Overall, sub-adults were the most abundant age class found in the canal (NRC 1985). Of the 16,619 sea turtles captured, 297 (1.8%) resulted in mortality. The facility did not report a single instance of entrainment of sea turtle hatchlings.

Based on this case study, it is reasonable to deduct that neritic sea turtles as small as 7.9-in. SCL and larger may have a potential to enter unprotected velocity caps at the project area in the GOM, and move into the intake tunnel. Because of the turtles' protected status, and despite the low entrance velocity, the velocity caps will be enclosed by 3-in. mesh bar screens to prevent the entrance of sea turtle juveniles and adults into the intake structure.

An additional way to evaluate the potential for juvenile sea turtles to interact with the velocity caps in the project area is to derive an area use factor (AUF). EPA (USEPA 1997) states that the AUF represents the ratio of an area under investigation to the area used by the animal in terms of its home range, breeding range, or feeding/foraging range. In addition, the smallest area used by each animal should be retained to calculate AUFs in order to remain conservative

In the context of the current evaluation, the five velocity caps represent the area under investigation because this defined space represents the area that has the potential to allow turtles to enter the intake structure.[35]

Calculating a species-specific AUF requires two separate pieces of information: a) the combined surface area of the five velocity caps (in square miles), and b) conservative estimates of the home ranges of the neritic juvenile turtles (also in square miles). A species-specific AUF is then

[35] The calculations presented below are entirely for illustrative purposes only because 3-in. mesh size bar screens will be placed in front of the entrances of the velocity caps to prevent any juvenile or adult turtles from entering the intake structure.

calculated by dividing the combined surface area of the five velocity caps by a conservative estimate of the species-specific home range.

The velocity caps are circular structures with a diameter of 16 ft, 5 in. (see **Figure 3-1**), and therefore a radius of 8 ft, 2.5 in. (98.5 in.). The area of a circle is calculated as $\pi * r^2$, or 3.14 * (98.5 in.)^2, which equals 30,465.065 in.^{2}, or 211.563 ft^2 (1 ft^2 = 144 in.^{2}). The total surface area of the five velocity caps equals 1,057.82 ft^2, which represents 0.000038 mi^2 (1 mi^2 = 27,878,400 ft^2).

Valverde and Holzwart (2017) provide the following home ranges for juvenile neritic sea turtles in the GOM: Kemp's Ridley (1.9 to 11.6 mi^2); loggerhead (35 to 1,652 mi^2); hawksbill (0.008 mi^2 (average nighttime home range) to 0.048 mi^2 (average daytime home range): and green (>7.5 mi^2) (note: the authors do not provide home ranges for the leatherbacks).

These two pieces of information are then used to calculate conservative species-specific AUFs, as follows:

- Kemp's Ridley $AUF_{juvenile}$ = 0.000038 mi^2/1.9 mi^2 = 0.0000200
- Loggerhead $AUF_{juvenile}$ = 0.000038 mi^2/35 mi^2 = 0.000001086
- Hawksbill $AUF_{juvenile}$ = 0.000038 mi^2/0.008 mi^2 = 0.0047500
- Green $AUF_{juvenile}$ = 0.000038 mi^2/7.5 mi^2 = 0.0000051.

These AUFs show that the surface area of the velocity caps represents a tiny fraction of the surface area of the species-specific home ranges. At one extreme, the home range of the hawksbill turtle is 211 times larger than the surface area of the velocity caps (i.e., 1/0.00475). At the other extreme, the home range of the loggerhead turtle is 920,810 times larger than the surface area of the velocity cap (i.e., 1/0.000001086). These AUFs should be considered conservative because they are obtained using the lowest-reported home range for each species. Even so, these values are minute and emphasize the low likelihood that juvenile neritic sea turtles would interact with the velocity caps during their foraging activities in the GOM.

In conclusion, while several T&E marine species are known to be present or have the potential to be present in the vicinity of the project area, most are deemed unlikely to experience I&E due to larger body sizes, viviparity, swimming abilities, and the slow intake velocities of ≤0.5 ft/s at the entrances of the velocity caps. The five sea turtle species require in-depth consideration. The "hatching frenzy" phenomenon, rate of water withdrawal at the velocity cap entrances (≤0.5 ft/s), velocity caps' depth below surface (20+ ft), and the velocity caps' distance from shore (beyond surf) assure that turtle hatchlings emerging from nests on beaches in the surrounding region have minimal potential for I&E. However, sea turtle juveniles and adults that use neritic habitat do have a potential for interacting with the intake structure. The small AUFs of juvenile sea turtles greatly limit any chance of encountering these structures. Furthermore, placing bar

screens across the entrances of the velocity caps to exclude juveniles and adults will eliminate the potential for interaction.

