



October 2022 Update to the Texas Water Quality Management Plan

Prepared by
Water Quality Division, Office of Water

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Prepared by the
Office of Water
Water Quality Division

Draft WQMP updates for public comment are available on the TCEQ webpage:
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Developed in accordance with Sections 205(j), 208,
and 303 of the Federal Clean Water Act
and applicable regulations thereto.

Contents

Introduction.....	1
Projected Effluent Limit Updates	3
Planning Information Summary.....	10
Designated Management Agencies	14
Total Maximum Daily Load Revisions.....	15

Appendixes

Appendix I. Updates to Eighteen Total Maximum Daily Loads for Bacteria in Buffalo and Whiteoak Bayous and Tributaries	16
Appendix II. Updates to Seven TMDLs for Indicator Bacteria in Lake Houston, East Fork San Jacinto River, West Fork San Jacinto River, and Crystal Creek Watersheds	18
Appendix III. Updates to Eight TMDLs for Indicator Bacteria in Greens Bayou Above Tidal and Tributaries	21
Appendix IV. Updates to Fifteen TMDLs for Indicator Bacteria in Watersheds Upstream of Lake Houston	23
Appendix V. Updates to One Total Maximum Daily Load for Bacteria in Upper Oyster Creek ..	29
Appendix VI. Updates to Two Total Maximum Daily Loads for Dissolved Oxygen in Upper Oyster Creek.....	31

Tables

Table 1. Projected Effluent Limit Updates	4
Table 2. Service Area Population Updates.....	12
Table 3. Designated Management Agencies	14
Table I-2 - TMDL summary calculations for two AUs in the TMDL watershed	17
Table II-1 - Changes to individual WLAs for the TMDL watersheds.....	19
Table II-2 - TMDL summary calculations for five AUs in the TMDL watersheds	19
Table II-3 - TMDL final calculations	20
Table III-1 - Changes to individual WLAs for the TMDL watersheds	21
Table III-2 - TMDL summary calculations for two AUs in the TMDL watersheds.....	22
Table IV-1 - Changes to individual WLAs for the TMDL watershed	24
Table IV-2 - TMDL summary calculations for 10 AUs in the TMDL watershed.....	25
Table IV-3 - TMDL final calculations	25
Table IV-4 - Changes to individual WLAs in the Brushy Creek watershed.....	26
Table IV-5 - TMDL summary calculations for one AU in the Brushy Creek watershed	27
Table IV-6 – TMDL addendum final calculations.....	27
Table IV-7 - Changes to individual WLAs in the Caney Creek watershed.....	28
Table IV-8 - TMDL summary calculations for one AU in the Caney Creek watershed.....	28
Table V-1 - Changes to individual WLAs for the Upper Oyster Creek watershed	30
Table V-2 - TMDL summary calculations for allocation reach in the Upper Oyster Creek watershed.....	30
Table VI-1 - Changes to individual WLAs for the Upper Oyster Creek watershed.....	31
Table VI-2 - Permitted loadings for individual WWTFs	32
Table VI-3 - Summary of TMDLs for Upper Reach CBOD ₅	32
Table VI-4 - Summary of TMDLs for Upper Reach NH ₃ -N.....	32

Introduction

The Texas Water Quality Management Plan (WQMP) is the product of a wastewater treatment facility (WWTF) planning process developed and updated in accordance with provisions of Sections 205(j), 208, and 303 of the federal Clean Water Act (CWA), as amended. The WQMP is an important part of the State's program for accomplishing its clean water goals.¹

The Texas Department of Water Resources, a predecessor agency of the Texas Commission on Environmental Quality (TCEQ), prepared the initial WQMP for waste treatment management during the late 1970s. The Clean Water Act mandates that the WQMP be updated as needed to fill information gaps and revise earlier certified and approved plans. Any updates to the plan need involve only the elements of the plan that require modification. The original plan and its subsequent updates are collectively referred to as the "State of Texas Water Quality Management Plan."

The WQMP is tied to the State's water quality assessments that identify priority water quality problems. WQMPs are used to direct planning for implementation measures that control and/or prevent water quality problems. Several elements may be contained in the WQMP, such as effluent limitations of wastewater facilities, total maximum daily loads (TMDLs), nonpoint source management controls, identification of designated management agencies, and groundwater and source-water protection planning. Some of these elements may be contained in separate documents, which are prepared independently of the current WQMP update process, but may be referenced as needed to address planning for water quality control measures.

This document, as with previous updates², will become part of the WQMP after completion of the public comment period, certification by TCEQ, and approval by the United States Environmental Protection Agency (EPA).

The materials presented in this document revise only the information specifically addressed in the following sections. Previously certified and approved WQMPs remain in effect.

¹ See the formal definition of a water quality management plan in Title 40 Code of Federal Regulations (CFR) 130.2(k).

² Fiscal Years 1974, 1975, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984/85, 1986/88, 1989, 1990, 1991, 1992, 1993/94, 1995, 1996, 1997/98, 02/1999, 05/1999, 07/1999, 10/1999, 01/2000, 04/2000, 07/2000, 10/2000, 01/2001, 04/2001, 07/2001, 10/2001, 01/2002, 04/2002, 07/2002, 10/2002, 01/2003, 04/2003, 07/2003, 10/2003, 01/2004, 04/2004, 07/2004, 10/2004, 01/2005, 04/2005, 07/2005, 10/2005, 01/2006, 04/2006, 07/2006, 10/2006, 01/2007, 04/2007, 07/2007, 10/2007, 01/2008, 04/2008, 07/2008, 10/2008, 01/2009, 04/2009, 07/2009, 10/2009, 01/2010, 04/2010, 07/2010, 10/2010, 01/2011, 04/2011, 07/2011, 10/2011, BPUB 2011, 01/2012, 04/2012, 07/2012, 10/2012, 01/2013, 04/2013, 07/2013, 10/2013, 01/2014, 04/2014, 07/2014, 10/2014, 01/2015, 04/2015, 07/2015, 10/2015, 01/2016, 04/2016, 07/2016, 10/2016, 01/2017, 04/2017, 07/2017, 10/2017, 01/2018, 04/2018, 07/2018, 10/2018, 01/2019, Terra Verde 2019, 04/2019, 07/2019, 10/2019, 01/2020, 04/2020, 07/2020, 10/2021, 01/2021, 04/2021, 07/2021, 10/2021, 01/2022, 04/2022, and 07/2022.

