

Sparta Aquifer Recovery

South Arkansas & North Louisiana

“We’re Not **California** – but We Coulda’ Been”

or

Problem Solving through Practical Application of Public Policy

Sherrel Johnson

Grants & Special Projects Manager, Union County Water Conservation Board
El Dorado Chamber of Commerce President & CEO 1995-2000

Environmental Law – Arkansas Bar Association

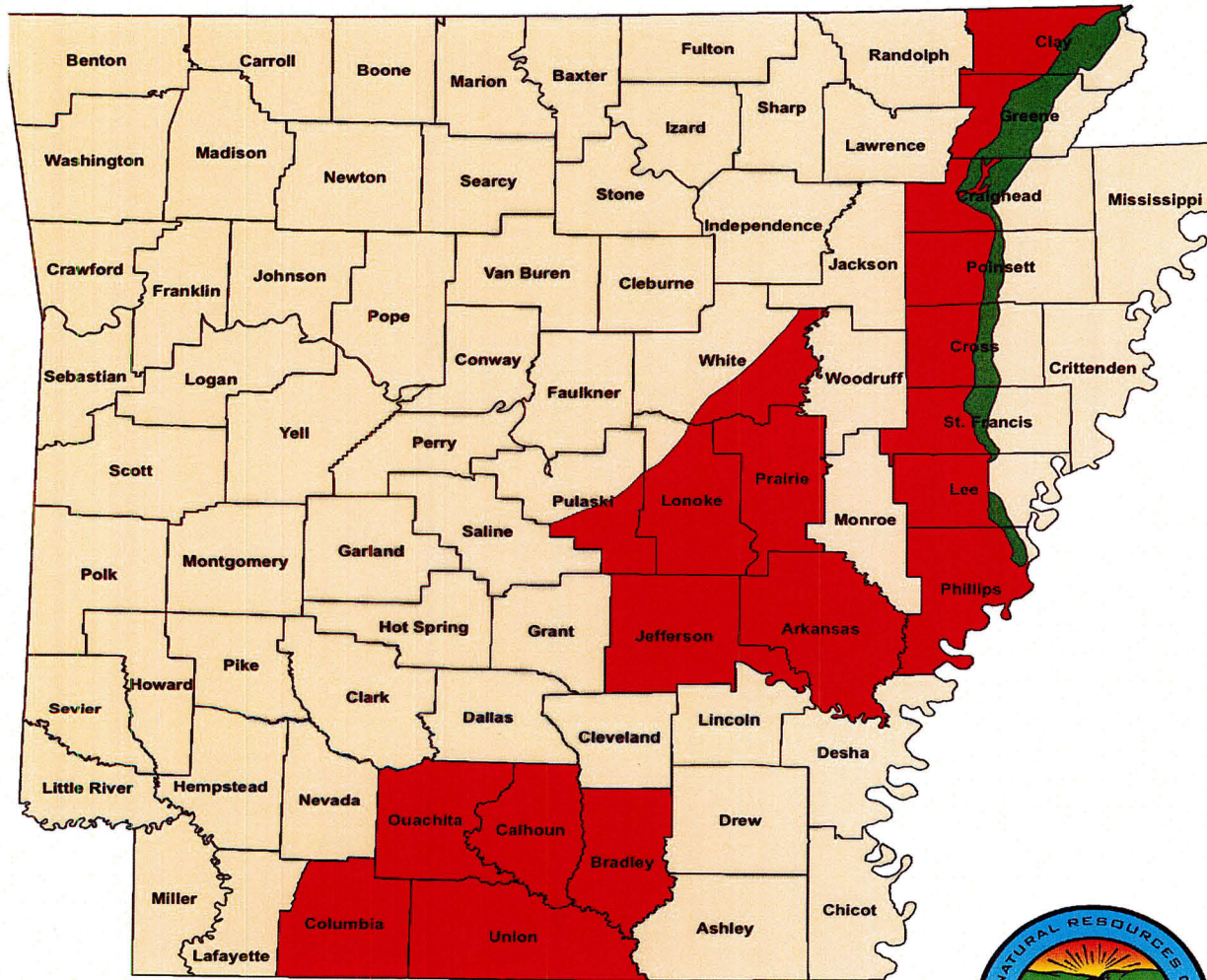
September 13, 2016

Union County Water Conservation Board

441 West Cedar, El Dorado, Arkansas 71730 • 870 814-2871 or cindywoolsey@suddenlink.net • www.ucwcb.org



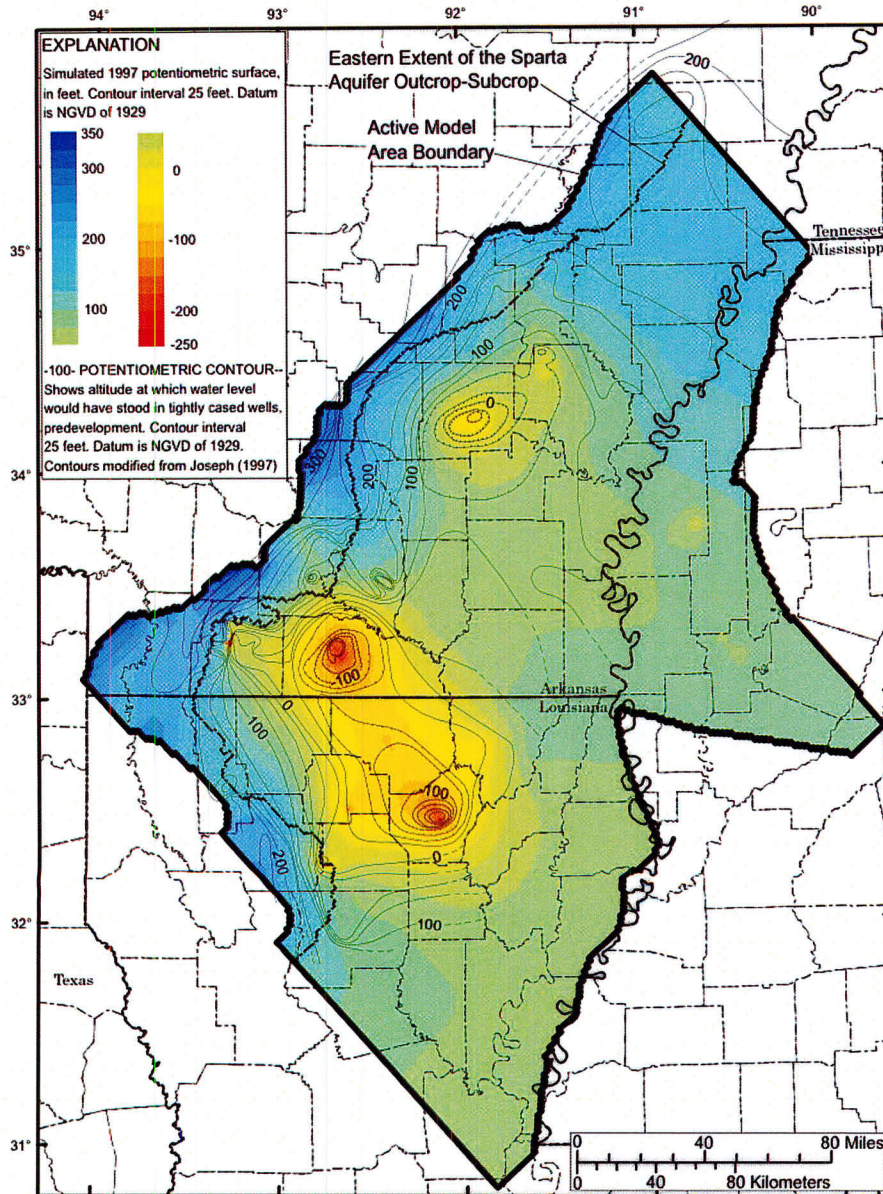
Critical Groundwater Areas



USGS & ANRC
agreed -- Union
County's situation
was the **worst**.

