



July 2021 Update to the Texas Water Quality Management Plan

Prepared by
Water Quality Division, Office of Water

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY • PO BOX 13087 • AUSTIN, TX 78711-3087

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Prepared by the
Office of Water
Water Quality Division

Final WQMP updates are available on the TCEQ webpage:
www.tceq.texas.gov/permitting/wqmp/WQmanagement_updates.html

Developed in accordance with Sections 205(j), 208,
and 303 of the Federal Clean Water Act
and applicable regulations thereto.

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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, 10/2020, 01/2021, and 04/2021.

The draft July 2021 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 July 2021 WQMP update was from August 6, 2021 through September 7, 2021.

The “Projected Effluent Limit Update” section provides information compiled from May 1, 2021 through July 31, 2021 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)	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
10442-002	0821	TX0103497	City of Farmersville Collin	0.754	10	62.88	3	18.87			4	
10495-079	1102	TX0035006	City of Houston Harris	15.2	5	633.84	1.9	240.86			6	
10726-001	0824	TX0022357	City of Gainesville Cooke	8.0	7	467.04	2	133.44			5	Apr.-Oct.
				8.0	7	467.04	5	333.60			5	Nov.-Mar.
10779-001	2436	TX0027260	City of Morgan's Point Harris	0.3	10	25.02	3	7.51			4	Apr.-Oct.
				0.3	10	25.02	5	12.51			4	Nov.-Mar.
11570-001	0823	TX0053112	City of The Colony Denton	6.3	5	262.71	1.6	84.07			6	
12447-001	1014	TX0088838	Harris County MUD No. 196 Harris	1.4	10	116.76	2	23.35			6	Apr.-Oct.
				1.4	10	116.76	3	35.03			6	Nov.-Mar.
14323-001	0823	TX0124745	Upper Trinity Regional Water District Denton	4.60	5	191.82	1.8	69.06			6	
14807-001	2422	TX0053317	City of Mont Belvieu Chambers	3.00	5	125.10	1.5	37.53			4	
15609-001	1202	TX0137979	Richmond Community Estates, L.L.C. Fort Bend	0.025	10	2.09	3	0.63			4	
15924-001	0826	TX0140759	South Central Water Company Denton	0.50	10	41.70	3	12.51			4	
15937-001	0506	TX0140651	Institute for Basic Life Principals, Inc. Upshur	0.10					20	16.68	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
15947-001	1010	TX0140848	East Montgomery County MUD No. 5 Montgomery	0.33	10	27.52	3	8.26			4	
15956-001	1004	TX0140937	Quadvest, L.P. Montgomery	0.96	10	80.06	3	24.02			6	
15958-001	1428	TX0140953	Gateway Oasis V L.L.C. Travis	0.15	5	6.26	2	2.50			6	
15965-001	1242	TX0141071	McLennan County WCID No. 2 McLennan	0.20	5	8.34	2	3.34			4	
15967-001	1002	TX0141062	Liberty County Utilities, L.L.C. Liberty	0.975	10	81.32	3	24.39			4	
15969-001	1009	TX0141089	Mathis 45 L.L.C. Waller	0.25	10	20.85	3	6.26			4	
15972-001	1102	TX0141097	The Landing At Pearland, Ltd. Brazoria	0.12	5	5.00	2	2.00			4	
15974-001	1412	TX0141101	Permian Lodging Big Spring, L.L.C. Howard	0.04					20	6.67	4	
15975-001	1245	TX0141119	Quadvest, L.P. Fort Bend	0.050	7	2.92	2	0.83			4	
15976-001	2311	TX0141160	Permian Lodging Orla, L.L.C. Reeves	0.025					20	4.17	4	
15977-001	1008	TX0141135	FM 290 Land Company, Ltd. Harris	0.120	10	10.01	3	3.00			4	
15979-001	1015	TX0141178	Sig Magnolia, L.P. Montgomery	0.60	10	50.04	3	15.01			6	
15984-001	1010	TX0141224	Texas Campgrounds Club, Inc. Montgomery	0.04	10	3.34	3	1.00			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.

