

STATEMENT OF BASIS/TECHNICAL SUMMARY AND
EXECUTIVE DIRECTOR'S PRELIMINARY DECISION

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City Secretary

DESCRIPTION OF APPLICATION

Applicant: City of Corpus Christi; Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0005289000 (EPA I.D. No. TX0139874)

Regulated activity: Industrial wastewater permit

Type of application: New permit

Request: New permit

Authority: Federal Clean Water Act (CWA) §402; Texas Water Code (TWC) §26.027; 30 Texas Administrative Code (TAC) Chapter 305, Subchapters C-F, and Chapters 307 and 319; commission policies; and Environmental Protection Agency (EPA) guidelines

EXECUTIVE DIRECTOR RECOMMENDATION

The Executive Director has made a preliminary decision that this permit, if issued, meets all statutory and regulatory requirements. The draft permit will expire at midnight, five years from the date of permit issuance according to the requirements of 30 TAC §305.127(1)(C)(i).

REASON FOR PROJECT PROPOSED

The applicant has applied to the Texas Commission on Environmental Quality (TCEQ) for a new permit.

PROJECT DESCRIPTION AND LOCATION

The applicant proposes to operate Inner Harbor Desalination Plant, a seawater desalination facility.

The wastewater system consists of taking raw seawater and producing potable water. The wastestreams will be generated by pretreatment, membrane filtration, and desalination processes. The wastestreams from these processes will be comingled for discharge through Outfall 001. The initial phase of producing water is at 20 million gallons per day (MGD) with the final phase increase to 30 MGD.

This permit does not authorize the discharge of domestic wastewater. All domestic wastewater must be disposed of in an approved manner, such as routing to an approved on-site septic tank and drainfield system or to an authorized facility for treatment and disposal.

The facility is located at the intersection of Nueces Bay Boulevard and East Broadway Street, in the City of Corpus Christi, Nueces County, Texas 78401.

Discharge Route and Designated Uses

The effluent is discharged directly to Corpus Christi Inner Harbor in Segment No. 2484 of the Bays and Estuaries. The designated uses for Segment No. 2484 are non-contact recreation and intermediate aquatic life use. The effluent limits in the draft permit will maintain and protect the existing instream uses. All determinations are preliminary and subject to additional review and revisions.

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Antidegradation Review

In accordance with 30 TAC §307.5 and TCEQ's *Procedures to Implement the Texas Surface Water Quality Standards* (June 2010), an antidegradation review of the receiving waters was performed. A Tier 1 antidegradation review has preliminarily determined that existing water quality uses will not be impaired by this permit action. Numerical and narrative criteria to protect existing uses will be maintained. A Tier 2 review has preliminarily determined that no significant degradation of water quality is expected in Corpus Christi Inner Harbor, which has been identified as having intermediate aquatic life use. Existing uses will be maintained and protected. The preliminary determination can be reexamined and may be modified if new information is received.

Endangered Species Review

The discharge from this permit action is not expected to have an effect on any federal endangered or threatened aquatic or aquatic dependent species or proposed species or their critical habitat. This determination is based on the United States Fish and Wildlife Service's (USFWS) biological opinion on the State of Texas authorization of the TPDES program September 14, 1998, October 21, 1998 update. To make this determination for TPDES permits, TCEQ and EPA only consider aquatic or aquatic dependent species occurring in watersheds of critical concern or high priority as listed in Appendix A of the USFWS biological opinion. Though the piping plover, *Charadrius melodus* Ord, can occur in Nueces County, the discharge is not to a watershed of high priority per Appendix A of the USFWS biological opinion. The determination is subject to reevaluation due to subsequent updates or amendments to the biological opinion. The permit does not require EPA review with respect to the presence of endangered or threatened species.

Impaired Water Bodies

Segment No. 2484 is currently listed on the state's inventory of impaired and threatened waters, the 2022 CWA §303(d) list. The listing is specifically for copper in water from U.S. Highway 181 to the Viola Turning Basin (entire segment) (AU 2484_01). The desalination process does not add additional copper to the segment. Therefore, it will not cause or contribute to the existing copper impairment.

Completed Total Maximum Daily Loads (TMDLs)

There are no completed TMDLs for Segment No. 2484.

Dissolved Oxygen

The proposed discharge is not expected to contain significant levels of oxygen-demanding constituents. Dissolved oxygen concentrations in the receiving waters are expected to consistently be protected and maintained above the criterion established for Corpus Christi Inner Harbor (3.0 mg/L).

Diffuser Analysis

Outfall 001 will consist of a submerged multi-port diffuser, located approximately 58 feet from the shoreline.

A mixing analysis of the discharge from Outfall 001 was conducted using the CORMIX 12.0GTD (Version 12.0.1.0) modeling software. This analysis relies, in part, on the documents titled *Technical Memorandum: City of Corpus Christi Desalination Study - Concentrate Modeling at Inner Harbor Channel - TPDES Permit No.: WQ0005289000* (July 26, 2021); *RFI Response Report: City of Corpus Christi TPDES Permit Application No. WQ0005289000 Response to the Request for Information (RFI)* (April 10, 2023); and *RFI Response Report: City of Corpus Christi TPDES Permit Application No. WQ0005289000 REVISION to Response to the Request for Information (RFI) dated April 6, 2023* (May 8, 2023). Information contained in those documents was used in the development of the TCEQ CORMIX analysis. Based on this initial mixing analysis, the following critical effluent percentages were recommended:

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Initial Phase - 20 MGD of produced water uses approximately 55.4 MGD of raw water and results in approximately 34.3 MGD of discharge at 40% reverse osmosis (RO) recovery. 20 MGD of produced water uses approximately 44.3 MGD of raw water and results in approximately 23.5 MGD of discharge at 50% RO recovery,

Chronic Aquatic Life Effluent Mixing Zone %:	20 MGD at 40% RO for 6.26 %
	20 MGD at 50% RO for 6.62 %
Acute Aquatic Life Effluent Zone of Initial Dilution %:	20 MGD at 40% RO for 8.76 %
	20 MGD at 50% RO for 9.26 %
Human Health Effluent %:	20 MGD at 40% RO for 4.87 %
	20 MGD at 50% RO for 5.15 %

Final Phase - 30 MGD of produced water uses approximately 83.1 MGD of raw water and results in approximately 51.5 MGD of discharge at 40% RO recovery. 30 MGD of produced water uses approximately 66.5 MGD of raw water and results in approximately 35.2 MGD of discharge at 50% RO recovery.

Chronic Aquatic Life Effluent Mixing Zone %:	30 MGD at 40% RO for 6.08 %
	30 MGD at 50% RO for 6.24 %
Acute Aquatic Life Effluent Zone of Initial Dilution %:	30 MGD at 40% RO for 8.50 %
	30 MGD at 50% RO for 8.74 %
Human Health Effluent %:	30 MGD at 40% RO for 4.72 %
	30 MGD at 50% RO for 4.85 %

The highest predicted percent effluent results should be used for the general assessment of permit effluent limits. However, since the percent effluent predictions are higher during the Initial phase (20 MGD production capacity) than they are for the Ultimate phase (30 MGD production capacity), the percent effluent values used for permitting purposes may be partitioned separately for these two permit phases (though it should be noted that future reviews, once discharge commences, will also include CORMIX model runs performed using median discharge flows). These percent effluent values are also predicted to be the maximum effluent percentages at the edges of the regulatory mixing zones for the assessment of potential concerns about salinity impacts related to this discharge. It is recommended that only the highest percent effluent predictions for each regulatory mixing zone be used for screening purposes and for the derivation of effluent limits, though again, those percent effluent values may be applied with more specificity to correspond to the two different permit phases (production capacities).