South Arkansas for Sparta in 1996
Grand Prairie for Sparta & Alluvial in 1998
Cache for Sparta/Memphis Sand & Alluvial in 2009
Phillips County for Alluvial in 2015

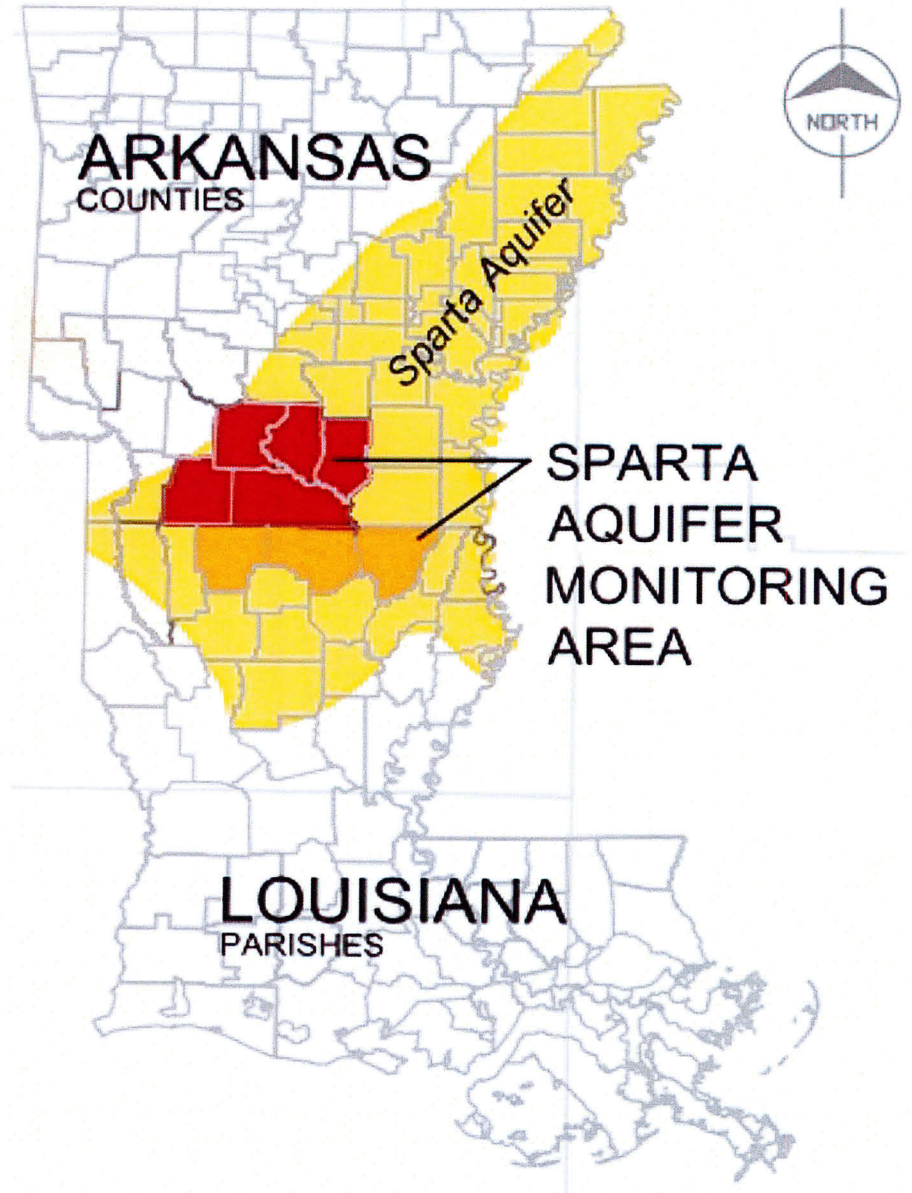
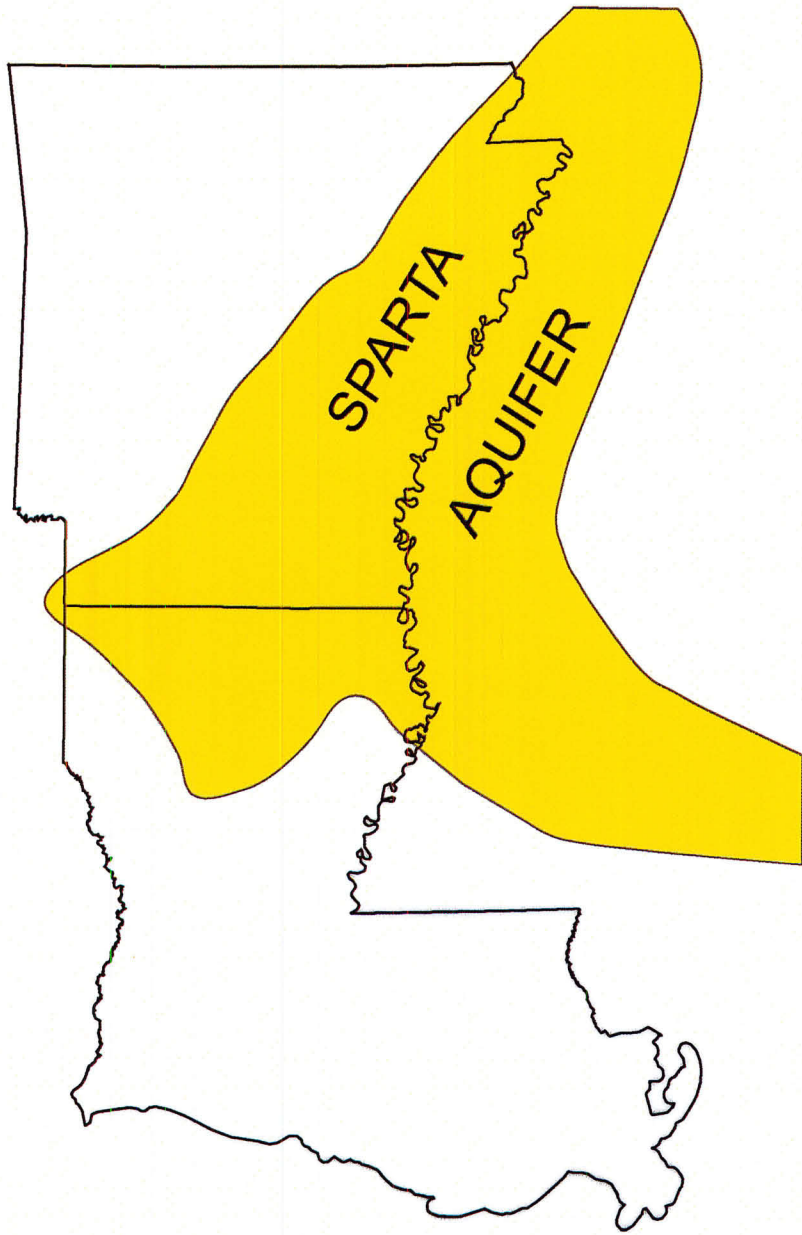




Problem – 1996: Union County’s only source of drinking & industrial water -- was declining rapidly and met Critical Groundwater criteria

- Groundwater levels declining 1’+ per year for 5 previous years
- Water quality degradation or threat
- Groundwater levels at or below top of aquifer

No time to waste. Help ourselves. Go it alone.



“Union County must reduce Sparta groundwater consumption by 72% from 21 mgd to 7 mgd in five years or less or risk inflicting irreparable damage on the Sparta aquifer,” at the time the County’s only source of drinking and industrial water.

- USGS Arkansas Water Science Center, 1998

Solving this problem was Union County’s top economic development priority.

1997

21 mgd Sparta groundwater

**Groundwater levels declining
as much as 7' per year**

**Saltwater encroachment
threatened our only source of
drinking water**

**No single authority over
Sparta groundwater in Union County
& no funding**

No alternative source

First step? In 1997, leadership decided that addressing the declining Sparta aquifer on a **county-wide** basis was **Union County's** top economic development priority.

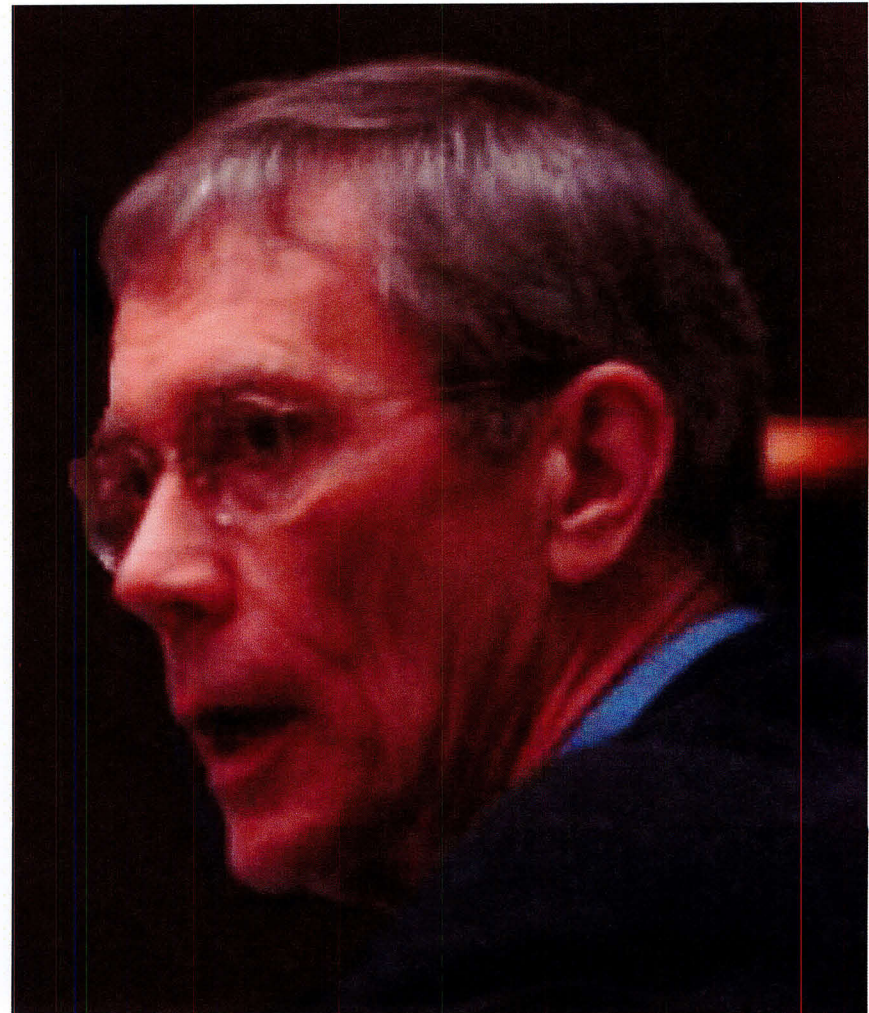
First problem? **No entity** with authority to manage the Sparta and generate funding.

