

Atascosa River Segment 2107

Designated Uses:

- Aquatic life use
- Contact recreation use
- Fish consumption use
- Public water supply use
- General use

2004 Section 303(d) Listing

Aquatic Life Use: Depressed dissolved oxygen concentrations in the 25 mile reach surrounding U.S. 281 (Initial listing 1996)

Recreation Use: Elevated bacteria levels in the lower 25 mile reach and the 25 mile reach surrounding U.S. 281 (Initial listing 1996)

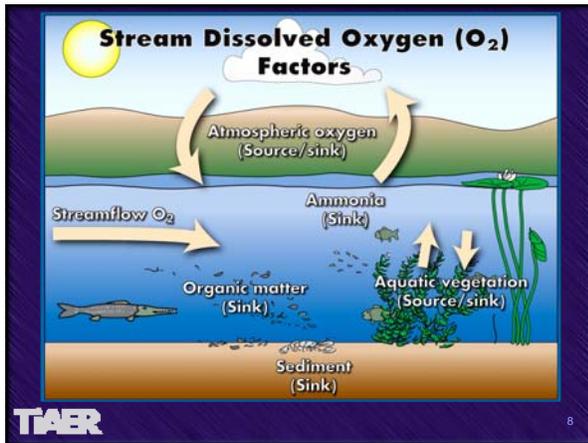
Aquatic Life Use

Dissolved oxygen is the major constituent evaluated to assess aquatic life use.

Most living organisms are dependent upon oxygen in one form or another to maintain metabolic processes.



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Dissolved Oxygen Criteria

- A 24-hour mean concentration
- A 24-hour minimum concentration

Atascosa River (high aquatic life use designation)

- Mean concentration = 5.0 mg/L
- Minimum concentration = 3.0 mg/L



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Dissolved Oxygen Criteria

Additional spring criteria to protect fish spawning in first half of year

When water temperatures are between 63 F to 73 F

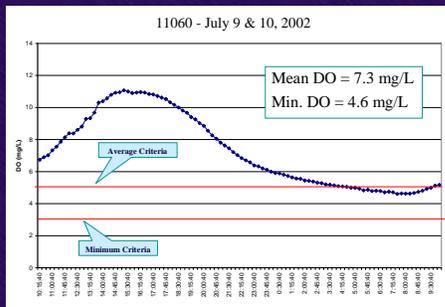
Mean concentration = 6.0 mg/L

Minimum concentration = 4.0 mg/L

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Example of 24-hour DO Survey Clear Fork Trinity River



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Assessment Methodology

Exceeds Current Criteria	Ranking
up to 10%	Supporting
>10%	Non Support

Percentages may vary due to the application of the binomial method used to control statistical errors

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Dissolved Oxygen Assessment Data 2002-2004

Texas Engineering Experiment Station (TEES)
Texas A&M University
Corpus Christi, TX



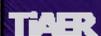
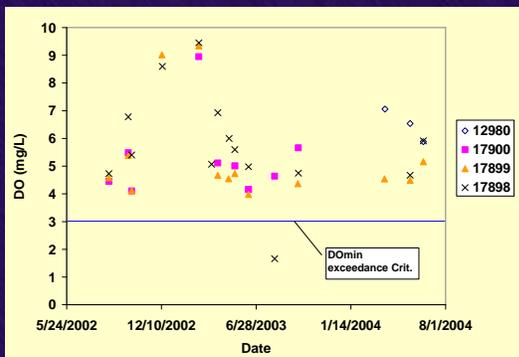
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Atascosa River (Segment 2107)

