



Comprehensive Update of the Arkansas Water Plan

Water Supply Availability Work Group Groundwater Sub-group Call

June 19, 2013



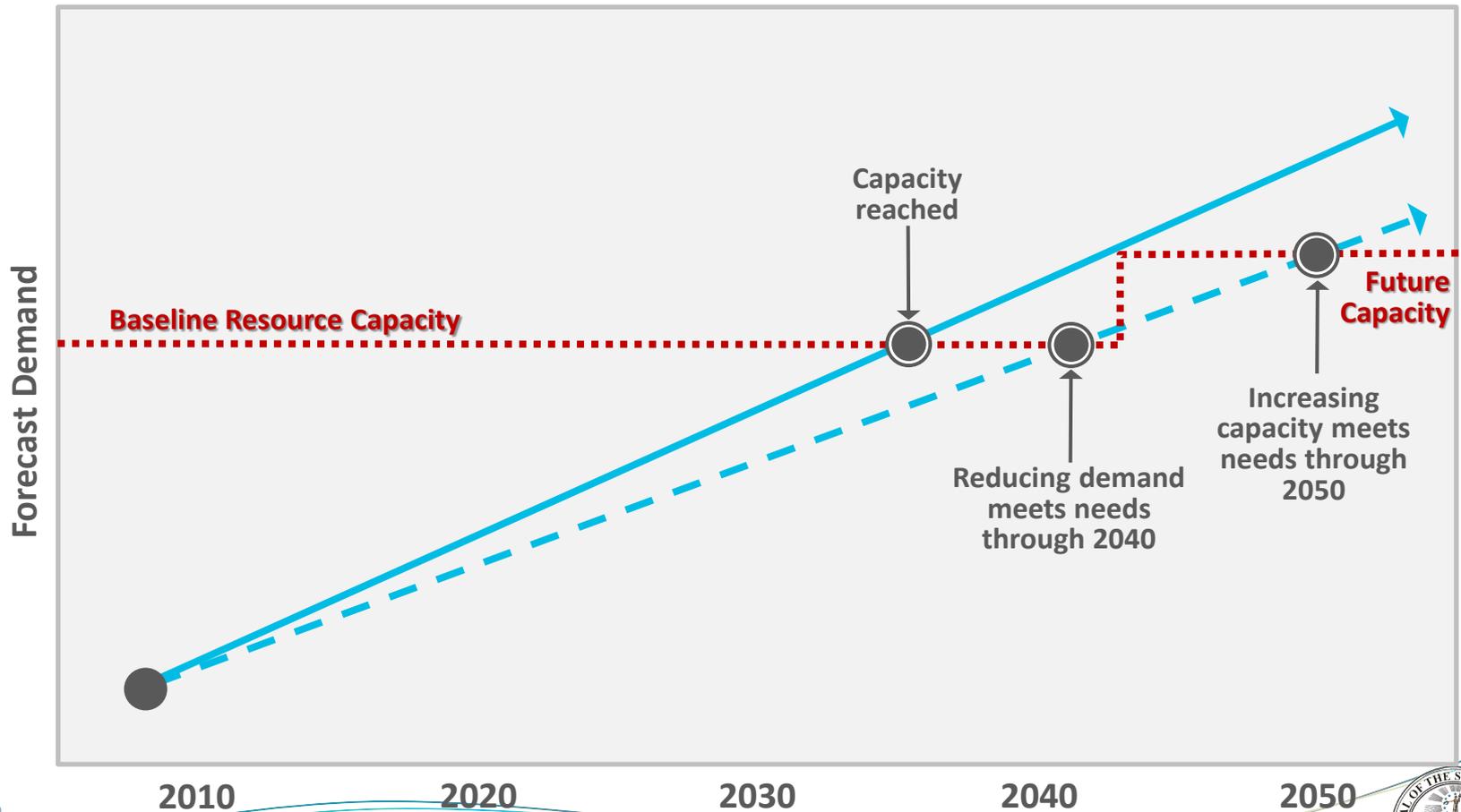
Water Supply Availability Work Group Schedule

Task	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Full Work Group Meeting – Overview of Methodologies									
Sub-group Meetings to Finalize Resource Specific Methodologies									
Full Work Group Meeting (if needed)									
Develop Water Availability Analyses									
Full Work Group Meeting									
Present Draft Availability Analysis to Public and Stakeholders across State									
Finalize Availability Analysis									

How much water do we have to
meet our current and future
needs?