Solution: **Legislation** resulting in Act 1050 of 1999, which allowed for formation of Critical Groundwater Counties Boards.



Jim Buttry

Friday Eldridge & Clark



Jodie Mahony

Legislator/Lawyer

Joe Hickey, El Dorado

Tom Leggett, Friday Firm, Little Rock

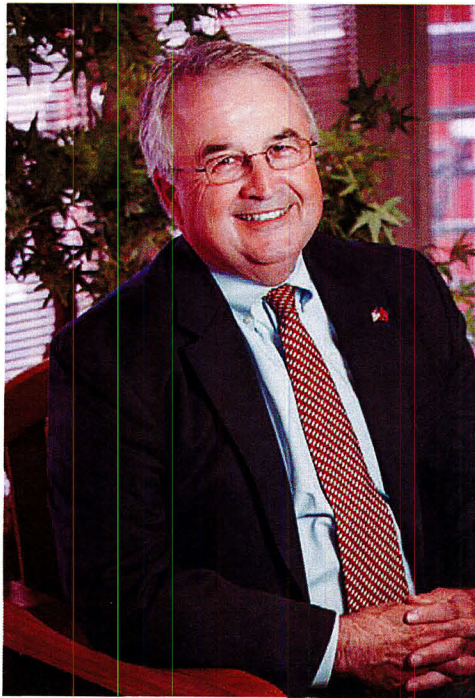
Jake Looney, Arkadelphia

Mark Hudson

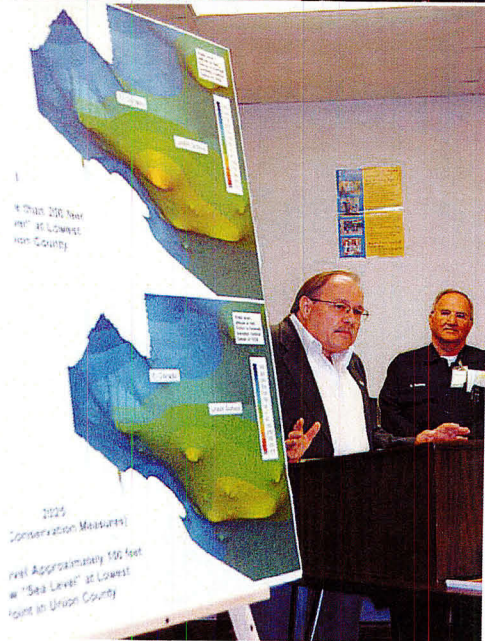
Legislative Research

Uvalde Lindsey

Ozark International



Randy Young, ANRC – then
Arkansas Soil & Water Commission



John Terry, USGS Arkansas

Union County Port Authority

201 North Jackson • El Dorado, Arkansas 71730
870 863-6113 • FAX 870 863-6115

COUNTY-WIDE WATER PROJECT OWNERSHIP STATEMENT Union County Water Alliance

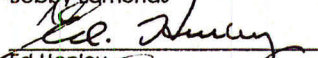
All portions of the infrastructure or related expenditures that are included in the final water project that will be described in state and federal grant applications and the proposed county-wide sales tax will come under the jurisdiction of a new county-wide entity.


The construction and operating agreement will be mutually agreed upon by all parties of the new county-wide entity. The structure of this new county-wide entity is to be comprised of equitable allocation of both city and county government assets which will fairly represent all the citizens of Union County.


Larry Combs


Mike Dumas


Bobby Edmonds


Ed Henley


Sherrel Johnson


Nick Macchiarolo


Ron Robinson

Dated December 22, 1998

Callion: Mary Lee Evers, Randle Tomlinson
El Dorado: John Lowery, John Garrison, Bill McGuire, Ron Robinson, Floyd Thomas
Smackover: Billy Neal, Bob Willett
Ex-officio: El Dorado Mayor Mike Dumas, Union County Judge Bobby Edmonds

Union County Port Authority – UCWA + Citizen at Large

El Dorado Industrial Development Corporation – 501(c)6

Union County Industrial Board – Public Facilities Board

May 1997 – June 1999

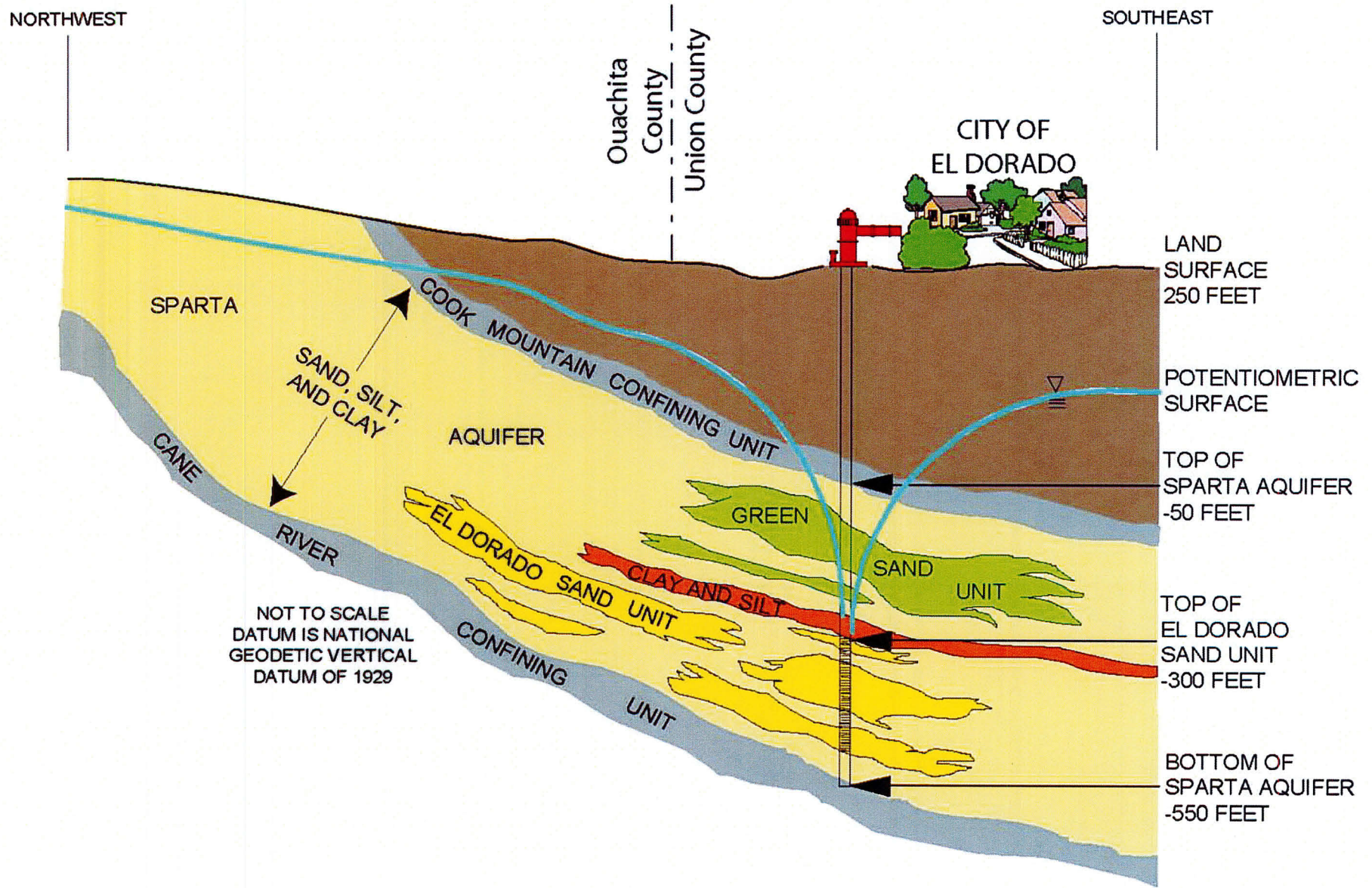
- **Union County Water Alliance (UCWA)** representing all Sparta stakeholders
- **Single repository** – the Chamber of Commerce – pubs, reports & good data from *U.S. Geologic Survey (USGS)*, *Arkansas Natural Resources Commission (ANRC)*, & *Union County Conservation District (UCCD)* so we would know
 1. *How much water we were using*
 2. *How much could we use*
 3. *How long could we use water at current rates before inflicting irreparable damage on the aquifer*
- **Agreements**
- **Priority components/preliminary work** – constituents, opponents, education, engineering, funding (federal clearinghouse pre-app), industry, hydrologic information, **legislation**, media/public information, permitting (Non-Riparian permit), 3rd party engineer report
- **Education, more education, communication, transparency, inclusion** – involved **everyone**

