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FINAL

April 2018 Update to the Texas Water Quality Management Plan



April 2018 Update to the Texas Water Quality Management Plan

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WQMP updates are also available on the TCEQ web site at:

< http://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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Table of Contents

Introduction1
Projected Effluent Limit Updates3
Planning Information Summary6
Designated Management Agencies10
Total Maximum Daily Load Updates11

Tables

Table 1. Projected Effluent Limit Updates 4
Table 2. Service Area Population Updates 8
Table 3. Designated Management Agencies 10

Appendices

Appendix I. 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..... 12
Appendix II. Eight Total Maximum Daily Loads for Indicator Bacteria in Greens Bayou Above
Tidal and Tributaries: Segments 1016, 1016A, 1016B, 1016C, and 1016D 14
Appendix III. 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 15
Appendix IV. Four Total Maximum Daily Loads for Indicator Bacteria in Sims Bayou Above
Tidal and Tributary For Segment Numbers 1007D and 1007N 17
Appendix V. One Total Maximum Daily Load for Bacteria in Upper Oyster Creek for Segment
Number 1245 19
Appendix VI. Two Total Maximum Daily Loads for Dissolved Oxygen in Upper Oyster Creek:
Segment Number 1245 20

Introduction

The Texas Water Quality Management Plan (WQMP) is the product of a wastewater treatment facility 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. The 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 ground water 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 its public participation process, certification by the 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 water quality management plans remain in effect.

The April 2018 WQMP update addresses the following topics:

1. Projected Effluent Limits Updates for water quality planning purposes
2. Service Area Population for Municipal Wastewater Facilities
3. Designation of Management Agencies for Municipal Wastewater Facilities
4. Total Maximum Daily Load Update

¹ A formal definition for a water quality management plan is found in 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, and 01/2018.

The public comment period for the April WQMP update was from May 11, 2018, through June 12, 2018.

The Projected Effluent Limit Update section provides information compiled from February 1, 2018 through April 30, 2018, and is based on water quality standards, and 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 Agency sections for municipal wastewater facilities has been developed and evaluated by the TCEQ in cooperation with the Texas Water Development Board (TWDB) and regional water quality management planning agencies.

The Total Maximum Daily Load (TMDL) Update section provides information on proposed wasteload allocations for new dischargers and revisions to existing TMDLs and has been developed by the Water Quality Planning Division, TMDL Program.

Projected Effluent Limit Updates

Table 1 reflects proposed effluent limits for new dischargers and preliminary revisions to original proposed effluent limits for preexisting dischargers (MGD-Million Gallons per Day, CBOD₅ – 5 Day Carbonaceous Biochemical Oxygen Demand, NH₃-N – Ammonia-Nitrogen, BOD₅ – 5 Day Biochemical Oxygen Demand and DO – Dissolved Oxygen).

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 water quality standards (WQS) effective at the time of the TCEQ production of this update. 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 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
12209-001	1014	TX0083500	Harris County MUD No. 127 Harris	1.335	10	111.34	2	22.27			6	April-Oct
				1.335	10	111.34	3	33.40			4	Nov-Mar
13051-002	1202	TX0106046	Fort Bend County MUD No. 81 Fort Bend	0.42					20	70.06	3	
14268-002	0804	TX0138029	City of Star Harbor Henderson	0.24	10	20.02	3	6.00			4	
14448-001	1009	TX0125938	Harris County MUD No. 405 Harris	0.55	7	32.11	2	9.17			4	
14577-001	0820	TX0127345	City of Lavon Collin	0.75	5	31.28	2	12.51			4	
14877-001	1233	TX0053716	City of Cisco Eastland	0.40	10	33.36	3	10.01			4	Relocated Outfall for Final Phase
14912-001	1008	TX0119628	Timbercrest Partners, L.L.C. Harris	0.235	10	19.60	3	5.88			4	
15557-002	1011	TX0138282	Crystal Springs Water Co., Inc. Montgomery	0.100	10	8.34	3	2.50			4	
15586-002	2494	TX0138312	Hill McKnight Dishman Cameron	0.04					20	6.67	2	
15590-001	1203	TX0137847	HILCO United Services, Inc. Hill	0.0065					10	0.54	4	
15595-001	1012	TX0137871	CW Construction Development, L.P. Montgomery	0.90	10	75.06	2	15.01			6	
15607-001	1006	TX0137961	Niazi Family Investments, Ltd. Harris	0.008	10	0.67	3	0.20			4	
15609-001	1202	TX0137979	Richmond RV Resort, L.L.C Fort Bend	0.0095	10	0.79	3	0.24			4	

