March13, 2012
FINAL

January 2012 Update to the Texas Water Quality Management Plan

Prepared by the:
Office of Water, Water Quality Division

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

January 2012 Update to the Texas Water Quality Management Plan

Compiled and distributed by the
Water Quality Assessment Section
Water Quality Division
Texas Commission on Environmental Quality
P.O. Box 13087, MC-150
Austin, Texas 78711-3087

March 2012

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

< *www.tceq.texas.gov/waterquality/assessment/WQmanagement_updates.html* >

Developed in accordance with Sections 205(j)
and 208 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 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 updates[2], will become part of the WQMP after completion of its public participation process, certification by the TCEQ on behalf of the Governor of Texas, and approval by the 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 January 2012 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 Updates

The Projected Effluent Limit Update section provides information compiled from November 1, 2011 through January 31, 2012, 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.

[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, and BPUB 2011.

The Service Area Population and Designation of Management Agencies 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 waste load 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, $CBOD_5$ – 5 Day Carbonaceous Biochemical Oxygen Demand, NH_3-N – Ammonia-Nitrogen, BOD_5 – 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 effective at the time of the TCEQ production of this update. Water Quality Standards 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
10027-004	0826	0119849	City of Denton Denton	0.80	5	33.36	3	20.02			4	
10147-001	0804	0077810	City of Centerville Leon	0.124	30	31.02	12	12.41			4	
10746-001	1901	0027774	City of Kenedy Karnes	2.0	10	166.80	3	50.04			4	
10857-001	1008	0025399	Montgomery County WCID No. 1 Montgomery	0.95	10	79.23	3	23.77			4	
13352-002	0838	0133388	Mansfield ISD Tarrant	0.02					10	1.67	4	
13775-001	1014	0115894	Harris-Fort Bend Counties MUD No. 5 Fort Bend	0.995	7	58.09	2	16.60			6	
14188-001	2432	0122823	Manvel Utilities L.P. Brazoria	0.099	10	8.26	2	1.65			4	
14520-001	1014	0126675	Fort Bend County MUD No. 58 Fort Bend	1.05	10	87.57	2	17.51			6	
14528-001	1014	0126764	Fort Bend County MUD No. 151 Fort Bend	1.20	5	50.04	2	20.02			6	
14555-002	1012	0129526	Far Hills UD and Utility Services of America, L.L.C. Montgomery	0.70	7	40.87	2	11.68			4	
14715-001	1245	0128791	Fort Bend County MUD No. 134A Fort Bend	0.60	7	35.03	2	10.01			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
14748-002	0502	0133205	City of Newton Newton	0.96	7	56.04	2	16.01			5	
14835-001	0823	0129879	Walton Texas, L.P. Grayson	0.40	10	33.36	3	10.01			5	
14935-001	0821	0129089	Wylie Northeast SUD Collin	0.30	7	17.51	3	7.51			4	
15010-001	0807	0133116	Abraxas Corp. Parker	0.030					10	2.50	4	
15011-001	1810	0133132	EB Windy Hill, L.P. Hays	0.40	5	16.68	2	6.67			5	
15012-001	1003	0133167	Utilities Investment Co., Inc. San Jacinto	0.225	10	18.77	3	5.63			4	
15014-001	1002	0133191	25610 Liberty Partners, Ltd. Liberty	0.50	10	41.70	3	12.51			6	
15015-001	1001	0133213	Harris County MUD No. 427 Harris	0.96	10	80.06	3	24.02			4	
15016-001	2117	0133230	South Central Water Co. McMullen	0.30	10	25.02	3	7.51			4	
15017-001	1016	0133256	Ravindra Bhakta Harris	0.019	10	1.58	3	0.48			4	
15025-001	1402	0133337	Town of Round Top Fayette	0.027					10	2.25	4	
15026-001	1016	0084093	VAM USA, L.L.C. Harris	0.01	10	0.83	3	0.25			4	
15028-001	1006	0133400	Ultra Premium Oilfield Services, Ltd. Harris	0.005	10	0.42	3	0.13			4	

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 Alba	Alba City Limits	T/C	2011	Cypress/Sabine Basin	0506	Wood	01/26/2012	Collection System Improvements, New Head works, and sludge handling facilities	2010	763
									2020	853
									2030	925
									2040	963
City of Eldorado	Eldorado City Limits and ETJ	T/C	2011	Colorado Basin	1424	Schleicher	10/27/2011	Collection system upgrade	2010	2,228
									2020	2,510
									2030	2,639
									2040	2,691
City of Laredo	Laredo City Limits and ETJ	T/C	2011	Rio Grande Basin	2304	Webb	01/11/2012	Wastewater Treatment Plant expansion	2010	105,490
									2020	136,069
									2030	170,310
									2040	207,979
City of Ranger	Ranger City Limits	T/C	2011	Brazos Basin	N/A	Eastland	01/23/2012	New Wastewater Treatment Plant and Irrigation Equipment	2010	2,590
									2020	2,596
									2030	2,551
									2040	2,481

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 Updates

Planning Agency	Service Area	DMA Needs	DMA Date	DMA Area/Comments
City of Alba	City Limits	T/C	11/07/2011	
City of Eldorado	City Limits/ETJ	T/C	05/17/2010	
City of Marlin	City Limits	T/C	04/12/2011	
City of Laredo	City Limits/ETJ	T/C	08/04/1997	

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 waste load 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 U.S. Environmental Protection Agency for review and approval.

The attached appendixes may reflect proposed waste load 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. And note that for bacteria TMDLs, loads may be expressed in counts for 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 04/08/2009 and approved by EPA on 06/11/09, and became an update to the state's Water Quality Management Plan (WQMP). Two subsequent WQMP updates prior to this one have provided individual Waste Load Allocations (WLAs) for permitted facilities.

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

- adjust the individual WLAs for three permits being amended to increase their discharges, and to correct the discharge for another permit;
- remove five permits that have expired or were canceled; and
- update or correct the names of 15 permits (some overlap with the other changes above). 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 four assessment units (AUs). This was originally presented in Table 53 in the TMDL document, and the affected AUs are included here as Table 2.

In Table 54 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 54 of the TMDL remains the same.

Table 1 – Changes to Individual Waste Load Allocations (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) - *E. coli* in Billion MPN/day	TMDL Comments
14683-001	001	TX0128309	1014A_01	ARO PARTNERS	N/A	N/A	Permit expired
13775-001	001	TX0115894	1014B_01	HARRIS FORT BEND COUNTIES MUD 005	0.995	2.373	Increased discharge and corrected name
14182-001	001	TX0122556	1014B_01	FORT BEND COUNTY MUD 122	No change	No change	Corrected name
14520-001	001	TX0126675	1014B_01	FORT BEND COUNTY MUD NO 58	1.05	2.504	Increased discharge
14528-001	001	TX0126764	1014B_01	FORT BEND COUNTY MUD 151	1.2	2.862	Increased discharge
14639-001	001	TX0128147	1014B_01	AUC GROUP LP	N/A	N/A	Permit canceled
14646-001	001	TX0128236	1014B_01	WILLOW CREEK FARMS MUD	No change	No change	Name changed
13328-001	001	TX0100137	1014E_01	REMINGTON MUD 1	No change	No change	Corrected name
12189-001	001	TX0082830	1014H_02	KATY SUN PARKS LTD	No change	No change	Name changed
04443-000	001 & 002	TX0124273	1017_01	TEXAS UNITED PIPE INC	N/A	N/A	Permit canceled
11375-001	001	TX0026247	1017_01	AQUA UTILITIES INC	No change	No change	Corrected name
11538-001	001	TX0057029	1017_01	WHITE OAK BAYOU JOINT POWERS BOARD	No change	No change	Corrected name
12397-001	001	TX0087416	1017_01	SPX CORP	No change	No change	Corrected name
12443-001	001	TX0088676	1017_01	SEC ENERGY PRODUCTS & SERVICES LP	N/A	N/A	Permit expired; corrected name
12552-001	001	TX0090115	1017_01	NCI GROUP INC	No change	No change	Name changed
12552-002	001	TX0117064	1017_01	NCI GROUP INC	No change	No change	Name changed
13433-001	001	TX0103705	1017_01	AQUA DEVELOPMENT INC	No change	No change	Corrected name
13578-001	001	TX0118583	1017_01	FAIRVIEW GARDENS DEVELOPMENTS LLC	No change	No change	Corrected name
14843-001	001	TX0129933	1017_01	GRAEME ANTHONY REED	N/A	N/A	Permit canceled