May 1997 – June 1999, *Continued*

- **Funding UCWA** – Industrial Board \$50-\$100K line of credit, industry/business contributions
- **Legislation** - ANRC legal counsel, legislative counsel, Friday law firm, Ozark Intrn'l. Public countywide meetings, widespread media, DRAFT distribution points -- involved citizens & businesses in writing legislation
- **Act 1050 of 1999** provided for Creation of Critical Groundwater Conservation Boards.
- Companion legislation, Act 765 increased the **industrial incentive** for infrastructure for groundwater to alternative source conversion.
- The eleven-member Board first appointed to staggered 2, 4, and 6 year terms then elected by **Justice of the Peace District.**
- First formed **June 24, 1999.** Levied Conservation Fee **July 28, 1999** – Public Hearing. Began assessing 24¢ per 1000 gallons **September 1, 1999.** First funds deposited **October 1, 1999.**

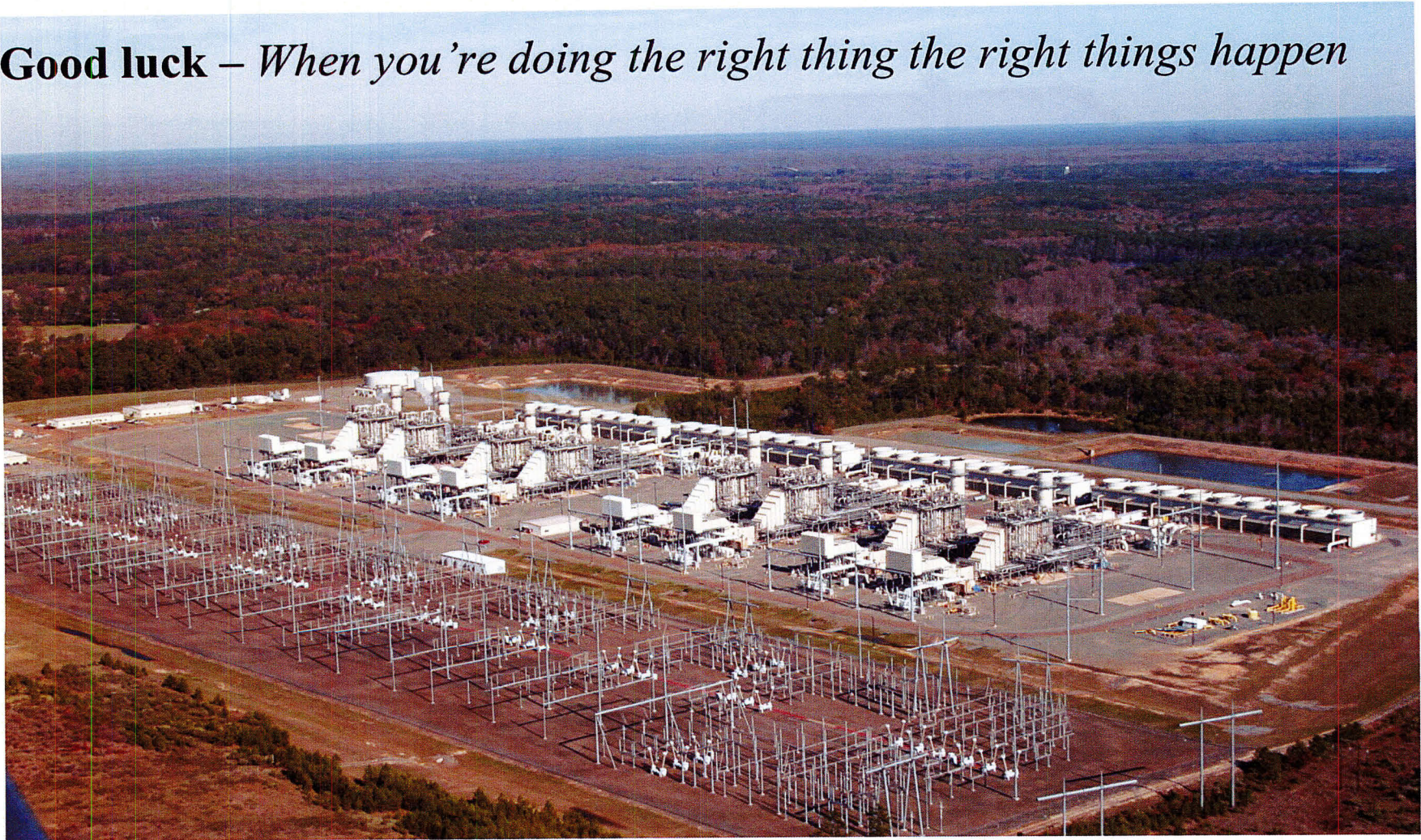
***Mission Statement:** The guiding purpose and primary objective of the Union County Water Conservation Board is to conserve, protect, and maintain the Sparta Formation Aquifer as a continuing source of high quality, potable water for current and future consumers by providing for affordable, alternate sources of fresh water pursuant to the authority and responsibility granted by the State of Arkansas. – Adopted July 21, 1999*

How does the underground Sparta aquifer replenish itself?



Act 1322 – “Panda Bill”

Good luck – *When you’re doing the right thing the right things happen*



Opportunity – *Had we not been working on our water problem, we would not have been ready January 1999 to develop this power plant. Likewise, developing the power plant expedited the water project and was key to doing so in time to save the aquifer.*

1997

21 mgd Sparta groundwater

Groundwater levels **declining**
as much as **7'** per year

Saltwater encroachment
threatened our only source of
drinking water

No single authority over
Sparta groundwater in Union County

No alternative source

Today

8-9 mgd Sparta, **11+ mgd** Ouachita
River

Groundwater levels **rising**,
one well **75'** since 2004; over
100' since its deepest measurement
of 379.7' Oct 2001

Saltwater encroachment appears to
have been halted

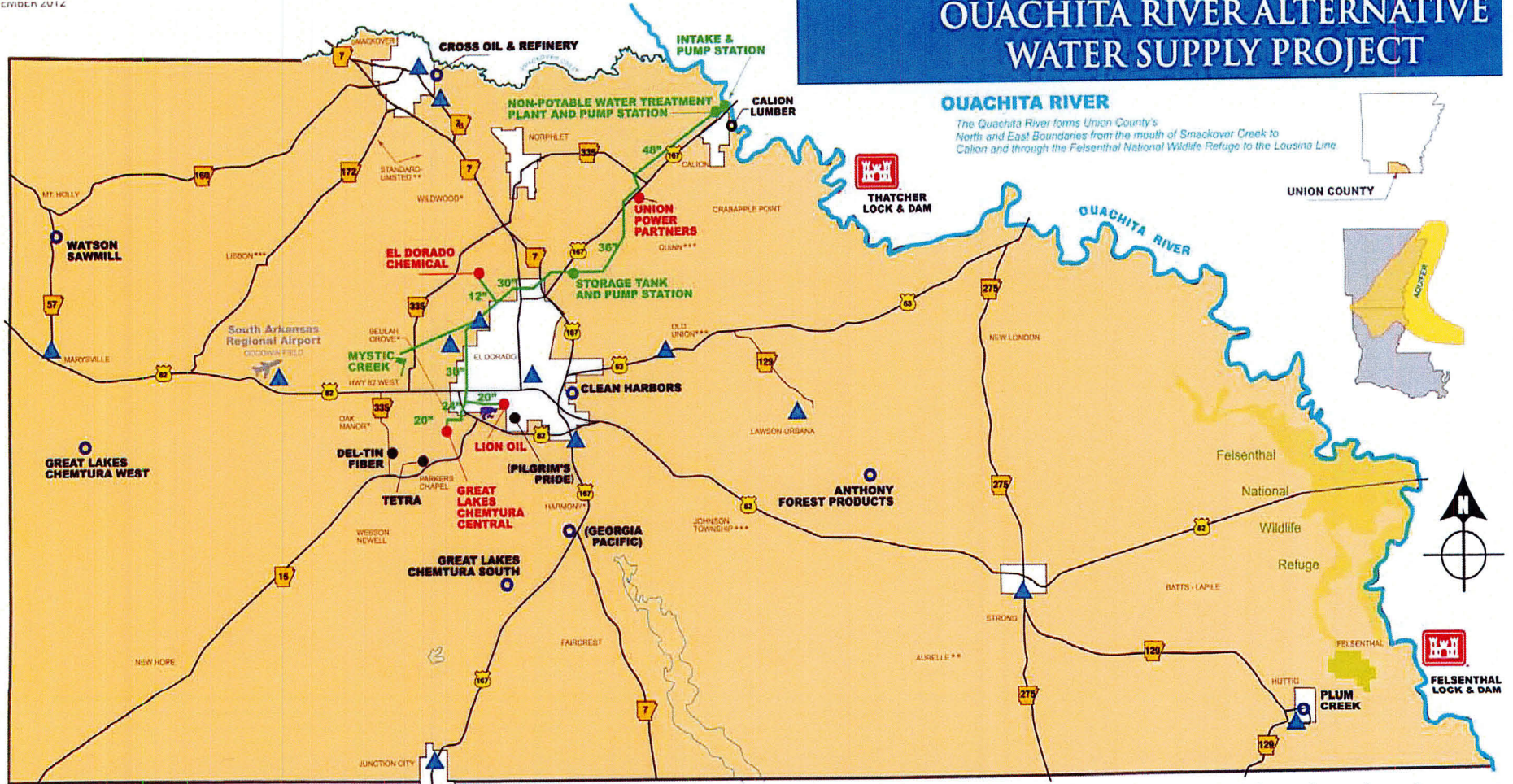
In June 1999, **Union County Water
Conservation Board** formed with
unprecedented authority provided in
Act 1050 of 1999, including collection of
24¢ per 1000 gallons conservation fee
from significant users