State Permit Number	Segment Number	EPA ID Number	Permittee Name 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
15618-001	0229	TX0138037	Love's Travel Stops & Country Stores, Inc. Potter	0.015	10	1.25	2	0.25			5	
15622-001	0814	TX0138061	Louis Vuitton U.S. Manufacturing, Inc. Johnson	0.013	5	0.54	2	0.22			4	
15626-001	1016	TX0138070	South Central Water Company Harris	0.60	10	50.04	3	15.01			5	
15628-001	1014	TX0138088	Morton Lake Company, Inc. Harris	0.60	5	25.02	2	10.01			6	
15632-001	1209	TX0138096	Spirit of Aggieland RV Resort, LLC Brazos	0.150					20	25.02	2	
15635-001	1810	TX0138118	Plum Creek Utility Co., L.L.C. Hays	0.24	10	20.02	3	6.00			5	
15636-001	2432	TX0138126	Hannover Estates, Ltd. Fort Bend	0.700	10	58.38	3	17.51			4	
15637-001	1108	TX0138134	Charleston C.M.I., Ltd. Fort Bend	0.245	10	20.43	3	6.13			6	
15642-001	1245	TX0138135	Aqua Texas, Inc. Fort Bend	0.150	10	12.51	3	3.75			6	
15644-001	1009	TX0138193	McAlister Opportunity Fund 2012, L.P. Harris	0.70	10	58.38	3	17.51			4	
15646-001	1002	TX0138207	Utilities Investment Co., Inc. Liberty	0.975	10	81.32	3	24.39			4	
15651-001	0605	TX0138240	Cornelius Eriks and Susan Charlotte Eriks	0.0075					20	1.25	3	
15658-001	1001	TX0088455	Vallourec Star, LP Harris	0.023	10	1.92	3	0.58			4	April-Oct
					10	1.92	5	0.96			4	Nov-Mar

Planning Information Summary

The Water Quality Planning Division of the TCEQ coordinated with the TWDB and regional planning agencies to compile the wastewater facility information in this section. Domestic facility financing decisions under the State Revolving Loan Fund (SRF) 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 the 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 wastewater treatment plant, additional treatment capacity, or the upgrading of a wastewater treatment plant 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.
4. Needs Year – The year in which the needs were identified for the planning area.
5. Basin Name – The river basin or designated planning area where the entity is located. The seven water quality management planning areas designated by the Governor are Corpus Christi [Coastal Bend Council of Governments (CBCOG)], Killeen-Temple [Central Texas Council of Governments (CTCOG)], Texarkana [Ark-Tex Council of Governments (ATCOG)], Southeast Texas [South East Texas Regional Planning Council (SETRPC)], Lower Rio Grande Valley [Lower Rio Grande Valley Development Council (LRGVDC)], Dallas-Fort Worth [North Central Texas Council of Governments (NCTCOG)] and Houston [Houston-Galveston Area Council (H-GAC)]. Basin names are shown for agencies outside one of these areas.
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 the 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 utilized 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 shall be as established in the completed and certified detailed engineering studies conducted during facility planning under the SRF and other state loan programs.