The draft October 2022 WQMP update addresses the following topics for water quality planning purposes:

1. Projected Effluent Limits Updates
2. Service Area Population for Municipal WWTFs
3. Designation of Management Agencies for Municipal WWTFs
4. Total Maximum Daily Load (TMDL) Updates

The public comment period for the draft October WQMP update will be from November 11, 2022 through December 15, 2022.

The “Projected Effluent Limit Update” section provides information compiled from August 1, 2022 through October 31, 2022 and is based on Texas water quality standards (WQS). Projected effluent limits may be used for water quality planning purposes in Texas Pollutant Discharge Elimination System (TPDES) permit actions.

The “Service Area Population” and “Designation of Management Agencies” sections for municipal wastewater facilities were developed and evaluated by TCEQ in cooperation with the Texas Water Development Board (TWDB) and regional water quality management planning agencies.

The “Total Maximum Daily Load Update” section provides information on proposed wasteload allocations for new dischargers and revisions to existing TMDLs and was developed by the TCEQ TMDL Program in the Water Quality Planning Division.

Projected Effluent Limit Updates

Table 1 reflects proposed effluent limits for new dischargers and preliminary revisions to original proposed effluent limits for preexisting dischargers. Abbreviations used in the table heading include:

- BOD₅–5-Day Biochemical Oxygen Demand
- CBOD₅–5-Day Carbonaceous Biochemical Oxygen Demand
- DO–Dissolved Oxygen
- lbs/day–Pounds per Day
- MGD–Million Gallons per Day
- mg/L–Milligrams per Liter
- NH₃-N–Ammonia-Nitrogen

Effluent flows indicated in Table 1 reflect future needs and do not reflect current permits for these facilities. These revisions may be useful for water quality management planning purposes. The effluent flows and constituent limits indicated in the table have been preliminarily determined to be appropriate to satisfy the stream standards for dissolved oxygen in their respective receiving waters. These flow volumes and effluent sets may be modified at the time of permit action. These limits are based on the Texas WQS effective at the time of the production of this update. The WQS are subject to revision on a triennial basis.

Table 1. Projected Effluent Limit Updates

State Permit Number	Segment Number	EPA ID Number	Permittee Name and County	Flow (MGD)	CBOD₅ (mg/L)	CBOD₅ (lbs/day)	NH₃-N (mg/L)	NH₃-N (lbs/day)	BOD₅ (mg/L)	BOD₅ (lbs/day)	DO (mg/L)	Months/ Comments
10541-002	1001	TX0070165	Sheldon Road MUD Harris	0.35	10	29.19	3	8.76			4	
11318-001	1218	TX0058378	City of Temple and City of Belton Bell	16	10	1334.40	2	266.88			6	
11709-002	0607	TX0092801	Lumberton Municipal Utility District Hardin	6.0	5	250.20	1.2	60.05			6	
13977-001	1428	TX0117609	Corix Utilities Texas Inc. Bastrop	0.51	5	21.27	2	8.51			6	
14049-002	0601	TX0143438	Vidor Mhp No. 1 LLC Orange	0.25	10	20.85	3	6.26			4	
14556-002	1227	TX0139378	Stonetown Pleasant Oaks, LLC Johnson	0.034	10	2.84	3	0.85			4	
14758-001	1245	TX0129216	Fort Bend County MUD No. 182 Fort Bend	2.5	5	104.25	1	20.85			6	
15010-001	0807	TX0133116	CSWR-Texas Utility Operating Company LLC Parker	0.075	10	6.26	3	1.88			4	

State Permit Number	Segment Number	EPA ID Number	Permittee Name and County	Flow (MGD)	CBOD ₅ (mg/L)	CBOD ₅ (lbs/day)	NH ₃ -N (mg/L)	NH ₃ -N (lbs/day)	BOD ₅ (mg/L)	BOD ₅ (lbs/day)	DO (mg/L)	Months/ Comments
15980-001	0826	TX0141151	Town of Northlake Denton	0.5	10	41.70	2	8.34			5	
16086-001	1008	TX0142212	Montgomery County MUD No. 199 Montgomery	0.25	10	20.85	3	6.26			4	
16148-001	1810	TX0142794	Greenwood Ventures Group LLC Caldwell	0.975	10	81.32	2	16.26			5	
16153-001	1009	TX0142824	Woodmere Development Co., Ltd. Harris	0.48	10	40.03	2	8.01			4	
16157-001	0826	TX0142867	WC 640 STPO LLC Denton	0.525	7	30.65	2	8.76			5	
16164-001	1002	TX0142913	Saint-Tropez Laguna Azure, LLC Harris	1.2	5	50.04	1.4	14.01			6	
16165-001	0821	TX0142921	Venetian 141 Swisher, LLC Collin	0.2	10	16.68	3	5.00			4	
16168-001	1008	TX0142956	Quadvest, L.P. Harris	0.65	10	54.21	3	16.26			4	
16171-001	1906	TX0142981	Municipal Operations LLC Bexar	1.0	5	41.70	2	16.68			4	

State Permit Number	Segment Number	EPA ID Number	Permittee Name and County	Flow (MGD)	CBOD ₅ (mg/L)	CBOD ₅ (lbs/day)	NH ₃ -N (mg/L)	NH ₃ -N (lbs/day)	BOD ₅ (mg/L)	BOD ₅ (lbs/day)	DO (mg/L)	Months/ Comments
16176-001	1110	TX0143022	Ashton Grey Development LLC Fort Bend	1.0	5	41.70	2	16.68			6	
16177-001	1810	TX0143049	Chisolm Hill, LP Caldwell	0.65	5	27.11	2	10.84			4	
16182-001	1008	TX0143120	Macedonia Asset LLC Waller	0.08	10	6.67	3	2.00			6	
16184-001	1002	TX0143146	Villas RV Park LLC Harris	0.025	10	2.09	3	0.63			6	
16185-001	1105	TX0143162	W Land Development Management LLC Brazoria	2.4	10	200.16	2	40.03			5	
16186-001	0507	TX0143171	Bahamas Laguna Azura LLC Rockwall	0.525	10	43.79	3	13.14			4	
16187-001	1003	TX0143189	City of Cleveland Liberty	1.8	10	150.12	2	30.02			6	
16188-001	1434	TX0143197	Cayetano Development, LLC Caldwell	0.405	5	16.89	2	6.76			4	
16189-001	0840	TX0143201	Buck Creek WWTP, LLC Grayson	0.999	5	41.66	2	16.66			5	