By 2005, the Board had built/paid for
\$65M infrastructure & was **delivering**
Ouachita River **surface water** to major
industries

OUACHITA RIVER ALTERNATIVE WATER SUPPLY PROJECT

OUACHITA RIVER

The Ouachita River forms Union County's North and East Boundaries from the mouth of Smackover Creek to Calion and through the Felsenthal National Wildlife Refuge to the Louisiana Line



UNION COUNTY



UNION COUNTY WATER SYSTEMS

- AURELLE**
- BATTS-LAPILE
- BEULAH GROVE*
- CALION
- CRABAPPLE POINT
- EL DORADO
- FAIRCREST
- FELSENTHAL
- HARMONY**
- HUTTIG
- HWY 82 WEST
- JOHNSON TOWNSHIP***
- JUNCTION CITY
- LAWSON-URBANA
- LIBBON***
- MARYSVILLE
- MT. HOLLY
- NEW HOPE
- NEW LONDON
- NORFLEET
- WESSON-NEWELL
- WILDWOOD**
- OLD UNION***
- PARRETT CHAPEL
- QUINCY**
- SMACKOVER
- STANDARD-UMSTEED**
- STRONG
- WESSON-NEWELL
- WILDWOOD**

* Purchase water from El Dorado Water Utilities
 ** Purchase water from another association or municipality
 *** Dual sources: own wells and purchase from another association or municipality

- UCWCB OUACHITA RIVER ALTERNATIVE WATER SUPPLY
- INDUSTRIES SERVED BY OUACHITA RIVER ALTERNATIVE WATER SUPPLY
- INDUSTRIES SERVED BY A WATER UTILITY (SPARTA GROUNDWATER) *
- INDUSTRIES WITH SPARTA WELLS
- () NOT OPERATING
- ▲ SPARTA AQUIFER RECOVERY MONITORING WELL
- ▲ MYSTIC CREEK GOLF COURSE/HOUSING IRRIGATION
- ▲ EL DORADO HIGH SCHOOL SITE IRRIGATION

UNION COUNTY WATER CONSERVATION BOARD

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\$65 Million Infrastructure

Federal 8%

EDA 1.5, EPA 3, Corps 500K
HUD 1.5

6.5 million

State 4% - EDAFC

2.5 million

Local 88%

1¢ COUNTY-WIDE
TEMPORARY SALES
TAX - 23

24¢ PER 1000 GAL
SPARTA
CONSERVATION
FEE - 11

ENTEGR/UNION
POWER
PARTNERS - 34

PRIVATE LANDOWNER
ACREAGE





December 2005 - “Drowning the Mortgage” ceremony celebrated turning on the surface water tap to El Dorado Chemical, Great Lakes Central Plant, and Lion Oil and paying off \$23 million debt 3 ½ years early.

Affordable Alternative Surface Water Supply

Entergy/Union Power Station - \$0.704 per 1,000 gallons

El Dorado Chemical, Great Lakes Central/Chemtura, Lion Oil Refinery – \$0.743 per 1,000 gallons

Mystic Creek Golf Course & Residential Irrigation - \$0.91 per 1,000 gallons

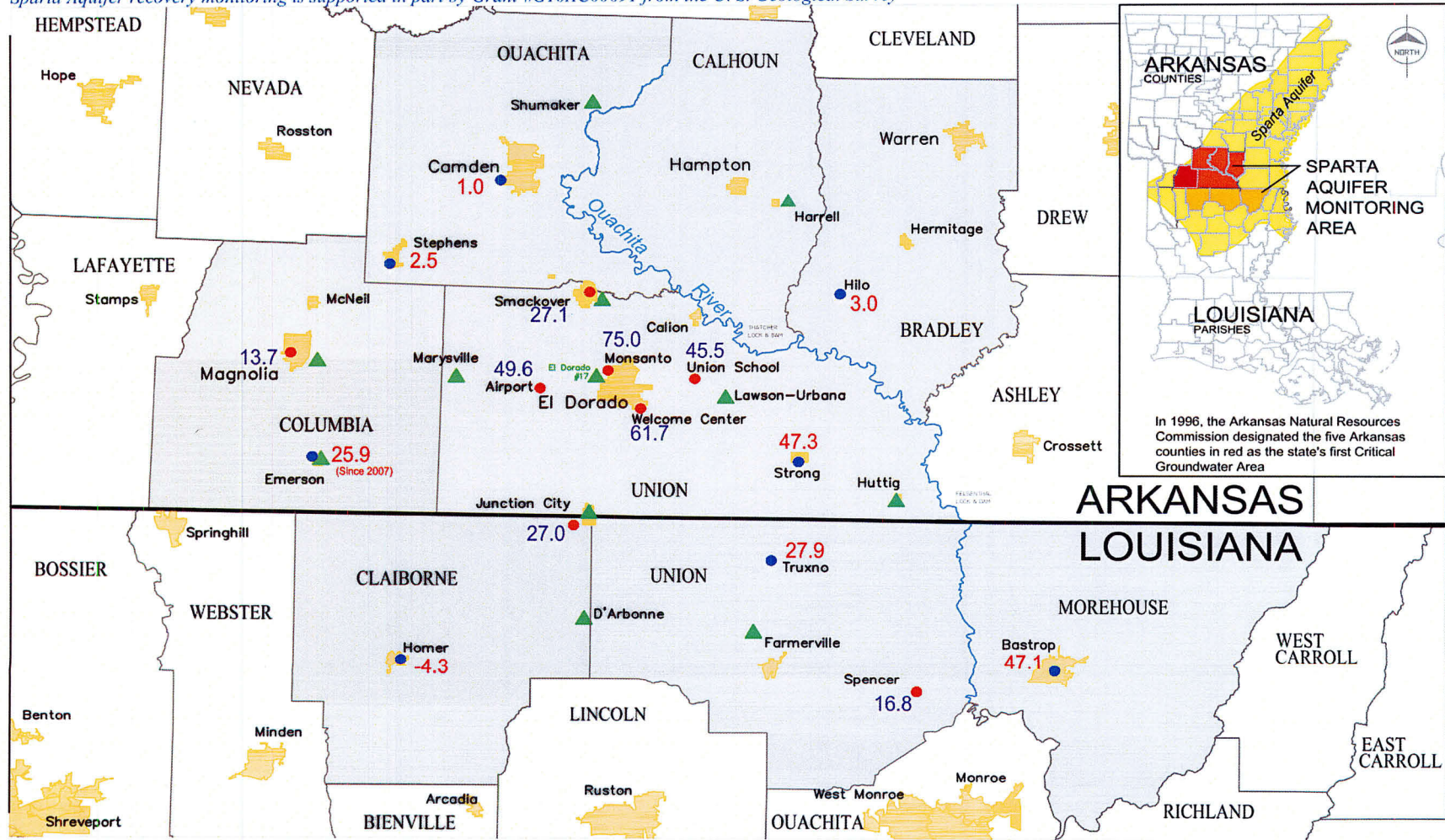
El Dorado High School & McConathy – \$0.993 per 1000 gallons

Source: Evers Cox & Gober 7.14.15



South Arkansas Sparta Aquifer Recovery Initiative - Monitoring Well Network

Sparta Aquifer recovery monitoring is supported in part by Grant #G10AC00691 from the U. S. Geological Survey