Specific effluent quality for any wastewater discharges resulting from any of the facilities recommended in this document will be in accordance with the rule on the Texas Surface Water Quality Standards in effect at the time of permit issuance for the 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 Arlington	City limits	C	2018	Trinity River Basin / NCTCOG	0841	Tarrant	2/8/2018	Collection system improvements	2017	372,427
									2020	377,478
									2030	395,124
									2040	421,478
Brookshire Municipal Water District	District boundary	C	2018	Brazos River Basin / HGAC	1202	Waller	1/9/2018	Collection system improvements	2015	4,879
									2020	6,136
									2030	8,492
									2040	11,991
City of Del Rio	City limits	T/C	2018	Rio Grande River Basin	2305	Val Verde	10/18/2017	WWTP and Collection system improvements	2017	37,318
									2020	38,083
									2030	40,524
									2040	42,887
City of Euless	City limits	C	2018	Trinity River Basin / NCTCOG	0841	Tarrant	2/8/2018	Expansion of reclaimed water distribution system	2017	54,870
									2020	54,214
									2030	57,150
									2040	57,150
City of Hurst	City limits	C	2018	Trinity River Basin / NCTCOG	0841	Tarrant	3/1/2018	Collection system improvements	2017	39,182
									2020	41,000
									2030	41,000
									2040	41,000
City of Hutto	City limits	C	2018	Brazos River Basin	1244	Williamson	5/15/2014	Collection system improvements	2017	23,832
									2020	24,325
									2030	33,924
									2040	45,877
Kerr County	City of Center Point wastewater service area	C	2018	Guadalupe River Basin	1806	Kerr	2/22/2018	Design and construct wastewater collection system	2017	2,365
									2020	2,442
									2030	2,561
									2040	2,612
City of Llano	City limits	T	2018	Colorado River Basin	1415	Llano	2/22/2018	Construction of alum chemical feeding system and tertiary filtration system for existing WWTP & Collection system improvements	2017	3,313
									2020	3,565
									2030	3,759
									2040	3,754
City of San Marcos	City limits	T	2018	Guadalupe River Basin	1814	Hays	3/1/2018	Property acquisition to mitigate nonpoint source pollution to the San Marcos River and the Edwards Aquifer	2017	61,950
									2020	71,117
									2030	84,818
									2040	101,159

Planning Agency	Service Area	Needs	Needs Year	Basin Name / COG	Segment	County	WQMP Date	Comments	Year	Population
Sunbelt Fresh Water Supply District	District boundary	T	2018	San Jacinto River Basin / HGAC	1006	Harris	3/1/2018	WWTP improvements	2017	4,380
									2020	4,540
									2030	5,241
									2040	5,894
Sienna Plantation MUD #1	District boundary	T	2018	Brazos River Basin / HGAC	1202	Fort Bend	4/17/2018	Construction of new WWTP	2017	25,800
									2020	34,300
									2030	51,300
									2040	56,700
Valley MUD #2	District boundary	C	2018	Bays and Estuaries / LRGVDC	2494	Cameron	2/2/2018	Collection system improvements	2017	2,626
									2020	3,067
									2030	3,583
									2040	4,106
Sienna Plantation MUD #1	District boundary	T	2018	Brazos River Basin / HGAC	1202	Fort Bend	4/17/2018	Construction of new WWTP	2017	25,800

Designated Management Agencies

In order 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 a state revolving fund 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 the services. The facilities listed in Table 3 have submitted Designated Management Agencies (DMA) resolutions to the TCEQ. The TCEQ submits this DMA information to the 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	DMA Area/Comments
Brookshire Municipal Water District	District boundary	C	1/9/2018	
City of Arlington	City limits	C	9/5/2017	
City of Del Rio	City limits	T/C	10/18/2017	
City of Euless	City limits	C	8/26/2014	
City of Hurst	City limits	C	9/26/2017	
City of Hutto	City limits	C	5/15/2014	
City of Llano	City limits	T/C	8/25/2017	
City of San Marcos	City limits	T	10/23/1978	After discussion with TWDB personnel, the application was moved forward with the existing DMA. TCEQ Project manager stressed the importance and necessity of updating the DMA before any future projects are developed.
Kerr County	Center Point wastewater service area	C	11/14/2011	
Sienna Plantation MUD #1	District boundary	T	1/26/2017	
Sunbelt Fresh Water Supply District	District boundary	T	9/25/2017	
Valley MUD #2	District boundary	C	9/5/2017	

Total Maximum Daily Load Updates

The Total Maximum Daily Load (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, the State develops an implementation plan with wasteload allocations for point source dischargers to mitigate anthropogenic (human-caused) sources of pollution within the watershed and restore full use of the water body.

The development of TMDLs is a process of intensive data collection and analysis. After adoption by the TCEQ, TMDLs are submitted to the EPA for review and approval.

The attached appendices may reflect proposed wasteload allocations for new dischargers and revisions to TMDLs. To be consistent, updates will be provided in the same units of measure used in the original TMDL document. Also note that for bacteria TMDLs, loads may be expressed in counts per day, organisms per day, colony forming units per day, or similar expressions. These typically reflect different lab methods, but for the purposes of the TMDL program, these terms are considered synonymous.