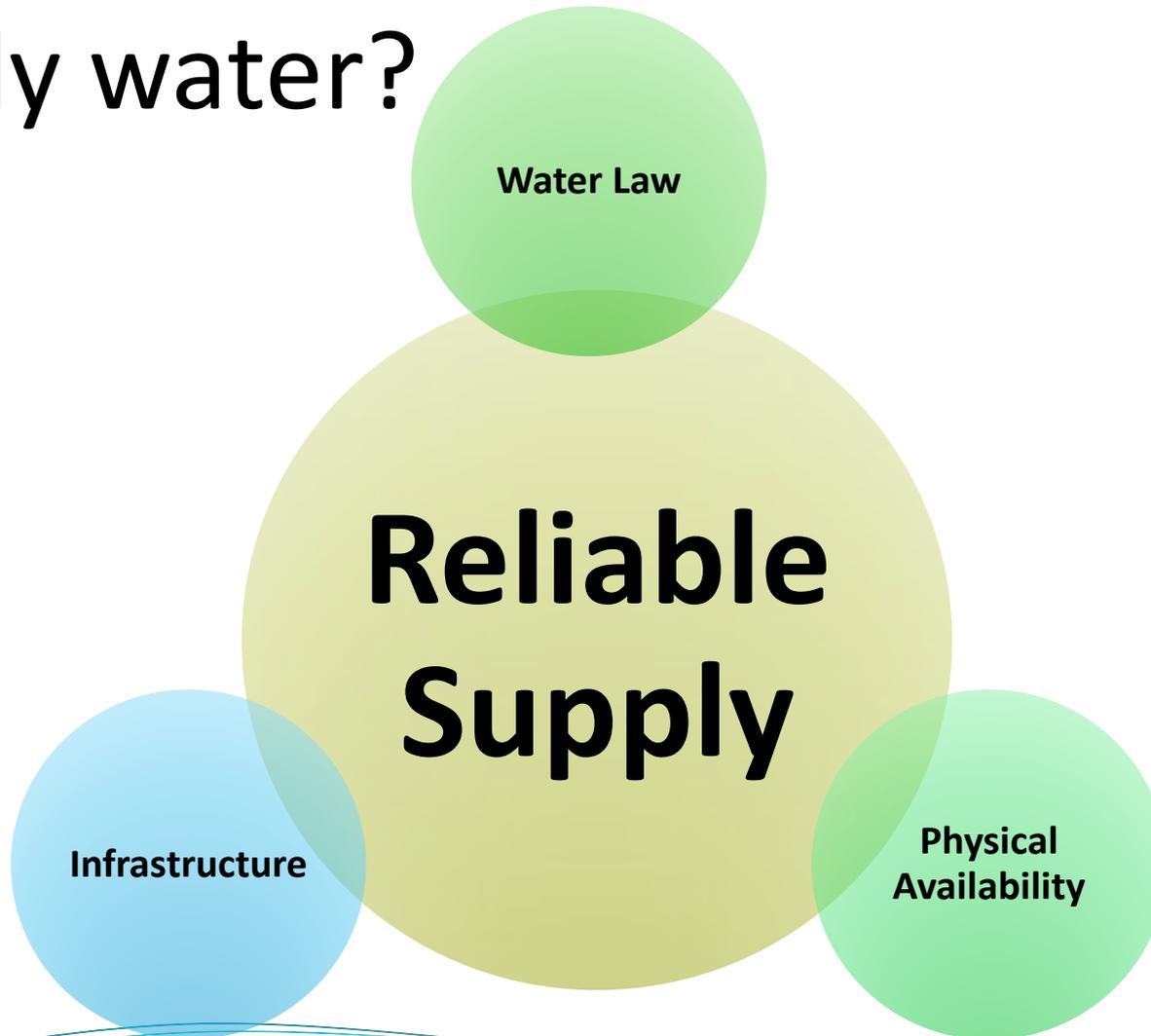
**A sound resources assessment is
critical in
water resources planning**