State Permit Number	Outfall	EPA Permit Number	Segment Number	Permittee Name	Flow (MGD)	Waste Load Allocation (WLA) - *E. coli* in Billion MPN/day	TMDL Comments
13764-001	001	TX0092932	1017_04	ALLIANCE HC III LP	No change	No change	Corrected name
13996-001	001	TX0117684	1017B_01	COLE CREEK BUSINESS PARK ASSN INC	0.0498	0.119	Corrected flow; corrected name

Table 2 - *E. coli* TMDL Summary Calculations (Updates Table 53, pp. 118-119 in the TMDL document.)

Assessment Unit	TMDL (Billion MPN/day)	WLA_{WWTF} (Billion MPN/day)	$WLA_{StormWater}$ (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	26.88	141.2	15.69	0	0	11.27
1014B_01	626.91	87.75	482.44	38.6	0	0	18.12
1017_01	173.57	74.74	58.94	6.55	0	0	33.34
1017B_02	137.95	53.09	52.68	5.85	0	0	26.33

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 6/2/2010 and approved by EPA on 08/12/2010, and became an update to the state's Water Quality Management Plan (WQMP). It has had one subsequent WQMP update prior to this one that provided individual Waste Load Allocations (WLAs) for permitted facilities.

The purpose of this WQMP update is to make the following changes to the TMDL (see Table 1):

- remove two permits and replace them with new permits;
- adjust the individual WLA for one of the replacement permits to decrease its discharge; and
- update the names of several facilities.

Table 1 - Permitted Facilities – Changes to List of Permittees (pp. 39-42 in original TMDL document)

State Permit Number	Outfall	EPA Permit Number	Segment Number	Permittee Name	Flow (MGD)	Waste Load Allocation (WLA) - *E. coli* in Billion MPN/day	TMDL Comments
03420-000	001	TX0084093	1016_02	VAM USA	N/A	N/A	Being replaced by municipal permit that follows
15026-001	001	TX0084093	1016_02	VAM USA	0.01	0.024	Replaced industrial permit in previous row and decreased discharge
12692-001	001	TX0092711	1016_03	KARBALAI RITA LAURA REDOW	No change	No change	Name changed
14625-001	001	TX0127981	1016_03	COMPASS BANK	No change	No change	Name changed
14419-001	001	TX0125661	1016A_03	HARRIS COUNTY MUD NO. 400	No change	No change	Name changed
10694-001	001	TX0027707	1016C_01	AQUA UTILITIES INC	No change	No change	Name changed
12766-001	001	TX0093548	1016D_01	QBN CORP.	N/A	N/A	Permit expired
15017-001	001	TX0133256	1016D_01	RAVINDRA BHAKTA	0.019	0.0453	Replacement for preceding permit

Because the one change to a discharge limit was so small compared to the overall loading of the affected assessment units, the changes to the TMDL equations are not apparent given the number of significant digits used. Therefore, the TMDL equations are not updated here.

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 Water Quality Management Plan (WQMP). Two subsequent WQMP updates prior to this one have provided individual Waste Load Allocations (WLAs) for permitted facilities.

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

- adjust the individual WLAs for two permits being amended to increase or decrease their discharges, and
- update the name of one facility.

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 five assessment units (AUs). This was originally presented in Table 18 in the TMDL document, and the three affected AUs are included here as Table 2.

In Table 19 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 19 of the TMDL remains the same.

Table 1 – Changes to Individual Waste Load 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) – *E. coli* in Billion MPN/day	TMDL Comments
10857-001	001	TX0025399	1008_03	MONTGOMERY CO WCID #1	0.95	2.27	Increase discharge
14116-001	001	TX0071412	1010_04	MONTGOMERY CO MUD 24	0.1	0.24	Decrease discharge
14536-001	001	TX0126853	1011_02	PILOT TRAVEL CENTERS LLC	No change	No change	Name changed

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

Assessment Unit	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	92.9	141	1050	70.9	62.8
1008_04	11312	Spring Creek	1510	123	146	1090	75.7	81
1010_04	11334	Caney Creek	493	15.5	28.2	413	24.7	11.5

Appendix IV. One Total Maximum Daily Load for Bacteria in the Lower San Antonio River: For Segment 1901

TMDL Updates to the WQMP: One Total Maximum Daily Load for Bacteria in the Lower San Antonio River (Segment 1901)

The document *One Total Maximum Daily Load for Bacteria in the Lower San Antonio River: For Segment 1901* was adopted by the TCEQ on 8/20/2008 and approved by EPA on 10/10/08, and became an update to the state's Water Quality Management Plan (WQMP). It has had one subsequent WQMP update prior to this one.

The purpose of this WQMP update is to make the following change to the TMDL:

- adjust the individual WLA due to an increase in permitted discharge for one permit (Table 1).

Table 1 - Permitted Bacteria Allocations (p. 28 in original TMDL document)

State Permit Number	Outfall	EPA Permit Number	Segment Number	Permittee Name	Flow (MGD)	Waste Load Allocation (WLA) – *E. coli* 10^9 cfu/day	Comments
10746-001	001	TX0027774	1901	CITY OF KENEDY	2.0	9.5	Increased discharge

There is a small change to the TMDL equation for the affected station (Table 2). As stated in the TMDL in the Future Growth section on page 29: "Future growth for existing and new point sources is not limited by this TMDL as long as their activities do not cause bacteria to exceed the water quality standard for contact recreation. The assimilative capacity of the stream will increase as the amount of flow in the stream increases. Increases in flow will allow for increased loadings."