Appendix I. 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

TMDL Updates to the Water Quality Management Plan (WQMP): 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)

The document *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 the TCEQ on 04/08/09 and approved by EPA on 06/11/09, and became an update to the state's WQMP. Twenty-one subsequent WQMP updates prior to this one have updated the list of individual wasteload allocations (WLAs) found in the original TMDL document. Additionally, two addenda to the original TMDL were submitted through the April 2013 and April 2015 WQMP updates. These addenda added two new assessment units (AUs) to the original TMDL project.

The purpose of this update is to make the following changes to the TMDL, presented in Table 1:

- update the WLA for one facility that has increased its permitted discharge, and
- add one new permit.

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

For AU 1014H_02, 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 load allocation (LA) terms. A small amount was taken proportionally from each of those terms and allotted to future growth. This results in no change to the overall TMDL allocation.

In Table 54 of the TMDL, the WLAs for permitted facilities are the sum of the individual WLAs and the AFG within each AU. Because a small amount of loading was moved from the WLA_{StormWater} and LA terms to be used for future growth for AU 1014H_02, that AU is updated in Table 3. Again, this results in no change to the overall TMDL allocation. These overall numbers for the other AU did not change.

Table 1 – Change to Individual Wasteload Allocation (Updates Table 45, pp. 99-103 in the TMDL document.)

State Permit Number	Outfall	EPA Permit Number	Segment Number	Permittee Name	Flow (MGD)	Waste Load Allocation (WLA) – <i>E. coli</i> in Billion MPN/day	TMDL Comments
12209-001	001	TX0083500	1014A_01	HARRIS CO MUD 127	1.335	3.184	Increased discharge
15628-001	001	TX0138088	1014H_02	MORTON LAKE COMPANY, INC.	0.6	1.431	New permit

Table 2 - *E. coli* TMDL Summary Calculations (Updates Table 53, pp. 116-117 in the TMDL document.)

AU	TMDL (Billion MPN/day)	WLA _{WWTF} (Billion MPN/day)	WLA _{Storm Water} (Billion MPN/day)	LA (Billion MPN/day)	MOS (Billion MPN/day)	Upstream Load (Billion MPN/day)	Future Growth (Billion MPN/day)
1014A_01	195.04	28.49	141.2	15.69	0	0	9.66
1014H_02	175.43	39.48	121.9	13.55	0	0	0.50

Table 3 – Final *E. coli* TMDL Calculations (Updates Table 54, pp. 118-119 in the TMDL document.)

AU	TMDL (Billion MPN/day)	WLA _{WWTF} (Billion MPN/day)	WLA _{Storm Water} (Billion MPN/day)	LA (Billion MPN/day)	MOS (Billion MPN/day)
1014H_02	175.43	39.98	121.9	13.55	0

Appendix II. Eight Total Maximum Daily Loads for Indicator Bacteria in Greens Bayou Above Tidal and Tributaries: Segments 1016, 1016A, 1016B, 1016C, and 1016D

TMDL Updates to the WQMP: Eight Total Maximum Daily Loads for Indicator Bacteria in Greens Bayou Above Tidal and Tributaries (Segments 1016, 1016A, 1016B, 1016C, and 1016D)

The document *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 the TCEQ on 06/02/10 and approved by EPA on 08/12/10, and became an update to the state's Water Quality Management Plan (WQMP). It has had 10 subsequent WQMP updates prior to this one that provided individual wasteload allocations (WLAs) for permitted facilities.

The purpose of this update is to make the following change to the TMDL, presented in Table 1:

- add one new permit.

The change reflected in this update resulted in the shifting of allocations between the sum of the individual WLAs and the allowance for future growth (AFG) in one assessment unit (AU). This was originally presented in Table 17 in the TMDL document, and the affected AU is included here as Table 2.

In Table 18 of the TMDL, the WLAs for permitted facilities are the sum of the individual WLAs and the allowance for future growth within each assessment unit. Therefore, these overall numbers did not change, and Table 18 of the TMDL remains the same.

Table 1 – Changes to Individual Wasteload Allocations (Updates Table 15, pp. 39-42 in the TMDL document.)

