Session #4
Processes to Ensure NPS TMDLs are Implemented
State-Federal Relationship

Texas Perspective

TMDL Program in Transition
Designing NPS TMDLs for Implementation
May 27-28, 2009
Shepherdstown, WV

"…you're going to find that many of the truths we cling to depend greatly on our own point of view."

– Obi-Wan Kenobi

Water Quality in Texas

- Texas Commission on Environmental Quality (TCEQ)
  - NPDES – WWTFs, CAFOs, MS4
  - CWA 305(b) & 303(d)
  - CWA 319(h) allocation
- Texas State Soil and Water Conservation Board (TSSWCB)
  - Agricultural & silvicultural NPS
  - CWA 319(h) allocation

Water Quality in Texas

- Texas General Land Office (GLO)
  - Coastal zone management
- Texas Department of Agriculture (TDA)
  - FIFRA
- Texas Water Development Board (TWDB)
  - Water supply planning
  - SRF
- Railroad Commission of Texas (RRC)
  - Oil & gas activities
- Texas Parks and Wildlife Department (TPWD)
  - primary responsibility for protecting state's fish and wildlife resources
- Texas A&M AgriLife
  - Land grant entity
  - Extension & Research
  - Texas Forest Service

NPS Management in TX

- TMDL
  - TCEQ, except where ag/silv NPS is involved, then also TSSWCB (MOU & MOA in place)
- NPS & 319(h)
  - Joint administration of NPS Management Program
  - Equally split state's 319(h) allocation between TCEQ & TSSWCB
- Coastal
  - GLO passes 6217 responsibility to TCEQ/TSSWCB

TSSWCB

- Soil and Water Conservation Districts (SWCDs) – facilitate/coordinate local programs
- Agricultural & silvicultural NPS
  - Water quality management plans (WQMPs)
    - site-specific conservation plans that emphasize implementation of BMPs that can improve water quality, in accordance with NRCS Field Office Technical Guide
  - 503 cost-share
  - 319 ($4.5M) + State GR ($1.5M)
- brush control to enhance water supply
- Flood Control (PL-566 FRS)
- Invasive Species Coordination

Texas Conservation Partnership

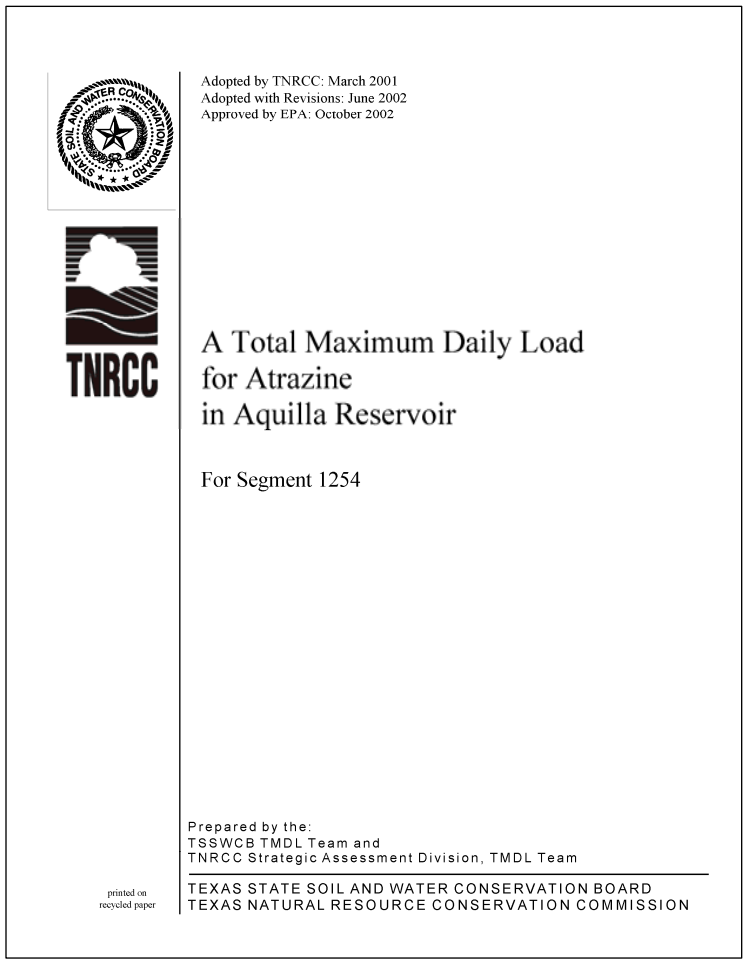
- Providing Conservation Assistance to Private Landowners for 70+ Years

- LOCAL
  - 216 Soil & Water Conservation Districts (SWCDs)
- STATE
  - Texas State Soil and Water Conservation Board (TSSWCB)
- FEDERAL
  - U.S. Department of Agriculture Natural Resources Conservation Service (NRCS)

TMDL vs WBP

- Hard distinction between TMDLs & 319(h) WBPs
- TMDL + I-Plan
  - Regulatory, federally driven
  - ≠ WBP
- WBPs
  - Voluntary, locally driven
  - holistic

Aquilla



Adopted by TNRCC: March 2001
Adopted with Revisions: June 2002
Approved by EPA: October 2002

TNRCC

A Total Maximum Daily Load
for Atrazine
in Aquilla Reservoir

For Segment 1254

Prepared by the:
TSSWCB TMDL Team and
TNRCC Strategic Assessment Division, TMDL Team