State Permit Number	Segment Number	EPA ID Number	Permittee Name and County	Flow (MGD)	CBOD ₅ (mg/L)	CBOD ₅ (lbs/day)	NH ₃ -N (mg/L)	NH ₃ -N (lbs/day)	BOD ₅ (mg/L)	BOD ₅ (lbs/day)	DO (mg/L)	Months/ Comments
16190-001	1009	TX0143227	Harris County MUD No. 535 Harris	0.6	10	50.04	3	15.01			4	
16193-001	1014	TX0143260	MAS Houston Revocable Trust Harris	0.02	10	1.67	2	0.33			6	
16197-001	1202	TX0143308	Undine Texas Environmental, LLC Fort Bend	0.24	10	20.02	3	6.00			4	
16199-001	1009	TX0143316	Falcon Commercial Development, LLC Harris	0.049	10	4.09	3	1.23			4	
16200-001	1202	TX0143324	Century Land Holdings of Texas, LLC Fort Bend	0.2	5	8.34	1.8	3.00			6	
16201-001	0826	TX0143332	Denton Stuart Ridge, LLC Denton	0.52	10	43.37	2	8.67			6	
16202-001	1228	TX0143341	The Psalm 25:10 Foundation Johnson	0.5	10	41.70	3	12.51			4	
16204-001	0820	TX0143375	Denton Stuart Ridge, LLC Collin	2.0	5	83.40	1.3	21.68			6	
16209-001	1008	TX0143391	Vista View Mobile Homes, LLC Waller	0.048	10	4.00	3	1.20			4	

State Permit Number	Segment Number	EPA ID Number	Permittee Name and County	Flow (MGD)	CBOD ₅ (mg/L)	CBOD ₅ (lbs/day)	NH ₃ -N (mg/L)	NH ₃ -N (lbs/day)	BOD ₅ (mg/L)	BOD ₅ (lbs/day)	DO (mg/L)	Months/ Comments
16211-001	1811	TX0143430	Douglas T. Harrison Comal	0.6	5	25.02	2	10.01			4	
16212-001	1248	TX0143421	Vale Building Group, LLC Williamson	0.322	10	26.85	3	8.06			4	
16213-001	0838	TX0143448	Indie Catch, LLC Johnson	0.975	10	81.32	3	24.39			4	
16216-001	0814	TX0143456	Buffalo Hills Development, LLC Johnson and Ellis	0.85	10	70.89	3	21.27			4	
16217-001	0814	TX0143472	67213, LLC Johnson	0.75	10	62.55	2	12.51			4	
16219-001	0823	TX0143502	Denton Stuart Ridge, LLC Denton	1.2	10	100.08	3	30.02			4	
16220-001	1810	TX0143511	Tack Redwood Partners Caldwell	0.423	10	35.28	3	10.58			4	
16223-001	1011	TX0143537	East Montgomery County MUD No. 13 Montgomery	0.6	5	25.02	2	10.01			6	
16224-001	1245	TX0143545	JDS Nursery Tract, LLC Fort Bend	0.2	10	16.68	3	5.00			6	

State Permit Number	Segment Number	EPA ID Number	Permittee Name and County	Flow (MGD)	CBOD ₅ (mg/L)	CBOD ₅ (lbs/day)	NH ₃ -N (mg/L)	NH ₃ -N (lbs/day)	BOD ₅ (mg/L)	BOD ₅ (lbs/day)	DO (mg/L)	Months/ Comments
16226-001	1244	TX0143570	Epitome Development LLC Williamson	0.3	10	25.02	3	7.51			4	

Planning Information Summary

The Water Quality Planning Division of TCEQ coordinated with TWDB and regional planning agencies to compile the wastewater facility information in this section. Domestic facility financing decisions under the State Revolving Fund (SRF) loan program must be consistent with the certified and approved WQMP.

The purpose of this section is to present data reflecting facility-planning needs, including previous water quality management plan needs requiring revision. Data are also presented to update other plan information for TWDB's SRF projects. Table 2 contains the updated service area population information. The table is organized in alphabetical order and includes the following 10 categories of information:

1. Planning Area – Area for which facility needs are proposed. The facility planning areas are subject to change during the facility planning process and any such changes will be documented in a later water quality management plan update. All planning areas listed are also designated management agencies (DMAs) unless otherwise noted in the “Comments” column.
2. Service Area – Area that receives the provided wastewater service.
3. Needs – A “T” indicates a need for either initial construction of a WWTF, additional treatment capacity, or the upgrading of a WWTF to meet existing or more stringent effluent requirements. A “C” indicates a need for improvements to, expansion of, rehabilitation of, or the initial construction of a wastewater collection system in the facility planning area. “T/C” indicates a need for both treatment and collection system facilities. More detailed facility planning conducted during a construction project may define additional needs and those needs will be reflected in a future update to the WQMP. A “F” indicates a need for flood mitigation.
4. Needs Year – The year in which the needs were identified for the planning area.
5. Basin Name – The river basin or designated planning entity for a designated planning area. The seven water quality management planning areas designated by the Governor are each administered by a Council of Governments (COG), a Development Council (DC), or a Planning Council (PC). Basin names are shown for areas outside one of these planning areas. The designated planning areas and their associated administering entities are:
 - a. Corpus Christi – Coastal Bend COG (CBCOG)
 - b. Killeen-Temple – Central Texas COG (CTCOG)
 - c. Texarkana – Ark-Tex COG (ATCOG)
 - d. Southeast Texas – South East Texas Regional Planning Council (SETRPC)
 - e. Lower Rio Grande Valley – Lower Rio Grande Valley Development Council (LRGVDC)
 - f. Dallas-Fort Worth – North Central Texas COG (NCTCOG)

g. Houston – Houston-Galveston Area Council (H-GAC)

6. Segment – The classified stream segment or tributary into which any recommended facility may discharge existing or projected wastewater. In the case of no-discharge facilities, this is the classified stream segment drainage area in which the facilities are located.
7. County – The county in which the facility planning area is located.
8. Date – The date the planning information was reviewed by TCEQ.
9. Comments – Additional explanation or other information concerning the facility planning area.
10. Population – The base year and projected populations for each facility planning area. Population projections presented are consistent with the latest available statewide population projections or represent the most current information obtained from facility planning analyses.