SUMMARY OF EFFLUENT DATA

Self-reporting data is not available because the facility has not been constructed.

DRAFT PERMIT CONDITIONS

The draft permit authorizes the discharge of water treatment wastes at a daily average flow not to exceed 34.3 MGD initial phase and 51.5 MGD final phase via Outfall 001.

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Effluent limitations are established in the draft permit as follows:

Outfall	Pollutant	Daily Average		Daily Maximum	
		mg/L	lbs/day	mg/L	lbs/day
001 Initial	Flow	34.3 MGD		41 MGD	
	Total Suspended Solids (TSS)	Report	Report	Report	Report
	Total Dissolved Solids (TDS)	Report	Report	Report	Report
	Chloride	Report	Report	Report	Report
	Sulfate	Report	Report	Report	Report
	pH (Standard Units, SU)	6.5 SU, min		9.0 SU	

Outfall	Pollutant	Daily Average		Daily Maximum	
		mg/L	lbs/day	mg/L	lbs/day
001 Final	Flow	51.5 MGD		62 MGD	
	TSS	Report	Report	Report	Report
	TDS	Report	Report	Report	Report
001 Final	Chloride	Report	Report	Report	Report
	Sulfate	Report	Report	Report	Report
	pH (Standard Units, SU)	6.5 SU, min		9.0 SU	

OUTFALL LOCATIONS

Outfall	Latitude	Longitude
001	27.814363 N	97.418753 W

Technology-Based Effluent Limitations

Regulations in Title 40 of the Code of Federal Regulations (40 CFR) require that technology-based limitations be placed in wastewater discharge permits based on effluent limitations guidelines (ELGs), where applicable, or on best professional judgment (BPJ) in the absence of guidelines.

The discharge of water treatment wastes resulting from desalination processes is not subject to any ELGs. Monitoring and reporting requirements for TSS have been included in the draft permit at Outfall 001 based upon BPJ due to the potential for elevated levels of suspended solids to be present in the discharge.

Water Quality-Based Effluent Limitations

Calculations of water quality-based effluent limitations for the protection of aquatic life and human health are presented in Appendix A. Aquatic life criteria established in Table 1 and human health criteria established in Table 2 of 30 TAC Chapter 307 are incorporated into the calculations, as are recommendations in the Water Quality Assessment Team's memorandum dated October 18, 2023. TCEQ practice for determining significant potential is to compare the reported analytical data from the facility against percentages of the calculated daily average water quality-based effluent limitation. Permit limitations are required when analytical data reported in the application exceeds 85 percent of the calculated daily average water quality-based effluent limitation. Monitoring and reporting is required when analytical data reported in the application exceeds 70 percent of the calculated daily average water quality-based effluent limitation.

No analytical data was submitted with the application because the facility has not been constructed. Other Requirement No. 8 has been added to the draft permit requiring sampling and analysis of the effluent upon commencement of discharge. Based on a review of the data, the permit may be reopened to add limitations or monitoring requirements, if needed.

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Total Dissolved Solids (TDS), Chloride, and Sulfate Screening

Segment No. 2484, which receives the discharge from this facility, does not have criteria established for TDS, chloride, or sulfate in 30 TAC Chapter 307; therefore, no screening was performed for TDS, chloride, or sulfate in the effluent. However, the applicant performed extensive analyses and modeling to conclude that the discharge would not impact salinity gradients in the surrounding waters and that survival, growth, and reproduction of aquatic life would not be significantly impacted and provided their report as part of their application. In addition, monitoring and reporting requirements for TDS, chloride, and sulfate have been included in the draft permit at Outfall 001 based on the presence of water treatment wastes which will include elevated levels of these constituents in the proposed discharge. Other Requirement No. 8 has been added to the draft permit requiring sampling and analysis of the effluent upon commencement of discharge. Due to the nature of water treatment wastes, TDS, chloride, and sulfate monitoring is initially placed in the draft. Based on a review of the data, the permit may be reopened to add limitations or monitoring requirements, if needed.

pH Screening

The permit includes pH limits of 6.5 – 9.0 SU at Outfall 001, which discharges directly into Corpus Christi Inner Harbor, Segment No. 2484. The segment has these same pH standards and thus limits are protective of the segment criteria.

SUMMARY OF CHANGES FROM APPLICATION

No changes were made from the application.

BASIS FOR DRAFT PERMIT

The following items were considered in developing the draft permit:

1. Application received on January 22, 2020, and additional information received on March 17 and 30, 2020; April 3, 8, 9, 14, 24, 27, and 28, 2020; May 4, 14, 19, and 21, 2020; April 10, 2023; and May 8, 2023.
2. TCEQ Rules.
3. *Texas Surface Water Quality Standards* – 30 TAC §§307.1-307.10, effective March 1, 2018, as approved by EPA Region 6.
4. *Texas Surface Water Quality Standards* – 30 TAC §§307.1-307.10, effective March 6, 2014, as approved by EPA Region 6, for portions of the 2018 standards not approved by EPA Region 6.
5. *Texas Surface Water Quality Standards* – 30 TAC §§307.1-307.10, effective July 22, 2010, as approved by EPA Region 6, for portions of the 2014 standards not approved by EPA Region 6.
6. *Texas Surface Water Quality Standards* – 30 TAC §§307.1-307.10, effective August 17, 2000, and Appendix E, effective February 27, 2002, for portions of the 2010 standards not approved by EPA Region 6.
7. *Procedures to Implement the Texas Surface Water Quality Standards (IPs)*, Texas Commission on Environmental Quality, June 2010, as approved by EPA Region 6.
8. *Procedures to Implement the Texas Surface Water Quality Standards*, Texas Commission on Environmental Quality, January 2003, for portions of the 2010 IPs not approved by EPA Region 6.
9. Memos from the Standards Implementation Team and Water Quality Assessment Team of the Water Quality Assessment Section of the TCEQ, including their diffuser memo.
10. *Guidance Document for Establishing Monitoring Frequencies for Domestic and Industrial Wastewater Discharge Permits*, TCEQ Document No. 98-001.000-OWR-WQ, May 1998.
11. EPA Effluent Guidelines: N/A.

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12. Consistency with the Coastal Management Plan: The executive director has reviewed this action for consistency with the goals and policies of the Texas Coastal Management Program (CMP) in accordance with the regulations of the General Land Office and has determined that the action is consistent with the applicable CMP goals and policies.
13. Letter dated May 28, 2014, from L'Oreal W. Stepney, P.E., Deputy Director, Office of Water, TCEQ, to Bill Honker, Director, Water Quality Protection Division, EPA (TCEQ proposed development strategy for pH evaluation procedures).
14. Letter dated June 2, 2014, from William K. Honker, P.E., Director, Water Quality Protection Division, EPA, to L'Oreal W. Stepney, P.E., Deputy Director, Office of Water, TCEQ (Approval of TCEQ proposed development strategy for pH evaluation procedures).
15. Letter dated April 10, 2023, from Katie Leatherwood, Environmental Scientist, Freese and Nichols, Inc., to TCEQ, City of Corpus Christi TPDES Permit Application No. WQ0005289000 Response to the Request for Information, with corrected table 1-2 on May 8, 2023.

