

## North Central Texas Water Quality Project

### Watershed Protection Plan Development for the Eagle Mountain Watershed

TARRANT REGIONAL  
WATER DISTRICT



## North Central Texas Water Quality Project

### Why We Are Here

- Proactive approach to solving water quality issues opposed to regulatory action through a TMDL (Total Maximum Daily Load)
- Trend of increasing Chlorophyll a levels in Eagle Mountain Lake
- Listing on the 303 (d) Water Quality list for Impairments

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### Project Objectives

- Assemble information on sediment and nutrient loads for specific TRWD managed reservoirs and associated streams.
- Identify the sources of non-point and point source loadings that may affect water quality in TRWD reservoirs
- Use computer modeling to analyze the biological, physical, and economic feasibility of alternative management practices and facilities to maintain or improve water quality in the reservoir.
- Conduct public meetings and provide educational programs about water quality protection to stakeholders.
- Develop and Implement a Watershed Protection Plan for Eagle Mountain Reservoir and Watershed

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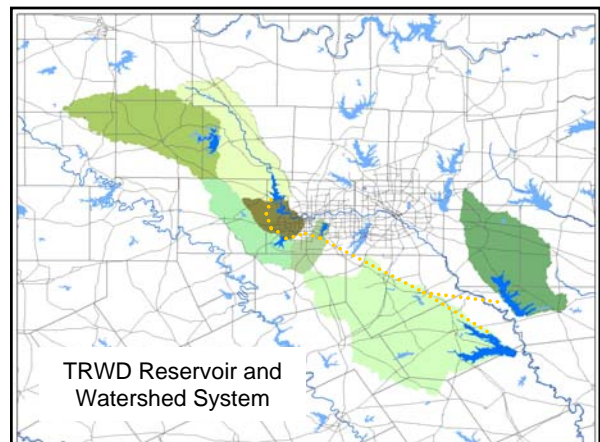
### Background

Darrel Andrews  
Assistant Environmental Director  
Tarrant Regional Water District

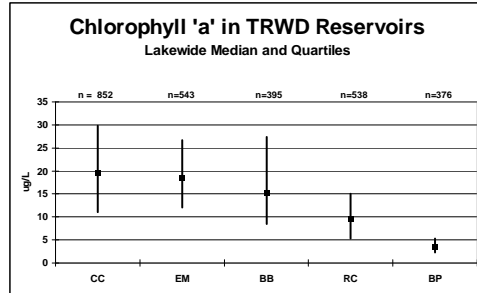
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### Tarrant Regional Water District

- Serves 1.7 million people
  - Eleven counties in and around Fort Worth
- Expected to serve a population of 2.6 million people by 2050
- Contracts with 66 cities
- Manages 5 major reservoirs
  - Cedar Creek, Eagle Mountain, Richland-Chambers, Bridgeport and Benbrook.



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### Eagle Mountain Watershed

- Watershed size – 860 square-miles
- Lake Surface area - 8702-acres
- Lake Conservation Storage - 182,505 ac/ft
- Mean Depth – 21 ft
- Maximum Depth – 55 ft
- Shoreline – 83.5 miles



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### 2008 Texas Water Quality Inventory

- Eagle Mountain Reservoir (0809) – 305(b) concern
  - Chlorophyll-a
  - Ammonia
  - Dissolved Oxygen
- Eagle Mountain Watershed – (0810) – 303(d) impaired for bacteria
  - West Fork Trinity River below Bridgeport
  - Big Sandy Creek
  - Garrett Creek
  - Martin Branch
  - Salt Creek

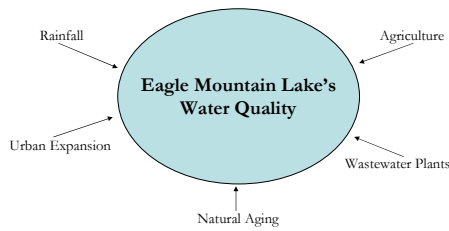
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### Eutrophication

- Aging of a lake or reservoir that can be natural or enhanced by man's activities

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### Controlling Eutrophication



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**Water Quality  
Assessment in Texas**

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**Texas Surface Water Quality**

- Federal Clean Water Act Sections 305 (b) and 303 (d)
- State of Texas has established Standards to protect the purpose for which waterbodies will be used
  - Designated uses are assigned to each water body
  - 5a: TMDL is underway or has been scheduled
  - 5b: Review of water quality standards for water body will be held prior to a TMDL
  - 5c: Additional data will be collected before a TMDL is scheduled

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**Water Use Categories**

- Aquatic Life
  - Designated to protect aquatic species
  - Dissolved Oxygen, toxic chemicals
- Contact Recreation
  - Estimates the relative risk of swimming and other water sports
- Public Water Supply
  - Indicator of whether water is available as a source for a public water system
  - Metals, pesticides, other toxic chemicals
- Fish Consumption
  - Protect public from consuming fish that may be contaminated

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**Water Quality Standards**

- Used by TCEQ regulatory programs to establish reasonable limits on permitted dischargers
- Numeric Standards
  - Segment specific numbers
- Narrative Standards
  - Descriptive standards to protect aesthetics and designated uses
  - Screening limits non-segment specific numeric standard for nutrients

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**Criteria Applicable to Eagle Mountain**

- Numeric Criteria
  - Dissolved Oxygen
  - pH
- Narrative Criteria
  - Nitrogen
  - Phosphorus
  - Excessive Algal Growth
  - Chlorophyll a

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**Dissolved Oxygen**

- Concentrations correlated with the occurrence and diversity of aquatic life in water
- 10 sample minimum
- Average daily minimum criteria – 5.0 mg/L
- If 10% or more of the samples are less than 5.0 mg/L then site is considered impaired

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### pH

- General water quality indicator
- Affects most chemical and biological reactions
- Minimum criteria – 6.5 mg/L
- Maximum criteria – 9 mg/L
- If 10% or more of the samples are less than 6.5 or exceed 9 then site is considered impaired

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### Chlorophyll-*a*

- Chlorophyll-*a* is the primary photosynthetic chemical found in algae and an indicator of the free floating algae in water
- Chlorophyll-*a* in the water column also reduces the amount of light available to rooted aquatic plants
- TCEQ proposed Chl*a* Criteria: 21.19 ug/L\*
- Annual Median Main Pool 16.3 ug/L
- Chl-*a* is controlled through measures that limit the loadings of nitrogen & phosphorus

\*Per draft TCEQ Nutrient Criteria – May 16, 2007

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### Surface Water Quality Standards

Substance	Eagle Mountain Lake Concentration	Proposed Criteria
Chlorophyll- <i>a</i>	16.3 ug/L	21.19 ug/L
Nitrogen	.79 mg/L	.995 mg/L
Phosphorus	.065 mg/L	.0666 mg/L
Dissolved Oxygen	7.5 mg/L	5.0 mg/L
pH	7.8	6.5-9