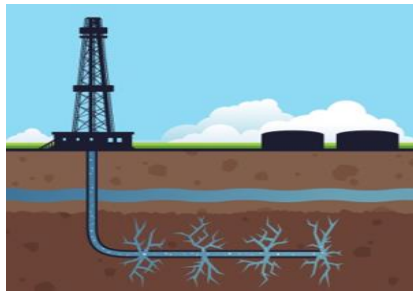


Mixing Oil and Water: The Importance of H₂O to Energy Development



AAPL Texas Land Institute

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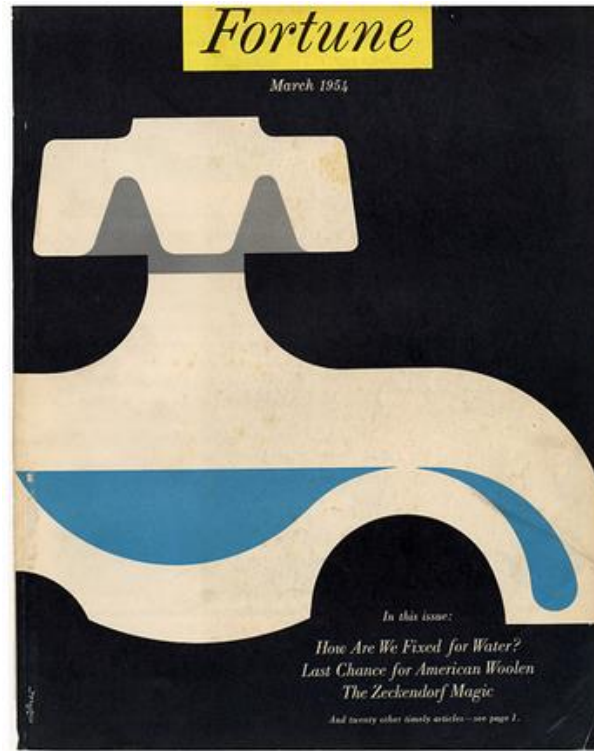
“When the well is dry, we know the worth of water.”

– Benjamin Franklin



“If the wars of this century were fought over oil, the wars of the next century will be fought over water”

– Ismail Serageldin, World Bank Vice President, 1995.



“Water promises to be to the 21st century what oil was to the 20th century: the precious commodity that determines the wealth of nations.”

—*Fortune* magazine, May 2000.

Overview:



- ❖ Water Supplies:
 - ❖ Importance to Energy Development
 - ❖ Water Sources
 - ❖ Importance of Reuse
- ❖ Planning, Politics, and Lawsuits
 - ❖ Proposition 6
 - ❖ Lawsuits
 - ❖ Rule of Capture/Trespass Law Comparisons
- ❖ Legal Framework: Contracts and Regulations
 - ❖ Contracting for Water
 - ❖ Water Regulation

Water Supplies and Water Quality

- ❖ Why should I care about water (and Texas Water law?)
 - ❖ Storage
 - ❖ Reuse
 - ❖ Supplies
 - ❖ Exploration and Production
 - ❖ Disposal of wastewater
 - ❖ Underground injection
 - ❖ Discharge
 - ❖ Regulatory Regime



water quiz

Q: What percentage of Texas' statewide water use is related to oil and gas mining/fracking/development?

A: 15%

B: 1%

C: 35%

D: 0.000001%

water quiz

Q: What is the approximate amount of water used in hydraulic fracking per well?

A: 4-6 million gallons

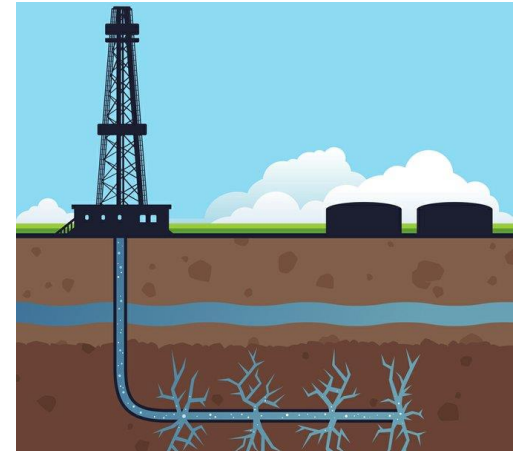
B: 100 million gallons

C: 1 billion gallons

D: 5,000 gallons

Water for Oil and Gas Exploration and Production

- ❖ Water use for oil and gas in exploration and production
 - ❖ Drilling operations
 - ❖ Well completion – Fracking