5.2.3 Potential I&E of the 11 Target Species

Table 4-7 identified for further evaluation 11 target species of fish and invertebrates of special interest based on their a) local abundance, b) life history characteristics, c) recognition as "fragile" species, d) reported impingement potential at other water intake facilities in the region, and e) recreational and/or commercial value. For each species, the general life history information was obtained for eggs, larvae, juveniles, and adults. The potential for each of these life stages to be withdrawn from the GOM and experience I&E due to the operation of the intake structure was then determined.

Table 5-1 summarizes the outcome of this process. For purpose of this evaluation, the potential for I&E is divided into the following four categories: minimal, low, medium, and high. These groupings are qualitative and assigned based on review of the available information and best professional judgement. The term "minimal" refers to the fact that the potential for passage through the intake structure, followed by I&E, is considered minor to none.

The table is also color coded to help visualize the potential for I&E, as follows: minimal is green, low is yellow, medium is orange, and high is blue.

When reviewing this body of information, it is important to keep in mind that the analysis is not a quantitative prediction of harm, but a qualitative evaluation of the potential for various life stages to be withdrawn by the intake structure in the GOM. Several factors not incorporated in the assessment need to be considered when reviewing this information:

- The evaluation does not predict mortality.
- The 3-in. mesh bar screens will prevent entry into the intake structure by larger life stages of some fish species.
- The traveling screens at the proposed desalination facility will collect and return to Aransas Channel a portion of the marine life withdrawn from the GOM.
- As presented in Section 3.3.2 of this report, any intake of marine life should not be viewed in absolute terms but must be considered within a broader ecological context. Specifically, for every egg or larva potentially withdrawn by the intake structure, vastly larger numbers of eggs and larvae in the surrounding area will not encounter this structure. So, for example, even though the potential for I&E of bay anchovy larvae is estimated to be "high" because they are found throughout the water column, it is only so for the 1 in almost 50,000 larvae within a quarter mile in any direction that potentially come into contact with the intake structure. Hence, when viewed within the context of all of the bay

anchovy larvae present in the vicinity of the project area, the potential for I&E should best be considered minor.

The results of the evaluation are as follows:

- **Atlantic Croaker (*Micropogonias undulatas*)**
  The potential I&E of eggs is estimated as low because they are pelagic and positively buoyant. The potential I&E of larvae is estimated as low because they only spend a short amount of time as plankton before becoming primarily demersal at depths commonly greater than that of the intake structure. The potential I&E of juveniles is estimated as minimal because they seek out shallow habitats in estuaries. The potential I&E of adults is estimated as low because this life stage may be present in nearshore areas of the GOM but adults are expected to swim at speeds substantially higher than the entrance velocity of ≤0.5 ft/s.
- **Bay Anchovy (*Anchoa mitchilli*)**
  The potential I&E of eggs is estimated as medium because they are buoyant until near hatching before they gradually sink into the water column. The potential I&E of larvae is estimated as high because they are found throughout the water column. The potential I&E of juveniles and adults is estimated as low because both are expected to swim at speeds substantially higher than the entrance velocity of ≤0.5 ft/s.
- **Bluefish (*Pomatomus saltatrix*)**
  The potential I&E of eggs is estimated as low because spawning occurs Offshore over the continental shelf. The potential I&E of larvae is estimated as high because larvae are pelagic and planktonic, and are dispersed throughout the water column when they move inshore. The potential I&E of juveniles and adults is estimated as low because both are expected to swim at speeds substantially higher than the entrance velocity of ≤0.5 ft/s.
- **Gulf Menhaden (*Brevoortia patronus*)**
  The potential I&E of eggs is estimated as high because they are planktonic and pelagic. The potential I&E of larvae is estimated as medium because they are planktonic (with diurnal vertical movements) but are more commonly found in Offshore environments before moving close to shore to enter the estuaries. The potential I&E of juveniles is estimated as minimal because they are predominantly found in estuarine environments and therefore are not in the vicinity of the intake structure. The potential I&E of adults is estimated as low because they are expected to swim at speeds substantially higher than the entrance velocity of ≤0.5 ft/s.
- **Red Drum (*Sciaenops ocellatus*)**
  The potential I&E of eggs is estimated as low because they are pelagic and positively buoyant, which will tend to keep them higher up in the water column than the depth of the intake structure. The potential I&E of larvae is estimated as high because they are