The facility information in this section is intended to be used in the preparation of facility plans and the subsequent design and construction of wastewater facilities. Design capacities of the treatment and collection systems will be based upon the population projections contained in this document, plus any additional needed capacity established for commercial/industrial flows and documented infiltration/inflow volumes (treatment or rehabilitation).

The probable needs shown under the “Needs” heading are preliminary findings; specific needs for an area must be as established in the completed and certified, detailed engineering studies conducted during facility planning under the SRF and other state loan programs.

Specific recommended effluent quality for any wastewater discharges resulting from any of the facilities in this document will be in accordance with the rule in the Texas WQS in effect at the time the permit is issued for a specific facility.

Table 2. Service Area Population Updates

Planning Agency	Service Area	Needs	Needs Year	Basin Name / COG	Segment	County	WQMP Date	Comments	Year	Population
City of China	City boundary	T/C	2050	Neches-Trinity Coastal	0701	Jefferson	9/13/2022	Construction of a new WWTP to replace the current WWTP	2020	1230
									2030	1309
									2040	1393
									2050	1489
City of Edinburg	Utility boundary	T/C	2046	Nueces-Rio Grande Coastal/ LRGVDC	2491	Hidalgo	9/20/2022	This project has three phases. Phase 1 will be to correct deficiencies at the existing WWTP. The second and third phases of the project will be implemented simultaneously. Phase 2 will be to construct a new 4.5 MGD plant on the north side of the City's service area. Phase 3 will provide for the construction of collection system improvements that will divert as much as 3.03 MGD of existing flow to the new plant, thereby offloading the existing plant	2022	105174
									2030	143702

Planning Agency	Service Area	Needs	Needs Year	Basin Name / COG	Segment	County	WQMP Date	Comments	Year	Population
									2040	162031
									2050	206001
City of Mertzon	Project service area	T	2050	Colorado	1423A	Irion	10/13/22	Upgrades to existing WWTP	2022	823
									2030	832
									2040	832
									2050	832
City of Leonard	City boundary	C	2060	Trinity	0821	Fannin	10/20/22	Collection system improvements.	2020	2200
									2035	2300
									2030	2400
									2040	2500

Designated Management Agencies

To be designated as a management agency for wastewater collection or treatment, an entity must demonstrate the legal, institutional, managerial and financial capability necessary to carry out the entity's responsibilities in accordance with Section 208(c) of the Clean Water Act (see below list of requirements). Before an entity can apply for an SRF loan, it must be recommended for designation as the management agency in the approved WQMP.

Designation as a management agency does not require the designated entity to provide wastewater services, but enables it to apply for grants and loans to provide those services. The facilities listed in Table 3 have submitted DMA resolutions to TCEQ. TCEQ submits this DMA information to EPA for approval as an update to the WQMP.

Section 208 (c) (2) Requirements for Management Agency

208(c)(2)(A): to carry out portions of an area-wide waste treatment plan.

208(c)(2)(B): to manage waste treatment works.

208(c)(2)(C): directly or by contract to design and construct new works.

208(c)(2)(D): to accept and utilize grants.

208(c)(2)(E): to raise revenues, including assessment of waste treatment charges.

208(c)(2)(F): to incur short and long term indebtedness.

208(c)(2)(G): to assure community pays proportionate cost.

208(c)(2)(H): to refuse to receive waste from non-compliant dischargers.

208(c)(2)(I): to accept for treatment industrial wastes.

Table 3. Designated Management Agencies

Planning Agency	Service Area	DMA Needs	DMA Date
City of China	City boundary	T/C	7/26/2021
City of Edinburg	Utility boundary	T/C	03/22/2022
City of Mertzon	Project service area	T	03/22/2022
City of Leonard	City boundary	C	10/22/2021

Total Maximum Daily Load Revisions

The TMDL Program works to improve water quality in impaired or threatened waters bodies in Texas. The program is authorized by and created to fulfill the requirements of Section 303(d) of the federal Clean Water Act.

The goal of a TMDL is to restore the full use of a water body that has limited quality in relation to one or more of its uses. The TMDL defines an environmental target, and based on that target, TCEQ and stakeholders develop an implementation plan with wasteload allocations for point source dischargers to mitigate human-caused sources of pollution within the watershed and restore full use of the water body.

TMDLs are developed based on intensive data collection and scientific analysis. After adoption by TCEQ, TMDLs are submitted to EPA for review and approval.

The attached appendixes may reflect proposed wasteload allocations for new dischargers and/or additions or revisions to TMDLs. Updates and addendums will be provided in the same units of measure used in the original TMDL document and will include the segment and assessment unit (AU) numbers of the affected segments. Also, note that for bacteria TMDLs, loads will typically be expressed as colony-forming units per day (cfu/day). On occasion, other expressions may be used due to different laboratory methods, such as counts or most probable number per day. For the purposes of the TMDL program, these terms are considered to be synonymous.

Appendix I. Updates to Eighteen Total Maximum Daily Loads for Bacteria in Buffalo and Whiteoak Bayous and Tributaries

Segments 1013, 1013A, 1013C, 1014, 1014A, 1014B, 1014E, 1014H, 1014K, 1014L, 1014M, 1014N, 1014O, 1017, 1017A, 1017B, 1017D, and 1017E

This appendix provides updates to TMDLs previously submitted through the state's WQMP for: Buffalo and Whiteoak Bayous and Tributaries.

The report *Eighteen Total Maximum Daily Loads for Bacteria in Buffalo and Whiteoak Bayous and Tributaries For Segment Numbers 1013, 1013A, 1013C, 1014, 1014A, 1014B, 1014E, 1014H, 1014K, 1014L, 1014M, 1014N, 1014O, 1017, 1017A, 1017B, 1017D, and 1017E* was adopted by TCEQ on 04/08/09 and approved by EPA on 06/11/09. Upon EPA approval, the TMDLs became part of the state's WQMP.