Water for Oil and Gas Exploration and Production

- ❖ Diversion and storage authorization



- ❖ Annual amount of diversion and rate of diversion

- ❖ On-channel storage / off-channel storage

- ❖ Permit authorization needed for on-channel storage
- ❖ Permit authorization needed for storage of state water in off-channel structure

Discharge and Disposal of Oil and Gas Waste

- ❖ Discharge into “waters of the United States”
 - ❖ Governed by the Clean Water Act
 - ❖ Regulated by the National Pollutant Discharge Elimination System (NPDES) permitting program
 - ❖ TWC Section 26.131(b):
 - ❖ Railroad Comm’n may issue permits for discharge of wastes from O&G exploration (but must meet TPDES water quality standards)
- ❖ Disposal by well injection
 - ❖ Safe Drinking Water Act (SDWA)

Discharge and Disposal of Oil and Gas Waste

- ❖ Disposal authority for Underground Injection Control Program
 - ❖ TWC Section 27.031: No person may continue using a disposal well or begin drilling a disposal well or converting an existing well into a disposal well to dispose of oil and gas waste without first obtaining a permit from the RCT.

Water Supplies

❖ Sources of Water Supplies

❖ Surface Water

❖ Chapter 11 of the TWC

- ❖ TCEQ Authority
- ❖ Water Rights Permits

❖ Groundwater

❖ Chapter 36 of the TWC

- ❖ Ownership of Groundwater
- ❖ Role of GCD

❖ Other sources:

- ❖ Reuse/Recycling
- ❖ Desalination



water quiz

Q: Who owns Surface Water in Texas?

A: Individual Property Owners

B: County Governments

C: King of Spain

D: State of Texas

water quiz

Q: Who owns Groundwater in Texas?

A: Individual Property Owners

B: County Governments

C: King of Spain

D: State of Texas

water quiz

Q: What is a “Priority Call?”

A: Method of Demanding Groundwater from GCDs

B: When EPA claims Environmental Priority over water

C: Method of Requesting Cut-offs of Junior Water rights

D: Method of obtaining front seat status on car rides

water quiz

Q: What is a “Water Master?”

A: A fourth-generation (or older) farmer with riparian water rights

B: Basin-specific manager of water rights

C: Slang term for TCEQ

D: Title for anyone who completes the Ice Bucket Challenge

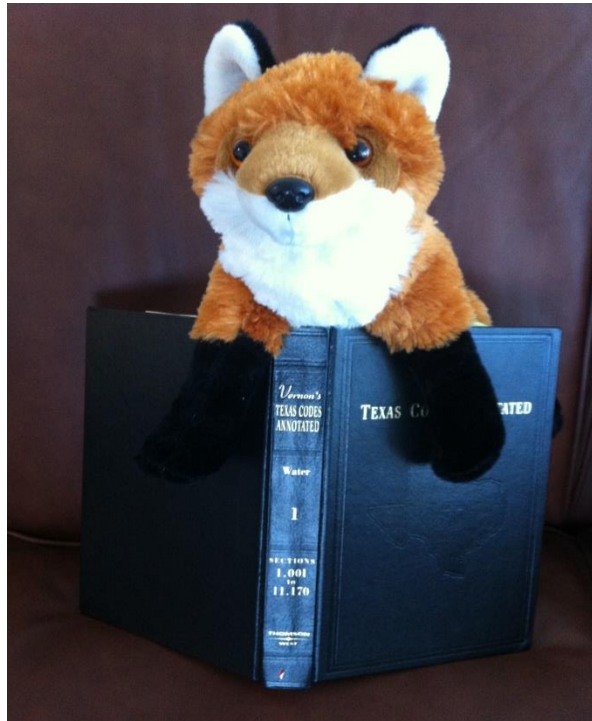
Texas Surface Water Law

Evolved from Two Doctrines of Water Law

- Riparian Doctrine
 - Private water rights are tied to the ownership of land bordering a natural stream or river
 - No longer available except for domestic and livestock purposes
- Doctrine of Prior Appropriation
 - Water rights are acquired through express appropriation by compliance with statutory requirements

“Prior Appropriation” – What does it mean?