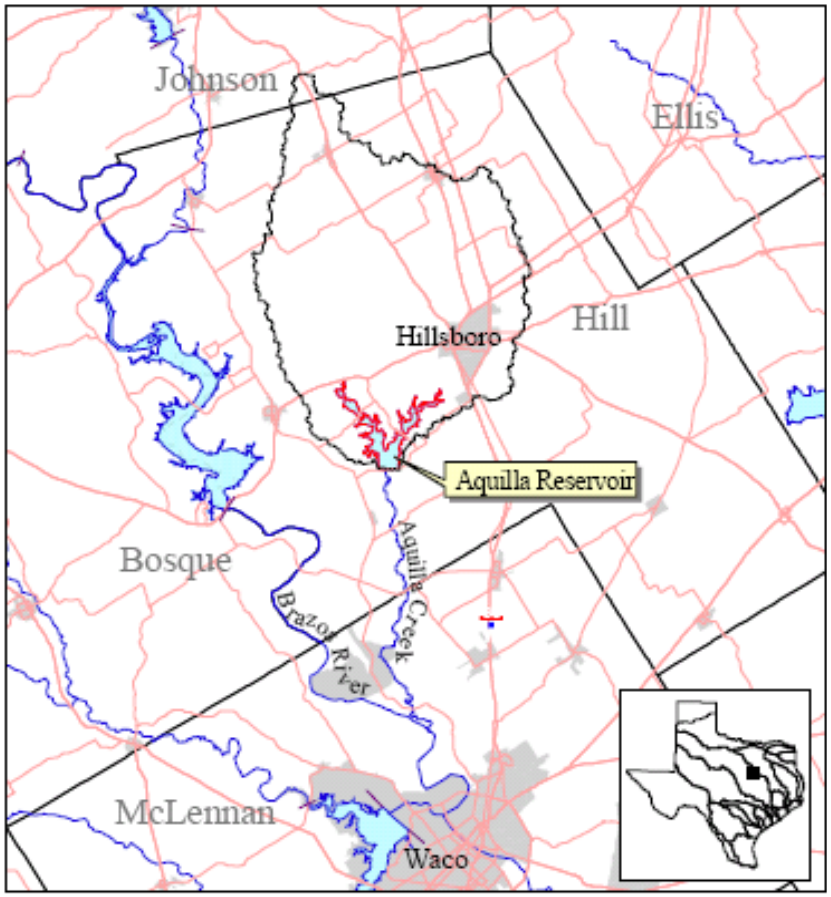
printed on
recycled paper

TEXAS STATE SOIL AND WATER CONSERVATION BOARD
TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

- TMDL for atrazine
  - TCEQ adopted March 2001, revised June 2002
  - TSSWCB approved September 2001
  - EPA approved October 2002

Aquilla

- Aquilla Reservoir in Brazos River Basin
- watershed 255 mi^2 (163,000 ac)
- Aquilla Water Supply District - reservoir is public drinking water sole-source for ~15k
- reservoir is 3,280 surface ac (45,962 ac-ft) at conservation pool elevation



Aquilla

- listed on 1998 303(d) List for failure to support public water supply use
  - "Atrazine concentrations in finished drinking water violate the MCL for primary drinking water standards. Origin of the contamination is source water and represents a failure of the waterbody to support the public water supply use."
- MCL of 0.003 mg/L for atrazine in treated drinking water based on running annual average from quarterly sampling
- running annual average for 2nd ¼ 1997 through 1st ¼ 1998 was 0.004 mg/L

Aquilla

- TMDL endpoint
  - atrazine concentration of 0.003 mg/L, which is numeric equivalent of drinking water MCL
    - running annual average to be based on monthly sampling of ambient water from reservoir
  - concentration, not loading, based
    - however, using data set from 1998 MCL violation suggests load reduction of ~25% would result in attainment
  - TMDL = WLA (0%) + LA (100%) + MOS (implicit)

Aquilla

- I-Plan
  - TSSWCB approved January 2002
  - TCEQ approved January 2002

TNRCC Approval: January 2002
TSSWCB Approval: January 2002

TNRCC

Implementation Plan for the TMDL for Atrazine in Aquilla Reservoir

For Segment 1254

Prepared by the:
TSSWCB TMDL Team and
TNRCC Strategic Assessment Division, TMDL Team
Field Operations Division, Region 4

printed on recycled paper

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Aquilla

- TSSWCB 319 grant to AgriLife Extension
  - 5 sites equipped with ISCO samplers across watershed for stormwater monitoring
  - results indicated 99.97% of atrazine load originated from agricultural NPS while 0.03% originated from urban NPS

Aquilla

- LULC
  - 47% - pastureland
  - 30% - cropland
  - 16% - brushy & open rangeland
  - 3% - urbanized
  - 4% - open water
  - <1% - wetlands
- atrazine widely used since 1960s for selective control of broadleaf weeds in corn & grain sorghum
  - within Aquilla Reservoir watershed, application of atrazine to corn & grain sorghum occurs between late fall & early spring
  - inexpensive, effective herbicide with no alternative that is as economically viable
- application of weed & feed products (which contain atrazine) to urban lawns occurs periodically