PROCEDURES FOR FINAL DECISION

When an application is declared administratively complete, the chief clerk sends a letter to the applicant advising the applicant to publish the Notice of Receipt of Application and Intent to Obtain Permit in the newspaper. In addition, the Chief Clerk instructs the applicant to place a copy of the application in a public place for reviewing and copying in the county where the facility is or will be located. This application will be in a public place throughout the comment period. The Chief Clerk also mails this notice to any interested persons and, if required, to landowners identified in the permit application. This notice informs the public about the application and provides that an interested person may file comments on the application or request a contested case hearing or a public meeting.

Once a draft permit is completed, it is sent to the Chief Clerk, along with the Executive Director's preliminary decision contained in the technical summary or fact sheet. At that time, the Notice of Application and Preliminary Decision will be mailed to the same people and published in the same newspaper as the prior notice. This notice sets a deadline for making public comments. The applicant must place a copy of the Executive Director's preliminary decision and draft permit in the public place with the application.

Any interested person may request a public meeting on the application until the deadline for filing public comments. A public meeting is intended for the taking of public comment and is not a contested case hearing.

After the public comment deadline, the Executive Director prepares a response to all significant public comments on the application or the draft permit raised during the public comment period. The Chief Clerk then mails the Executive Director's response to comments and final decision to people who have filed comments, requested a contested case hearing, or requested to be on the mailing list. This notice provides that if a person is not satisfied with the Executive Director's response and decision, they can request a contested case hearing or file a request to reconsider the Executive Director's decision within 30 days after the notice is mailed.

The Executive Director will issue the permit unless a written hearing request or request for reconsideration is filed within 30 days after the Executive Director's response to comments and final decision is mailed. If a hearing request or request for reconsideration is filed, the Executive Director will not issue the permit and will forward the application and request to the TCEQ commissioners for their consideration at a scheduled commission meeting. If a contested case hearing is held, it will be a legal proceeding similar to a civil trial in state district court.

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If the Executive Director calls a public meeting or the commission grants a contested case hearing as described above, the commission will give notice of the date, time, and place of the meeting or hearing. If a hearing request or request for reconsideration is made, the commission will consider all public comments in making its decision and shall either adopt the Executive Director's response to public comments or prepare its own response.

For additional information about this application, contact Thomas E. Starr at (512) 239-4570.

Thomas E. Starr
Thomas E. Starr, P.E.

November 28, 2023
Date

Appendix A Calculated Water Quality-Based Effluent Limits

TEXTOX MENU #5 - BAY OR WIDE TIDAL RIVER

The water quality-based effluent limitations developed below are calculated using:

Table 1, 2014 Texas Surface Water Quality Standards (30 TAC 307) for Saltwater Aquatic Life

Table 2, 2018 Texas Surface Water Quality Standards for Human Health

"Procedures to Implement the Texas Surface Water Quality Standards," TCEQ, June 2010

PERMIT INFORMATION

Permittee Name:	<u>The City of Corpus Christi</u>
TPDES Permit No:	<u>WQ0005289000</u>
Outfall No:	<u>001 Initial</u>
Prepared by:	<u>Thomas Starr, P.E.</u>
Date:	<u>November 27, 2023</u>

DISCHARGE INFORMATION

Receiving Waterbody:	<u>Corpus Christi Inner Harbor</u>
Segment No:	<u>2484</u>
TSS (mg/L):	<u>9</u>
Effluent Flow for Aquatic Life (MGD)	<u>N/A</u>
% Effluent for Chronic Aquatic Life (Mixing Zone):	<u>6.62</u>
% Effluent for Acute Aquatic Life (ZID):	<u>9.26</u>
Oyster Waters?	<u>no</u>
Effluent Flow for Human Health (MGD):	<u>N/A</u>
% Effluent for Human Health:	<u>5.15</u>

CALCULATE DISSOLVED FRACTION (AND ENTER WATER EFFECT RATIO IF APPLICABLE):

<i>Estuarine Metal</i>	<i>Intercept</i>		<i>Partition</i>	<i>Dissolved</i>	<i>Source</i>	<i>Water</i>	<i>Source</i>
	<i>(b)</i>	<i>Slope</i>	<i>Coefficient</i>	<i>Fraction</i>		<i>Effect Ratio</i>	
		<i>(m)</i>	<i>(Kp)</i>	<i>(Cd/Ct)</i>		<i>(WER)</i>	
Aluminum	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Arsenic	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Cadmium	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Chromium (total)	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Chromium (trivalent)	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Chromium (hexavalent)	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Copper	4.85	-0.72	13489.63	0.881		1.00	Assumed
Lead	6.06	-0.85	162181.01	0.381		1.00	Assumed
Mercury	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Nickel	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Selenium	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Silver	5.86	-0.74	131825.67	0.431		1.00	Assumed
Zinc	5.36	-0.52	69183.10	0.591		1.00	Assumed

AQUATIC LIFE

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

Parameter	SW Acute	SW Chronic	WLAa	WLAc	LTAa	LTAc	Daily Avg.	Daily Max.
	Criterion (µg/L)	Criterion (µg/L)						
Acrolein	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Aldrin	1.3	N/A	14.0	N/A	4.49	N/A	6.60	13.9
Aluminum	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arsenic	149	78	1609	1178	515	719	756	1601
Cadmium	40.0	8.75	432	132	138	80.6	118	250
Carbaryl	613	N/A	6620	N/A	2118	N/A	3113	6588
Chlordane	0.09	0.004	0.972	0.0604	0.311	0.0369	0.0541	0.114
Chlorpyrifos	0.011	0.006	0.119	0.0906	0.0380	0.0553	0.0558	0.118
Chromium (trivalent)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium (hexavalent)	1090	49.6	11771	749	3767	457	671	1421
Copper	13.5	3.6	165	61.5	52.8	37.5	55.1	116
Copper (oyster waters)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cyanide (free)	5.6	5.6	60.5	84.6	19.4	51.6	28.4	60.1
4,4'-DDT	0.13	0.001	1.40	0.0151	0.449	0.00921	0.0135	0.0286
Demeton	N/A	0.1	N/A	1.51	N/A	0.921	1.35	2.86
Diazinon	0.819	0.819	8.84	12.4	2.83	7.55	4.16	8.80
Dicofol [Kelthane]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dieldrin	0.71	0.002	7.67	0.0302	2.45	0.0184	0.0270	0.0573
Diuron	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Endosulfan I (alpha)	0.034	0.009	0.367	0.136	0.117	0.0829	0.121	0.257
Endosulfan II (beta)	0.034	0.009	0.367	0.136	0.117	0.0829	0.121	0.257
Endosulfan sulfate	0.034	0.009	0.367	0.136	0.117	0.0829	0.121	0.257
Endrin	0.037	0.002	0.400	0.0302	0.128	0.0184	0.0270	0.0573
Guthion [Azinphos Methyl]	N/A	0.01	N/A	0.151	N/A	0.0921	0.135	0.286
Heptachlor	0.053	0.004	0.572	0.0604	0.183	0.0369	0.0541	0.114
Hexachlorocyclohexane (gamma) [Lindane]	0.16	N/A	1.73	N/A	0.553	N/A	0.812	1.71
Lead	133	5.3	3729	208	1193	127	186	394
Malathion	N/A	0.01	N/A	0.151	N/A	0.0921	0.135	0.286
Mercury	2.1	1.1	22.7	16.6	7.26	10.1	10.6	22.5
Methoxychlor	N/A	0.03	N/A	0.453	N/A	0.276	0.406	0.859
Mirex	N/A	0.001	N/A	0.0151	N/A	0.00921	0.0135	0.0286
Nickel	118	13.1	1274	198	408	121	177	375
Nonylphenol	7	1.7	75.6	25.7	24.2	15.7	23.0	48.7
Parathion (ethyl)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pentachlorophenol	15.1	9.6	163	145	52.2	88.5	76.7	162
Phenanthrene	7.7	4.6	83.2	69.5	26.6	42.4	39.1	82.7
Polychlorinated Biphenyls [PCBs]	10	0.03	108	0.453	34.6	0.276	0.406	0.859
Selenium	564	136	6091	2054	1949	1253	1842	3897
Silver	2	N/A	49.3	N/A	15.8	N/A	23.1	49.0
Toxaphene	0.21	0.0002	2.27	0.00302	0.726	0.00184	0.00270	0.00573
Tributyltin [TBT]	0.24	0.0074	2.59	0.112	0.829	0.0682	0.100	0.212
2,4,5 Trichlorophenol	259	12	2797	181	895	111	162	343
Zinc	92.7	84.2	1660	2108	531	1286	780	1651