planktonic and dispersed throughout the water column. The potential I&E of juveniles is estimated as minimal because they seek out shallow estuarine habitats and are therefore not expected to be present in the vicinity of the intake structure. The potential I&E of adults is estimated as low because they are expected to swim at speeds substantially higher than the entrance velocity of ≤0.5 ft/s.

- **Spotted Seatrout (*Cynoscion nebulosus*)**
  The potential I&E of eggs is estimated as low because spawning occurs mainly in coastal bays, estuaries, and lagoons, but also close to shore in the GOM. Eggs are positively buoyant at salinities >25 ppt and are therefore expected to remain near the surface. The potential I&E of larvae is estimated as medium because they are planktonic for a short duration before settling to the sea bed. The potential I&E of juveniles is estimated as minimal because juveniles seek out shallow habitat ≤7.2 ft and are therefore not anticipated to be in the vicinity of the intake structure. The potential I&E of adults is estimated as low because they are demersal and are expected to swim at speeds substantially higher than the entrance velocity of ≤0.5 ft/s at the water intakes.

- **Blue Crab (*Callinectes sapidus*)**
  The potential I&E of eggs is estimated as minimal because the gravid females are external brooders, and the eggs attach to females' pleopods and are held against their abdomens until hatching. The potential I&E of larvae is estimated as high because the larval stages are planktonic forms that disperse throughout the water column. The potential I&E of juveniles is estimated as minimal because they are demersal and seek out estuarine habitats and are unlikely to occur in the vicinity of the intake structure. The potential I&E of adults is estimated as low because they are demersal and unlikely to spend much time in the upper water column.

- **Gulf Crab (*Callinectes similis*)**
  The potential I&E of eggs is estimated as minimal because the gravid females are external brooders, and the eggs are attached to the females' pleopods and are held against their abdomens until hatching. The potential I&E of larvae is estimated as high because all larval stages are planktonic forms that disperse throughout the water column. The potential I&E of juveniles is estimated as minimal because they are demersal, seek out estuarine habitats, and are therefore unlikely to occur in the vicinity of the intake structure, except as older juveniles. The potential I&E of adults is estimated as low because they are benthopelagic and unlikely to spend much time in the upper water column.

- **Brown Shrimp (*Penaeus aztecus*)**
  The potential I&E of eggs is estimated as minimal because they are demersal and found at depths greater than the proposed location of the intake structure. The potential I&E of larvae is estimated as high because they are planktonic and follow diurnal migrations throughout the water column. The potential I&E of juveniles is estimated as low because they reside in estuarine habitats with only some older juveniles migrating into the

nearshore GOM. The potential I&E of adults is estimated as low because they are demersal, are capable of swimming at speeds higher than the entrance velocity, and prefer areas deeper than 35 ft.

- **Pink Shrimp (*Penaeus duorarum*)**
  The potential I&E of eggs is estimated as low because they are demersal and are released at depths equivalent to or greater than the proposed location of the intake structure. The potential I&E of larvae is estimated as high because they are planktonic and found dispersed throughout the water column. The potential I&E of juveniles is estimated as low because juveniles are commonly found in estuaries over seagrass at depths <9.8 ft but subadults occur at depths ranging from 3.3 to 213 ft. The potential I&E of adults is estimated as low because they are demersal and are capable of swim speeds above the entrance velocity of ≤0.5 ft/s.
- **White Shrimp (*Penaeus setiferus*)**
  The potential I&E of eggs is estimated as low because they are demersal and found at depths equal to or greater than the proposed location of the intake structure. The potential I&E of larvae is estimated as high because they are planktonic and dispersed throughout the water column. The potential I&E of juveniles and subadults is estimated as low because they are demersal and found over soft-bottom habitats in estuaries. Older juveniles migrate out into the GOM to mature. The potential I&E of adults is estimated as low because they are demersal and are capable of swim speeds above the entrance velocity of ≤0.5 ft/s.