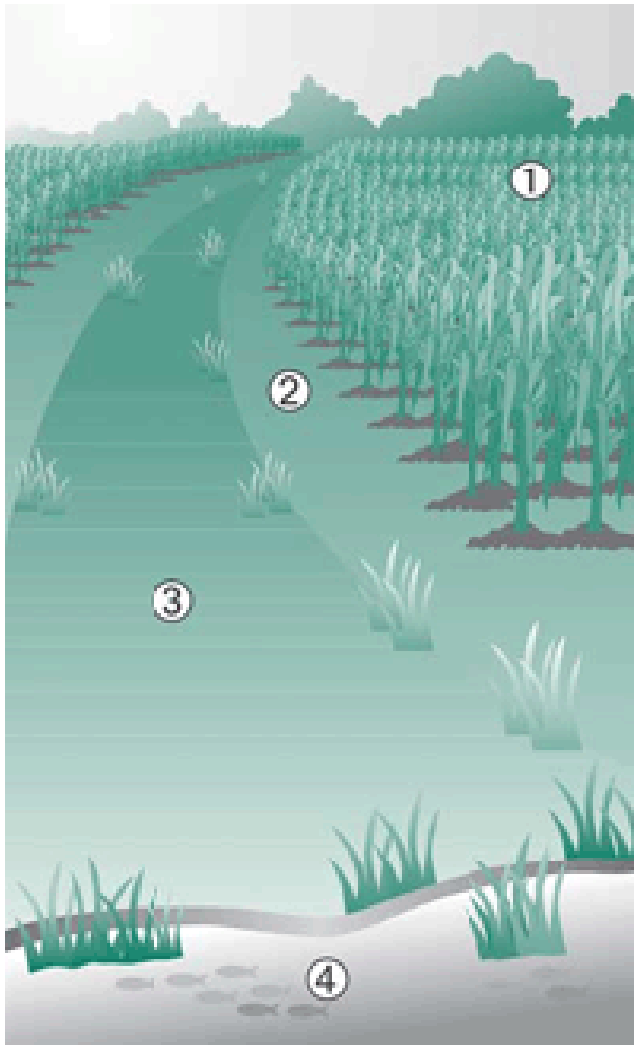
Aquilla

- I-Plan called for
  - BMPs to be implemented to better manage corn & milo production areas
    - Hill County-Blackland SWCD & NRCS provided technical assistance
    - TSSWCB & NRCS provided financial assistance
  - Increased education & outreach led by AgriLife Extension (w/ TSSWCB & TCEQ 319)
    - Awareness of pesticide dealers that there was a water quality problem
    - BMP effectiveness demonstrations for corn & sorghum producers
    - general public & homeowners in urban areas
    - TAEX provided education, demonstration and training programs utilizing proven technologies in the area of water quality to assist residents of Hill County interested in environmental stewardship.
    - alternative lawn management & proper application/storage of herbicides through Master Gardeners & PSAs

Aquilla

- phased approach to implementation – benchmark timeframes to achieve TMDL
- TDA take primary role in pesticide law enforcement and regulation
- Phase I – July 2000, initiate technical and financial assistance
- BMPs from previous phase not effective if running annual average for atrazine continues to exceed MCL, therefore
  - Phase II – January 2005, TDA shall increase enforcement measures
  - Phase III – January 2009, TDA shall initiate regulatory procedures to reclassify atrazine as state-limited use pesticide
  - Phase IV – January 2011, TDA shall assume responsibility of regulating atrazine use as state-limited use pesticide
  - Phase V – January 2014, TDA will initiate procedures to cancel atrazine's registration for use in Aquilla Reservoir watershed

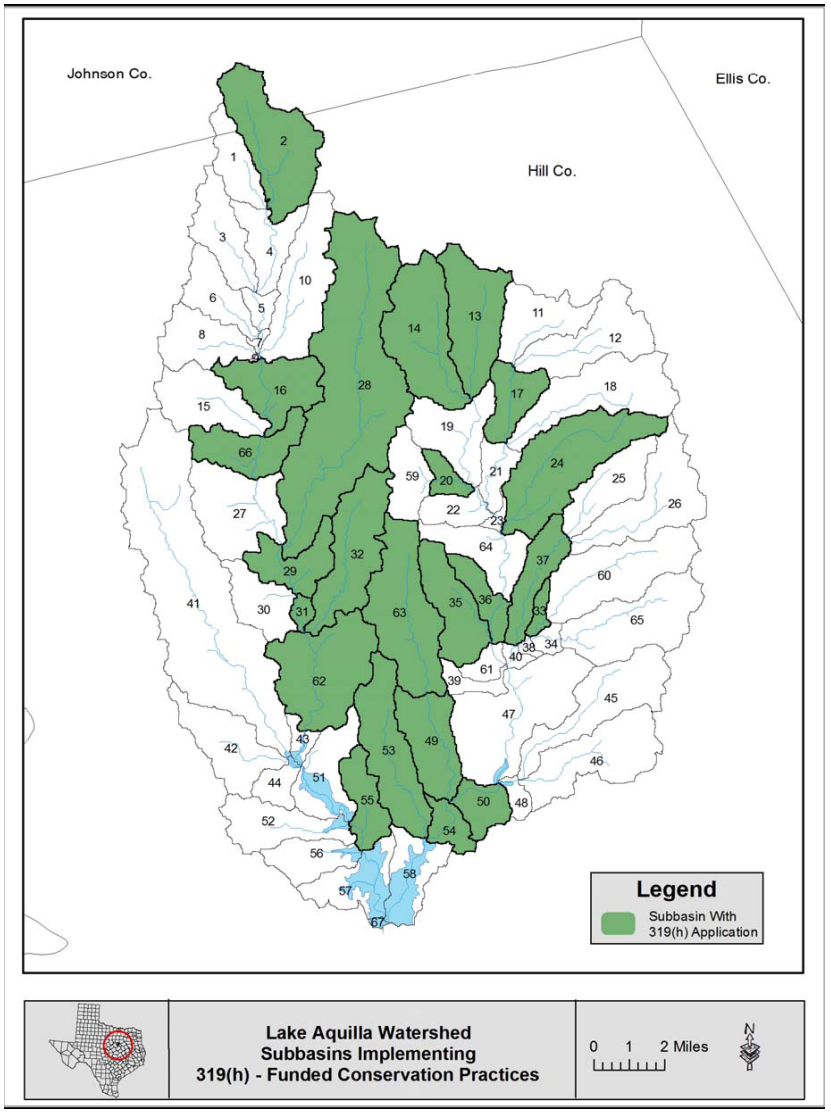
Aquilla



- NRCS
  - $1.93M across FY1998-2003
  - EQIP
    - 99 ac grass filter strips
    - 12,609 ac field borders
    - 3.5 ac riparian buffers
    - 196 ac grassed waterways
    - total 53,022 ac managed
  - CRP & WRP
    - 300 ac cropland converted to wetland areas

Aquilla

- TSSWCB
  - WQMPs w/ 319(h) grant
    - 47,766 linear ft terraces
    - 781 ac cropland converted to hayland
    - 63 ac grassed waterways
    - 3 grade stabilization structures
    - 18 ponds
    - 4 water & sediment basins
    - additional 16,461 ac applied BMPs such as pesticide incorporation, banded application, conservation tillage, & crop residue management