HUMAN HEALTH

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

Parameter	Fish Only				
	Criterion (µg/L)	WLAh (µg/L)	LTAh (µg/L)	Daily Avg. (µg/L)	Daily Max. (µg/L)
Acrylonitrile	115	2233	2077	3052	6458
Aldrin	1.147E-05	0.000223	0.000207	0.000304	0.000644
Anthracene	1317	25573	23783	34960	73964
Antimony	1071	20796	19340	28430	60148
Arsenic	N/A	N/A	N/A	N/A	N/A
Barium	N/A	N/A	N/A	N/A	N/A
Benzene	581	11282	10492	15423	32629
Benzidine	0.107	2.08	1.93	2.84	6.00
Benzo(a)anthracene	0.025	0.485	0.451	0.663	1.40
Benzo(a)pyrene	0.0025	0.0485	0.0451	0.0663	0.140
Bis(chloromethyl)ether	0.2745	5.33	4.96	7.28	15.4
Bis(2-chloroethyl)ether	42.83	832	773	1136	2405
Bis(2-ethylhexyl) phthalate [Di(2-ethylhexyl) phthalate]	7.55	147	136	200	424
Bromodichloromethane [Dichlorobromomethane]	275	5340	4966	7300	15444
Bromoform [Tribromomethane]	1060	20583	19142	28138	59530
Cadmium	N/A	N/A	N/A	N/A	N/A
Carbon Tetrachloride	46	893	831	1221	2583
Chlordane	0.0025	0.0485	0.0451	0.0663	0.140
Chlorobenzene	2737	53146	49425	72655	153713
Chlorodibromomethane [Dibromochloromethane]	183	3553	3305	4857	10277
Chloroform [Trichloromethane]	7697	149456	138994	204321	432272
Chromium (hexavalent)	502	9748	9065	13325	28192
Chrysene	2.52	48.9	45.5	66.8	141
Cresols [Methylphenols]	9301	180602	167960	246900	522354
Cyanide (free)	N/A	N/A	N/A	N/A	N/A
4,4'-DDD	0.002	0.0388	0.0361	0.0530	0.112
4,4'-DDE	0.00013	0.00252	0.00235	0.00345	0.00730
4,4'-DDT	0.0004	0.00777	0.00722	0.0106	0.0224
2,4'-D	N/A	N/A	N/A	N/A	N/A
Danitol [Fenpropathrin]	473	9184	8542	12556	26564
1,2-Dibromoethane [Ethylene Dibromide]	4.24	82.3	76.6	112	238
m-Dichlorobenzene [1,3-Dichlorobenzene]	595	11553	10745	15794	33415
o-Dichlorobenzene [1,2-Dichlorobenzene]	3299	64058	59574	87574	185275
p-Dichlorobenzene [1,4-Dichlorobenzene]	N/A	N/A	N/A	N/A	N/A
3,3'-Dichlorobenzidine	2.24	43.5	40.5	59.4	125
1,2-Dichloroethane	364	7068	6573	9662	20442
1,1-Dichloroethylene [1,1-Dichloroethene]	55114	1070175	995263	1463035	3095266
Dichloromethane [Methylene Chloride]	13333	258893	240771	353932	748796
1,2-Dichloropropane	259	5029	4677	6875	14545
1,3-Dichloropropene [1,3-Dichloropropylene]	119	2311	2149	3158	6683
Dicofol [Kelthane]	0.30	5.83	5.42	7.96	16.8
Dieldrin	2.0E-05	0.000388	0.000361	0.000530	0.00112
2,4-Dimethylphenol	8436	163806	152339	223938	473775
Di-n-Butyl Phthalate	92.4	1794	1669	2452	5189
Dioxins/Furans [TCDD Equivalents]	7.97E-08	0.0000015	0.0000014	0.0000021	0.0000045
Endrin	0.02	0.388	0.361	0.530	1.12
Epichlorohydrin	2013	39087	36351	53436	113052
Ethylbenzene	1867	36252	33715	49560	104852
Ethylene Glycol	1.68E+07	326213592	303378641	445966601	943507572
Fluoride	N/A	N/A	N/A	N/A	N/A
Heptachlor	0.0001	0.00194	0.00181	0.00265	0.00561
Heptachlor Epoxide	0.00029	0.00563	0.00524	0.00769	0.0162
Hexachlorobenzene	0.00068	0.0132	0.0123	0.0180	0.0381
Hexachlorobutadiene	0.22	4.27	3.97	5.84	12.3

HUMAN HEALTH

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

Parameter	Fish Only				
	Criterion (µg/L)	WLAh (µg/L)	LTAh (µg/L)	Daily Avg. (µg/L)	Daily Max. (µg/L)
Hexachlorocyclohexane (<i>alpha</i>)	0.0084	0.163	0.152	0.222	0.471
Hexachlorocyclohexane (<i>beta</i>)	0.26	5.05	4.70	6.90	14.6
Hexachlorocyclohexane (<i>gamma</i>) [Lindane]	0.341	6.62	6.16	9.05	19.1
Hexachlorocyclopentadiene	11.6	225	209	307	651
Hexachloroethane	2.33	45.2	42.1	61.8	130
Hexachlorophene	2.90	56.3	52.4	76.9	162
4,4'-Isopropylidenediphenol [Bisphenol A]	15982	310330	288607	424252	897567
Lead	3.83	193	180	263	558
Mercury	0.0250	0.485	0.451	0.663	1.40
Methoxychlor	3.0	58.3	54.2	79.6	168
Methyl Ethyl Ketone	9.92E+05	19262136	17913786	26333266	55711875
Methyl <i>tert</i> -butyl ether [MTBE]	10482	203534	189287	278251	588681
Nickel	1140	22136	20586	30262	64023
Nitrate-Nitrogen (as Total Nitrogen)	N/A	N/A	N/A	N/A	N/A
Nitrobenzene	1873	36369	33823	49719	105189
N-Nitrosodiethylamine	2.1	40.8	37.9	55.7	117
N-Nitroso-di- <i>n</i> -Butylamine	4.2	81.6	75.8	111	235
Pentachlorobenzene	0.355	6.89	6.41	9.42	19.9
Pentachlorophenol	0.29	5.63	5.24	7.69	16.2
Polychlorinated Biphenyls [PCBs]	6.4E-04	0.0124	0.0116	0.0169	0.0359
Pyridine	947	18388	17101	25138	53184
Selenium	N/A	N/A	N/A	N/A	N/A
1,2,4,5-Tetrachlorobenzene	0.24	4.66	4.33	6.37	13.4
1,1,2,2-Tetrachloroethane	26.35	512	476	699	1479
Tetrachloroethylene [Tetrachloroethylene]	280	5437	5056	7432	15725
Thallium	0.23	4.47	4.15	6.10	12.9
Toluene	N/A	N/A	N/A	N/A	N/A
Toxaphene	0.011	0.214	0.199	0.292	0.617
2,4,5-TP [Silvex]	369	7165	6663	9795	20723
1,1,1-Trichloroethane	784354	15230175	14164063	20821171	44050234
1,1,2-Trichloroethane	166	3223	2998	4406	9322
Trichloroethylene [Trichloroethene]	71.9	1396	1298	1908	4037
2,4,5-Trichlorophenol	1867	36252	33715	49560	104852
TTHM [Sum of Total Trihalomethanes]	N/A	N/A	N/A	N/A	N/A
Vinyl Chloride	16.5	320	298	438	926