- AUTOMATED DATA LOGGER MONITORING WELL
- ▲ USGS WATER QUALITY MONITORING WELL
- USGS REAL-TIME MONITORING WELL

75.0 RISE IN SPARTA AQUIFER GROUNDWATER LEVEL IN FEET BETWEEN OCTOBER 2004* AND APRIL 2016, USGS REAL-TIME WELLS

47.3 RISE IN SPARTA AQUIFER GROUNDWATER LEVEL IN FEET SINCE DECEMBER 2004*, UCED ADL WELLS

* THREE MAJOR UNION COUNTY (ARKANSAS) INDUSTRIES BEGAN CONVERSION GROUNDWATER TO SURFACE WATER OCTOBER 2004

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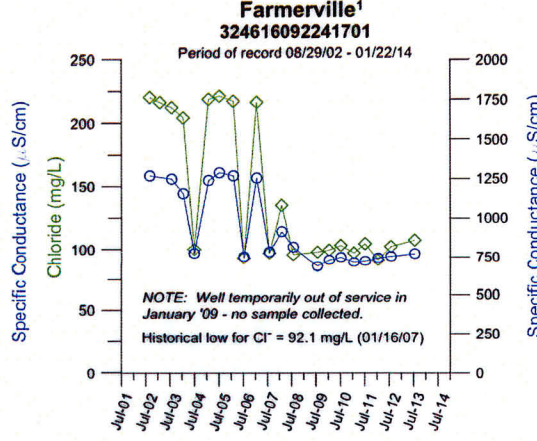
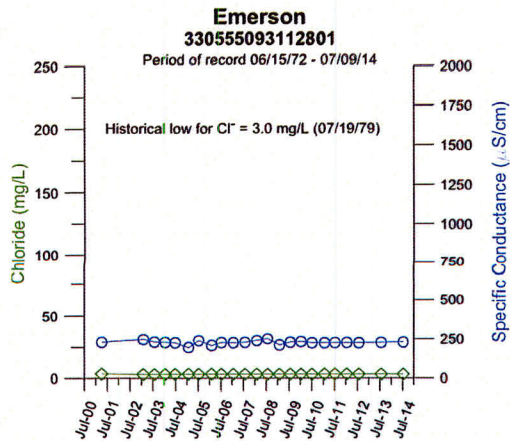
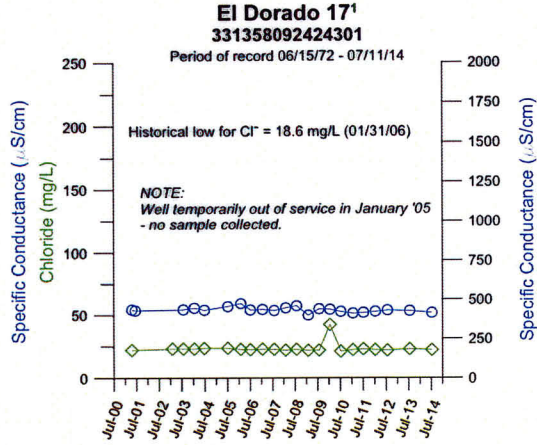
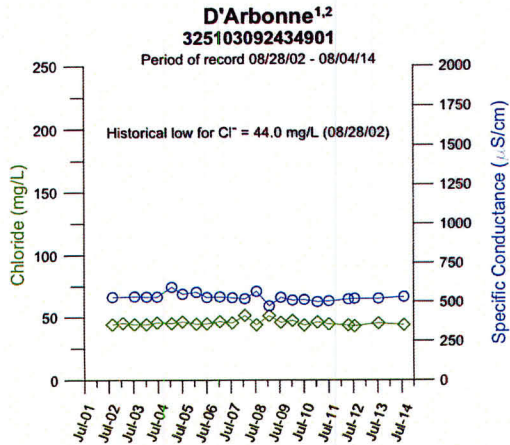
APRIL 2016

Union County (Arkansas) Water Conservation Board

Chloride & Specific Conductance

Sparta Aquifer Recovery - 12 Water Quality Monitoring Wells
South Arkansas and North Louisiana

July and August 2014
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NOTES:

- Specific conductance data collected 01/30/03 from D'Arbonne, El Dorado 17, and Farmerville wells were removed from the data set. These data were judged to be erroneous as a result of field equipment malfunction.
- USGS Louisiana collected and reported August 2014 sample through shared monitoring arrangement with Louisiana Department of Natural Resources.

LEGEND

- Chloride in mg/L
- Specific Conductance, microsiemens (µs)



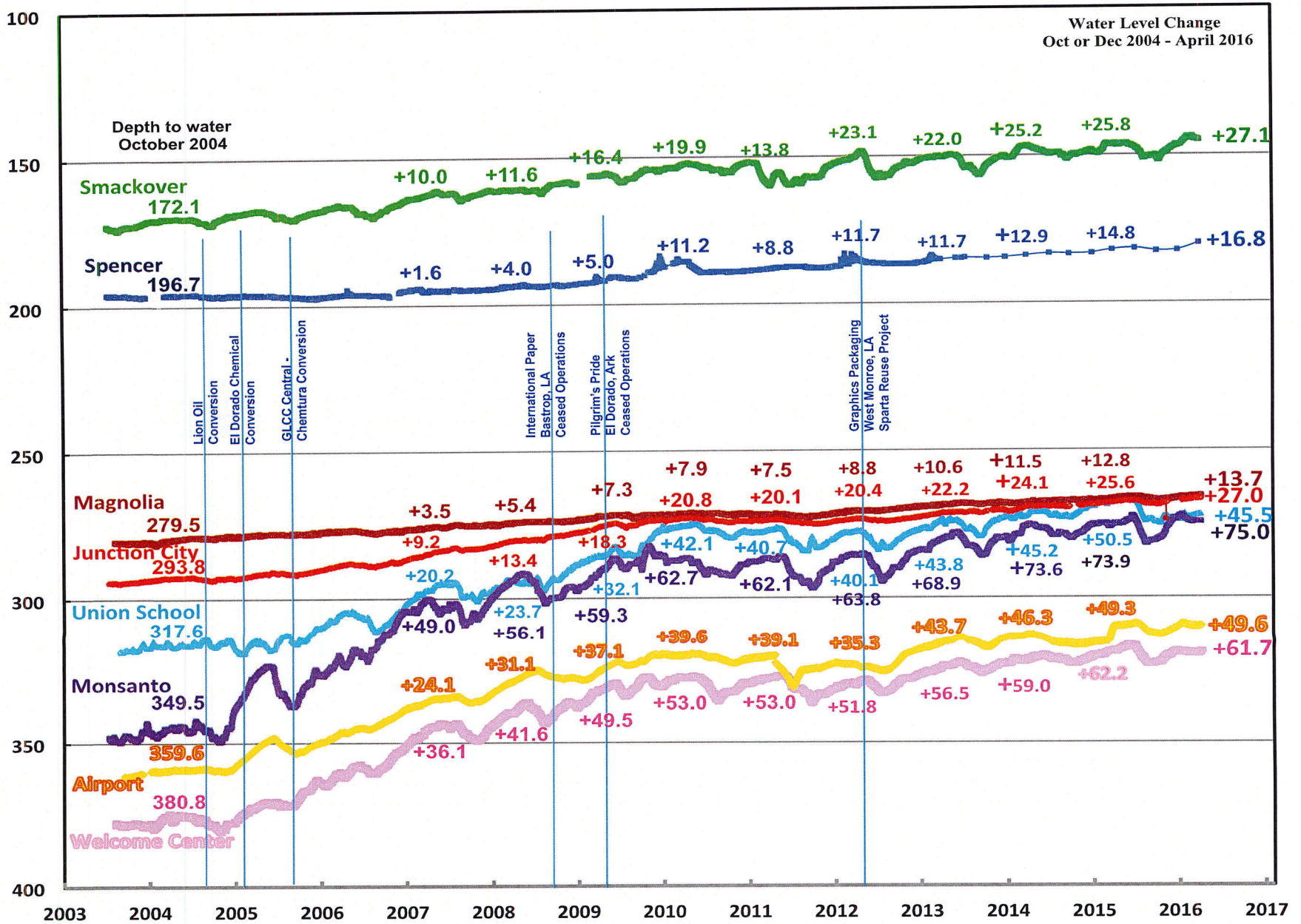
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WQ Jul2014 D'Arbonne-Farmerville.grf 12/05/14