Table 2 - TMDL Allocation Summary for Station 12793 (*E. coli* 10^9 cfu/day) – Updates Table 17 in original TMDL

	Flow Regime (percentile)				
	0-10	**10-40**	**40-60**	**60-90**	**90-100**
Wasteload Allocation (WLA)	11.9	11.9	11.9	11.9	11.9
Load Allocation (LA)	9536.8	2451.7	1375.6	876.5	488.6
Margin of Safety (MOS)	502.6	129.7	73.0	46.8	26.3
TMDL (WLA+LA+MOS)	10,051.3	2593.3	1460.6	935.2	526.9

Appendix V. Six Total Maximum Daily Loads for Bacteria in Waters of the Upper Gulf Coast: (Segments 2421, 2422, 2423, 2424, 2432, and 2439)

TMDL Updates to the WQMP: TMDL Updates to the WQMP: Six Total Maximum Daily Loads for Bacteria in Waters of the Upper Gulf Coast (Segments 2421, 2422, 2423, 2424, 2432, and 2439)

The document *Six Total Maximum Daily Loads for Bacteria in Waters of the Upper Gulf Coast: Segments 2421, 2422, 2423, 2424, 2432, and 2439* was adopted by the TCEQ on 8/20/2008 and approved by EPA on 02/04/2009, and became an update to the state's Water Quality Management Plan (WQMP). Four subsequent WQMP updates prior to this one have updated the list of individual waste load allocations (WLAs) found in the original TMDL document.

The purpose of this WQMP update is to make the following changes to the TMDL:

- remove two permits which have expired or have been canceled; and
- correct the names of three other permits. (Table 1).

Table 1 – Name Changes and Daily Loads for WWTFs based on Concentration Allocations (Updates p. A-1 in TMDL)

State Permit Number	Outfall	EPA Permit Number	Segment Number	Permittee Name	Flow (MGD)	Waste Load Allocation (WLA) Fecal Coliform (org/day)*	Waste Load Allocation (WLA) *E. coli* (org/day) *	Waste Load Allocation (WLA) Enterococcus (org/day) *	Comments
13643-001	001	TX0042081	2422	NERRO SUPPLY LLC	No change	No change	No change	No change	Name changed
11679-001	001	TX0104353	2439	TALENS MARINE AND FUEL LLC	No change	No change	No change	No change	Name changed
10931-001	001	TX0057258	2439	MARTIN OPERATING PARTNERSHIP LP	No change	No change	No change	No change	Name changed
14562-001	001	TX0127167	2439	COASTAL FLATS LTD.	N/A	N/A	N/A	N/A	Permit expired
11672-001	001	TX0063207	2439	TEXAS DEPT. OF TRANSPORTATION	N/A	N/A	N/A	N/A	Permit canceled

*Concentrations limits will be based on the applicable indicator bacteria criterion geometric means (Fecal coliform or *E. coli* or Enterococcus).

Note that this is a concentration-based TMDL, and therefore there are no final TMDL equations to be affected by this change.

Appendix VI. Addendum Two to Six Total Maximum Daily Loads for Bacteria in Waters of the Upper Gulf Coast. Two TMDLs for Bacteria in Drum Bay For Segment Number 2435OW

Two TMDLs for Bacteria in Drum Bay

For Segment 2435OW
Assessment Units 2435OW_01 and 2435OW_02

Introduction

The Texas Commission on Environmental Quality (TCEQ) adopted the total maximum daily loads (TMDLs) Six Total Maximum Daily Loads for Bacteria in Waters of the Upper Gulf Coast: Segments 2421, 2422, 2423, 2424, 2432, and 2439 (TCEQ 2008) on 8/20/2008. The TMDLs were approved by the United States Environmental Protection Agency (EPA) on 2/4/2009. This is an addendum to that original TMDL document.

Drum Bay (Segment 2435OW) was inadvertently not included in the Draft 2010 Texas Integrated Report for Clean Water Act Sections 305(b) and 303(d) (TCEQ 2010a; the Integrated Report), and the TCEQ and EPA reached an agreement to allow it to be addressed through an update to the Water Quality Management Plan (WQMP).

This addendum includes information specific to Drum Bay that has been added to the adopted TMDL. Figure 1 shows Drum Bay's location in relation to the original TMDL segments.

Background Information

This TMDL addresses an impairment to the oyster waters use identified as a "Restricted Harvest Zone" (RHZ) by the Texas Department of State Health Services (DSHS). The RHZ pertinent to this TMDL is described and illustrated by a map in the DSHS publication *Classification of Shellfish Harvesting Areas of West Galveston Bay* (DSHS 2010; Figure 2). The DSHS publication describes the RHZ for Drum Bay as: "All of Drum Bay following a line from Rattlesnake Point 162 degrees southeast to the marsh, then south and west to the Intracoastal Waterway."

This TMDL addresses elevated fecal coliform concentrations in the restricted area for:

- Drum Bay; Segment 2435OW; Assessment Units (AUs) 2435OW_01 (area adjacent to Christmas Bay) and 2435OW_02 (remainder of Drum Bay).

The criteria used for assessing attainment of the oyster waters use are expressed as the number of colony-forming units (cfu) of fecal coliform bacteria per hundred milliliters (100 mL) of water. Using the fecal coliform criteria in the 2010 Texas Surface Water Quality Standards (TCEQ 2010c), if the minimum sample requirement during the assessment period is met, the oyster waters use is not supported when:

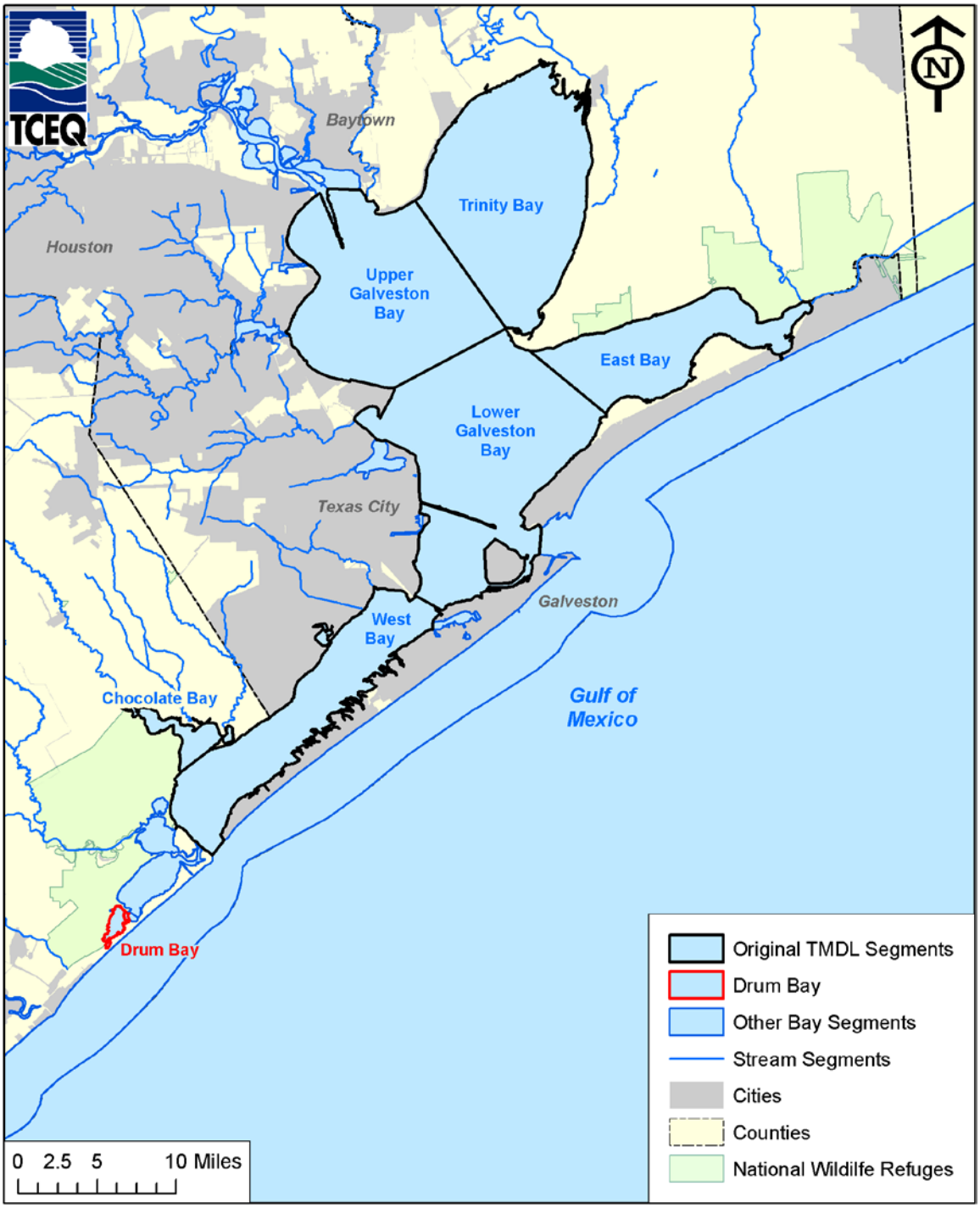

Figure 1. Galveston Bay System [a]

[a] This map was developed by the TMDL Program of the TCEQ. No claims are made to the accuracy or completeness of the data or to its suitability for a particular use.

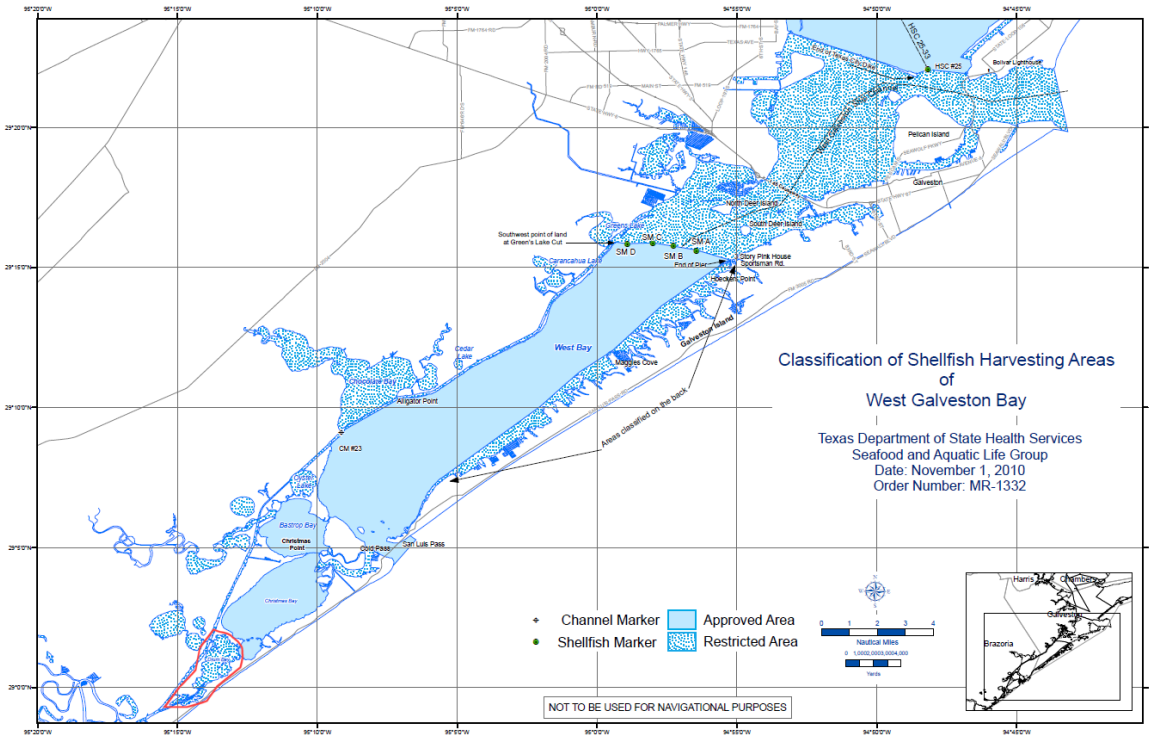

Figure 2. Classification of Shellfish Harvesting Areas of West Galveston Bay (Drum Bay circled in red)

- the median fecal coliform concentration in bay and gulf waters, exclusive of 1,000-foot shoreline buffer zones, exceeds 14 cfu per 100 mL; AND/OR
- more than 10 percent of all samples exceed 43 cfu per 100 mL.

However, DSHS may use other factors in addition to a simple application of the Water Quality Standards to determine the classification of oyster harvest zones. Additionally, the TCEQ bases its list of impaired oyster waters on the DSHS classifications rather than on its own assessments of the fecal coliform data for these water bodies (TCEQ 2010b).

Drum Bay Information

Drum Bay has an area of about 1.97 square miles (5.10 square kilometers), based on the TCEQ's definition of the segment (Figure 3). As shown in Figure 3, the DSHS designation of the RHZ for Drum Bay does not perfectly coincide with the TCEQ's designation of the Drum Bay impaired AUs, extending slightly farther to the southwest on the DSHS map.

Drum Bay is located at the southwestern end of the Galveston Bay system. It is bordered by Christmas Bay to the northeast, Follets Island to the southeast, and Brazoria National Wildlife Refuge to the west. The Gulf Intracoastal Waterway is just inland from Drum Bay along its western edge. Drum Bay has an average depth of 1.1 feet (GBNEP 1991).

In the original TMDL, the 90th percentile criterion was found to be the most critical condition for examining the fecal coliform data, and that applies to the Drum Bay data as well. This percentile represents the most stringent conditions that are likely to result in attainment of the water quality standard.

Table 1 updates Table 3 in the original TMDL, and is based on fecal coliform data provided by DSHS. The date range for the data is 12/01/2001 – 11/30/2008. This matches the dates for data used in the 2010 Integrated Report.

Table 1. Bacteria Concentration in Drum Bay

Segment Number	Segment Name	Number of Samples in RHZ	RHZ Median (cfu/100 mL of Fecal Coliform)	RHZ 90th Percentile (cfu/100 mL of Fecal Coliform)	Exceedances at Sampling Locations within RHZ
2435OW	Drum Bay	245	8	79	Yes

Table 2 updates Table 5 in the original TMDL, and is based on the same DSHS data used in Table 1. The 90th percentile criterion was used to determine the percent reduction goals. Since all stations are below the median criterion, the load reductions based on attainment of the 90th percentile criterion are also protective of the median criteria. DSHS provided data for five stations associated with Drum Bay. Four of these stations fall within the 1,000-foot shoreline buffer. This area is subject to the contact recreation standard, and the oyster waters standard would normally not apply. However, due to the very small size of this bay, all stations are included in the table.

During previous WQMP updates related to the original TMDL report, a method was developed to consistently determine when regulated dischargers should be given individual wasteload allocations (WLAs). Specifically, facilities discharging within one stream mile of the listed segments should be given individual WLAs. There are no permitted discharges to Drum Bay. Therefore, there are no WLAs to add or revise in Table 6 or Appendix A in the original TMDL document. Should permits be issued to wastewater dischargers in the future, the permits should include individual WLAs determined through the regular WQMP update process.