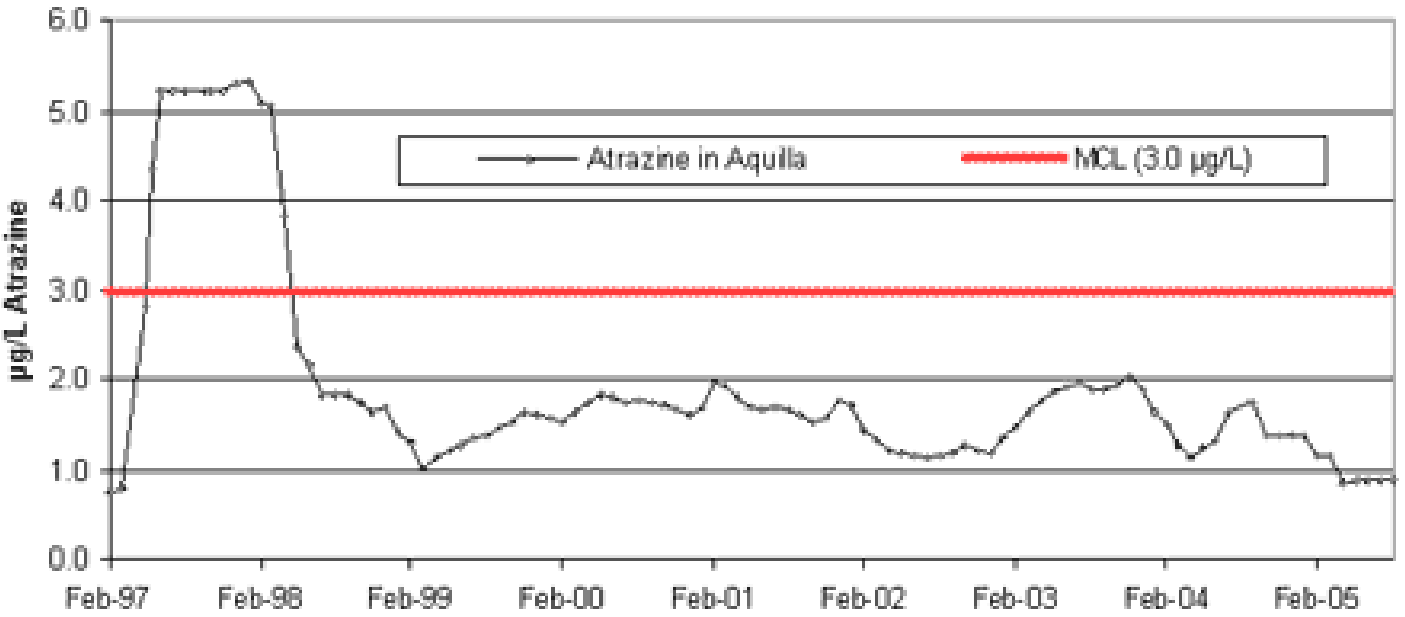


Aquilla

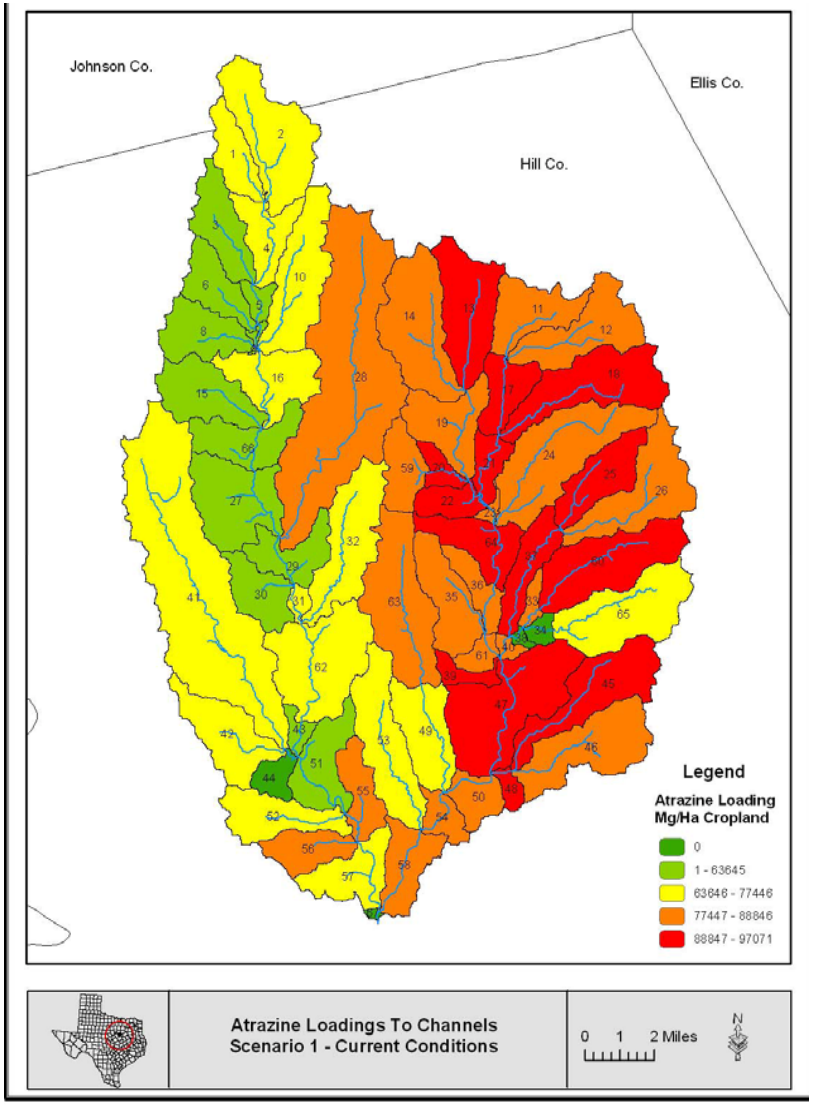
- TSSWCB 319 = $1.6M (federal) + $1.2M (match)
  - TMDL development (inc. stakeholder facilitation)
  - I-Plan development (inc. monitoring)
  - BMP implementation (technical & financial assistance)
  - Outreach, education, demonstration
  - Post-BMP modeling