- *Pierson v. Post* – “What does the fox say?”



“First in time is first in right”

Texas Surface Water Law

Currently . . .

- With few exceptions, anyone seeking a surface water right must comply with the Texas Water Code and prior appropriation system in allocating water rights.



What about the exceptions?

Water Rights Permit Exemptions
TWC Sections 11.142, 11.1421, 11.1422

- Domestic and Livestock (but only up to 200 acre feet)
- Fish and Wildlife Purposes (but only up to 200 acre feet)
- Sediment control reservoir as part of surface coal mining operation
- Irrigation of historic cemeteries



Exception for Oil and Gas Exploration/Production?

- ❖ No exemption for oil and gas exploration or production purposes
- ❖ Exempt dams or reservoirs for domestic and livestock purposes may not be used for oil and gas exploration or production purposes



TWC Section 11.023

Purposes for which water may be appropriated, stored or diverted:

- ❖ Domestic and municipal
- ❖ Agricultural and industrial
- ❖ Mining and recovery of minerals
- ❖ Hydroelectric power and navigation
- ❖ Recreation and pleasure, public parks and game preserves
- ❖ Or for any other beneficial use



Types of Water Rights Permits



1. Perpetual Permits – TWC Section 11.121
 - ❖ General authorization to divert, store, and use water
2. Seasonal Permits – TWC Section 11.137
 - ❖ Issued in same manner as a general permit
 - ❖ Right to take, use, or divert water under seasonal permit is limited to the portion or portions of the calendar year stated in the permit

Types of Water Rights Permits

3. Temporary Permits – TWC Section 11.138

- ❖ No notice or hearing required if water appropriation is less than 10 acre-feet for less than 1 year
- ❖ Must be for beneficial purpose and not interfere with prior appropriations
- ❖ Maximum of 3 years for permit



4. Term Permits – TWC Section 11.1381

- ❖ A permit for a term of years for the use of unused appropriated water when there is insufficient unappropriated water in the source supply to satisfy the application.

Types of Water Rights Permits

5. Permit to use water from exempt dam or reservoir for nonexempt purpose – TWC 11.143



- ❖ The owner of a dam or reservoir exempted under TWC 11.142 for domestic and livestock purposes or fish and wildlife purposes must obtain a permit to use water from the dam or reservoir if for non-exempt purpose.
- ❖ Owner may obtain a regular permit, a seasonal permit, or a permit for a term of years.

Enforcement?

- ❖ Failure to comply with TWC Section 11.121 provisions re: acquiring a permit may result in:
 - ❖ Civil penalties of up to \$5,000 for each day a person willfully takes, stores, or diverts state water without a permit
 - ❖ Injunction
 - ❖ Administrative penalties of up to \$5,000 for each day a person willfully takes, stores, or diverts state water without a permit

And Now For Something Completely Different . . .



Texas Groundwater Law

Texas Groundwater Law



Texas Groundwater Law

❖ Rule of Capture

- ❖ English common law doctrine
- ❖ Affirmed by Texas Supreme Court in 1904
- ❖ Texas Supreme Court reaffirmed rule of capture in 1999
- ❖ Surface estate owner has the right to pump groundwater from beneath the surface of surface estate
- ❖ Rule of the “biggest pump”

Texas Groundwater Law

- ❖ *Edwards Aquifer Auth. v. Day*, 369 S.W. 3d 814 (Tex. 2012), reh'g denied (June 8, 2012)
 - ❖ Constitutionally protected property interest in groundwater in place
 - ❖ Takings analysis
 - ❖ *However*, role of groundwater conservation districts preserved

Groundwater Conservation Districts

- ❖ Creation (three ways):
 - ❖ Legislative action
 - ❖ Petition from landowners
 - ❖ TCEQ initiates creation of GCD
- ❖ Authority under Chapter 36
 - ❖ Management Plans
 - ❖ Joint planning groups
 - ❖ Rules (including drilling permits)

water quiz

Q: How many surface water regulators are there in Texas?