The Texas WQMP has since been updated 32 times prior to this update for this TMDL. The previous updates have revised the list of individual WLAs in the original TMDL document. Additionally, TCEQ submitted addenda to the original TMDL in the April 2013, April 2015, and January 2021 WQMP updates. These addenda added three new AUs to the original TMDL project.

The purpose of this update is to make the following changes to the TMDL (presented in Table I-1):

- add one new permit and
- remove one cancelled permit.

The changes reflected in this update resulted in the shifting of allocations between the sum of the individual WLAs and the allowance for future growth (FG) in two AUs. This was originally presented in Table 53 in the original TMDL document. The affected AUs in this update are included here as Table I-2.

In Table 54 of the original TMDL, the WLAs for permitted facilities are the sum of the individual WLAs and the allowance for FG within each AU. These overall numbers did not change; Table 54 of the original TMDL remains the same.

Table I-1 - Change to individual WLAs for the TMDL watershed

Updates Table 45, p. 99-103 in the original TMDL document.

The WLA is expressed in billion MPN/day *E. coli*.

State Permit Number	Outfall	EPA Permit Number	AU	Permittee Name	Flow (MGD)	WLA	TMDL Comments
14794-001	001	TX0129534	1014H_02	SOUTH CENTRAL WATER COMPANY	NA	NA	Cancelled permit
16193-001	001	TX0143260	1014L_01	MAS HOUSTON REVOCABLE TRUST	0.02	0.048	New permit

Table I-2 - TMDL summary calculations for two AUs in the TMDL watershed

Updates Table 53, p. 116-117 in the original TMDL document.

All loads expressed as billion MPN/day *E. coli*.

AU	Segment Name	TMDL	WLA WWTF	WLA SW	LA	MOS	Upstream Load	FG
1014H_02	South Mayde Creek	175.43	50.10	112.00	12.44	0	0	0.89
1014L_01	Mason Creek	69.66	33.24	23.11	2.57	0	0	10.74

Appendix II. Updates to Seven TMDLs for Indicator Bacteria in Lake Houston, East Fork San Jacinto River, West Fork San Jacinto River, and Crystal Creek Watersheds

Segments 1002, 1003, 1004, and 1004D

This appendix provides updates to TMDLs previously submitted through the state's WQMP for: Lake Houston, East Fork San Jacinto River, West Fork San Jacinto River, and Crystal Creek Watersheds.

The report *Seven Total Maximum Daily Loads for Indicator Bacteria in Lake Houston, East Fork San Jacinto River, West Fork San Jacinto River, and Crystal Creek Watersheds For Segments 1002, 1003, 1004, and 1004D* was adopted by TCEQ on 08/24/16 and approved by EPA on 10/07/16. Upon EPA approval, the TMDLs became part of the state's WQMP.

The Texas WQMP has since been updated 12 times prior to this update for this TMDL. The previous updates have revised the list of individual WLAs in the original TMDL document. Additionally, TCEQ submitted an addendum to the original TMDL in the October 2018 WQMP update. This addendum added one new AU to the original TMDL project.

The purpose of this update is to make the following changes to the TMDL (presented in Table II-1):

- add three new permits and
- remove one withdrawn permit.

The changes reflected in this update resulted in the shifting of allocations between the sum of the individual WLAs and the allowance for FG in three AUs. This was originally presented in Table 17 in the original TMDL document. The three affected AUs in this update are included here as Table II-2.

For AUs 1003_01 and 1003_02, the existing future growth allocations were insufficient to cover the increased flow to the AUs for this update. However, ample loading is available in the WLA_{StormWater} and LA terms. Loading was taken from each of those terms (in a way that maintains the proportions for them in the original TMDL) and allotted to future growth for both AUs. This results in no changes to the overall TMDL allocations.

In Table 18 of the original TMDL, the WLAs for permitted facilities are the sum of the individual WLAs and the allowance for FG within each AU. Because loading was moved from the WLA_{StormWater} and LA terms to be used for future growth for AUs 1003_01 and 1003_02, these AUs are updated in Table II-3. These overall numbers for the other AUs did not change, and again this results in no changes to the overall TMDL allocations.

Table II-1 - Changes to individual WLAs for the TMDL watersheds

Updates Table 13, p. 54-55 in the original TMDL document.

The WLA is expressed in billion MPN/day *E. coli*.

State Permit Number	Outfall	EPA Permit Number	AU	Permittee Name	Flow (MGD)	WLA	TMDL Comments
16184-001	001	TX0143146	1002_06	VILLAS RV PARK LLC	0.025	0.0596	New permit
16180-001	001	TX0143081	1003_01	TEXAS WATER UTILITIES LP	0.99	2.3610	New permit
16087-001	001	TX014222	1003_02	CITY OF CLEVELAND	n/a	n/a	Permit withdrawn
16187-001	001	TX0143189	1003_02	CITY OF CLEVELAND	1.8	4.2927	New permit

Table II-2 - TMDL summary calculations for five AUs in the TMDL watersheds

Updates Table 17, p. 59 in the original TMDL document.

All loads expressed as billion MPN/day *E. coli*.

AU	Segment Name	TMDL	MOS	WLA WWTF	WLA SW	LA AU	LA TRIB	LA RES	LA TOTAL	FG
1002_06	Lake Houston	6,197	106.57	106.45	288.17	1,535.70	3,106.90	958.70	5,601.30	94.51
1003_01	East Fork San Jacinto River	866.4	43.32	17.61	1.74	803.59	0	0	803.59	0.14
1003_02	East Fork San Jacinto River	722.8	36.14	8.24	1.18	677.13	0	0	677.13	0.10

Table II-3 - TMDL final calculations

Updates Table 18, p. 60 in the original TMDL document.

All loads expressed as billion MPN/day *E. coli*.

AU	TMDL	WLA _{WWTF}	WLA _{SW}	LA _{TOTAL}	MOS
1003_01	866.4	17.75	1.74	803.59	43.32
1003_02	722.8	8.34	1.18	677.13	36.14

Appendix III. Updates to Eight TMDLs for Indicator Bacteria in Greens Bayou Above Tidal and Tributaries

Segments 1016, 1016A, 1016B, 1016C, and 1016D

This appendix provides updates to TMDLs previously submitted through the state's WQMP for: Greens Bayou Above Tidal and Tributaries.