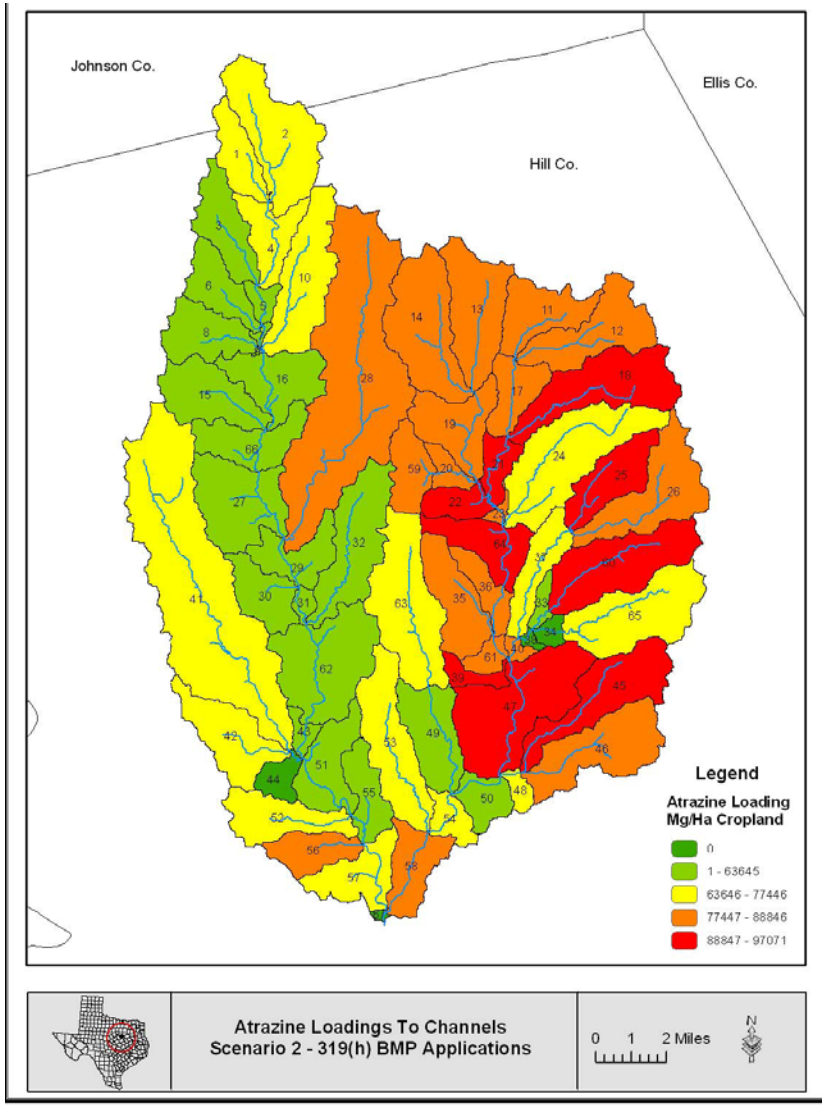
Aquilla

- efforts led to 60% decline in atrazine concentrations, far exceeding TMDL
- removed from 303(d) list for 2004 assessment



Aquilla


Johnson Co.
Ellis Co.
Hill Co.
Legend
Atrazine Loading
Mg/Ha Cropland
0
1 - 63645
63646 - 77446
77447 - 88846
88847 - 97071
Atrazine Loadings To Channels
Scenario 1 - Current Conditions
0 1 2 Miles
N


Johnson Co.
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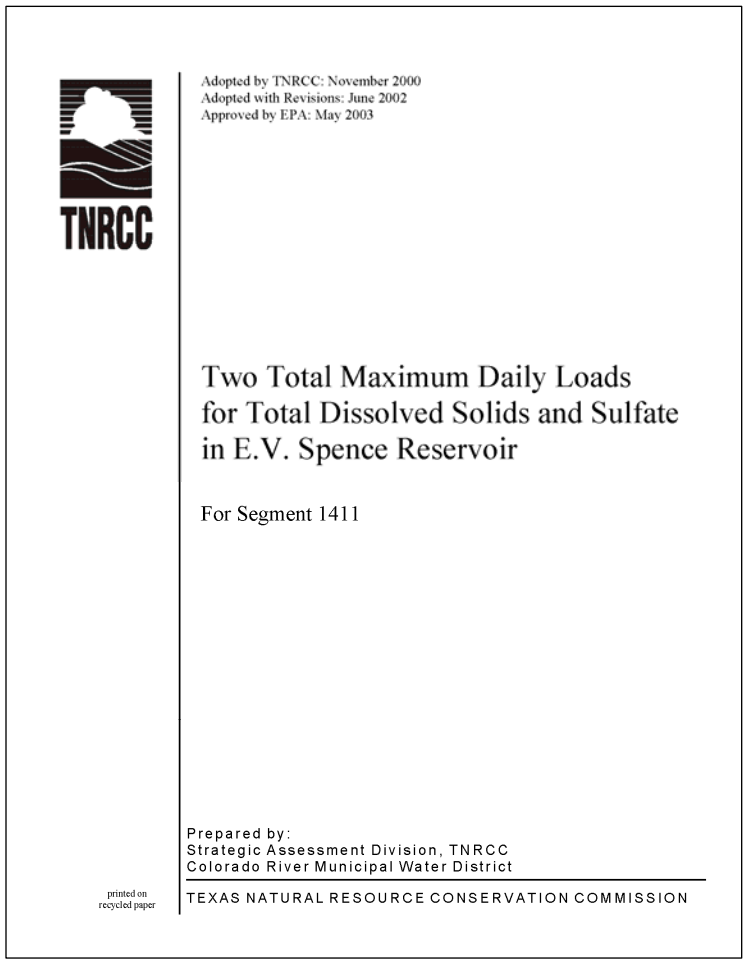
Atrazine Loading
Mg/Ha Cropland
0
1 - 63645
63646 - 77446
77447 - 88846
88847 - 97071
Atrazine Loadings To Channels
Scenario 2 - 319(h) BMP Applications
0 1 2 Miles
N

Aquilla

- Water quality restoration achieved
  - 319 success story
  - http://www.epa.gov/owow/nps/Success319/state/tx_aquilla.htm
- But, SWAT modeling showed that BMPs
  - at farm level, where they were implemented, reduced atrazine loadings from 70-100%
  - at subbasin level reduced atrazine loadings from 2-67%
  - at watershed level reduced atrazine loadings into Aquilla Reservoir by only 6%
- And however, 2008 305(b) report
  - 2 MCL exceedances out of 15 samples @ 3 different locations in reservoir
  - Don't want to loose this success story
  - Need to do follow-up BMP implementation tracking & additional education/outreach? (= 319 to non-impaired waterbody?)