Storm water flowing into Drum Bay is not regulated. There are no marinas on Drum Bay. These were identified as potential sources of bacteria in certain areas covered by the original TMDL, but are not pertinent here.

Table 2. Endpoint Target Reductions at Sampling Stations

Sampling Station	Number of Samples[a]	Median[b]	90th Percentile[b]	Exceedance Identified	Median Reduction to Meet End-point	90th Percentile Reduction to Meet End-point
FRE-11[c]	49	10	55	Yes	N/A	22%
FRE-24	49	11	79	Yes	N/A	46%
FRE-25	49	7	47	Yes	N/A	8%
FRE-26	49	11	49	Yes	N/A	12%
FRE-31	49	8	616	Yes	N/A	93%

a. Samples used in assessing bacteria concentrations were collected during the 2010 assessment period (12/01/2001 – 11/30/2008).

b. All concentrations are reported in cfu/100 mL.

c. Station FRE-11 is the only station outside the 1,000-foot shoreline buffer area.

The original TMDL report established concentration-based TMDLs and load allocations expressed in terms of bacteria concentrations. Table 3 below updates Table 11 in the original document.

Table 3. TMDL Indicator Bacteria for Drum Bay

Water Body	TMDL Indicator Parameter
Drum Bay (2435OW_01 & 2435OW_02)	Fecal coliform 90th percentile < 43 cfu/100 mL

Table 4 presents concentration-based limits (load allocations) for indicator bacteria in the source categories associated with the Upper Gulf Coast project, including Drum Bay. These load allocations will apply year-round to each source category of pollution in the watershed (e.g., urban runoff, on-site sewage facilities (OSSFs), wastewater treatment facilities (WWTFs), boat discharges). Compliance with these load allocations will ensure protection of the water quality and beneficial uses of the bay. Table 4 in this addendum is a reproduction of Table 12 from the original TMDL document.

Figure 3. Drum Bay[a]

[a] This map was developed by the TMDL Program of the TCEQ. No claims are made to the accuracy or completeness of the data or to its suitability for a particular use.

Table 4. Concentration-Based Pollutant Wasteload and Load Allocations for Upper Gulf Coast Segments[a]

Discharge Type	Fecal coliform densities for Discharges to the RHZ	For Discharges to Adjacent Watersheds and the 1,000 foot Buffer Zone[b]
Wasteload Allocations		
Mechanical WWTFs[c]	Discharges directly to the RHZ are not possible[d]	Fecal Coliform 200 per 100 mL OR *E. coli* 126 per 100 mL OR Enterococcus 35 per 100 mL
Wetland WWTFs	Discharges directly to the RHZ are not possible[d]	Wetland systems are measured based on detention time. Human waste must be detained for at least 21 days in sun light before reaching the bay system, unless individual permit requires additional time.
Municipal Separate Storm Sewer Systems (MS4s)[c]	Discharges directly to the RHZ are not possible[e]	Numerical concentrations requirements are unreasonable for storm water runoff. This TMDL will require MS4s to follow implementation of bacteria reduction efforts and best management practices.
Load Allocations		
OSSFs	Discharges directly to the RHZ are not possible[e]	0 per 100 mL
Recreational Boat and Ship Discharges	0 per 100 mL	0 per 100 mL
Marina	Discharges directly to the RHZ are not possible[d]	0 per 100 mL
Non-Regulated Municipal Runoff	Discharges directly to the RHZ are not possible[e]	Numerical concentrations requirements are unreasonable for storm water runoff. Incentive based options will be developed for municipalities with non-regulated runoff. Bacteria reductions will be achieved through the implementation of the resulting implementation plan.
Direct Deposition into Segment[f]	The reduction of wildlife or changing natural background conditions is not the intended goal of a TMDL.	The reduction of wildlife or changing natural background conditions is not the intended goal of a TMDL.

a. Allocations are applicable year-round. WLAs apply to any sources (existing or future) subject to regulation by a Texas Pollutant Discharge Elimination System (TPDES) permit.

b. All concentrations limits within the 1,000-foot buffer zone will be based on the geometric means of the applicable indicator bacteria.

c. Regulated entities may use indicator bacteria other than fecal coliform, as listed in individual TPDES permits. Indicator bacteria concentrations for each permit must be consistent with the applicable water quality standard for the receiving water. Dischargers releasing effluent into a segment buffer zone shall meet those water quality standards.

d. Discharges to RHZ are not possible for WWTFs and Marinas because DSHS implements safety perimeters known as Prohibited Harvest Zones around this source to protect against any unauthorized discharges of raw sewage.

e. Discharges to RHZ are not possible because TCEQ implements a 1,000-foot buffer zone around this source designated as contact recreation.

f. The listed segments contain wildlife and unmanaged animals and are therefore potential sources.

Median Fecal Coliform Capacity of Restricted Harvest Zone Assessment Units

Table 5 updates the table in the first addendum to the original TMDL that gave the capacity of the restricted oyster water assessment units based on the oyster waters criterion for fecal coliform (14 cfu/100mL; the median concentration).

Table 5. Median RHZ Capacity in Drum Bay

Segment Name	RHZ Assessment Unit	Area (Sq. Mi.)	Average Depth (Ft.)	Volume (Cu. Ft)	Median RHZ Capacity (cfu)
Drum Bay	2435OW_01	0.15	1.1	4,569,270	1.81E+10
Drum Bay	2435OW_02	1.82	1.1	55,689,892	2.21E+11

References

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TCEQ 2010b. Guidance for Assessing and Reporting Surface Water Quality in Texas. Texas Commission on Environmental Quality. <www.tceq.texas.gov/assets/public/compliance/monops/water/10twqi/ 2010_guidance.pdf>.

TCEQ 2010c. Texas Surface Water Quality Standards. Texas Commission on Environmental Quality. <www.tceq.texas.gov/waterquality/standards/ 2010standards.html>

Revised Tables

Tables and table numbers from the original TMDL report, revised based on the information in this addendum.

Revised Table 1. Characteristics of Impaired Segments of Galveston Bay

Segment Name	Segment Number	Year Listed	Area (square kilometers)	Percent Area in the RHZ
Upper Galveston Bay	2421	1996	299.1	47%
Trinity Bay	2422	2000	317.5	48%
East Bay	2423	1998	148.9	25%
West Bay	2424	1996	195.3	37%
Chocolate Bay	2432	1996	21.1	100%
Drum Bay[1]	2435OW	2010	5.1	100%
Lower Galveston Bay	2439	1996	362.4	27%

[1] Inadvertently not included in the first published 2010 Integrated Report

Revised Table 3. Bacteria Concentrations in Impaired Segments of Galveston Bay

Segment Number	Segment Name	Number of Samples in RHZ	RHZ Median (cfu/100 mL of Fecal Coliform)	RHZ 90th Percentile (cfu/100 mL of Fecal Coliform)	Exceedances at Sampling Locations within RHZ
2421	Upper Galveston Bay	947	8.0	130.0	Yes
2422	Trinity Bay	376	2.0	33.0	Yes
2423	East Bay	199	2.0	36.2	Yes
2424	West Bay	515	5.0	49.0	Yes
2432	Chocolate Bay	37	5.0	61.0	Yes
2435OW	Drum Bay	245	8	79	Yes
2439	Lower Galveston Bay	707	2.0	49.0	Yes