CALCULATE 70% AND 85% OF DAILY AVERAGE EFFLUENT LIMITATIONS:

Aquatic Life <i>Parameter</i>	70% of Daily Avg. ($\mu\text{g/L}$)	85% of Daily Avg. ($\mu\text{g/L}$)
Acrolein	N/A	N/A
Aldrin	4.62	5.61
Aluminum	N/A	N/A
Arsenic	529	643
Cadmium	82.9	100
Carbaryl	2179	2646
Chlordane	0.0379	0.0460
Chlorpyrifos	0.0391	0.0474
Chromium (trivalent)	N/A	N/A
Chromium (hexavalent)	470	571
Copper	38.6	46.8
Copper (oyster waters)	N/A	N/A
Cyanide (free)	19.9	24.1
4,4'-DDT	0.00948	0.0115
Demeton	0.948	1.15
Diazinon	2.91	3.53
Dicofol [Kelthane]	N/A	N/A
Dieldrin	0.0189	0.0230
Diuron	N/A	N/A
Endosulfan I (<i>alpha</i>)	0.0853	0.103
Endosulfan II (<i>beta</i>)	0.0853	0.103
Endosulfan sulfate	0.0853	0.103
Endrin	0.0189	0.0230
Guthion [Azinphos Methyl]	0.0948	0.115
Heptachlor	0.0379	0.0460
Hexachlorocyclohexane (<i>gamma</i>) [Lindane]	0.568	0.690
Lead	130	158
Malathion	0.0948	0.115
Mercury	7.46	9.06
Methoxychlor	0.284	0.345
Mirex	0.00948	0.0115
Nickel	124	150
Nonylphenol	16.1	19.5
Parathion (ethyl)	N/A	N/A
Pentachlorophenol	53.6	65.2
Phenanthrene	27.3	33.2
Polychlorinated Biphenyls [PCBs]	0.284	0.345
Selenium	1289	1565
Silver	16.2	19.7
Toxaphene	0.00189	0.00230
Tributyltin [TBT]	0.0701	0.0852
2,4,5 Trichlorophenol	113	138
Zinc	546	663

Human Health	70% of Daily Avg.	85% of Daily Avg.
Parameter	(µg/L)	(µg/L)
Acrylonitrile	2136	2594
Aldrin	0.000213	0.000258
Anthracene	24472	29716
Antimony	19901	24165
Arsenic	N/A	N/A
Barium	N/A	N/A
Benzene	10796	13109
Benzidine	1.98	2.41
Benzo(a)anthracene	0.464	0.564
Benzo(a)pyrene	0.0464	0.0564
Bis(chloromethyl)ether	5.10	6.19
Bis(2-chloroethyl)ether	795	966
Bis(2-ethylhexyl) phthalate [Di(2-ethylhexyl) phthalate]	140	170
Bromodichloromethane [Dichlorobromomethane]	5110	6205
Bromoform [Tribromomethane]	19696	23917
Cadmium	N/A	N/A
Carbon Tetrachloride	854	1037
Chlordane	0.0464	0.0564
Chlorobenzene	50858	61757
Chlorodibromomethane [Dibromochloromethane]	3400	4129
Chloroform [Trichloromethane]	143025	173673
Chromium (hexavalent)	9328	11327
Chrysene	46.8	56.8
Cresols [Methylphenols]	172830	209865
Cyanide (free)	N/A	N/A
4,4'-DDD	0.0371	0.0451
4,4'-DDE	0.00241	0.00293
4,4'-DDT	0.00743	0.00902
2,4'-D	N/A	N/A
Danitol [Fenprothrin]	8789	10672
1,2-Dibromoethane [Ethylene Dibromide]	78.7	95.6
<i>m</i> -Dichlorobenzene [1,3-Dichlorobenzene]	11056	13425
<i>o</i> -Dichlorobenzene [1,2-Dichlorobenzene]	61301	74437
<i>p</i> -Dichlorobenzene [1,4-Dichlorobenzene]	N/A	N/A
3,3'-Dichlorobenzidine	41.6	50.5
1,2-Dichloroethane	6763	8213
1,1-Dichloroethylene [1,1-Dichloroethene]	1024125	1243580
Dichloromethane [Methylene Chloride]	247753	300842
1,2-Dichloropropane	4812	5844
1,3-Dichloropropene [1,3-Dichloropropylene]	2211	2685
Dicofol [Kelthane]	5.57	6.76
Dieldrin	0.000371	0.000451
2,4-Dimethylphenol	156757	190348
Di- <i>n</i> -Butyl Phthalate	1716	2084
Dioxins/Furans [TCDD Equivalents]	0.0000015	0.0000018
Endrin	0.371	0.451
Epichlorohydrin	37405	45420
Ethylbenzene	34692	42126
Ethylene Glycol	312176621	379071611
Fluoride	N/A	N/A
Heptachlor	0.00185	0.00225
Heptachlor Epoxide	0.00538	0.00654
Hexachlorobenzene	0.0126	0.0153
Hexachlorobutadiene	4.08	4.96

Human Health	70% of Daily Avg.	85% of Daily Avg.
Parameter	(µg/L)	(µg/L)
Hexachlorocyclohexane (<i>alpha</i>)	0.156	0.189
Hexachlorocyclohexane (<i>beta</i>)	4.83	5.86
Hexachlorocyclohexane (<i>gamma</i>) [Lindane]	6.33	7.69
Hexachlorocyclopentadiene	215	261
Hexachloroethane	43.2	52.5
Hexachlorophene	53.8	65.4
4,4'-Isopropylidenediphenol [Bisphenol A]	296976	360614
Lead	184	224
Mercury	0.464	0.564
Methoxychlor	55.7	67.6
Methyl Ethyl Ketone	18433286	22383276
Methyl <i>tert</i> -butyl ether [MTBE]	194775	236513
Nickel	21183	25722
Nitrate-Nitrogen (as Total Nitrogen)	N/A	N/A
Nitrobenzene	34803	42261
N-Nitrosodiethylamine	39.0	47.3
N-Nitroso-di- <i>n</i> -Butylamine	78.0	94.7
Pentachlorobenzene	6.59	8.01
Pentachlorophenol	5.38	6.54
Polychlorinated Biphenyls [PCBs]	0.0118	0.0144
Pyridine	17597	21367
Selenium	N/A	N/A
1,2,4,5-Tetrachlorobenzene	4.45	5.41
1,1,2,2-Tetrachloroethane	489	594
Tetrachloroethylene [Tetrachloroethylene]	5202	6317
Thallium	4.27	5.18
Toluene	N/A	N/A
Toxaphene	0.204	0.248
2,4,5-TP [Silvex]	6856	8326
1,1,1-Trichloroethane	14574820	17697996
1,1,2-Trichloroethane	3084	3745
Trichloroethylene [Trichloroethene]	1336	1622
2,4,5-Trichlorophenol	34692	42126
TTHM [Sum of Total Trihalomethanes]	N/A	N/A
Vinyl Chloride	306	372