EV Spence



TNRCC

Adopted by TNRCC: November 2000
Adopted with Revisions: June 2002
Approved by EPA: May 2003

Two Total Maximum Daily Loads for Total Dissolved Solids and Sulfate in E.V. Spence Reservoir

For Segment 1411

Prepared by:
Strategic Assessment Division, TNRCC
Colorado River Municipal Water District

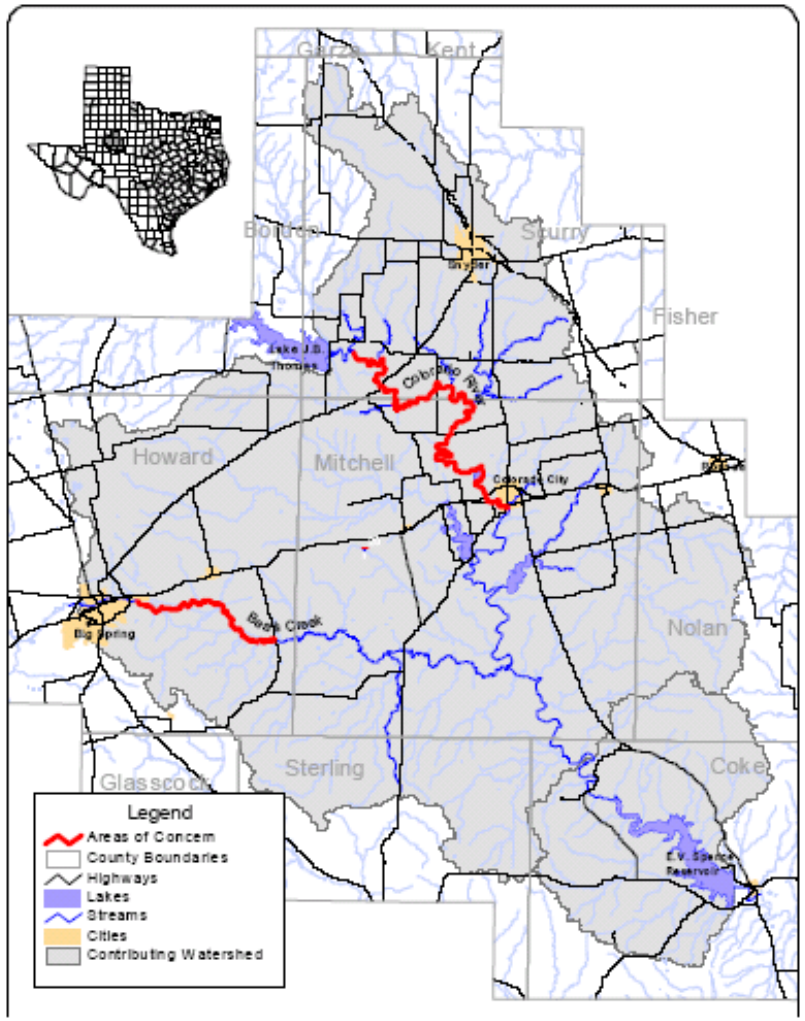
TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

printed on recycled paper

- TMDLs for TDS & sulfate
  - TCEQ adopted November 2000, revised June 2002
  - EPA approved May 2003

EV Spence

- E.V. Spence Reservoir in Colorado River Basin
- watershed 5,018 mi^2
- Colorado River Municipal Water District - reservoir is public drinking water for ~305k
- reservoir is 15,893 surface ac at conservation pool elevation



EV Spence

- placed on 1998 303(d) List
  - sulfate concentrations exceeded criteria of 450 mg/L
  - TDS concentrations exceeded criteria of 1,500 mg/L
  - chloride concentrations approaching criteria of 950 mg/L
- since 1992, water quality in reservoir has continued to deteriorate, partly due to most severe drought conditions region has experienced since reservoir began impounding water in 1969

EV Spence

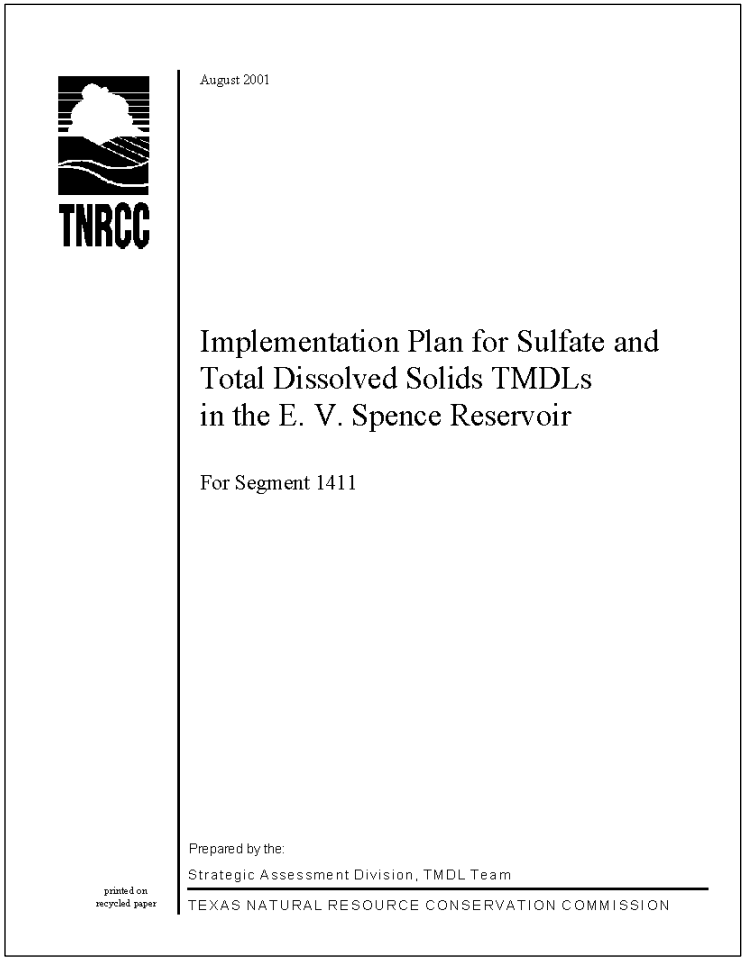
- TMDL endpoint
  - achieve and maintain segment-specific standards for sulfate & TDS, i.e. 450 and 1,500 mg/L, at least 80% of the time
  - load reduction scenario also expected to mitigate the recent increases in reservoir chloride concentrations
- TMDL = WLA (10%) + LA_{nat} (50%) + LA_{man} (40%)
  - ~39% reduction in 80th percentile TDS & sulfate concentrations