Revised Table 4. Use Attainment of Segments of Galveston Bay

Segment Number	Segment Name	Recreational Use	Oyster Use	Parameter
2421	Upper Galveston Bay	Fully Supporting	Dependent upon specific location	Bacteria
2422	Trinity Bay	Fully Supporting	Dependent upon specific location	Bacteria
2423	East Bay	Fully Supporting	Dependent upon specific location	Bacteria
2424	West Bay	Fully Supporting	Dependent upon specific location	Bacteria

Segment Number	Segment Name	Recreational Use	Oyster Use	Parameter
2432	Chocolate Bay	Fully Supporting	Non-Supporting	Bacteria
2435OW	Drum Bay	Fully Supporting	Non-Supporting	Bacteria
2439	Lower Galveston Bay	Fully Supporting	Dependent upon specific location	Bacteria

Revised Table 5. Endpoint Target Reductions at Sampling Stations in Project Segments

Station	Number of Samples[a]	Median[b]	90th Percentile[b]	Exceedance Identified	Median Reduction	90th Percentile Reduction
Segment 2421, Upper Galveston Bay: Station and Sampling Results					**Reductions Needed to Meet Endpoint Concentrations**	
13305	5	10.0	18.0	No		
14546	35	23.0[c]	130.0[d]	Yes	39%	67%
14556	67	11.0	73.6	Yes		42%
14560	107	5.0	110.0	Yes		61%
14562	105	5.0	97.6	Yes		56%
14570	116	5.0	79.0	Yes		46%
14571	107	13.0	174.0	Yes		75%
14572	107	10.0	110.0	Yes		61%
14580	58	79.0	920.0	Yes	82%	95%
14581	120	7.5	110.0	Yes		61%
14582	120	2.0	49.0	Yes		12%
Segment 2422, Trinity Bay: Stations and Sampling Results					**Reductions Needed to Meet Endpoint Concentrations**	
13314	62	2.0	23.0	No		
13315	66	2.0	15.0	No		
14548	62	6.0	49.0	Yes		12%
14549	60	5.0	51.1	Yes		16%
16838	64	2.0	16.1	No		
17092	62	2.0	22.4	No		
Segment 2423, East Bay: Stations and Sampling Results					**Reductions Needed to Meet Endpoint Concentrations**	
14527	56	2.0	24.5	No		
14528	47	2.0	97.4	Yes		56%

Station	Number of Samples[a]	Median[b]	90th Percentile[b]	Exceedance Identified	Median Reduction	90th Percentile Reduction
14529	49	2.0	13.8	No		
14530	47	2.0	63.8	Yes		33%
Segment 2424, West Bay: Stations and Sampling Results					**Reductions Needed to Meet Endpoint Concentrations**	
13321	37	13.0	33.0	No		
14607	37	2.0	3.2	No		
14608	37	11.0	49.0	Yes		12%
14618	36	2.0	17.0	No		
14620	37	11.0	49.0	Yes		12%
14621	37	5.0	33.0	No		
14622	36	13.5	94.5	Yes		54%
14623	37	11.0	73.6	Yes		42%
16839	37	8.0	99.4	Yes		57%
16840	37	2.0	9.2	No		
16841	37	2.0	19.4	No		
16842	37	5.0	73.6	Yes		42%
16844	37	5.0	33.0	No		
Segment 2439, Lower Galveston Bay: Stations and Sampling Results					**Reductions Needed to Meet Endpoint Concentrations**	
14576	120	4.0	79.0	Yes		46%
14577	122	8.0	79.0	Yes		46%
14584	122	2.0	49.0	Yes		12%
14594	54	4.0	20.5	No		
14595	53	5.0	49.0	Yes		12%
14597	57	2.0	10.0	No		
Segment 2432 Chocolate Bay: Stations and Sampling Results					**Reductions Needed to Meet Endpoint Concentrations**	
14610	37	5.0	61.0	Yes		30%
Segment 2435OW Drum Bay: Stations and Sampling Results					**Reductions Needed to Meet Endpoint Concentrations**	
FRE-11c	49	10	55	Yes		22%

Station	Number of Samples[a]	Median[b]	90th Percentile[b]	Exceedance Identified	Median Reduction	90th Percentile Reduction
FRE-24	49	11	79	Yes		46%
FRE-25	49	7	47	Yes		8%
FRE-26	49	11	49	Yes		12%
FRE-31	49	8	616	Yes		93%

a. Samples used in assessing bacteria concentrations were collected during the years 2001 through 2008 (varies by station).

b. All concentrations are reported in cfu/100 mL.

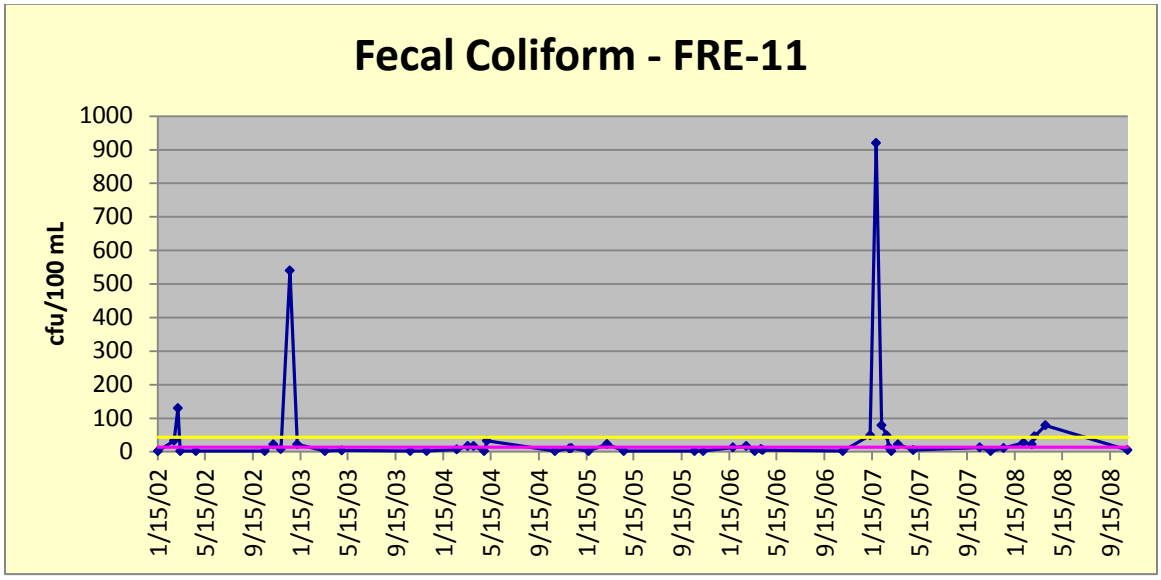
c. Pink shading indicates concentrations exceed the median criterion.