Water Supply Planning – Demand and Supply



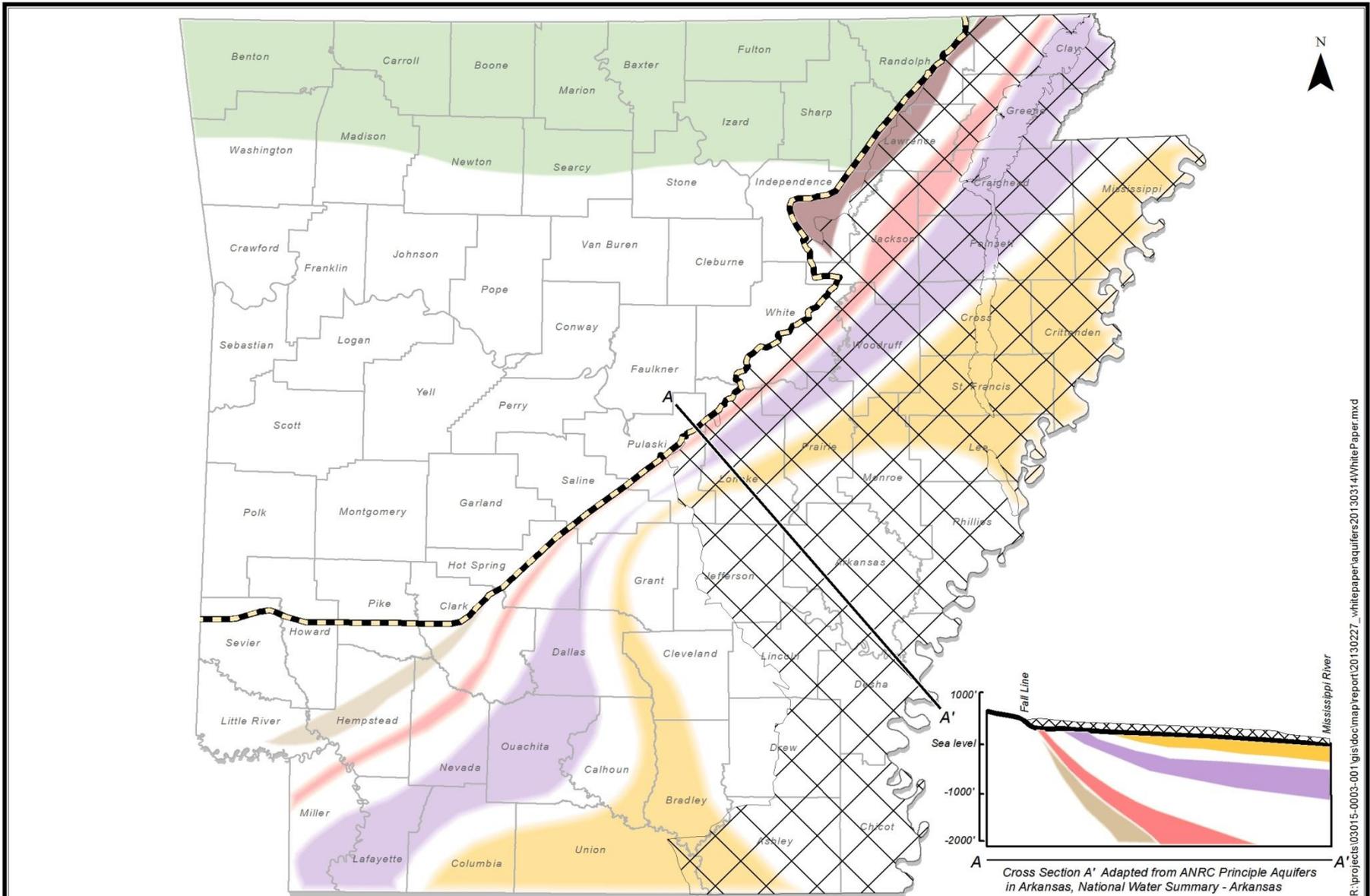
Total Demand Projection (Broken line indicates total demand with conservation)

What constrains our ability to supply water?