State Permit Number	Outfall	EPA Permit Number	Segment Number	Permittee Name	Flow (MGD)	Waste Load Allocation (WLA) – <i>E. coli</i> in Billion MPN/day	TMDL Comments
15626-001	001	TX0138070	1016_03	SOUTH CENTRAL WATER COMPANY	0.60	1.431	New permit

Table 2 - *E. coli* TMDL Summary Calculations for Greens Bayou Assessment Units (Updates Table 17, pp. 46 in the TMDL document.)

AU	Sampling Location	Stream Name	TMDL (Billion MPN /day)	WLA _{WWTF} (Billion MPN /day)	WLA _{StormWater} (Billion MPN /day)	LA (Billion MPN /day)	MOS (Billion MPN /day)	Future Growth (Billion MPN /day)
1016_03	11369	Greens Bayou Above Tidal	1,780	206.3	1,114	167	89.0	203.7

Appendix III. 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

TMDL Updates to the Water Quality Management Plan (WQMP): Watersheds Upstream of Lake Houston (1004E, 1008, 1008H, 1009, 1009C, 1009D, 1009E, 1010, and 1011)

The document *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 the TCEQ on 04/06/11 and approved by EPA on 06/29/11, and became an update to the state's WQMP. Twenty-four subsequent WQMP updates prior to this one have updated the list of individual wasteload allocations (WLAs) found in the original TMDL document. Additionally, an addendum to the original TMDL was submitted through the October 2013 WQMP update. This addendum added six new assessment units (AUs) to the original TMDL project.

The purpose of this update is to make the following changes to the TMDL, presented in Table 1:

- update the WLA for one facility that has increased its permitted discharge, and
- add one new 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 in six AUs. This was originally presented in Table 18 in the original TMDL document, and the six affected AUs are included here as Table 2.

In Table 19 of the original TMDL, the WLAs for permitted facilities are the sum of the individual WLAs and the allowance for future growth within each AU. Therefore, these overall numbers did not change, and Table 19 of the TMDL remains the same.

Table 1 – Changes to Individual Wasteload Allocations (Updates Table 16, pp. 49-56 in the TMDL document.)

State Permit Number	Outfall	EPA Permit Number	Segment Number	Permittee Name	Flow (MGD)	Waste Load Allocation (WLA) – <i>E. coli</i> in Billion MPN/day	TMDL Comments
14912-001	001	TX0119628	1008H_01*	TIMBERCREST PARTNERS LLC	0.235	0.560	Increased discharge
15644-001	001	TX0138193	1009E_01	MCALISTER OPPORTUNITY FUND 2012, LP	0.7	1.669	New permit

*This WWTF is downstream of USGS Gauge 8068325, and is not used in the WLA-WWTF for 1008H_01, but is included in the overall totals for 1008_03 and 1008_04.

Table 2 - *E. coli* TMDL Summary Calculations for Lake Houston Assessment Units (Updates Table 18, pp. 61 in the TMDL document.)

AU	Sampling Location	Stream Name	TMDL (Billion MPN /day)	WLA_{WWTF} (Billion MPN /day)	WLA_{StormWater} (Billion MPN /day)	LA (Billion MPN /day)	MOS (Billion MPN /day)	Future Growth (Billion MPN /day)
1008_03	11313	Spring Creek	1420	99.13	322	869	70.9	58.97
1008_04	11312	Spring Creek	1510	134.80	334	902	75.7	63.50
1009_02	11331	Cypress Creek	615	97.97	196	270	30.8	20.23
1009_03	11328	Cypress Creek	1340	183.42	415	574	67.0	100.58
1009_04	11324	Cypress Creek	1550	221.94	469	648	77.4	133.66
1009E_01	14159	Little Cypress Creek	91.1	14.03	16.14	48.42	4.56	7.95

Appendix IV. Four Total Maximum Daily Loads for Indicator Bacteria in Sims Bayou Above Tidal and Tributary For Segment Numbers 1007D and 1007N

TMDL Updates to the WQMP: Four Total Maximum Daily Loads for Indicator Bacteria in Sims Bayou Above Tidal and Tributary (Segments 1007D and 1007N)

The document *Four Total Maximum Daily Loads for Indicator Bacteria in Sims Bayou Above Tidal and Tributary For Segment Numbers 1007D and 1007N* was adopted by the TCEQ on 09/15/10 and approved by EPA on 09/27/10, and became an update to the state’s Water Quality Management Plan (WQMP). It has had three subsequent WQMP updates prior to this one that provided individual Waste Load Allocations (WLAs) for permitted facilities. Additionally, one addendum to the original TMDL was submitted through the April 2013 WQMP update. This addendum added one new assessment unit (AU) to the original TMDL project.