The report *Eight Total Maximum Daily Loads for Indicator Bacteria in Greens Bayou Above Tidal and Tributaries: Segments 1016, 1016A, 1016B, 1016C, and 1016D* was adopted by TCEQ on 06/02/10 and approved by EPA on 08/12/10. Upon EPA approval, the TMDLs became part of the state's WQMP.

The Texas WQMP has since been updated 13 times prior to this update for this TMDL. The previous updates have revised the list of individual WLAs in the original TMDL document.

The purpose of this update is to make the following change to the TMDL (presented in Table III-1):

- update an existing permit with increased discharge.

The changes reflected in this update resulted in the shifting of allocations between the sum of the individual WLAs and the allowance for FG in two AUs. This was originally presented in Table 17 in the original TMDL document. The two affected AUs in this update are included here as Table III-2.

In Table 18 of the original TMDL, the WLAs for permitted facilities are the sum of the individual WLAs and the allowance for FG within each AU. These overall numbers did not change; Table 18 of the original TMDL remains the same.

Table III-1 - Changes to individual WLAs for the TMDL watersheds

Updates Table 15, pp. 39-42 in the original TMDL document.

The WLA is expressed in billion MPN/day *E. coli*.

State Permit Number	Outfall	EPA Permit Number	AU	Permittee Name	Flow (MGD)	WLA	TMDL Comments
10495-078	001	TX0034916	1016_02	CITY OF HOUSTON	14.0	33.387	Increased Discharge

Table III-2 - TMDL summary calculations for two AUs in the TMDL watersheds

Updates Table 17, p. 46 in the original TMDL document.

All loads expressed as billion MPN/day *E. coli*.

AU	Segment Name	TMDL	WLA wwtf	WLA sw	LA	MOS	FG
1016_02	Greens Bayou Above Tidal	1,020	121.0	789	0	51.2	58.8
1016_03	Greens Bayou Above Tidal	1,780	220.2	1,114	167	89.0	189.8

Appendix IV. Updates to Fifteen TMDLs for Indicator Bacteria in Watersheds Upstream of Lake Houston

Segments 1004E, 1008, 1008H, 1009, 1009C, 1009D, 1009E, 1010, and 1011

This appendix provides updates to TMDLs previously submitted through the state's WQMP for: Watersheds Upstream of Lake Houston.

The report *Fifteen Total Maximum Daily Loads for Indicator Bacteria in Watersheds Upstream of Lake Houston For Segment Numbers 1004E, 1008, 1008H, 1009, 1009C, 1009D, 1009E, 1010, and 1011* was adopted by TCEQ on 04/06/11 and approved by EPA on 06/29/11. Upon EPA approval, the TMDLs became part of the state's WQMP.

The Texas WQMP has since been updated 39 times prior to this update for this TMDL. The previous updates have revised the list of individual WLAs in the original TMDL document. Additionally, TCEQ submitted four addenda to the original TMDL in the October 2013, October 2019, October 2020, and April 2022 WQMP updates. These addenda added 10 new AUs to the original TMDL project.

The purpose of this update is to make the following changes to the TMDL (presented in Table IV-1):

- remove an expired permit with a name change,
- add eight new permits, and
- update two existing permits discharging into a newly approved addendum watershed.

The changes reflected in this update resulted in the shifting of allocations between the sum of the individual WLAs and the allowance for FG in 10 AUs. This was originally presented in Table 18 in the original TMDL document. The 10 affected AUs in this update are included here as Table IV-2.

For AUs 1008_02, 1009E_01, and 1010_02, the existing future growth allocations were insufficient to cover the increased flow to the AUs for this update. However, ample loading is available in the WLA_{StormWater} and LA terms. Loading was taken from each of those terms (in a way that maintains the proportions for them as updated in the July 2016 WQMP update) and allotted to future growth for these AUs. This results in no changes to the overall TMDL allocations.

In Table 19 of the original TMDL, the WLAs for permitted facilities are the sum of the individual WLAs and the allowance for FG within each AU. Because loading was moved from the WLA_{StormWater} and LA terms to be used for future growth for AUs 1008_02, 1009E_01, and 1010_02, these AUs are updated in Table IV-3. These overall numbers for the other AUs did not change, and again this results in no changes to the overall TMDL allocations.

Table IV-1 - Changes to individual WLAs for the TMDL watershed

Updates Table 16, p. 49-56 in the original TMDL document.

The WLA is expressed in billion MPN/day *E. coli*.

State Permit Number	Outfall	EPA Permit Number	AU	Permittee Name	Flow (MGD)	WLA	TMDL Comments
16086-001	001	TX0142212	1008_02	MONTGOMERY COUNTY MUD NO. 199	0.25	0.596	New permit
16182-001	001	TX0143120	1008_02	MACEDONIA ASSET LLC	0.08	0.191	New permit
16209-001	001	TX0143391	1008_02	VISTA VIEW MOBILE HOMES LLC	0.048	0.114	New permit
16168-001	001	TX0142956	1008_03	QUADVEST LP	0.65	1.550	New permit
16190-001	001	TX0143227	1009E_01	HARRIS COUNTY MUD NO. 535	0.6	1.431	New permit
16153-001	001	TX0142824	1009E_01	WOODMERE DEVELOPMENT CO., LTD	0.48	1.145	New permit
16199-001	001	TX0143316	1009E_01	FALCON COMMERCIAL DEVELOPMENT LLC	0.049	0.117	New permit
16174-001	001	TX0142999	1010_02	ROCKPOINT 1375 LLC	0.7	1.669	New permit
14536-001	001	TX0126853	1011_02	EAST MONTGOMERY COUNTY MUD #4	n/a	n/a	Expired permit with name change

Table IV-2 - TMDL summary calculations for 10 AUs in the TMDL watershed

Updates Table 18, p. 61 in the original TMDL document.

All loads expressed as billion MPN/day *E. coli*.