Add Map w/ stations

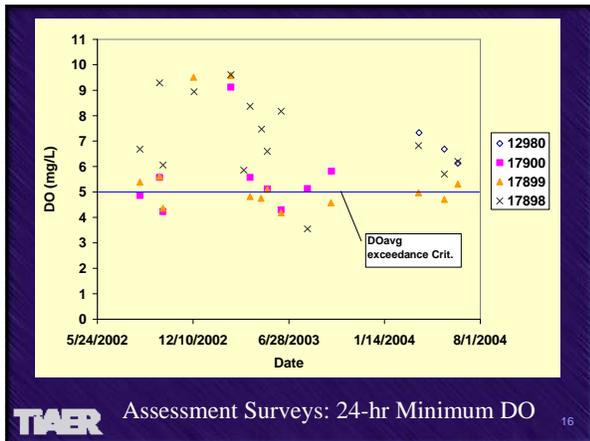


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Assessment Surveys: 24-hr Minimum DO

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Conclusion of DO Assessment

- Dissolved oxygen concentrations are depressed in portions of the Atascosa River.
- A review of the designated high aquatic life use and water quality standards will be conducted by TCEQ before a TMDL is scheduled.

Contact Recreation Use

Contact recreation is assigned unless elevated concentrations of indicator bacteria frequently occur due to sources of pollution, which cannot be reasonably controlled by existing regulations or contact recreation is considered unsafe for other reasons such as ship or barge traffic.

Source: Texas Surface Water Quality Standards (2000)

Indicator bacteria, although not generally pathogenic, are indicative of potential contamination by feces of warm blooded animals.

Source: Texas Surface Water Quality Standards (2000)



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Indicator Bacteria for Freshwater

Fecal coliform A portion of the coliform bacteria group that is present in the intestinal tracts of warm-blooded animals; heat tolerant bacteria from other sources can sometimes be included.

E. coli *Escherichia coli*, a subgroup of fecal coliform bacteria that is present in the intestinal tracts and feces of warm-blooded animals.

Source: Texas Surface Water Quality Standards (2000)



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Bacteria Culture



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E. Coli Basics

Escherichia coli (*E. coli*) is a bacterium that is naturally found in the intestines and the feces of warm-blooded animals

Many different types, most harmless, but some may cause illness (e.g. hamburger restaurant outbreaks)

Commonly used as a Bacterial Indicator Organism

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Bacterial Indicator Organisms

Generally not pathogenic themselves

Abundant in feces of warm-blooded animals

Should not reproduce naturally in the environment

Relatively long survival times in the environment

Should be present whenever a fecal pathogen is present

More easily measurable than the pathogens themselves

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Contact Recreation Use Specific Criteria for Atascosa River

E. coli:

- ◆ The geometric mean should not exceed 126 organisms (org) per 100 ml.
- ◆ Single samples should not exceed 394 org per 100 ml.

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Assessment Methodology for Contact Recreational Use

Evaluate most recent 5-year period of historical data against:

- geometric average criterion (126 org/100ml)
- single sample criterion (394 org/100ml)

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Fully Supporting

The long-term geometric average is less than the criterion

and

25% or less of the samples exceed the single sample criterion.

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Not Supporting

The long-term geometric average exceeds the criterion

and/or

greater than 25% of the time, concentrations are greater than the single sample criterion.

Percentages may vary due to the application of the binomial method used to control statistical errors

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Hypothetical Example of Methodology

E. coli Data

(units: org/100 ml)

1. 90	6. 320
2. 130	7. 840
3. 40	8. 180
4. 1,000	9. 270
5. 260	10. 70

20 percent of samples exceed 394 criterion
Geometric mean 202 org/100 ml

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Hypothetical Assessment Finding

Geometric average (202 org/100ml)
exceeds the criterion

25% or less of the samples exceed the
single sample criterion

Conclusion: Not supporting contact
recreation use

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Bacteria Assessment Data 2002-2004

Texas Engineering Experiment Station (TEES)
Texas A&M University
Corpus Christi, TX