The purpose of this update is to make the following change to the TMDL, presented in Table 1:

- update the WLA for one facility that has decreased 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 future growth (AFG) in three AUs, as is reflected in Table 17 of the TMDL, and presented in Table 2 here.

In Table 18 of the TMDL, the WLAs for permitted facilities are the sum of the individual WLAs and the allowance for future growth within each assessment unit. The TMDL equation for 1007D_01 (Table 3) was adjusted to match the changes made in Table 2 and to restore the overall allocation to what was in the original TMDL document. The overall numbers for the other AUs did not change.

Table 1 – Changes to Individual Wasteload Allocations (Table 15, p. 33 in original TMDL document.)

State Permit Number	Outfall	EPA Permit Number	Segment Number	Permittee Name	Flow (MGD)	Waste Load Allocation (WLA) – <i>E. coli</i> in Billion MPN/day	TMDL Comments
12073-001	001	TX0078891	1007D_01	Fort Bend County MUD No. 26	0.5	1.19	Decrease discharge

Table 2 - *E. coli* TMDL Summary Calculations for Sims Bayou Assessment Units (Updates Table 17, p.37 in original TMDL document.)

AU	Sampling Location	Stream Name	TMDL (Billion MPN/day)	WLA _{WWTF} (Billion MPN/day)	WLA _{Storm Water} (Billion MPN/day)	LA (Billion MPN/day)	MOS (Billion MPN/day)	Future Growth (Billion MPN/day)
1007D_01	11135	Sims Bayou Above Tidal	213	30.6	171	0	11.1	0.3
1007D_02	11133	Sims Bayou Above Tidal	527	97.5	368.2	0	26.3	35.0
1007D_03	11132	Sims Bayou Above Tidal	777	114.2	574.8	11.7	38.9	37.4

Table 3 - Final TMDL Allocations (Updates Table 18, p. 38 in the TMDL document)

AU	TMDL (Billion MPN/day)	WLA _{WWTF} (Billion MPN/day)	WLA _{MS4} (Billion MPN/day)	LA (Billion MPN/day)	MOS (Billion MPN/day)
1007D_01	213	30.9	171	0	11.1

In addition, Table 4 below provides an update to Table 9 found in the April 2013 addendum to this TMDL project (*Addendum One to Four Total Maximum Daily Loads for Indicator Bacteria in Sims Bayou Above Tidal and Tributary: One Total Maximum Daily Load for Indicator Bacteria in Canal C-147 For Segment 1007A, Assessment Unit 1007A_01*). The permit with a decreased discharge affects an additional AU in this addendum.

Table 5 below provides an update to Table 10 found in the April 2013 addendum to this TMDL project. The addendum added one AU that was not included in the original TMDL, where it was considered a contributing load to 1007D_01. The permit for the decreased discharge affects the loadings of both 1007A_01 as well as the original TMDL AU 1007D_01.

In Table 11 of the TMDL addendum, the WLAs for permitted facilities are the sum of the individual WLAs and the allowance for future growth within each AU. Therefore, these overall numbers did not change, and Table 11 of the TMDL addendum remains the same.

Table 4 – Changes to Individual Waste Load Allocations and Permittee Names (Updates Table 9, p. 16 in the TMDL Addendum document.)

AU	Stream Name	TPDES Number	NPDES Number	Facility Name	Final Permitted Flow (MGD)	<i>E. coli</i> WLA _{WWTF} (Billion MPN/day)	TMDL Comments
1007A_01	Canal C-147	12073-001	TX0078891	Fort Bend County MUD No. 26	0.5	1.19	Decrease discharge

Table 5 – *E. coli* TMDL Summary for Impaired AU of the Addendum (Updates Table 10, p. 17 in the TMDL Addendum document.)