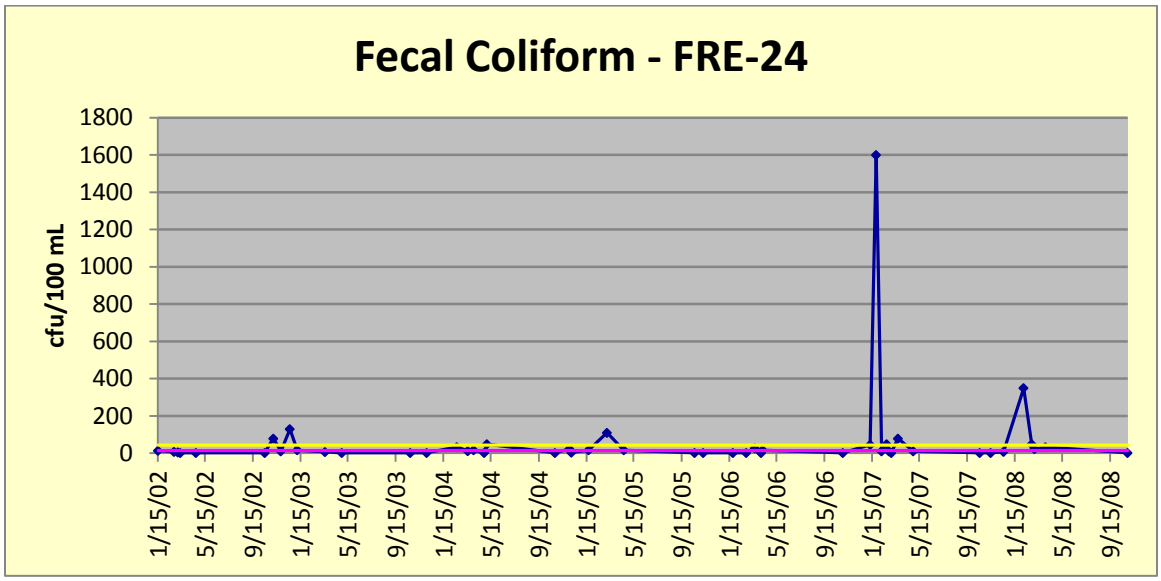
d. Gray shading indicates concentrations exceed the 90th percentile criterion.

Revised Table 11. Total Maximum Daily Loads of Indicator Bacteria for Galveston Bay System Segments

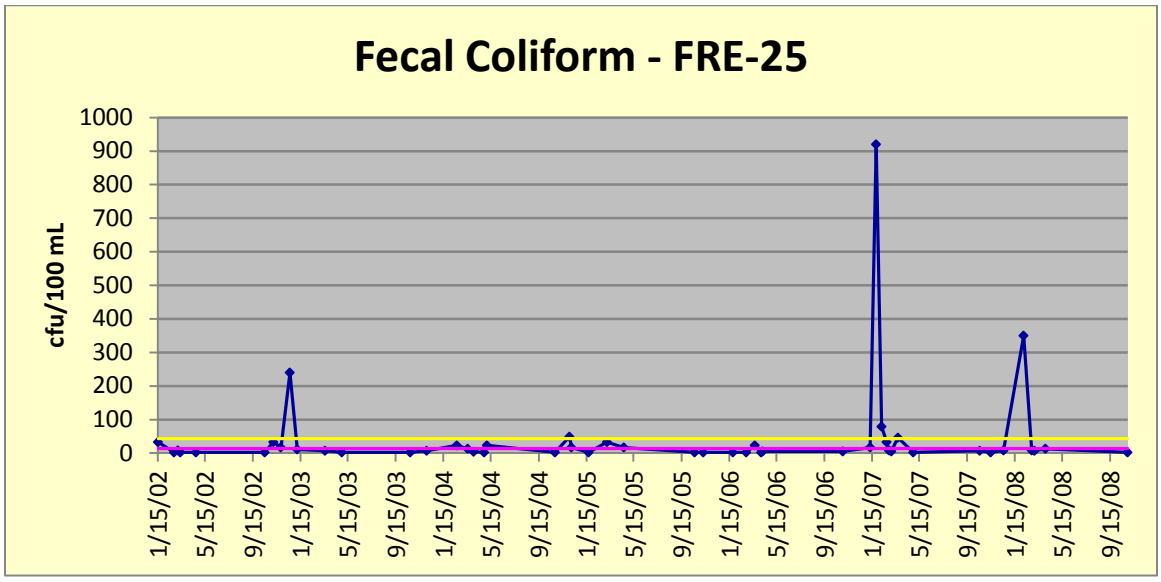
Segment Name	TMDL Indicator Parameter
Upper Galveston Bay Trinity Bay East Bay West Bay Chocolate Bay Lower Galveston Bay Drum Bay	Fecal coliform 90th Percentile < 43 cfu/100 mL

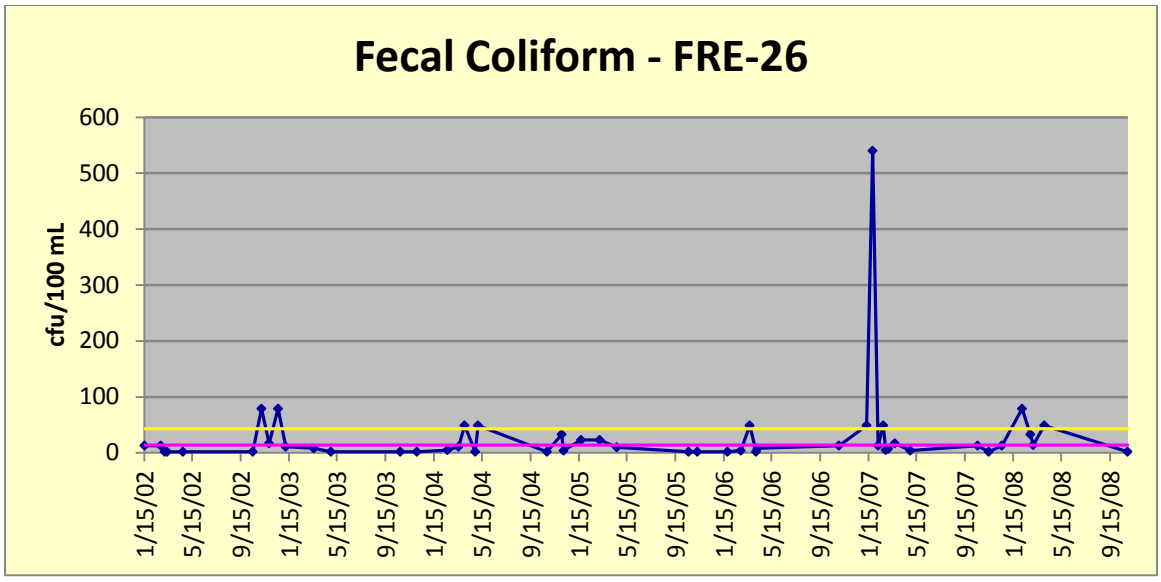
Revisions to Appendix B:
Temporal Trends in Bacteria Samples