AU	Sampling Location	Segment Name	TMDL	WLA _{wwtf}	WLA _{sw}	LA	MOS	FG
1008_02	11314	Spring Creek	287	15.15	69.50	187.93	14.4	0.02
1008_03	11313	Spring Creek	1420	116.11	322	869	70.9	41.99
1008_04	11312	Spring Creek	1510	151.78	334	902	75.7	46.52
1009_02	11331	Cypress Creek	615	118.05	196	270	30.8	0.15
1009_03	11328	Cypress Creek	1340	201.80	415	574	67.0	82.20
1009_04	11324	Cypress Creek	1550	240.98	469	648	77.4	114.62
1009E_01	14159	Little Cypress Creek	91.1	23.17	15.66	46.97	4.56	0.75
1010_02	14241	Caney Creek	245	3.67	29.76	199.21	12.3	0.06
1010_04	11334	Caney Creek	493	25.81	57.4	383.8	24.7	1.29
1011_02	17746	Peach Creek	422	13.24	34.5	348.5	21.1	4.66

Table IV-3 - TMDL final calculations

Updates Table 19, p. 62 in the original TMDL document.

All loads expressed as billion MPN/day *E. coli*.

AU	TMDL	WLA _{wwtf}	WLA _{sw}	LA _{TOTAL}	MOS
1008_02	287	15.17	69.50	187.93	14.4
1009E_01	91.1	23.92	15.66	46.97	4.56
1010_02	245	3.73	29.76	199.21	12.3

In addition, Table IV-4 below provides an update to Table 9 found in the October 2019 addendum to this TMDL project (*Addendum Two to Fifteen Total Maximum Daily Loads for Indicator Bacteria in Watersheds Upstream of Lake Houston: Two Total Maximum Daily Loads for Indicator Bacteria in Brushy Creek and Spring Branch For AUs 1008J_01 and 1010C_01*). Two of the permits discussed earlier in this update also affect one AU in this addendum.

Table IV-5 below provides updates to Table 10 found in the October 2019 addendum to this TMDL project. The addendum added two AUs that were not included in the original TMDL. The AU affected here (1008J_01) was included as an upstream loading to 1008_02 in the original TMDL. Two of the permits (16182-001/TX0143120 and 16209-001/ TX0143391) affect the loading of 1008J_01 as well as the original TMDL AU 1008_02.

For AU 1008J_01, the existing future growth allocation was insufficient to cover the increased flow to the AU for this update. However, ample loading is available in the WLA_{StormWater} and LA terms. Loading was taken from each of those terms (in a way that maintains the proportions for them as updated in the that addendum) and allotted to future growth for this AU. This results in no changes to the overall TMDL allocations.

In Table 11 of the October 2019 TMDL addendum, the WLAs for permitted facilities are the sum of the individual WLAs and the allowance for FG within the single affected AU. Because loading was moved from the WLA_{StormWater} and LA terms to be used for future growth for AU 1008J_01, this AU is updated in Table IV-6. These overall numbers for the other AU did not change, and again this results in no changes to the overall TMDL allocations.

Table IV-4 - Changes to individual WLAs in the Brushy Creek watershed

Updates Table 9, p. 17 in the TMDL addendum document.

The WLA is expressed in billion cfu/day *E. coli*.

State Permit Number	Outfall	EPA Permit Number	AU	Permittee Name	Flow (MGD)	WLA	TMDL Comments
16182-001	001	TX0143120	1008J_01	MACEDONIA ASSET LLC	0.08	0.191	New permit
16209-001	001	TX0143391	1008J_01	VISTA VIEW MOBILE HOMES LLC	0.048	0.114	New permit

Table IV-5 - TMDL summary calculations for one AU in the Brushy Creek watershed

Updates Table 10, p. 19 in the TMDL addendum document.

All loads expressed as billion cfu/day *E. coli*.

Water Body	AU	TMDL	WLA _{WWTF}	WLA _{sw}	LA	FG	MOS
Brushy Creek	1008J_01	200.615	0.543	8.038	181.992	0.011	10.031

Table IV-6 – TMDL addendum final calculations

Updates Table 11, p. 19 in the TMDL addendum document.

All loads expressed as billion cfu/day *E. coli*.

AU	TMDL	WLA _{WWTF}	WLA _{sw}	LA	MOS
1008J_01	200.615	0.554	8.038	181.992	10.031

Finally, Table IV-7 below provides an update to Table VII-8 found in the April 2022 addendum to this TMDL project (*Addendum Four to Fifteen Total Maximum Daily Loads for Indicator Bacteria in Watersheds Upstream of Lake Houston: One Total Maximum Daily Load for Indicator Bacteria Caney Creek For AU 1010_03*). One of the permits discussed earlier in this update also affects one AU in this addendum. In addition, two permits addressed in recent updates to the original TMDL were added since the fourth addendum was developed and affect one AU in this addendum.

Table IV-8 below provides updates to Table VII-9 found in the April 2022 addendum to this TMDL project. The addendum added one AU that was not included in the original TMDL. The AU affected here (1010_03) was included as an upstream loading to 1010_02 in the original TMDL. Three of the permits (16116-001/TX0142492, 16174-001/TX0142999, and 16067-001/TX0142000) affect the loading of 1010_03 as well as the original TMDL AU 1010_02.

In Table VII-10 of the April 2022 TMDL addendum, the WLAs for permitted facilities are the sum of the individual WLAs and the allowance for FG within the single affected AU. Therefore, these overall numbers did not change, and Table VII-10 of the TMDL addendum remains the same.

Table IV-7 - Changes to individual WLAs in the Caney Creek watershed

Updates Table VII-8, p. 20-21 in the TMDL addendum document.

The WLA is expressed in billion cfu/day *E. coli*.

State Permit Number	Outfall	EPA Permit Number	AU	Permittee Name	Flow (MGD)	WLA	TMDL Comments
16116-001	001	TX0142492	1010_03	CRYSTAL SPRINGS WATER CO., INC.	0.14	0.334	New permit
16174-001	001	TX0142999	1010_03	ROCKPOINT 1375 LLC	0.7	1.669	New permit
16067-001	001	TX0142000	1010_03	WILLIS WAUKEGAN DEVELOPMENT LLC	0.07	0.167	New permit

Table IV-8 - TMDL summary calculations for one AU in the Caney Creek watershed

Updates Table VII-9, p. 22 in the TMDL addendum document.

All loads expressed as billion cfu/day *E. coli*.

Water Body	AU	TMDL	MOS	WLA WWTF	WLA SW	LA	FG
Caney Creek	1010_03	237.441	11.872	6.995	12.977	188.219	17.378

Appendix V. Updates to One Total Maximum Daily Load for Bacteria in Upper Oyster Creek Segment 1245

This appendix provides updates to TMDLs previously submitted through the state's WQMP for: Upper Oyster Creek.