TEXTOX MENU #5 - BAY OR WIDE TIDAL RIVER

The water quality-based effluent limitations developed below are calculated using:

Table 1, 2014 Texas Surface Water Quality Standards (30 TAC 307) for Saltwater Aquatic Life

Table 2, 2018 Texas Surface Water Quality Standards for Human Health

"Procedures to Implement the Texas Surface Water Quality Standards," TCEQ, June 2010

PERMIT INFORMATION

Permittee Name:	<u>The City of Corpus Christi</u>
TPDES Permit No:	<u>WQ0005289000</u>
Outfall No:	<u>001 Final</u>
Prepared by:	<u>Thomas Starr, P.E.</u>
Date:	<u>November 27, 2023</u>

DISCHARGE INFORMATION

Receiving Waterbody:	<u>Corpus Christi Inner Harbor</u>
Segment No:	<u>2484</u>
TSS (mg/L):	<u>9</u>
Effluent Flow for Aquatic Life (MGD)	<u>N/A</u>
% Effluent for Chronic Aquatic Life (Mixing Zone):	<u>6.24</u>
% Effluent for Acute Aquatic Life (ZID):	<u>8.74</u>
Oyster Waters?	<u>no</u>
Effluent Flow for Human Health (MGD):	<u>N/A</u>
% Effluent for Human Health:	<u>4.85</u>

CALCULATE DISSOLVED FRACTION (AND ENTER WATER EFFECT RATIO IF APPLICABLE):

<i>Estuarine Metal</i>	<i>Intercept</i>		<i>Partition Coefficient (Kp)</i>	<i>Dissolved Fraction (Cd/Ct)</i>	<i>Source</i>	<i>Water Effect Ratio</i>	
	<i>(b)</i>	<i>Slope (m)</i>				<i>(WER)</i>	<i>Source</i>
Aluminum	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Arsenic	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Cadmium	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Chromium (total)	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Chromium (trivalent)	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Chromium (hexavalent)	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Copper	4.85	-0.72	14552.76	0.884		1.00	Assumed
Lead	6.06	-0.85	177375.60	0.385		1.00	Assumed
Mercury	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Nickel	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Selenium	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Silver	5.86	-0.74	142514.99	0.438		1.00	Assumed
Zinc	5.36	-0.52	73079.22	0.603		1.00	Assumed

AQUATIC LIFE

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

Parameter	SW Acute		SW Chronic		WLAa		WLAc		LTAa		LTAc		Daily Avg.		Daily Max.	
	Criterion (µg/L)	Criterion (µg/L)	WLAa (µg/L)	WLAc (µg/L)	WLAa (µg/L)	WLAc (µg/L)	LTAa (µg/L)	LTAc (µg/L)	LTAa (µg/L)	LTAc (µg/L)	Daily Avg. (µg/L)	Daily Avg. (µg/L)	Daily Max. (µg/L)	Daily Max. (µg/L)		
Acrolein	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Aldrin	1.3	N/A	14.9	N/A	4.76	N/A	6.99	14.8								
Aluminum	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A								
Arsenic	149	78	1705	1250	546	763	801	1696								
Cadmium	40.0	8.75	458	140	146	85.5	125	266								
Carbaryl	613	N/A	7014	N/A	2244	N/A	3299	6980								
Chlordane	0.09	0.004	1.03	0.0641	0.330	0.0391	0.0574	0.121								
Chlorpyrifos	0.011	0.006	0.126	0.0962	0.0403	0.0587	0.0592	0.125								
Chromium (trivalent)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A								
Chromium (hexavalent)	1090	49.6	12471	795	3991	485	712	1507								
Copper	13.5	3.6	175	65.2	55.9	39.8	58.5	123								
Copper (oyster waters)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A								
Cyanide (free)	5.6	5.6	64.1	89.7	20.5	54.7	30.1	63.7								
4,4'-DDT	0.13	0.001	1.49	0.0160	0.476	0.00978	0.0143	0.0304								
Demeton	N/A	0.1	N/A	1.60	N/A	0.978	1.43	3.04								
Diazinon	0.819	0.819	9.37	13.1	3.00	8.01	4.40	9.32								
Dicofol [Kelthane]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A								
Dieldrin	0.71	0.002	8.12	0.0321	2.60	0.0196	0.0287	0.0608								
Diuron	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A								
Endosulfan I (alpha)	0.034	0.009	0.389	0.144	0.124	0.0880	0.129	0.273								
Endosulfan II (beta)	0.034	0.009	0.389	0.144	0.124	0.0880	0.129	0.273								
Endosulfan sulfate	0.034	0.009	0.389	0.144	0.124	0.0880	0.129	0.273								
Endrin	0.037	0.002	0.423	0.0321	0.135	0.0196	0.0287	0.0608								
Guthion [Azinphos Methyl]	N/A	0.01	N/A	0.160	N/A	0.0978	0.143	0.304								
Heptachlor	0.053	0.004	0.606	0.0641	0.194	0.0391	0.0574	0.121								
Hexachlorocyclohexane (gamma) [Lindane]	0.16	N/A	1.83	N/A	0.586	N/A	0.861	1.82								
Lead	133	5.3	3951	221	1264	135	197	418								
Malathion	N/A	0.01	N/A	0.160	N/A	0.0978	0.143	0.304								
Mercury	2.1	1.1	24.0	17.6	7.69	10.8	11.3	23.9								
Methoxychlor	N/A	0.03	N/A	0.481	N/A	0.293	0.431	0.912								
Mirex	N/A	0.001	N/A	0.0160	N/A	0.00978	0.0143	0.0304								
Nickel	118	13.1	1350	210	432	128	188	398								
Nonylphenol	7	1.7	80.1	27.2	25.6	16.6	24.4	51.6								
Parathion (ethyl)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A								
Pentachlorophenol	15.1	9.6	173	154	55.3	93.8	81.2	171								
Phenanthrene	7.7	4.6	88.1	73.7	28.2	45.0	41.4	87.6								
Polychlorinated Biphenyls [PCBs]	10	0.03	114	0.481	36.6	0.293	0.431	0.912								
Selenium	564	136	6453	2179	2065	1329	1954	4134								
Silver	2	N/A	52.2	N/A	16.7	N/A	24.5	51.9								
Toxaphene	0.21	0.0002	2.40	0.00321	0.769	0.00196	0.00287	0.00608								
Tributyltin [TBT]	0.24	0.0074	2.75	0.119	0.879	0.0723	0.106	0.224								
2,4,5 Trichlorophenol	259	12	2963	192	948	117	172	364								
Zinc	92.7	84.2	1758	2237	563	1364	827	1749								