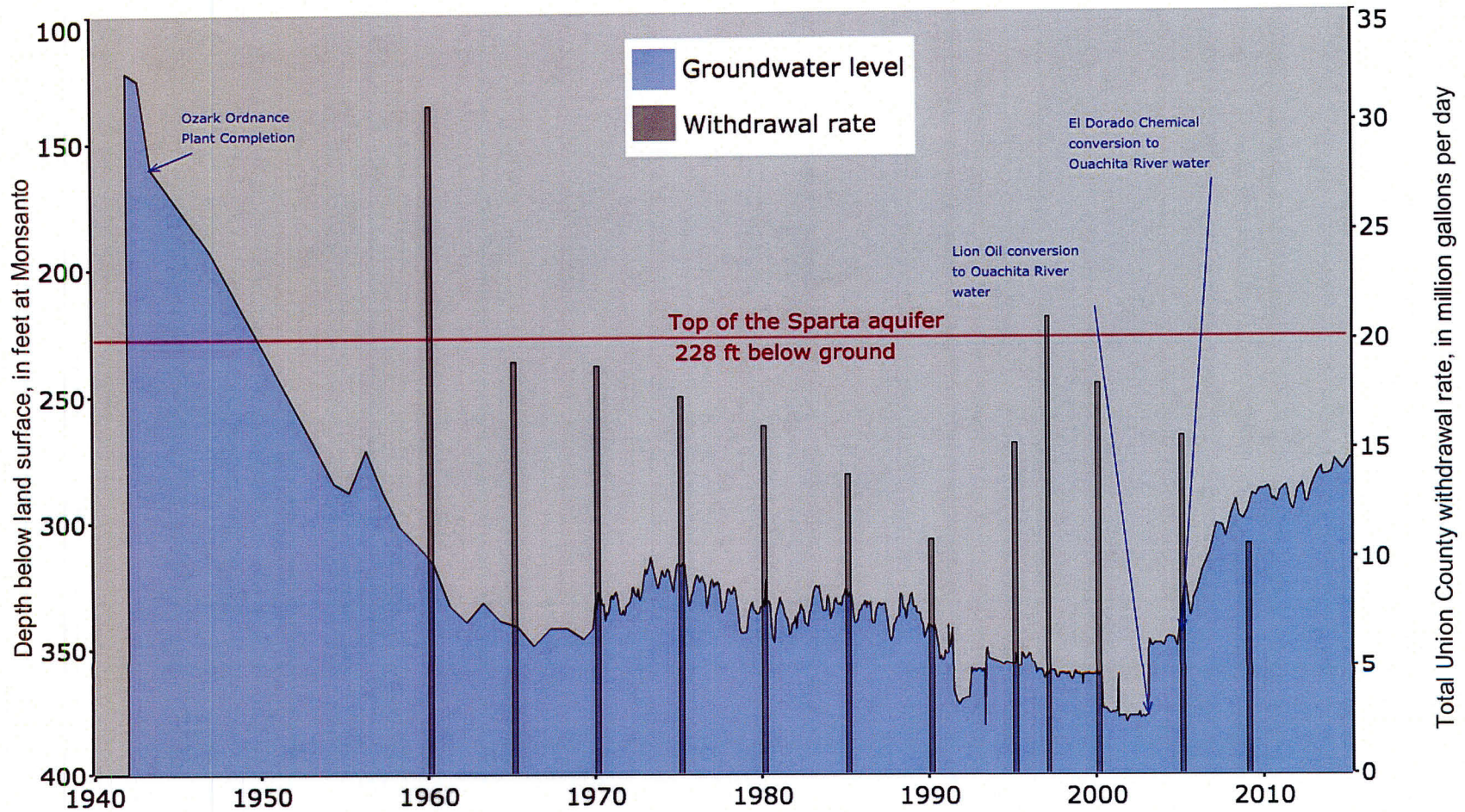
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D'Arbonne, LA
El Dorado
Emerson
Farmerville, LA
Harrell
Huttig
Junction City
Lawson
Magnolia
Marysville
Shumaker
Smackover

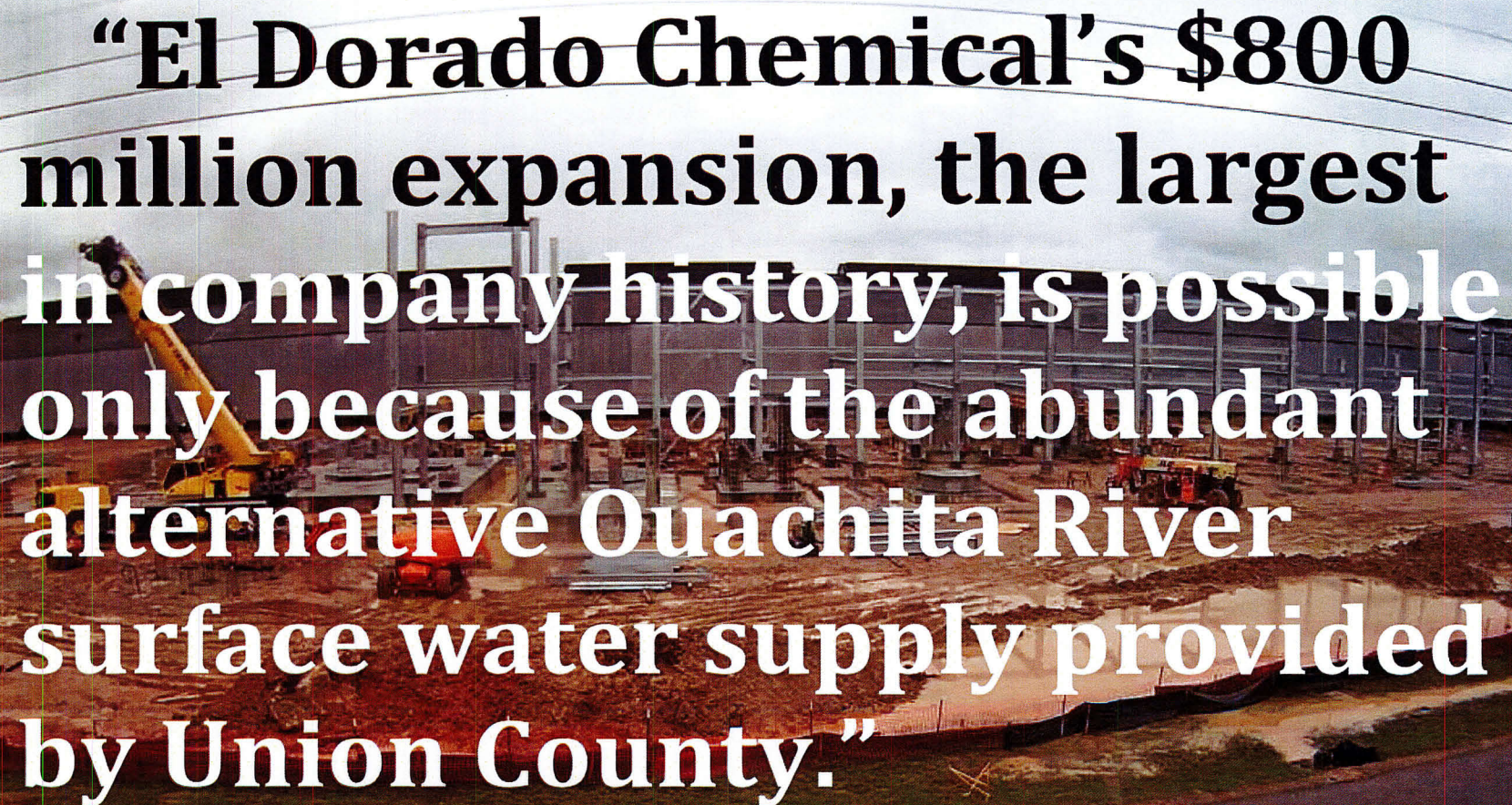
WATER LEVEL, IN FEET BELOW LAND SURFACE



USGS Monsanto Real-Time Monitoring Well

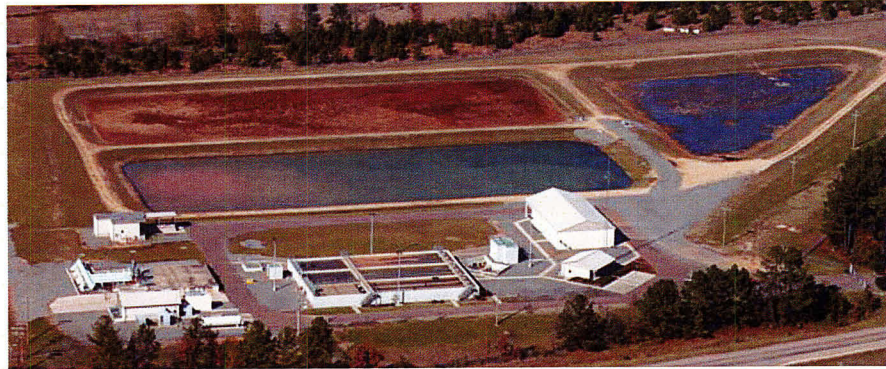


Groundwater Levels 1942 – 2016
Total Union County Groundwater Usage 1960 - 2016
Aquifer Test Pumping Well in 1947 - 1999 – 2012
Interactive at www.ucwcb.org

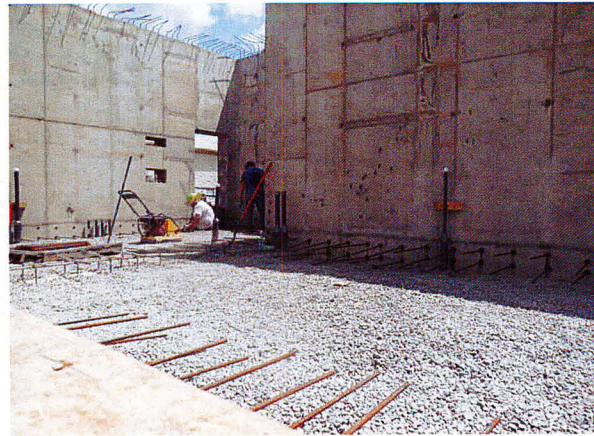


“El Dorado Chemical’s \$800 million expansion, the largest in company history, is possible only because of the abundant alternative Ouachita River surface water supply provided by Union County.”