A: 13

B: 36

C: 4

D: 1

water quiz

Q: How many groundwater conservation districts are there in Texas?

A: 13

B: 254 (one per county)

C: 99

D: 7

Confirmed Groundwater Conservation Districts

1. Anderson County UWCD - 10/17/1987
2. Bandera County River Authority & Ground Water District - 11/7/1989
3. Barton Springs/Edwards Aquifer CD - 8/13/1987
4. Bee GCD - 1/28/2001
5. Blanco-Pedernales GCD - 1/23/2001
6. Bluebonnet GCD - 11/5/2002
7. Brazoria County GCD - 11/8/2005
8. Brazos Valley GCD - 11/5/2002
9. Brewster County GCD - 11/6/2001
10. Brush County GCD - 11/3/2009
11. Central Texas GCD - 9/24/2005
12. Clear Fork GCD - 11/5/2002
13. Clearwater UWCD - 8/21/1999
14. Coastal Bend GCD - 11/6/2001
15. Coastal Plains GCD - 11/6/2001
16. Coke County UWCD - 11/4/1986
17. Colorado County GCD - 11/6/2007
18. Corpus Christi ASRCD - 6/17/2005
19. Cow Creek GCD - 11/5/2002
20. Crockett County GCD - 1/26/1991
21. Culberson County GCD - 5/2/1998
22. Duval County GCD - 7/25/2009
23. Edwards Aquifer Authority - 7/28/1996
24. Evergreen UWCD - 8/30/1965
25. Fayette County GCD - 11/6/2001
26. Fox Crossing Water District - 4/4/1986
27. Garza County UWCD - 11/5/1996
28. Gateway GCD - 5/3/2003
29. Glasscock GCD - 8/22/1981
30. Goliad County GCD - 11/6/2001
31. Gonzales County UWCD - 11/2/1994
32. Guadalupe County GCD - 11/14/1999
33. Hays Trinity GCD - 5/2/2003
34. Headwaters GCD - 11/5/1991
35. Hemphill County UWCD - 11/4/1997
36. Hickory UWCD No. 1 - 8/14/1982
37. High Plains UWCD No. 1 - 8/20/1951
38. Hill Country UWCD - 8/8/1987
39. Hudspeth County UWCD No. 1 - 10/5/1957
40. Iron County UWCD - 8/21/1985
41. Jeff Davis County UWCD - 11/2/1993
42. Kenedy County GCD - 11/2/2004
43. Kinbley County GCD - 5/28/2002
44. Kinney County GCD - 11/2/2002
45. Lipan-Kickapoo WCD - 11/3/1987
46. Live Oak UWCD - 11/7/1989
47. Llano Estacado UWCD - 11/3/1998
48. Lone Star GCD - 11/6/2001
49. Lone Wolf GCD - 2/22/2002
50. Lost Pines GCD - 11/5/2002
51. Lower Trinity GCD - 11/7/2006
52. McMullen GCD - 11/6/2001
53. Medina County GCD - 8/26/1991
54. Menard County UWCD - 8/14/1999
55. Mesa UWCD - 1/26/1999
56. Mesquite GCD - 11/4/1986
57. Mid-East Texas GCD - 11/5/2002
58. Middle Pecos GCD - 11/5/2002
59. Middle Trinity GCD - 5/4/2002
60. Neches & Trinity Valleys GCD - 11/6/2001
61. North Plains GCD - 1/21/1955
62. North Texas GCD - 1/21/2009
63. Northern Trinity GCD - 5/15/2007
64. Panhandle GCD - 1/21/1956
65. Panola County GCD - 11/6/2007
66. Pecan Valley GCD - 11/6/2001
67. Permian Basin UWCD - 9/21/1985
68. Pineywoods GCD - 11/6/2001
69. Plateau UWCD and Supply District - 3/4/1974
70. Plum Creek CD - 5/1/1993
71. Post Oak Savannah GCD - 11/5/2002
72. Prairies GCD - 3/7/2009
73. Presidio County UWCD - 8/31/1999
74. Real-Edwards C and R District - 5/30/1959
75. Red River GCD - 11/6/2001
76. Red Sands GCD - 11/5/2002
77. Refuge GCD - 11/6/2001
78. Rolling Plains GCD - 1/26/1999
79. Rusk County GCD - 5/5/2004
80. San Patricio County GCD - 5/12/2007
81. Sandy Land UWCD - 11/7/1989
82. Santa Rita UWCD - 8/19/1989
83. Saratoga UWCD - 11/7/1989
84. South Plains UWCD - 2/8/1992
85. Southeast Texas GCD - 11/2/2004
86. Southern Trinity GCD - 8/19/2009
87. Starr County GCD - 11/6/2007
88. Sterling County UWCD - 11/3/1987
89. Sutton County UWCD - 4/5/1986
90. Texana GCD - 11/6/2001
91. Trinity Glen Rose GCD - 11/5/2002
92. Upper Trinity GCD - 11/6/2007
93. Uvalde County UWCD - 9/1/1993
94. Victoria County GCD - 8/5/2005
95. Waco-TEX GCD - 11/5/2003
96. Watergardens GCD - 11/7/1998