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)

5. 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.
6. County – The county in which the facility planning area is located.
7. Date – The date the planning information was reviewed by TCEQ.
8. Comments – Additional explanation or other information concerning the facility planning area.
9. 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 Seguin	City limits	T/C	2070	Guadalupe River Basin	1804	Guadalupe	6/15/2021	Pending permit amendment and modeler update	2020	27874
									2025	34562
									2030	41521
									2040	54628
City of Breckenridge	City limits	T/C	2050	Brazos River Basin	1232	Stephens	6/15/2021		2020	5457
									2025	5794
									2030	6130
									2040	6232
City of Cranfills Gap	City limits	T/C	2040	Brazos River Basin	1226	Bosque	6/15/2021		2020	286
									2025	289
									2030	292
									2040	298
City of Comanche	City limits	C	2050	Brazos River Basin	1221	Comanche	6/15/2021		2020	4508
									2025	4581
									2030	4670
									2040	4791
City of Dilley	City limits	T	2040	Nueces River Basin	2117	Frio	6/15/2021		2020	9407
									2025	9627
									2030	9847
									2040	10290

Planning Agency	Service Area	Needs	Needs Year	Basin Name / COG	Segment	County	WQMP Date	Comments	Year	Population
City of La Joya	City limits	T	2040	Rio Grande River Basin/ LRGVDC	2302	Hidalgo	7/22/2021		2020	5050
									2025	5684
									2030	6271
									2040	7495
Pettus MUD	District boundary	T	2040	San Antonio-Nueces Coastal Basin/ CBCOG	2002	Bee	7/27/2021		2020	705
									2025	720
									2030	729
									2040	742

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 Seguin	City limits	T/C	7/23/2020
City of Breckenridge	City limits	T/C	3/11/2021
City of Cranfills Gap	City limits	T/C	10/26/2020
City of Comanche	City limits	C	3/23/2021
City of Dilley	City limits	T	3/19/2021
City of La Joya	City limits	T	3/17/2021
Pettus MUD	District Boundary	T	7/23/2020
Buffalo Creek	District Boundary	C	8/16/2019

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 Nine TMDLs for Bacteria in Clear Creek and Tributaries

Segments 1101, 1101B, 1101D, 1102, 1102A, 1102B, 1102C, 1102D, and 1102E

This appendix provides updates to TMDLs previously submitted through the state's WQMP for: Clear Creek and Tributaries.

The report *Nine Total Maximum Daily Loads for Bacteria in Clear Creek and Tributaries: Segments 1101, 1101B, 1101D, 1102, 1102A, 1102B, 1102C, 1102D, and 1102E* was adopted by TCEQ on 09/10/08 and approved by EPA on 03/06/09. Upon EPA approval, the TMDLs became part of the state's WQMP.

The Texas WQMP has since been updated seven times prior to this update for this TMDL. The previous updates have revised the list of individual WLAs in the original TMDL document. TCEQ submitted two addenda to the original TMDL in the October 2012 and October 2018 WQMP updates. These addenda added five 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
- update the WLA for one facility that has increased its permitted 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 Tables 18 and 21 in the original TMDL document. The affected AUs in this update are included here as Tables I-2 and I-3.

For Segment 1102A/AU 1102A_01 and Segment 1102E/AU 1102E_01, the existing FG allocation was 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 the AUs. This results in no changes to the overall TMDL allocations.

Table I-1 - Changes to individual WLAs within the TMDL watersheds

Updates Table 16, pp. 47 in the original TMDL document.

All loads expressed as MPN/day.