The available information suggests that eggs and larvae are the life stages with the highest potential for I&E. This finding is not surprising considering that eggs are unable to swim independently, and larvae only have limited swimming capabilities, particularly in the planktonic stage. Even though the entrance velocity of the velocity caps will be engineered to withdraw water at ≤0.5 ft/s, some eggs and larvae present in the water column that passively enter the intake structure can be expected to be drawn in.

It is important to note that the potential for I&E is species- and life-stage specific. For example, blue crab eggs are not expected to be withdrawn by the velocity caps because females carry their eggs until hatching. As a result, blue crab eggs have a minimal potential for withdrawal. Red drum post-larvae are carried by tidal currents out of the GOM, through the Aransas Inlet, and into the extensive estuarine seagrass beds beyond. Therefore, juvenile red drum are not expected to be present in the GOM approximately 1.3 miles Offshore and have a minimal potential for I&E. Other species, such as the bay anchovy and bluefish, have eggs and larvae that are present throughout the water column in the GOM, and therefore have a higher potential to be withdrawn by the velocity caps. But, as mentioned earlier, for every egg or larva that may be withdrawn by the intake structure, large numbers of eggs and larvae in the surrounding area will not encounter this structure. Hence, even though the potential for I&E by life stages of certain species is estimated to be "high" because they are found throughout the

water column, it is only so for a tiny fraction of the total number of ichthyoplankton present in the larger area around the intake structure. So, when viewed within the context of all of the eggs and larvae present in the vicinity of the project area, the potential for I&E should best be considered to be minor when viewed on a larger scale.

5.2.4 I&E Studies in Texas

The proposed Harbor Island desalination facility and its associated intake structure are under design but have not yet been constructed. Hence, I&E data specific to this facility are not available for evaluation. By default, any assessment of the potential effect to biota from the proposed desalination facility and its intake structure is qualitative and based on extrapolated data and assumptions. Published monitoring information from several power plants operating in Texas was reviewed to support the current assessment and develop a realistic understanding of the potential for causing measurable population-level effects.

Table 5-2 summarizes I&E data collected from power stations in Texas that withdraw large volumes of cooling water from nearby water bodies. The facilities with quantitative information retained for this evaluation are the Barney M. Davis Power Plant in Corpus Christi, Texas (near Corpus Christi Bay), the P.H. Robinson Generating Station in Bacliff, Texas (Galveston Bay), the Sam Bertron Station in Strand, Texas (Houston Ship Channel), and the Cedar Bayou Generating Station in Baytown, Texas (Cedar Bayou). This section of the report focuses specifically on the data provided for these power facilities. For the sake of completeness, **Table 5-2** also provides monitoring data for several other power generating facilities in Texas. However, information from these other power generating facilities is not discussed below because it lacks actual counts of the number of impinged marine life during the monitoring period.

Several key factors must be considered when evaluating and interpreting this kind of facility-specific information:

- The power stations do not withdraw their cooling waters from the GOM 1.3 miles away from shore but instead from nearby shallow estuaries or other water bodies that have habitats, physical characteristics, salinities, and species assemblages that are expected to be quite different than those found in the GOM.
- It is unlikely that the power stations encounter the same mix of species and life stages as the intake structure in the GOM. For example, older demersal life stages of the blue crab will be more prevalent in the estuaries because of their habitat requirements, whereas planktonic life stages of the blue crab will be more prevalent in the GOM where this species spawns. Older larvae and juveniles of red drum are found in estuaries, whereas adults are also found in the GOM.
- The seasonal timing for the presence of different life stages will vary between the GOM and the other water bodies. For example, in the fall, red drum eggs are expected to be

present in the nearshore waters of the GOM where the adults spawn but not within estuaries where widespread spawning by this species is not expected to occur.

- The number of the smallest marine life that might have been entrained through the traveling screens has not been counted, and therefore is unknown.
- All else being equal, the potential for I&E also depends on a number of facility-specific factors, such as water intake capacity (mgd versus billions of gallons per day [bgd]), average intake velocities, depth of the intakes, any additional avoidance technologies, the type of fish screen technology implemented at the facility, and other engineering considerations. These variables inevitably cause existing power plants to differ substantially in their I&E performance. With full consideration of known variables and improved technologies, I&E performance is expected to be significantly improved with the more modern facilities proposed for the Harbor Island intake structure, particularly since most of the previous monitoring studies occurred before implementation of the 316(b) CWIS rules.