EV Spence

- Source ID
  - Discharges from 2 WWTFs
  - Leaking oil wells (total production in 1998 in watershed was nearly 18M barrels)
  - Historic, unlined brine pits (in one county in watershed in 1961, 3.7M barrels were placed in pits)
  - Brine injection wells (41M barrels in 1987)
  - Abandoned industrial magnesium plant (frequently documented unauthorized discharges of high saline water from storage ponds)
  - Groundwater dissolution of natural mineral deposits & surface water moving across salt flats
  - proliferation of invasive phreatophytic brush (saltcedar)

EV Spence

- I-Plan
  - TCEQ approved August 2001



August 2001

TNRCC

Implementation Plan for Sulfate and Total Dissolved Solids TMDLs in the E. V. Spence Reservoir

For Segment 1411

Prepared by the:

Strategic Assessment Division, TMDL Team

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

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EV Spence

- I-Plan components
  - Revision of Municipal Discharge Permits
  - Modifications of Reservoir Operations (Release & Diversion Management)
  - Well Plugging Program
  - Weather Modification
  - Remediation of Magnesium Plant Site
  - Targeted Brush Control

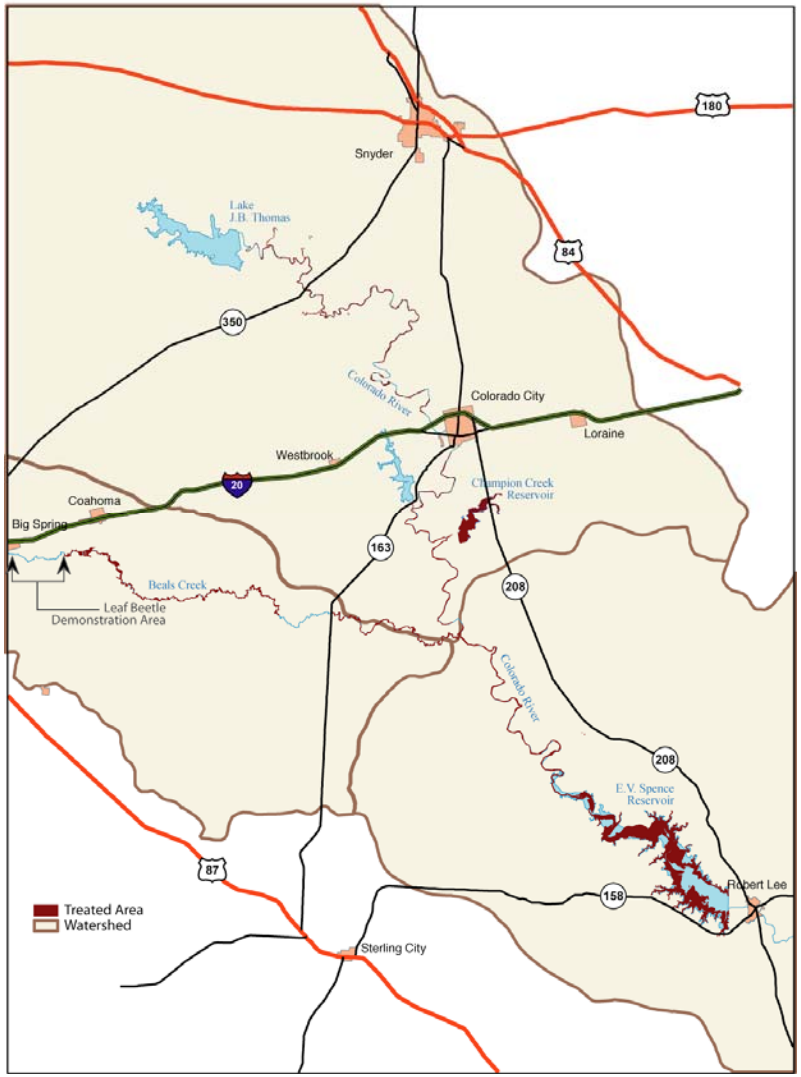
EV Spence

- TCEQ 319 to RRC
  - Properly Plug 171 Abandoned Oil & Gas Wells
  - Assessment of 2 Oil Field Seeps
  - Assessment of Historical Oil Field Brine Pits
  - Monitor & Analyze Data

EV Spence

- Phased, targeted brush control (TSSWCB 319 + state GR)
  - estimated increase in water yield of 3,843 ac-ft per yr to EV Spence
  - chemically treat (aerial application of Arsenal) saltcedar in 150 ft corridor along Colorado River & its major tributaries
    - estimated that 95% of all saltcedar in watershed exists within these riparian areas
    - Needed Section 24(c) “Special Local Needs” Label due to adjacent habitat for Texas poppy-mallow (endangered species)
  - estimated life of one-time chemical treatment is approximately 15 years, so implemented biological control follow-up treatment using Chinese leaf beetles (*Diorhabda elongata*) [USDA-ARS]