State Permit Number / EPA Permit Number	Outfall	AU	Permittee Name	Flow (MGD)	WLA – Fecal Coliform MPN/day	WLA – <i>E. coli</i> MPN/day	WLA – Enterococci MPN/day	TMDL Comments
15972-001 / TX0141097	001	1102A_01	THE LANDING AT PEARLAND, LTD.	0.12	9.08E+08	5.72E+08	NA	New permit
10495-079 / TX0035009	001	1102E_01	CITY OF HOUSTON	15.2	1.15E+11	7.25E+10	NA	Increased discharge

Table I-2 - *E. coli* and Fecal Coliform TMDL Calculations for Freshwater Segments

Updates Table 18, p. 50 in the original TMDL document.

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

Segment	Sampling Location	Stream Name	Indicator Bacteria	TMDL	WLA WWTF	WLA sw	LA	MOS	FG
1102A	16477	Cowart Creek	<i>E. coli</i>	4.87E+10	9.73E+08	2.26E+10	2.26E+10	2.43E+09	1.35E+08
1102E	17071	Mud Gully	Fecal Coliform	1.79E+11	1.15E+11	4.35E+10	1.81E+09	8.97E+09	9.64E+09

Table I-3 - TMDL Allocation Table

Updates Table 21, p. 53 in the original TMDL document.

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

Segment	Stream Name	AU	Indicator Bacteria	TMDL	WLA WWTF	WLA sw	LA	MOS	FG
1102A	Cowart Creek	1102A_01	<i>E. coli</i>	4.87E+10	9.73E+08	2.26E+10	2.26E+10	2.43E+09	1.35E+08
1102E	Mud Gully	1102E_01	Fecal Coliform	1.79E+11	1.15E+11	4.35E+10	1.81E+09	8.97E+09	9.64E+09

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 eight 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 four new permits.

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 four AUs. This was originally presented in Table 17 in the original TMDL document. The four affected AUs in this update are included here as Table II-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 II-1 - Changes to individual WLAs within the TMDL watersheds

Updates Table 13, pp. 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
15880-001	001	TX0140261	1004_01	MARBAC LLC	0.099	0.2361	New permit
15956-001	001	TX0140937	1004D_01	QUADVEST, L.P.	0.96	2.2894	New permit
15971-001	001	TX0141127	1004D_01	STONE HEDGE UTILITY CO., INC.	0.015	0.0358	New permit
15979-001	001	TX0141178	1015_01 ^a	SIG MAGNOLIA LP	0.60	1.4309	New permit

^a Lake Creek (1015_01) is not impaired, but is a tributary to impaired West Fork San Jacinto River AU 1004_02.**Table II-2 - TMDL summary calculations for four AUs within 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	102.36	288.17	1,535.70	3,106.90	958.70	5,601.30	98.60
1004_01	West Fork San Jacinto River	2,779	88.77	99.14	196.81	1,294.21	44.86	958.70	2,297.77	96.51
1004_02	West Fork San Jacinto River	1,141	9.12	46.18	4.04	75.26	0	958.70	1,033.96	47.70
1004D_01	Crystal Creek	137.8	6.89	8.27	18.79	100.92	0	0	100.92	2.93

Appendix III. 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 34 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 three addenda to the original TMDL in the October 2013, October 2019, and October 2020 WQMP updates. These addenda added nine new AUs to the original TMDL project.

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

- add three new permits, and
- remove four canceled permits.

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 III-2.

For AUs 1008_02 and 1009_01, 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 both 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 and 1009_01, these AUs are updated in Table III-3. These overall numbers for the other AUs did not change, and again this results in no changes to the overall TMDL allocations.