The report *One Total Maximum Daily Load for Bacteria in Upper Oyster Creek for Segment Number 1245* was adopted by TCEQ on 08/08/07 and approved by EPA on 09/28/07. Upon EPA approval, the TMDLs became part of the state's WQMP.

The Texas WQMP has since been updated 17 times prior to this update for this TMDL. The previous updates have revised the list of individual WLAs in the original TMDL document.

The purpose of this update is to make the following changes to the TMDL (presented in Table V-1):

- update an existing permit with increased discharge and
- remove one cancelled permit.

Note that this TMDL was written for *E. coli* and that it used the single sample criterion of 394 cfu/100 mL. All of the permitted facilities covered by the original TMDL and subsequent WQMP updates have also been given a daily average for *E. coli* of 126 cfu/100 mL consistent with standard bacteria permitting practices for the state of Texas. In addition, watershed stakeholders are meeting annually to discuss water quality in Upper Oyster Creek related to this TMDL project (both instream data as well as self-reported data from permitted facilities) and may recommend stricter permit limits for *E. coli* in the future if deemed necessary.

The changes reflected in this update resulted in the shifting of allocations between WLA Continuous, WLA Non-continuous, and LA Other terms in Allocation Reach 2. This was originally presented in Table 11 in the original TMDL document, and the new allocations are updated here in Table V-2. This shifting of allocations is done in such a way that the WLA Non-continuous and LA Other terms maintain the proportions presented in the April 2016 WQMP update.

Table V-1 - Changes to individual WLAs for the Upper Oyster Creek watershed

Updates p. 33-37 in the original TMDL document.

The WLA is expressed in cfu/day *E. coli*.

State Permit Number	Outfall	EPA Permit Number	Allocation Reach	Permittee Name	Flow (MGD)	WLA	TMDL Comments
11475-001	001	TX0031674	2	TDCJ JESTER UNIT # 1	n/a	n/a	Cancelled permit
14758-001	001	TX0129216	2	FORT BEND CO. MUD # 182	2.5	3.73×10^{10}	New permit

Table V-2 - TMDL summary calculations for allocation reach in the Upper Oyster Creek watershed

Updates Table 11, p. 37 in the original TMDL document.

All loads expressed as billion cfu/day *E. coli*.

Allocation Reach	TMDL	WLA Continuous	WLA Non-continuous	LA Other	MOS
2	1,682	231.75	679.15	771.10	Implicit

Appendix VI. Updates to Two Total Maximum Daily Loads for Dissolved Oxygen in Upper Oyster Creek

Segment 1245

This appendix provides updates to TMDLs previously submitted through the state's WQMP for: Upper Oyster Creek.

The report *Two Total Maximum Daily Loads for Dissolved Oxygen in Upper Oyster Creek: Segment 1245* was adopted by TCEQ on 07/28/10 and approved by EPA on 09/21/10. Upon EPA approval, the TMDLs became part of the state's WQMP.

The Texas WQMP has since been updated 12 times prior to this update for this TMDL. The previous updates have revised the list of individual WLAs in the original TMDL document.

The purpose of this update is to make the following changes to the TMDL (presented in Table VI-1):

- update an existing permit with increased discharge and
- remove one cancelled permit.

The allocations presented in this update were verified as satisfactory using the QUAL2K model used in establishing the original TMDL. The relevant permit limits for the facility that increased its discharge are provided in Table VI-2. The TMDL summary equations must also be updated for carbonaceous biochemical oxygen demand (CBOD₅; Table VI - 3) and ammonia nitrogen (NH₃-N; Table VI -4) to reflect these changes.

Table VI-1 - Changes to individual WLAs for the Upper Oyster Creek watershed

Updates Table 9, p. 29 in the original TMDL document.

Permittee Name	TCEQ Permit No. EPA Permit No. Outfall No.	AU	Final Permitted Discharge (MGD)	Allowable CBOD ₅ Loading (kg/d) (lb/d)	Allowable NH ₃ -N Loading (kg/d) (lb/d)	TMDL Comments
Fort Bend Co. MUD # 182	14758-001 / TX0129216 / 001	03	2.5	47.31 104.33	9.46 20.87	Increased discharge
TDCJ Jester Unit #1	11475-001 / TX0031674 / 001	03	N/A	N/A	N/A	Cancelled permit

Table VI-2 - Permitted loadings for individual WWTFs

Corresponds to Table 3, p. 13 in the original TMDL document.

Facility Name	TCEQ Permit No. EPA Permit No. Outfall No.	Final Permitted Discharge (MGD)	CBOD ₅ (mg/L)	NH ₃ -N (mg/L)	Dissolved Oxygen (mg/L)
Fort Bend Co. MUD # 182	14758-001 / TX0129216 / 001	2.5	5.0	1.0	6.0

Table VI-3 - Summary of TMDLs for Upper Reach CBOD₅

Updates Table 13, p. 36 in the original TMDL document.

Source Category	Proposed (Full Permitted) Loading ¹ (kg/d)	Allowable Loading ² (kg/d)
1245_03:		
WLA	384.59	384.59
LA	96	96
Total Loading	480.59	480.59

Table VI-4 - Summary of TMDLs for Upper Reach NH₃-N

Updates Table 14, p. 37 in the original TMDL document.

Source Category	Proposed (Full Permitted) Loading ¹ (kg/d)	Allowable Loading ² (kg/d)
1245_03:		
WLA	95.87	95.87
LA	3.69	3.69
Total Loading	99.56	99.56

- Those facilities routing wastewater through polishing ponds are included in the total, assuming quality exiting the pond(s) is 1.3 mg/L CBOD₅ and 0.05 mg/L NH₃-N.
- Allowable loading is determined using the QUAL2K model developed for the TMDL and existing/proposed discharges at limits necessary to meet the relevant dissolved oxygen criteria.

Note: As stated earlier, the allocations presented in this update were verified as satisfactory using the QUAL2K model used in establishing the original TMDL. The original water quality sampling for the project was completed in 2005, and since then conditions in the watershed have changed and there had been limited sampling to assess water quality. A new sampling project for Segment 1245 began in December 2015 and continued approximately monthly through August 2017. In addition to providing valuable information to concerned stakeholders in the watershed, these data are now being analyzed and a new modeling effort is underway.