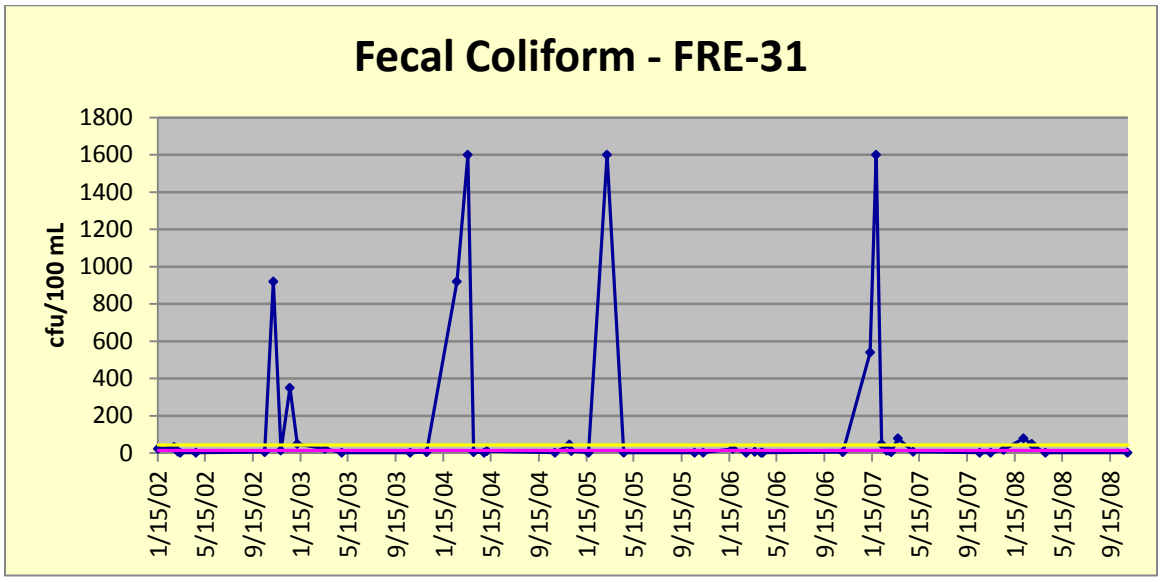


Yellow Line = 90th percentile criterion (43 cfu/100mL)
Red Line = median criterion (14 cfu/100mL)
Yellow shaded border = concentrations at station exceeded 90th percentile criterion.





Yellow Line = 90th percentile criterion (43 cfu/100mL)
Red Line = median criterion (14 cfu/100mL)
Yellow shaded border = concentrations at station exceeded 90th percentile criterion.



Yellow Line = 90th percentile criterion (43 cfu/100mL)
Red Line = median criterion (14 cfu/100mL)
Yellow shaded border = concentrations at station exceeded 90th percentile criterion.

Revised First Addendum: Median Fecal Coliform Capacity of Restricted Harvest Zone Assessment Units

Based on the Oyster Waters criterion of 14 cfu/100mL (the median concentration), the capacity of the restricted oyster water assessment units are listed below.

Segment Name	RHZ Assessment Unit	Area (Sq. Mi.)	Average Depth (Ft.)	Volume (Cu. Ft)	Median RHZ Capacity (cfu)
Upper Galveston Bay	2421_01	16.8	9.5	4,449,392,640	1.76E+13
Upper Galveston Bay	2421_02	48.2	9.5	12,765,519,360	5.06E+13
Trinity Bay	2422_01	64.4	7.5	13,465,267,200	5.34E+13
East Bay	2423_01	52.1	3.5	5,083,626,240	2.02E+13
Chocolate Bay	2432_01	7.6	3.5	741,565,440	2.94E+12
West Bay	2424_02	17.1	5	2,383,603,200	9.45E+12
Drum Bay	2435OW_01	0.15	1.1	4,569,270	1.81E+10
Drum Bay	2435OW_02	1.82	1.1	55,689,892	2.21E+11
Lower Galveston Bay	2439_01	38.4	3.5	3,746,856,960	1.49E+13

Appendix VII. 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). Six subsequent WQMP updates prior to this one have provided individual Waste Load Allocations (WLAs) for permitted facilities.

The purpose of this WQMP update is to make the following changes to the TMDL(all in Table 1):

- adjust the individual WLA due to an increase in permitted discharge for one facility in Allocation Reach 2 (the upper portion) of Upper Oyster Creek; and
- update the names of three facilities.

Table 1 – Name Changes and Permitted Bacteria Allocation for Amended Discharge (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
14715-001	001	TX0128791	1245	FORT BEND CO. MUD 134A	0.6	8.9×10^9 cfu *E. coli* per day	Increased discharge and name changed
12003-002	001	TX0132217	1245	FORT BEND COUNTY MUD NO. 25	No change	No change	Name corrected
14745-001	001	TX0129119	1245	FORT BEND MUD NO. 169 AND CITY OF FULSHEAR	No change	No change	Name changed

Note that this TMDL was written for *E. coli* and that it used the single sample criterion of 394 cfu/100 mL.

The increase in discharge for this facility in Allocation Reach 2 also changes the TMDL equation for the reach, given in Table 11 of the TMDL document. Note that other changes have already taken place that affected this equation, which have been outlined in previous WQMP Updates. The WLA Continuous for Allocation Reach 2 will now be 1.53×10^{11} cfu *E. coli* per day.

The Allowable Loading for Allocation Reach 2 will also have to increase to allow for the increased flow (and therefore increased allowable *E. coli* concentration) in Upper Oyster Creek as a result of this new discharge. As established on pages 32 and 33 and in Table 9 of the TMDL document, this "additional loading" is determined by calculating the "…difference between

loadings if WWTFs operated at their full allowable daily discharges and the loadings that would be allowable under the average WWTF discharges reported…" The actual average discharge data related to this increase in discharge are not available; therefore, it is not possible to calculate this additional loading at this time. However, as long as all new/increased discharges have *E. coli* concentrations at or below the criterion, they will result in a neutral impact on Segment 1245 by increasing stream flow while adding bacteria at concentrations meeting protective criteria, as explained in the Future Growth section of the TMDL document on page 37.

Appendix VIII. Two Total Maximum Daily Loads for Dissolved Oxygen in Upper Oyster Creek: Segment 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 7/28/10 and approved by EPA on 09/21/10, and became an update to the state's Water Quality Management Plan (WQMP). It has had one subsequent WQMP update prior to this one.

The purpose of this update is to make the following changes to the TMDL:

- provide new individual waste load allocations (WLAs) for a facility with an amended permit (Table 1);
- provide new permit limits for that facility (Table 2); and
- update the name of one facility (Table 1).

The allocations presented in this update were calculated using the QUAL2K model used in establishing the original TMDL. This facility is ceasing the use of an onsite polishing pond system.

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

Facility	TCEQ Permit No. / EPA Permit No.	Final Permitted Discharge (MGD)	Allowable $CBOD_5$ Loading (kg/d) | (lb/d)	Allowable NH_3-N Loading (kg/d) | (lb/d)	Comments
FORT BEND CO. MUD 134A	WQ0014715-001 TX0128791	0.6	15.90 | 35.05	4.54 | 10.02	Increased discharge and name changed
FORT BEND MUD NO. 169 AND CITY OF FULSHEAR	WQ14745-001 TX0129119	No change	No change	No change	Name changed

The relevant permit limits for the facility are as follows:

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

Facility	TCEQ Permit No. / EPA Permit No.	Final Permitted Discharge (MGD)	$CBOD_5$ (mg/L)	NH_3-N (mg/L)	Dissolved Oxygen (mg/L)
FORT BEND CO. MUD 134A	WQ0014715-001 TX0128791	0.6	7	2	4

The TMDL summary equations must also be updated for carbonaceous biochemical oxygen demand ($CBOD_5$; Table 3) and ammonia nitrogen (NH_3-N; Table 4).

Table 3 - Summary of TMDLs for Upper Reach $CBOD_5$ (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	124.59	124.59
Load Allocation	96.00	96.00
Total Loading	220.59	220.59

Table 4 - Summary of TMDLs for Upper Reach NH_3-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	27.62	27.62
Load Allocation	3.69	3.69
Total Loading	31.31	31.31

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.