Unconfirmed Groundwater Conservation Districts

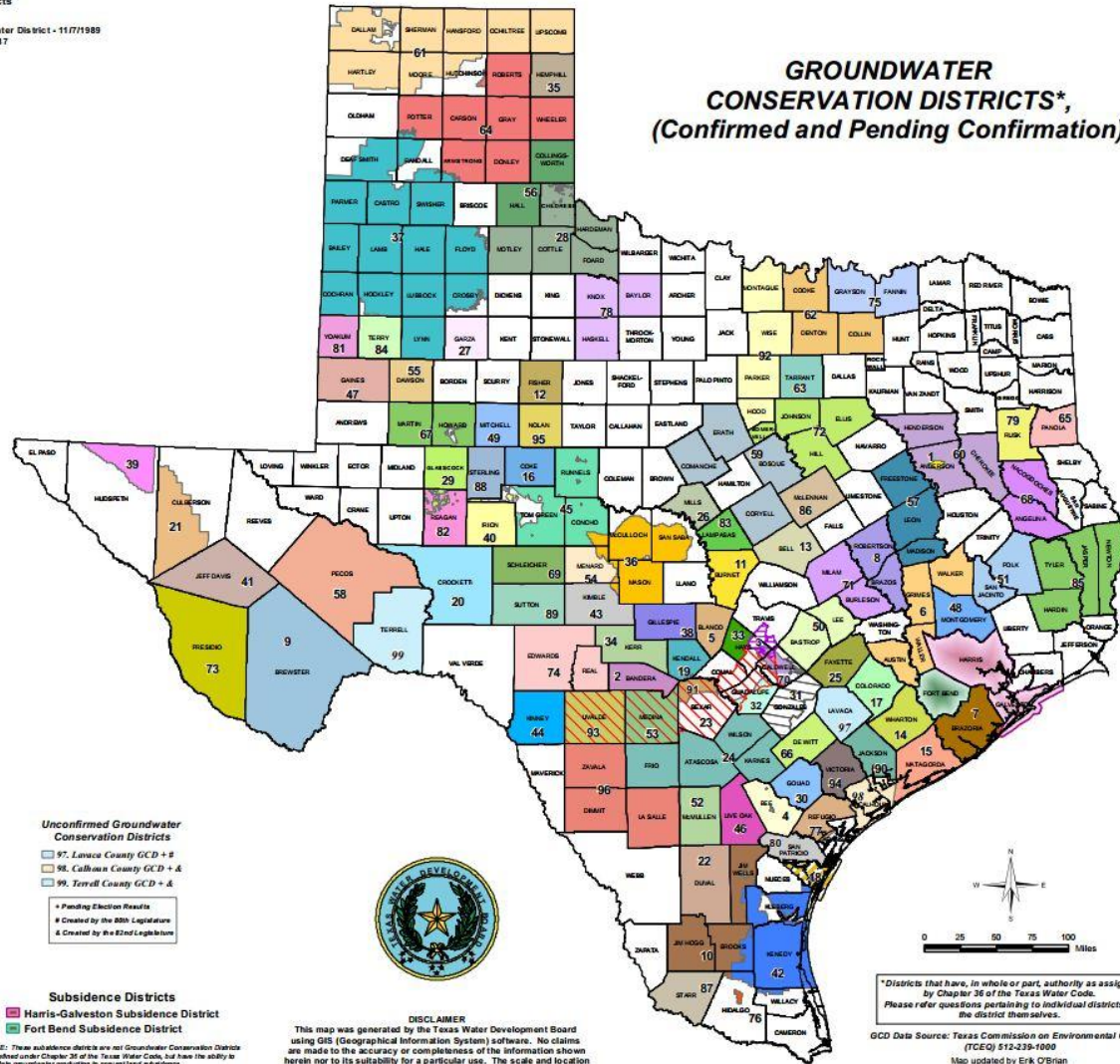
- 97. Lavaca County GCD - 8
 - 98. Culberson County GCD - 4
 - 99. Terrell County GCD - 4
- * Pending Election Results
 * Created by the 80th Legislature
 * Created by the 82nd Legislature