AU	TMDL (Billion MPN/day)	WLA _{WWTF} (Billion MPN/day)	WLA _{STORMWATER} (Billion MPN/day)	LA (Billion MPN/day)	MOS (Billion MPN/day)	Future Growth (Billion MPN/day)
1007A_01	109	21.11	78.80	0	5.44	3.65

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

TMDL Updates to the Water Quality Management Plan (WQMP): Bacteria in Upper Oyster Creek (Segment 1245)

The document *One Total Maximum Daily Load for Bacteria in Upper Oyster Creek for Segment Number 1245* was adopted by the TCEQ on 08/08/07 and approved by EPA on 09/28/07, and became an update to the state's Water Quality Management Plan (WQMP). Ten subsequent WQMP updates prior to this one have provided individual wasteload allocations (WLAs) for permitted facilities.

The purpose of this WQMP update is to make the following change to the TMDL, presented in Table 1:

- add one new permit.

Table 1 –Permitted Bacteria Allocation for Amended Discharges (pp. 35-37 in original TMDL document)

State Permit Number	Outfall	EPA Permit Number	Segment Number	Permittee Name	Flow (MGD)	Waste Load Allocation (WLA)	TMDL/ Comments
15642-001	001	TX0138135	1245	AQUA TEXAS, INC.	0.150	2.24 x 10 ⁹ cfu <i>E. coli</i> per day	New 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 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 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 2 – TMDL allocation summary for Allocation Reach 2 (Updates Table 11, p. 37 in the TMDL document) (all units expressed in billion cfu of *E. coli* per day)

Allocation Reach	TMDL	WLA Continuous	WLA Non-continuous	LA Other	MOS
2	1,682	202	693	787	Implicit

Appendix VI. Two Total Maximum Daily Loads for Dissolved Oxygen in Upper Oyster Creek: Segment Number 1245

TMDL Updates to the Water Quality Management Plan (WQMP): Dissolved Oxygen in Upper Oyster Creek (Segment 1245)

The document *Two Total Maximum Daily Loads for Dissolved Oxygen in Upper Oyster Creek: Segment 1245* was adopted by the TCEQ on 07/28/10 and approved by EPA on 09/21/10, and became an update to the state's Water Quality Management Plan (WQMP). It has had five subsequent WQMP updates prior to this one.

The purpose of this update is to make the following change to the TMDL, presented in Table 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.

Table 1 –WLA for Upper Reach 1245_03 by Individual WWTF (Table 9, p. 29 in original TMDL document)

Facility	TCEQ Permit No. EPA Permit No. Outfall No.	Final Permitted Discharge (MGD)	Allowable CBOD5 Loading (kg/d) (lb/d)	Allowable NH3-N Loading (kg/d) (lb/d)	Comments
AQUA TEXAS, INC.	WQ0015642-001 TX0138135 Outfall 001	0.150	5.68 12.52	1.70 3.76	New permit

The relevant permit limits for this new facility is provided in Table 2.

Table 2 – Permitted Loadings for Individual WWTFs (Corresponds to Table 3, p. 13 in original TMDL document)

Facility	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)
AQUA TEXAS, INC.	WQ0015642-001 TX0138135 Outfall 001	0.150	10	3	6

The TMDL summary equations must also be updated for carbonaceous biochemical oxygen demand (CBOD₅; Table 3) and ammonia nitrogen (NH₃-N; Table 4) for the new permits.

Table 3 - Summary of TMDLs for Upper Reach CBOD₅ (Table 13, p. 36 in original TMDL document)

Source Category	Proposed (Full Permitted) Loading ¹ (kg/d)	Allowable Loading ² (kg/d)
1245_03:		
Waste Load Allocation	281.23	281.23
Load Allocation	96.00	96.00
Total Loading	377.23	377.23

Table 4 - Summary of TMDLs for Upper Reach NH₃-N (Table 14, p. 37 in original TMDL document)

Source Category	Proposed (Full Permitted) Loading ¹ (kg/d)	Allowable Loading ² (kg/d)
1245_03:		
Waste Load Allocation	74.72	74.72
Load Allocation	3.69	3.69
Total Loading	78.41	78.41

- 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 to determine if a new modeling effort or revisions to the original modeling effort will be required for future analyses.