EV Spence

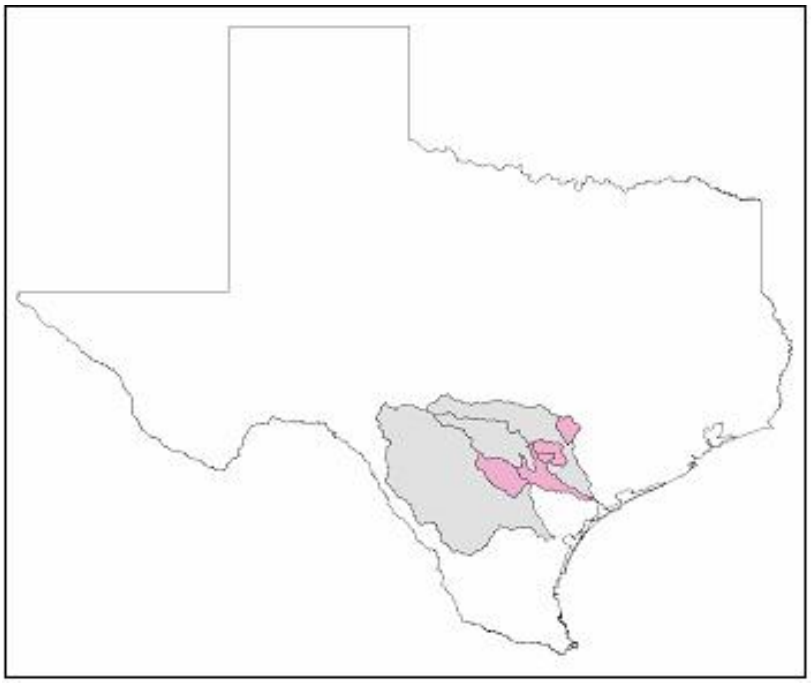


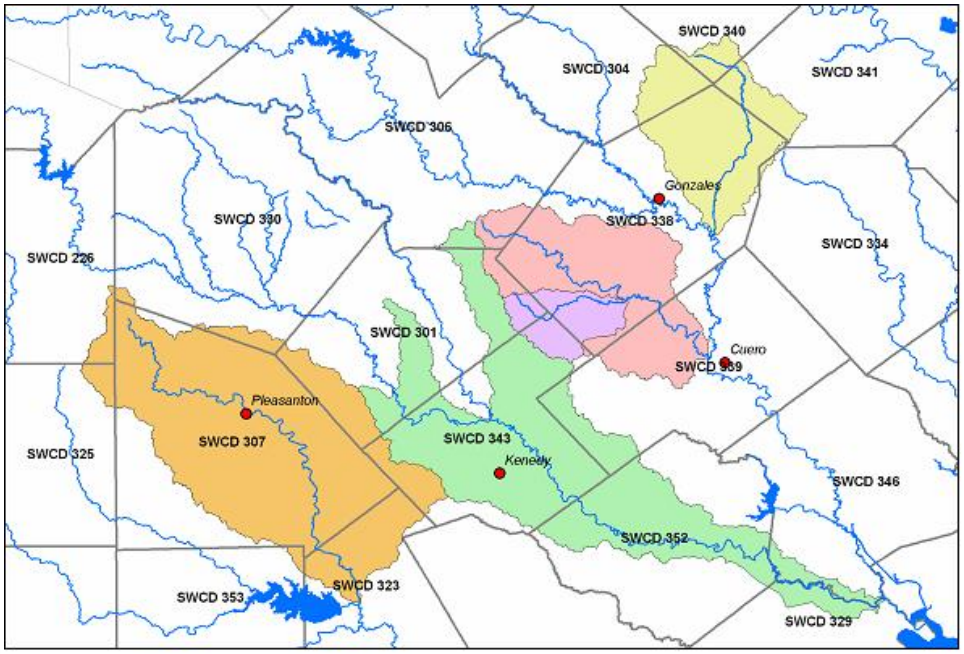
- Over 3 years of spraying, chemically treated 11,391 ac of saltcedar along Colorado River, major tributaries & EV Spence lake basin
- 319 = $2.6M (federal) + $1.6 (match)

South Central TX Bacteria

- ~840 waterbody-pollutant combinations on 2008 303(d), nearly 50% are for bacteria
- Lower San Antonio River, Peach Creek, Elm & Sandies Creeks, and Atascosa River
  - in San Antonio River Basin, Guadalupe River Basin, and Nueces River Basin
- development of these TMDLs initiated several years ago (some adopted, some converted to UAA)

South Central TX Bacteria





South Central TX Bacteria

- To get a jump on implementation, in 2005, TSSWCB & TCEQ worked with NRCS & STAC to establish EQIP State Resource Concern for Water Quality in South Central Texas
- directed toward protection of streams impacted by bacterial contamination from livestock for implementation of BMPs such as cross-fencing, water wells, riparian buffers, watering facilities, and prescribed grazing
- FY2006-2008, NRCS has allocated $2.9M for this State Resource Concern

South Central TX Bacteria

- TSSWCB 319 $850k (federal)
- Technical Assistance Supporting Cooperative Conservation in South Central Texas
- 4 SWCDs taking lead in providing technical assistance to livestock operators in target watersheds, cooperating with 13 adjacent SWCDs
  - provides for support of 4 SWCD technicians who are assisting cattlemen in developing and implementing WQMPs
  - technicians are critically important in promoting EQIP cost-share availability, and encouraging participation from livestock producers
  - technicians also work with AgriLife Extension to educate ranchers about water quality issues and how WQMPs and BMPs address bacterial contamination from livestock
  - technicians work with cattlemens' organizations to educate their members on this opportunity to jointly enhance the value of their operation and achieve water quality goals

Perspective

- Relationship between TCEQ, TSSWCB, EPA and NRCS is working in Texas
- Voluntary implementation of ag/silv NPS is tending towards water quality restoration success in Texas
- TSSWCB frequently plays on-the-ground intermediary between EPA and NRCS

Watershed Planning Short Course

- Instruction for watershed coordinators in developing 9-element WBPs
- Bandera, TX
- August 17-21, 2009
- http://watershedplanning.tamu.edu/

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http://www.tsswcb.state.tx.us/watersheds