Subsidence Districts

- Harris-Galveston Subsidence District
- Fort Bend Subsidence District

NOTE: The subsidence districts are not Groundwater Conservation Districts as defined under Chapter 20 of the Texas Water Code, but have the ability to regulate groundwater production to prevent land subsidence.
 (Refer to Senate Bill 1537 from the 75th Legislature Session)

GROUNDWATER CONSERVATION DISTRICTS*, (Confirmed and Pending Confirmation)



*Districts that have, in whole or part, authority as assigned by Chapter 20 of the Texas Water Code.
 Please refer questions pertaining to individual districts to the district themselves.
 GCD Data Source: Texas Commission on Environmental Quality (TCEQ) 512-239-1000
 Map updated by Erik O'Brien
 September 2011

Other Supplies/Sources

❖ Desalination

- ❖ Energy required

- ❖ Cost

- ❖ Disposing waste streams

❖ Conservation and Consequences

❖ Reuse

- ❖ Direct Reuse

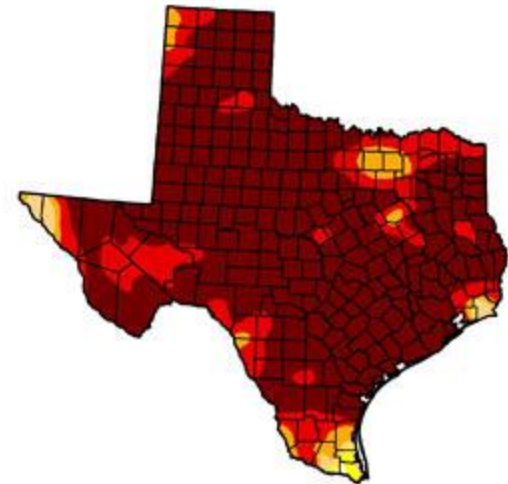
- ❖ Indirect Reuse

❖ Recycling



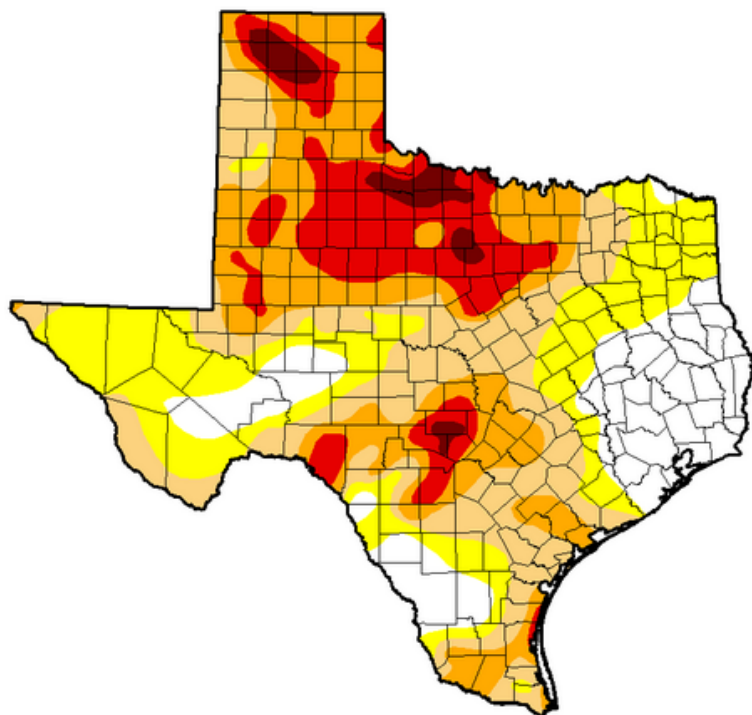
Drought

- ❖ Impact of current drought upon water planning



Drought

U.S. Drought Monitor Texas



August 26, 2014

(Released Thursday August 28, 2014)