HUMAN HEALTH

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

Parameter	Fish Only				
	Criterion (µg/L)	WLAh (µg/L)	LTAh (µg/L)	Daily Avg. (µg/L)	Daily Max. (µg/L)
Acrylonitrile	115	2371	2205	3241	6858
Aldrin	1.147E-05	0.000236	0.000220	0.000323	0.000684
Anthracene	1317	27155	25254	37123	78539
Antimony	1071	22082	20537	30188	63869
Arsenic	N/A	N/A	N/A	N/A	N/A
Barium	N/A	N/A	N/A	N/A	N/A
Benzene	581	11979	11141	16377	34647
Benzidine	0.107	2.21	2.05	3.01	6.38
Benzo(a)anthracene	0.025	0.515	0.479	0.704	1.49
Benzo(a)pyrene	0.0025	0.0515	0.0479	0.0704	0.149
Bis(chloromethyl)ether	0.2745	5.66	5.26	7.73	16.3
Bis(2-chloroethyl)ether	42.83	883	821	1207	2554
Bis(2-ethylhexyl) phthalate [Di(2-ethylhexyl) phthalate]	7.55	156	145	212	450
Bromodichloromethane [Dichlorobromomethane]	275	5670	5273	7751	16399
Bromoform [Tribromomethane]	1060	21856	20326	29878	63213
Cadmium	N/A	N/A	N/A	N/A	N/A
Carbon Tetrachloride	46	948	882	1296	2743
Chlordane	0.0025	0.0515	0.0479	0.0704	0.149
Chlorobenzene	2737	56433	52483	77149	163221
Chlorodibromomethane [Dibromochloromethane]	183	3773	3509	5158	10913
Chloroform [Trichloromethane]	7697	158701	147592	216960	459010
Chromium (hexavalent)	502	10351	9626	14150	29936
Chrysene	2.52	52.0	48.3	71.0	150
Cresols [Methylphenols]	9301	191773	178349	262173	554665
Cyanide (free)	N/A	N/A	N/A	N/A	N/A
4,4'-DDD	0.002	0.0412	0.0384	0.0563	0.119
4,4'-DDE	0.00013	0.00268	0.00249	0.00366	0.00775
4,4'-DDT	0.0004	0.00825	0.00767	0.0112	0.0238
2,4'-D	N/A	N/A	N/A	N/A	N/A
Danitol [Fenpropathrin]	473	9753	9070	13332	28207
1,2-Dibromoethane [Ethylene Dibromide]	4.24	87.4	81.3	119	252
m-Dichlorobenzene [1,3-Dichlorobenzene]	595	12268	11409	16771	35482
o-Dichlorobenzene [1,2-Dichlorobenzene]	3299	68021	63259	92990	196736
p-Dichlorobenzene [1,4-Dichlorobenzene]	N/A	N/A	N/A	N/A	N/A
3,3'-Dichlorobenzidine	2.24	46.2	43.0	63.1	133
1,2-Dichloroethane	364	7505	6980	10260	21707
1,1-Dichloroethylene [1,1-Dichloroethene]	55114	1136371	1056825	1553532	3286726
Dichloromethane [Methylene Chloride]	13333	274907	255664	375825	795114
1,2-Dichloropropane	259	5340	4966	7300	15445
1,3-Dichloropropene [1,3-Dichloropropylene]	119	2454	2282	3354	7096
Dicofol [Kelthane]	0.30	6.19	5.75	8.45	17.8
Dieldrin	2.0E-05	0.000412	0.000384	0.000563	0.00119
2,4-Dimethylphenol	8436	173938	161762	237790	503081
Di-n-Butyl Phthalate	92.4	1905	1772	2604	5510
Dioxins/Furans [TCDD Equivalents]	7.97E-08	0.0000016	0.0000015	0.0000022	0.0000048
Endrin	0.02	0.412	0.384	0.563	1.19
Epichlorohydrin	2013	41505	38600	56741	120045
Ethylbenzene	1867	38495	35800	52626	111338
Ethylene Glycol	1.68E+07	346391753	322144330	473552164	1001868865
Fluoride	N/A	N/A	N/A	N/A	N/A
Heptachlor	0.0001	0.00206	0.00192	0.00281	0.00596
Heptachlor Epoxide	0.00029	0.00598	0.00556	0.00817	0.0172
Hexachlorobenzene	0.00068	0.0140	0.0130	0.0191	0.0405
Hexachlorobutadiene	0.22	4.54	4.22	6.20	13.1

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

<i>Parameter</i>	<i>Fish Only</i>				
	<i>Criterion</i> (µg/L)	<i>WLAh</i> (µg/L)	<i>LTAh</i> (µg/L)	<i>Daily Avg.</i> (µg/L)	<i>Daily Max.</i> (µg/L)
Hexachlorocyclohexane (<i>alpha</i>)	0.0084	0.173	0.161	0.236	0.500
Hexachlorocyclohexane (<i>beta</i>)	0.26	5.36	4.99	7.32	15.5
Hexachlorocyclohexane (<i>gamma</i>) [Lindane]	0.341	7.03	6.54	9.61	20.3
Hexachlorocyclopentadiene	11.6	239	222	326	691
Hexachloroethane	2.33	48.0	44.7	65.6	138
Hexachlorophene	2.90	59.8	55.6	81.7	172
4,4'-Isopropylidenediphenol [Bisphenol A]	15982	329526	306459	450494	953087
Lead	3.83	205	191	280	593
Mercury	0.0250	0.515	0.479	0.704	1.49
Methoxychlor	3.0	61.9	57.5	84.5	178
Methyl Ethyl Ketone	9.92E+05	20453608	19021856	27962127	59157971
Methyl <i>tert</i> -butyl ether [MTBE]	10482	216124	200995	295462	625094
Nickel	1140	23505	21860	32133	67983
Nitrate-Nitrogen (as Total Nitrogen)	N/A	N/A	N/A	N/A	N/A
Nitrobenzene	1873	38619	35915	52795	111696
N-Nitrosodiethylamine	2.1	43.3	40.3	59.1	125
N-Nitroso-di- <i>n</i> -Butylamine	4.2	86.6	80.5	118	250
Pentachlorobenzene	0.355	7.32	6.81	10.0	21.1
Pentachlorophenol	0.29	5.98	5.56	8.17	17.2
Polychlorinated Biphenyls [PCBs]	6.4E-04	0.0132	0.0123	0.0180	0.0381
Pyridine	947	19526	18159	26693	56474
Selenium	N/A	N/A	N/A	N/A	N/A
1,2,4,5-Tetrachlorobenzene	0.24	4.95	4.60	6.76	14.3
1,1,2,2-Tetrachloroethane	26.35	543	505	742	1571
Tetrachloroethylene [Tetrachloroethylene]	280	5773	5369	7892	16697
Thallium	0.23	4.74	4.41	6.48	13.7
Toluene	N/A	N/A	N/A	N/A	N/A
Toxaphene	0.011	0.227	0.211	0.310	0.655
2,4,5-TP [Silvex]	369	7608	7076	10401	22005
1,1,1-Trichloroethane	784354	16172247	15040190	22109079	46774991
1,1,2-Trichloroethane	166	3423	3183	4679	9899
Trichloroethylene [Trichloroethene]	71.9	1482	1379	2026	4287
2,4,5-Trichlorophenol	1867	38495	35800	52626	111338
TTHM [Sum of Total Trihalomethanes]	N/A	N/A	N/A	N/A	N/A
Vinyl Chloride	16.5	340	316	465	983

CALCULATE 70% AND 85% OF DAILY AVERAGE EFFLUENT LIMITATIONS:

Aquatic Life	70% of Daily Avg.	85% of Daily Avg.
Parameter	(µg/L)	(µg/L)
Acrolein	N/A	N/A
Aldrin	4.89	5.94
Aluminum	N/A	N/A
Arsenic	561	681
Cadmium	88.0	106
Carbaryl	2309	2804
Chlordane	0.0402	0.0488
Chlorpyrifos	0.0414	0.0503
Chromium (trivalent)	N/A	N/A
Chromium (hexavalent)	498	605
Copper	40.9	49.7
Copper (oyster waters)	N/A	N/A
Cyanide (free)	21.0	25.6
4,4'-DDT	0.0100	0.0122
Demeton	1.00	1.22
Diazinon	3.08	3.74
Dicofol [Kelthane]	N/A	N/A
Dieldrin	0.0201	0.0244
Diuron	N/A	N/A
Endosulfan I (<i>alpha</i>)	0.0905	0.109
Endosulfan II (<i>beta</i>)	0.0905	0.109
Endosulfan sulfate	0.0905	0.109
Endrin	0.0201	0.0244
Guthion [Azinphos Methyl]	0.100	0.122
Heptachlor	0.0402	0.0488
Hexachlorocyclohexane (<i>gamma</i>) [Lindane]	0.602	0.731
Lead	138	168
Malathion	0.100	0.122
Mercury	7.91	9.60
Methoxychlor	0.301	0.366
Mirex	0.0100	0.0122
Nickel	131	160
Nonylphenol	17.1	20.7
Parathion (ethyl)	N/A	N/A
Pentachlorophenol	56.8	69.0
Phenanthrene	29.0	35.2
Polychlorinated Biphenyls [PCBs]	0.301	0.366
Selenium	1368	1661
Silver	17.1	20.8
Toxaphene	0.00201	0.00244
Tributyltin [TBT]	0.0744	0.0903
2,4,5 Trichlorophenol	120	146
Zinc	578	703

Human Health	70% of Daily Avg.	85% of Daily Avg.
Parameter	(µg/L)	(µg/L)
Acrylonitrile	2269	2755
Aldrin	0.000226	0.000274
Anthracene	25986	31554
Antimony	21132	25660
Arsenic	N/A	N/A
Barium	N/A	N/A
Benzene	11463	13920
Benzidine	2.11	2.56
Benzo(a)anthracene	0.493	0.598
Benzo(a)pyrene	0.0493	0.0598
Bis(chloromethyl)ether	5.41	6.57
Bis(2-chloroethyl)ether	845	1026
Bis(2-ethylhexyl) phthalate [Di(2-ethylhexyl) phthalate]	148	180
Bromodichloromethane [Dichlorobromomethane]	5426	6588
Bromoform [Tribromomethane]	20915	25397
Cadmium	N/A	N/A
Carbon Tetrachloride	907	1102
Chlordane	0.0493	0.0598
Chlorobenzene	54004	65577
Chlorodibromomethane [Dibromochloromethane]	3610	4384
Chloroform [Trichloromethane]	151872	184416
Chromium (hexavalent)	9905	12027
Chrysene	49.7	60.3
Cresols [Methylphenols]	183521	222847
Cyanide (free)	N/A	N/A
4,4'-DDD	0.0394	0.0479
4,4'-DDE	0.00256	0.00311
4,4'-DDT	0.00789	0.00958
2,4'-D	N/A	N/A
Danitol [Fenprothrin]	9332	11332
1,2-Dibromoethane [Ethylene Dibromide]	83.6	101
<i>m</i> -Dichlorobenzene [1,3-Dichlorobenzene]	11740	14255
<i>o</i> -Dichlorobenzene [1,2-Dichlorobenzene]	65093	79042
<i>p</i> -Dichlorobenzene [1,4-Dichlorobenzene]	N/A	N/A
3,3'-Dichlorobenzidine	44.1	53.6
1,2-Dichloroethane	7182	8721
1,1-Dichloroethylene [1,1-Dichloroethene]	1087473	1320503
Dichloromethane [Methylene Chloride]	263077	319451
1,2-Dichloropropane	5110	6205
1,3-Dichloropropene [1,3-Dichloropropylene]	2348	2851
Dicofol [Kelthane]	5.91	7.18
Dieldrin	0.000394	0.000479
2,4-Dimethylphenol	166453	202122
Di- <i>n</i> -Butyl Phthalate	1823	2213
Dioxins/Furans [TCDD Equivalents]	0.0000016	0.0000019
Endrin	0.394	0.479
Epichlorohydrin	39719	48230
Ethylbenzene	36838	44732
Ethylene Glycol	331486515	402519340
Fluoride	N/A	N/A
Heptachlor	0.00197	0.00239
Heptachlor Epoxide	0.00572	0.00694
Hexachlorobenzene	0.0134	0.0162
Hexachlorobutadiene	4.34	5.27

Human Health	70% of Daily Avg.	85% of Daily Avg.
Parameter	(µg/L)	(µg/L)
Hexachlorocyclohexane (<i>alpha</i>)	0.165	0.201
Hexachlorocyclohexane (<i>beta</i>)	5.13	6.22
Hexachlorocyclohexane (<i>gamma</i>) [Lindane]	6.72	8.17
Hexachlorocyclopentadiene	228	277
Hexachloroethane	45.9	55.8
Hexachlorophene	57.2	69.4
4,4'-Isopropylidenediphenol [Bisphenol A]	315346	382920
Lead	196	238
Mercury	0.493	0.598
Methoxychlor	59.1	71.8
Methyl Ethyl Ketone	19573489	23767808
Methyl <i>tert</i> -butyl ether [MTBE]	206823	251143
Nickel	22493	27313
Nitrate-Nitrogen (as Total Nitrogen)	N/A	N/A
Nitrobenzene	36956	44876
N-Nitrosodiethylamine	41.4	50.3
N-Nitroso-di- <i>n</i> -Butylamine	82.8	100
Pentachlorobenzene	7.00	8.50
Pentachlorophenol	5.72	6.94
Polychlorinated Biphenyls [PCBs]	0.0126	0.0153
Pyridine	18685	22689
Selenium	N/A	N/A
1,2,4,5-Tetrachlorobenzene	4.73	5.75
1,1,2,2-Tetrachloroethane	519	631
Tetrachloroethylene [Tetrachloroethylene]	5524	6708
Thallium	4.53	5.51
Toluene	N/A	N/A
Toxaphene	0.217	0.263
2,4,5-TP [Silvex]	7280	8841
1,1,1-Trichloroethane	15476355	18792717
1,1,2-Trichloroethane	3275	3977
Trichloroethylene [Trichloroethene]	1418	1722
2,4,5-Trichlorophenol	36838	44732
TTHM [Sum of Total Trihalomethanes]	N/A	N/A
Vinyl Chloride	325	395

**Appendix B
Comparison of Technology-Based Effluent Limits and Water Quality-Based Effluent Limits**

The following table is a summary of technology-based effluent limitations calculated/assessed in the draft permit (Technology-Based) and calculated/assessed water quality-based effluent limitations (Water Quality-Based). Effluent limitations appearing in bold are the most stringent of the two and are included in the draft permit.

Outfall	Pollutant	Technology-Based			Water Quality-Based		
		Daily Avg lbs/day	Daily Max mg/L	Daily Max mg/L	Daily Avg mg/L	Daily Avg lbs/day	Daily Max mg/L
001 Initial	Flow	34.3 MGD	41 MGD	-	-	-	-
	Total Suspended Solids (TSS)	Report	Report	Report	Report	Report	Report
	Total Dissolved Solids (TDS)	-	-	-	Report	Report	Report
	Chloride	-	-	-	Report	Report	Report
	Sulfate	-	-	-	Report	Report	Report
	pH	6.5 SU, minimum	9.0 SU	-	-	-	-
001 Final	Flow	51.5 MGD	62 MGD	-	-	-	-
	TSS	Report	Report	Report	Report	Report	Report
	TDS	-	-	-	Report	Report	Report
	Chloride	-	-	-	Report	Report	Report
	Sulfate	-	-	-	Report	Report	Report
	pH	6.5 SU, minimum	9.0 SU	-	-	-	-