Notwithstanding these important caveats and unknowns, the available impingement information from the Texas power stations is summarized below:

- The *Barney M. Davis Power Plant in Corpus Christi, Texas*, performed a monitoring study over a period of 11 months, between March 14, 2006, and February 21, 2007 (estimated total of 345 days). During that time frame, the facility impinged 42,286 fish and 28,418 invertebrates, for a total of 70,704 organisms, or around 205 organisms per day. This total is equivalent to 0.38 organisms per day per million gallons of intake water based on the water intake capacity at this facility of 540 mgd.[36] Eleven species made up 92% of the impinged marine life during the study period. Five of those 11 species (specifically, Atlantic croaker, bay anchovy, Gulf menhaden, blue crab, and brown shrimp) also represent the target species outlined in Section 4 of this report.
- The *P.H. Robinson Generating Station in Bacliff, Texas,* performed a monitoring study over a 13-month period, from February 1969 to March 1970 (estimated total of up to 395 days). During that time frame, the facility impinged 68,518 organisms representing 83 species, or around 173 organisms per day. This total is equivalent to 0.0012 organisms per million gallons of intake water based on the water intake capacity at this facility of 138.6 bgd. The reported injury rates of the impinged marine life varied by species (10 species were assessed), and ranged from a high of 34.2% for bay anchovies to a low of 2.6% for Atlantic croakers and spotted seatrout.
- The *Sam Bertron Generating Station in Strand, Texas*, performed a monitoring study over a 12-month period, from January 12, 1978, to January 2, 1979 (estimated total of 356 days).

[36] The flow rate at this facility was variable. The highest flow occurred at ~492 mgd (20.52 million gallons per hour) for 7.5% of the time during the study. The flows fell below ~233 mgd (9.72 million gallons/hour) for 70% of the time during the study.

During that time frame, the facility impinged 479,448 fish and 132,450 invertebrates, for a total of 611,898 organisms, or around 1,719 organisms per day. This total is equivalent to 0.007 organisms per million gallons of intake water based on the water intake capacity at this facility of 241.1 bgd. Brown shrimp, white shrimp, and blue crab accounted for 96.2% of the invertebrate impingement. These three species are target species outlined in Section 4 of this report. Also, close to 90% of all impinged fish species consisted of Gulf menhaden, threadfin shad, bay anchovy, sand seatrout, spotted seatrout, Atlantic croaker, red drum, and southern flounder. Five of those eight species are target species outlined in Section 4 of this report.

- The *Cedar Bayou Generating Station in Baytown, Texas* (Cedar Bayou) performed a monitoring study over an 11-month period (estimated total of 334 days). During that time frame, the facility impinged 11,556 organisms, or around 35 organisms per day. It is not possible to calculate the number of organisms impinged per million gallons of intake water because the reference does not report the water intake capacity of this facility.

Galveston Bay NEP (1993) analyzed the I&E data for five power generating stations around Galveston Bay (note: the monitoring data collected at several of these stations are summarized above). The overall conclusions of those various monitoring studies were as follows:

- Small or weak-swimming larvae, post-larvae, and young fish were susceptible to I&E when intake velocities averaged >1.1 ft/s.
- Species most frequently subjected to I&E consisted of white shrimp, blue crab, Gulf menhaden, bay anchovy, sand seatrout, spot, and Atlantic croaker.
- Species less frequently subjected to I&E consisted of brown shrimp, sea catfish, and striped mullet.
- Larval fish found to be susceptible to entrainment included the naked goby, juvenile Gulf menhaden, bay anchovy, larval comb-tooth blennies, and Atlantic croaker.
- Generally, members of commercially or recreationally important fish species were not impinged in large numbers with respect to the most-abundant species.
- The overall probabilities of survival for impinged fish were much lower than for crustaceans.
- More crustaceans were impinged by number and weight compared to finfish, other than menhaden.