Valid 8 a.m. EDT

Statistics type: ☒ Traditional (D0-D4, D1-D4, etc.) ☐ Categorical (D0, D1, etc.)

Drought Condition (Percent Area):

Week	Date	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	8/26/2014	16.83	83.17	61.25	38.21	16.23	2.76
Last Week	8/19/2014	19.17	80.83	59.28	34.23	15.16	2.76
3 Months Ago	5/27/2014	10.72	89.28	71.16	49.16	32.81	10.76
Start of Calendar Year	12/31/2013	28.48	71.52	43.84	21.15	5.82	0.79
Start of Water Year	10/1/2013	6.62	93.38	70.95	25.08	4.01	0.12
One Year Ago	8/27/2013	2.82	97.18	87.88	66.12	19.34	2.74

[View More Statistics](#)

Intensity:

D0 - Abnormally Dry

D1 - Moderate Drought

D2 - Severe Drought

D3 - Extreme Drought

D4 - Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying [text summary](#) for forecast statements.



Drought



- ❖ Rainfall in production areas of Texas
 - ❖ Eagle Ford Shale: averages 21 inches/year rainfall
 - ❖ Permian Basin: averages 17 inches/year rainfall
 - ❖ Compare with Houston: 53 inches/year rainfall

Recycling



❖ Recycling

- ❖ Railroad Commission Rules

❖ Permit Required to Recycle Water?

- ❖ A: Yes

- ❖ B: No

❖ Impact on Water Supplies in the Field

- ❖ Current wastewater fracking recycling rate 30%

- ❖ In 2009: 1%

- ❖ By 2014: 50%

Planning, Politics, and Lawsuits

❖ Water Planning

- ❖ Texas Water Development Board
- ❖ Regional Water Plans
- ❖ State Water Plan

❖ Proposition 6

- ❖ Supporters
- ❖ Impact



Lawsuits

- ❖ Texas vs. Neighbors:
- ❖ Who's taking Texas water?



Texas v. New Mexico et al, 141, ORIG., 2014 WL 273246 (U.S. Jan. 27, 2014).

Planning, Politics, and Lawsuits

❖ Where can Texas obtain more water?



❖ *Tarrant Reg'l Water Dist. v. Herrmann*,
133 S. Ct. 2120 (2013)

Planning, Politics, and Lawsuits

❖ Suing neighbors:

❖ Rule of Capture

❖ *Edwards Aquifer Auth. v. Day*, 369 S.W.3d 814 (Tex. 2012), reh'g denied (June 8, 2012)



Planning, Politics, and Suing Neighbors

❖ Suing private neighbors:

❖ *FPL Farming LTD., v. Env'tl. Processing Systems*, 383 S.W.3d 274 (Tex. App.—Beaumont 2012, pet. granted)

❖ Lawsuits against injection well operators for fluid migration

❖ Potential impacts



Legal Framework: Obtaining Water

- ❖ Legal Framework
 - ❖ Contracting for Water
 - ❖ Water Supply Contracts
 - ❖ TCEQ Requirements
 - ❖ Contracting for Water



Legal Framework: Regulations

❖ Regulations

❖ TCEQ, Railroad Commission, EPA, et al.



Legal Framework: Regulations

- ❖ Regulations (EPA)
 - ❖ Clean Water Act
 - ❖ Safe Drinking Water Act
 - ❖ EPA interest in fracking



Conclusions

- ❖ Water Supplies as Major Policy and Private Enterprise Challenge.
- ❖ “Blue Paydirt” concept.
- ❖ Value of water to energy in Texas
- ❖ Regulatory Environment: Compliance with current regulations; anticipation of future requirements.

Questions



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