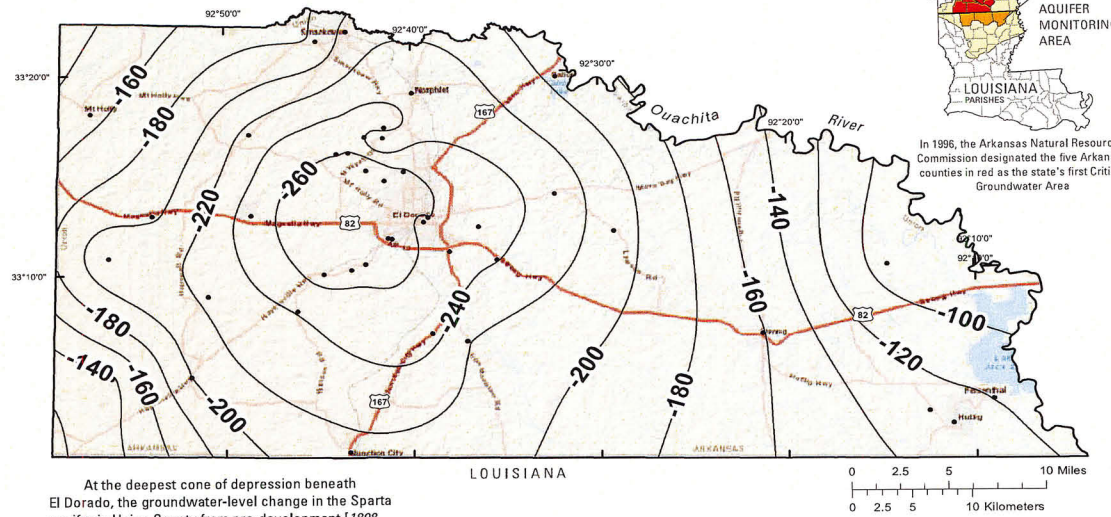
- *Greg Withrow, Plant Manager*



**Water
Clarification
Facility &
Current
Expansion**



Groundwater-Level Change Sparta Aquifer - Union County, Arkansas
Pre-Development to April, 2013



At the deepest cone of depression beneath El Dorado, the groundwater-level change in the Sparta aquifer in Union County from pre-development [1898, *McKee model*] to 1999 was -340 feet. The groundwater-level change in the same location pre-development to 2013 is -260 feet. Because of Union County's conservation efforts, Sparta aquifer groundwater levels have risen 80 feet between 1999 and 2013.

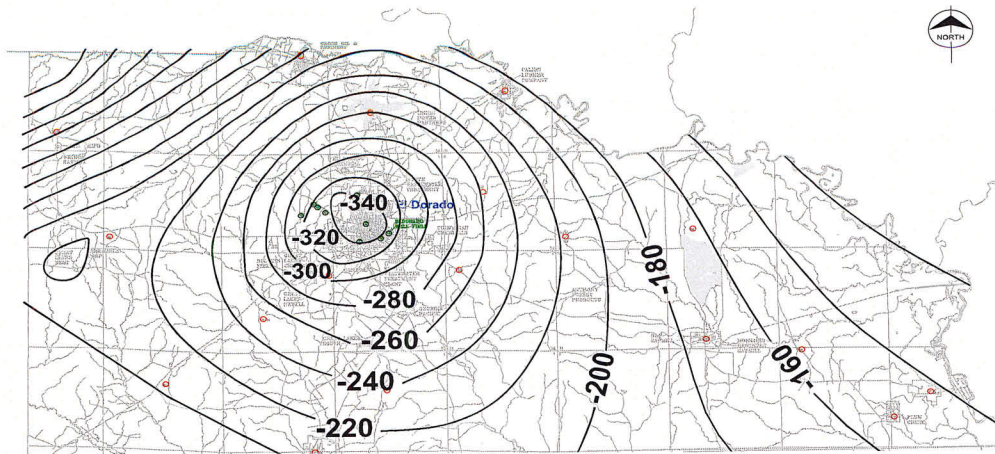
Tony Schrader, Hydrologist
U.S. Geological Survey
Arkansas Water Science Center

- Water-level change, in feet*
- Sparta groundwater-level data well

*Shows water-level change from pre-development to April 2013; McKee and Clark (2003).

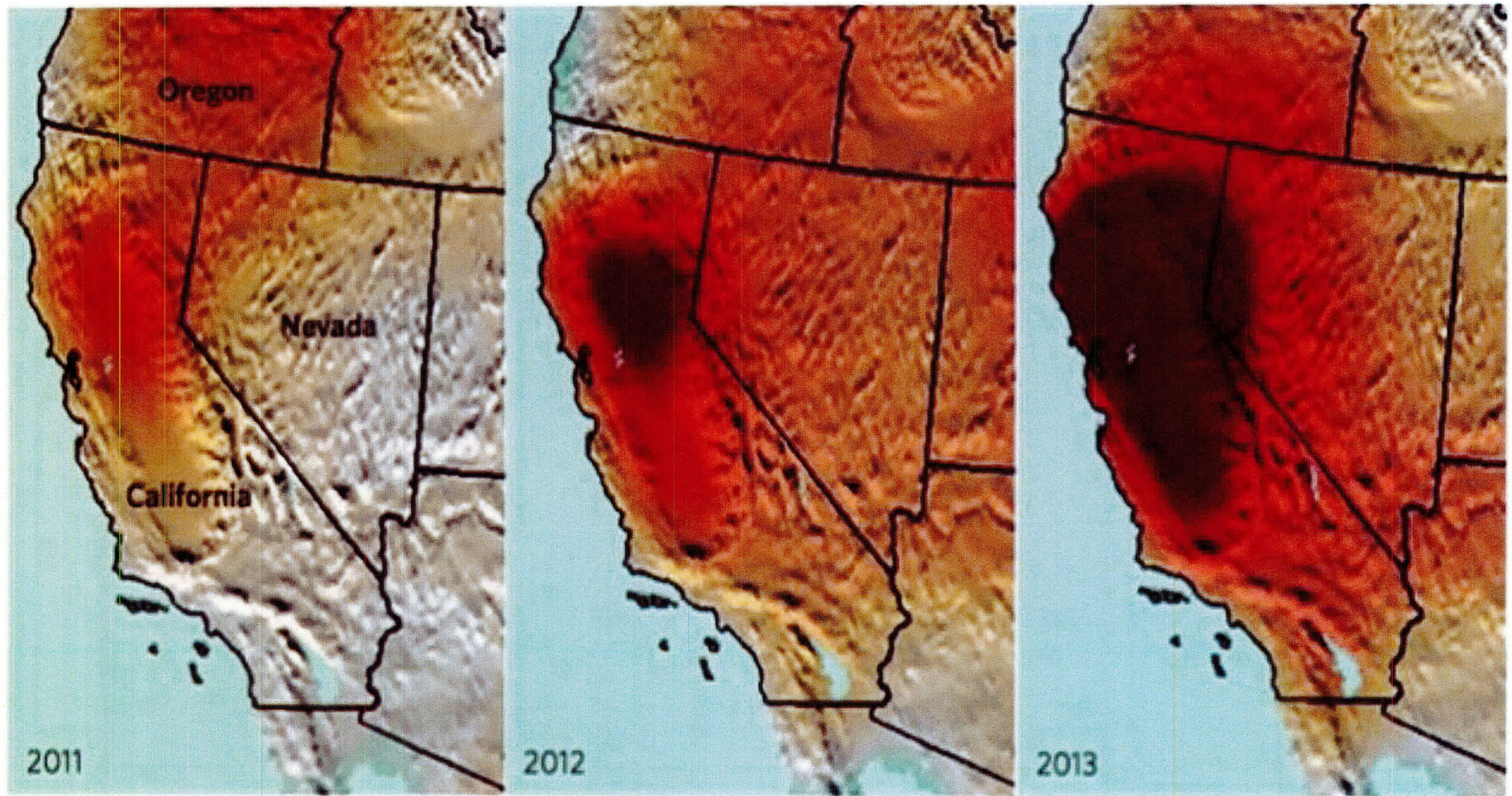
USGS U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
ARKANSAS WATER SCIENCE CENTER

MARCH 2014



LEGEND

3 0 3 6



-160 -80 0 80 160
mm equivalent water height

Mission Statement

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