The available Texas I&E studies show that the number of marine life that may be retained on traveling fish screens at the proposed Harbor Island desalination facility is expected to be relatively minor when considered within a larger ecosystem context. **Table 5-3** provides fecundity information for 5 of the 11 target species. A recurring theme is the extraordinary fecundity of these species, with each female laying from tens of thousands to many millions of

eggs each year. This reproductive strategy releases untold number of eggs in the GOM based on the evolutionary premise that the vast majority of early life stages will perish before they reach adulthood. This general pattern is also described in Section 3.3.2 of this report.

5.3 POTENTIAL FOR POPULATION-LEVEL EFFECTS

The potential I&E impacts to area marine life caused by the intake structure supplying State Water to the proposed Harbor Island desalination facility will be minor based on the following considerations: a) a review of the physical variables and salinities in the GOM in the vicinity of the intake structure, b) the general engineering details and components that combine to deliver a state-of-the-art State Water diversion system, and c) review of representative and relevant marine species at all life stages for the intake structure location. This conclusion is primarily due to the relatively low numbers of marine life expected to be drawn through the intake structure as compared to the high numbers of marine life present in the vicinity of the project area.

Entrainment impacts of planktonic larvae are typically assessed indirectly based on modeling. From a population biology perspective, the spatial scale of the proposed State Water diversion is very minor when considering the substantially larger amount of source water containing eggs and planktonic larvae in the vicinity of the project area. Depending on site-specific factors, such as withdrawal volume, velocity, and density of planktonic larvae, the range of potential larval entrainment losses derived from modeling results have been estimated as 0.02% to 0.33% of the source water populations for the Huntington Beach Desalination Facility in California, which had a proposed intake volume of 152 mgd (Tenera Environmental 2010a). Modeled species-specific losses of 0.01% to 0.063% were calculated by Tenera Environmental (2010b) for another facility in California with a proposed intake flow rate of 7 mgd. These losses were not considered significant because of the high fluctuations in population levels from changing environmental conditions, other stressors, and natural sources of mortality, which reach 99.9% (Tenera Environmental 2010b).

Several studies have modeled the movement of passive particles, representing red drum eggs and larvae, from the GOM into the Aransas Inlet by accounting for various environmental forces (e.g., tides and wind) and biological factors (e.g., egg or larval development and settlement) (Brown et al. 2000, 2004, 2005). These modeling studies found that between 39% and 55% of all the passive particles present in the GOM immediately outside of the Aransas Inlet at the start of the simulations were not anticipated to enter the inlet and were therefore effectively "lost" to the ecosystem. This type of large-scale loss is normal and expected. It emphasizes that the relatively small numbers of eggs and larvae that may be withdrawn by the intake structure at a more remote location in the GOM, when compared to the total number of eggs and larvae present in the vicinity of the project area (Section 3.3.1) and for many miles beyond in all directions, is not expected to affect local populations.

5.4 SUMMARY AND CONCLUSIONS

The analysis presented in this report suggests that the proposed water intake structure for the Harbor Island desalination plant has the potential to interact with planktonic life stages and weakly swimming older life stages of fish and invertebrates present in the GOM, as well as sea turtle juveniles. The numbers, kinds, and sizes of fish and invertebrates that interact with the intake structure will depend on life history considerations (e.g., spawning close to shore vs. pelagic areas; floating and demersal eggs vs. neutrally buoyant eggs; organism size; swimming abilities), seasonal considerations (e.g., fall spawners vs. year-round spawners), and intake structure considerations (e.g., average intake velocities, structure and function of velocity caps), among others. These topics have been discussed above.

Although some intake of marine life is inevitable with the intake structure for the project area in the GOM, the following considerations indicate that the potential effects to marine species and their local populations are expected to be minor:

- The design intake flow velocity at the entrance to the intake structure will fall below the EPA-established limit of ≤0.5 ft/s for power plants in other contexts, and is expected to drastically reduce the amount of marine life entering the velocity caps (and therefore greatly reduce I&E).
- The prevailing tidal velocities in the GOM are generally higher than the entrance velocity of 0.5 ft/s at the intake structure (see **Figure 2-10**). This combination suggests that, on average, eggs and larvae are more likely to pass through the velocity caps instead of being withdrawn by them.
- The location of the intake structure is approximately 1.3 miles Offshore, away from shallow habitat that comprises areas that may be used more widely by smaller species or for spawning.
- The intake structure will be submerged at depth with approximately 20 to 25 ft of water overlying the velocity caps. This deeper placement will greatly limit or eliminate the withdrawal of positively buoyant eggs found at or near the surface of the GOM.
- The intake structure entrances will be at least 5 ft above the sea bed. This design feature will greatly limit or eliminate the withdrawal of demersal eggs and other benthic marine life species.
- The number of those marine species potentially affected by I&E is further reduced by application of current technology, including bar screens that prevent certain marine life from entering the intake structure, and traveling screens at the proposed desalination facility on Harbor Island that return marine life to a natural habitat.