Table III-1 - Changes to individual WLAs in the Lake Houston watershed

Updates Table 16, pp. 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
15977-001	001	TX0141135	1008_02	FM 2920 LAND COMPANY, LTD.	0.12	0.286	New permit
15969-001	001	TX0141071	1009_01	MATHIS 45, LLC	0.25	0.596	New permit
15947-001	001	TX0140848	1010_04	EAST MONTGOMERY COUNTY MUD #5	0.33	0.787	New permit
13059-001	001	TX0098434	1009_02	KWIK-KOPY CORPORATION	NA	NA	Permit canceled
15460-001	001	TX0137014	1009_02	TEXAS PROVIDENCE INVESTMENTS, LLC	NA	NA	Permit canceled
12224-001	001	TX0083801	1009D_01	KLEIN INDEPENDENT SCHOOL DISTRICT	NA	NA	Permit canceled
15578-001	001	TX0137774	1009E_01	SSPS PROPERTIES, LLC	NA	NA	Permit canceled

Table III-2 - TMDL summary calculations for 10 AUs in the Lake Houston 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	11.17	70.58	190.82	14.4	0.03
1008_03	11313	Spring Creek	1420	107.22	322	869	70.9	50.88
1008_04	11312	Spring Creek	1510	142.89	334	902	75.7	55.41
1009_01	11333	Cypress Creek	227	23.51	80.65	111.37	11.4	0.07
1009_02	11331	Cypress Creek	615	107.50	196	270	30.8	10.70
1009_03	11328	Cypress Creek	1340	191.26	415	574	67.0	92.74
1009_04	11324	Cypress Creek	1550	230.43	469	648	77.4	125.17

AU	Sampling Location	Segment Name	TMDL	WLA_{wwTF}	WLA_{sw}	LA	MOS	FG
1009D_01	17481	Spring Gully	20.5	4.71	12.22	0	1.02	2.55
1009E_01	14159	Little Cypress Creek	91.1	19.13	16.14	48.42	4.56	2.85
1010_04	11334	Caney Creek	493	19.35	57.4	383.8	24.7	7.75

Table III-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	MOS
1008_02	287	11.20	70.58	190.82	14.4
1009_01	227	23.58	80.65	111.37	11.4

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

This appendix provides an update to a TMDL 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 15 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 IV-1):

- add one new permit, and
- remove one canceled 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 IV-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 IV-1 - Changes to individual WLAs within the TMDL watershed

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

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

State Permit Number	Outfall	EPA Permit Number	Allocation Reach	Permittee Name	Flow (MGD)	WLA	TMDL Comments
15975-001	001	TX0141119	2	QUADVEST, LP	0.050	7.46 x 10 ⁸	New permit
03015-000	001	TX0103608	2	HOUSTON NURSERY LLC	NA	NA	Permit canceled

Table IV-2 - TMDL summary calculations for allocation reach within the TMDL watershed

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

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

Allocation Reach	TMDL	WLA Continuous	WLA Non-continuous	LA Other	MOS
2	1,682	196.2	695.8	790.0	Implicit

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

Segment 1245

This appendix provides an update to a TMDL 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 10 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 V-1):

- add one new 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 facilities are provided in Table V-2. The TMDL summary equations must also be updated for carbonaceous biochemical oxygen demand (CBOD₅; Table V-3) and ammonia nitrogen (NH₃-N; Table V-4) to reflect these changes.

Table V-1 - Changes to individual WLAs within the TMDL watershed

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

Permittee Name	TCEQ Permit No. EPA Permit No. Outfall No.	Final Permitted Discharge (MGD)	Allowable CBOD ₅ Loading (kg/d) (lb/d)	Allowable NH ₃ -N Loading (kg/d) (lb/d)	Comments
Quadvest, LP	15975-001/ TX0141119/ 001	0.050	1.32 2.92	0.38 0.83	New permit

Table V-2 - Permitted loadings for individual WWTFs

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

Permittee 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)
Quadvest, LP	15975-001/ TX0141119/ 001	0.050	7.0	2.0	4.0

Table V-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:		
Waste Load Allocation	330.28	330.28
Load Allocation	96.00	96.00
Total Loading	426.28	426.28

Table V-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:		
Waste Load Allocation	87.72	87.72
Load Allocation	3.69	3.69
Total Loading	91.41	91.41

- 1 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.
- 2 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.