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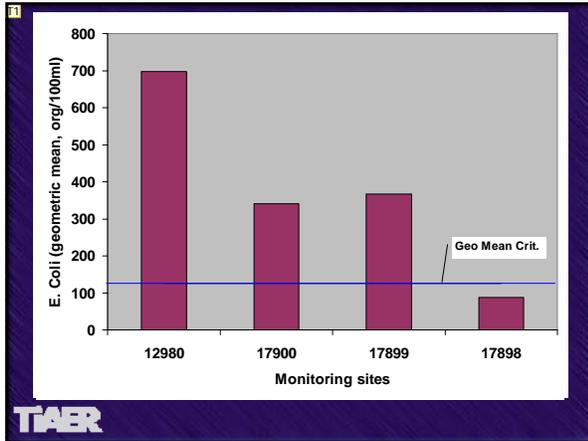
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Atascosa River (Segment 2107)

Add Map w/ stations



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Conclusion of Bacteria Assessment

- Bacteria concentrations are elevated in portions of the Atascosa River indicating nonsupport of the contact recreation use designation.
- A TMDL will be developed for bacteria with a goal of restoring the contact recreation use.



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T1

Could you insert the total number of samples for each of the stations?

TCEQ, 8/16/2007

Project Overview and Status



Milestones/Progress

- Assessment data collection completed in 2004 by Texas A&M at Corpus Christi
- Texas Institute for Applied Environmental Research (TIAER), Tarleton State University under contract with TCEQ in late 2005
- Quality Assurance Project Plan (QAPP) developed and approved by TCEQ and EPA on May 18, 2006



Milestones/Progress

- Additional bacteria monitoring conducted by TIAER (July 2006 – February 2007)
- Modeling QAPP developed, approved by TCEQ, awaiting EPA approval.
- Conduct TMDL allocation process } Next Steps
- Develop draft TMDL document }



Atascosa River (Segment 2107)

Add Map w/ TIAER monitored stations

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Station 12980, Atascosa River
at FM99 near Whitsett, TX

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Station 18646, Atascosa River at Coughran Rd.
(Approx. 5 miles east of Pleasanton, TX)



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Station 12982, US Hwy 281, Pleasanton, TX
September 18, 2006 Runoff Event



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Summary of Monitoring

- Eight routine sampling events conducted monthly from July 2006 through February 2007.
- Emphasis on wet-weather runoff months.
- Two sediment bacteria sampling events.
- Purpose: To collect additional data to complete the bacteria TMDL allocation process.

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Remaining Steps in Bacteria TMDL Process

Continue public participation meetings

TIAER will apply a tool referred to as the Load Duration Curve to determine the TMDL allocation for bacteria

TIAER will assist TCEQ and TSSWCB in technical aspects of preparing the draft TMDL document

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Remaining Steps in Bacteria TMDL Process

TMDL will undergo public comment and approval by TCEQ and EPA

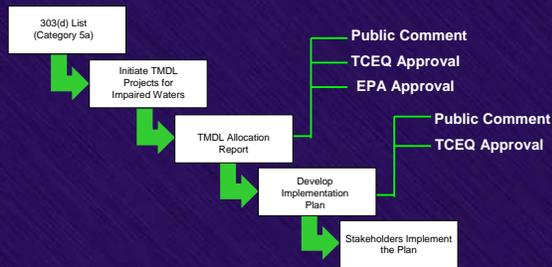
TCEQ and TSSWCB responsible for developing an Implementation Plan

Implementation will be put into action



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TMDL Development Process



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Major Technical Aspects Remaining in TMDL

TMDL Allocation Process

The culminating step of a TMDL

Involves allocating pollutant loads among various point, nonpoint, and natural background sources in the watershed



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Allocation process equation:

$$LC = WLA + LA + MOS$$

Loading capacity (LC) is the maximum amount of pollutant loading a water body can receive without violating water quality standards.

Wasteload allocation (WLA) is the portion of the LC allocated to existing and future point sources.

Load allocation (LA) is the portion of the LC allocated to existing and future nonpoint sources and to natural background sources.

Margin of safety (MOS) is the mechanism to account for uncertainty in determining pollutant loadings.



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TMDL Allocation Process

Allocation process typically conducted using mathematical models.

In simplest terms, models are analytical abstractions of the real world.

For this bacteria TMDL, the Load Duration Curve method will be applied.



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