Based on volumetric considerations, and assuming even distribution throughout the water column, any withdrawal of eggs and larvae by the intake structure will represent a very small

fraction of the total number of eggs and larvae expected to be present in the vicinity of the project area. If ELS are not evenly distributed in the water column (e.g., the eggs of red drum and spotted seatrout have positive buoyancy in the salty waters of the GOM), then the potential for withdrawal of such marine life is reduced even further.

The survival potential of marine life impinged on the traveling screens likely depends on the species (e.g., early life stages of fish have lower survival rates than invertebrates, "fragile" fish species are more affected than other fish species) and the proposed efficiency and efficacy of the steps used to remove the impinged marine life from the traveling screens for return to the nearby aquatic habitat.

An important consideration is the high fecundity of the 11 target species evaluated in this report. Their reproductive strategy presupposes that the vast majority of eggs and larvae will not survive to adulthood. Such a strong, built-in resiliency helps mitigate any impacts that might be associated with any potential withdrawal of these early life stages by the intake structure.

Finally, T&E species (sea turtles) and HMS are not expected to be affected by the intake structure due to a combination of the following factors: lack of presence in the project area, strong swimming abilities, large body sizes, birthing of fully formed neonates (e.g., shark pups and whale calves, instead of eggs and larvae), the design of the intake velocity caps, the presence of 3-in. bar screens, the depth of intake, and the distance of the intake from shore.

Turtle hatchlings have the potential to be present in the project area in the GOM for short periods of time based on the recorded presence of sea turtle nests on several regional beaches. However, nesting activity does not appear to be widespread (i.e., dozens of nests, not thousands), and the potential for withdrawal of sea turtle hatchlings by the intake structure is anticipated to be rare based on behavioral considerations (e.g., "frenzied" swimming close to the GOM surface towards the open ocean to minimize mortality from nearshore predators). Juvenile and adult sea turtles are present in the vicinity of the project area and have the potential to interact with the intake structure, as has been shown to occur at the Port St. Lucie Nuclear Power Plant in Florida. However, the potential for neritic juvenile sea turtles to interact with the velocity caps is demonstrably minimal using an AUF approach. The design of the intake structure will include adding 3-in. mesh size bar screens at the entrances of the velocity caps to eliminate any potential for accidental "take" of juvenile turtles. This mitigation measure will also prevent adult sea turtles or larger fish from entering the velocity caps.

The following components will be implemented based on all these considerations: a) place the water intake structure approximatively 1.3 miles Offshore at 5 to 10 ft above the sea bed in approximately 35 ft of water to limit interaction with marine life, b) set the entrance velocity at the velocity caps to ≤0.5 ft/s to reduce the potential withdrawal of eggs and larvae, c) enclose the velocity caps with 3-in. mesh size bar screens to prevent incidental entrance by juvenile and

adult sea turtles, and d) use traveling screens at the proposed desalination facility to support survival.

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ATTACHMENT G

PROOF OF PAYMENT

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Port of Corpus Christi
PO Box 1541
Corpus Christi, TX 78403

301897

Page 1 of 1

Date 02/02/2023

Account # 99354

Invoice Date	Invoice Number	Description	Gross Amt	Discount Amt	Net Amt
02/01/2023	112929		62,025.00	0.00	62,025.00
		TOTALS:	62,025.00	0.00	62,025.00

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FROST BANK
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301897
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DATE	AMOUNT
02/02/2023	$**** 62,025.00

PAY Sixty Two Thousand Twenty Five And 0/100 Dollars

VOID AFTER 180 DAYS

TO THE ORDER OF
TX COMMISSION ON ENVIRONMENTAL QUALITY
PO BOX 13089
AUSTIN, TX 78711-3089

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