Arkansas Water Rights

- Riparian reasonable use state
- Riparian use of water is a property right
- Reasonable use theory applies to surface water and groundwater
- ANRC Rules for the Utilization of Surface Water provide a mechanism for nonriparian owners to divert excess surface water to nonriparian land upon approval of the ANRC



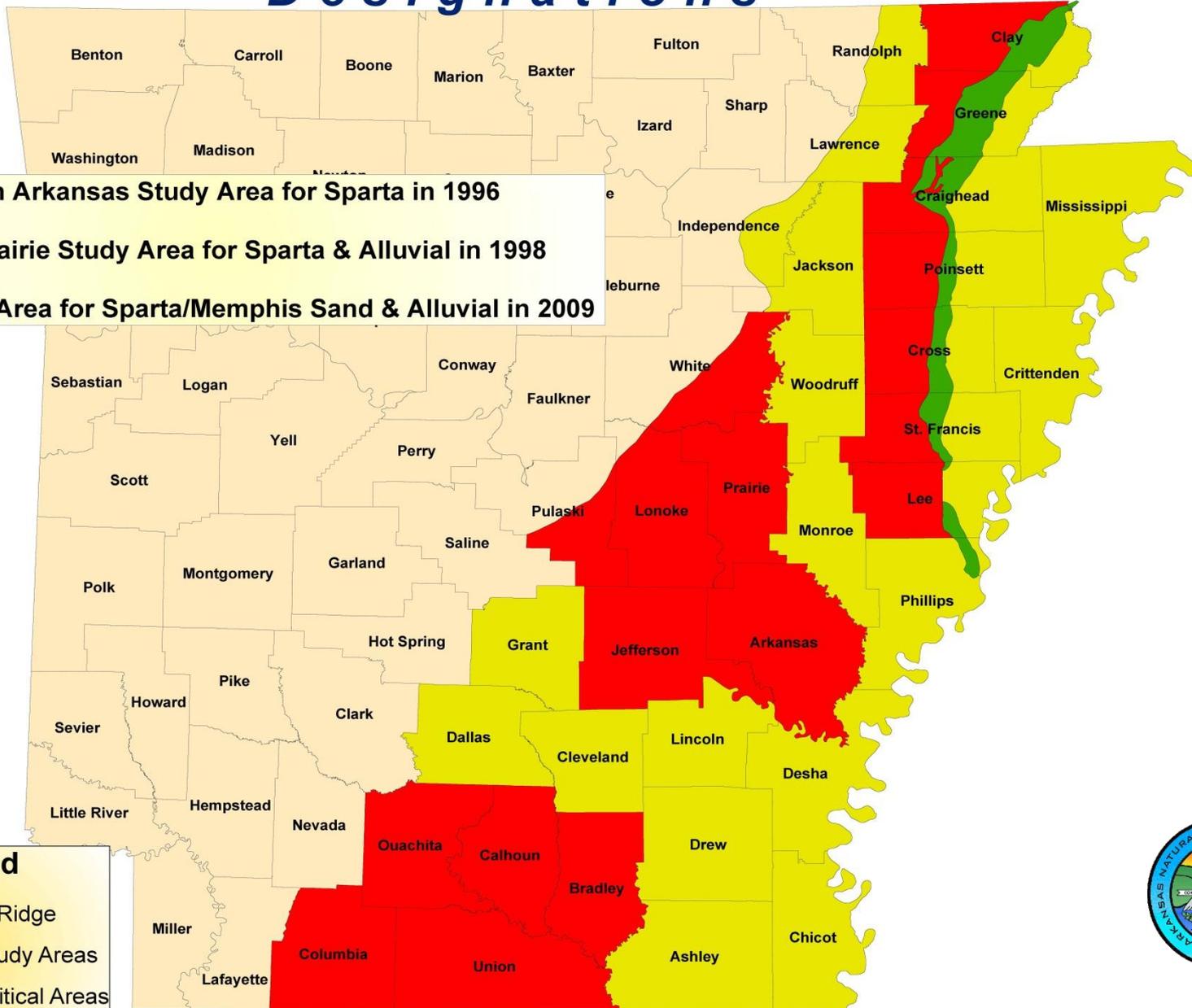
R:\projects\03015-0003-001\gis\doc\map\report\20130227_WhitePaper\aquifers20130314\WhitePaper.mxd

Aquifers

- Fall line
- Alluvial Extent
- Cockfield
- Sparta/Memphis
- Wilcox
- Nacatoch SW
- Ozark
- Nacatoch NE



Critical Ground Water Designations



South Arkansas Study Area for Sparta in 1996

Grand Prairie Study Area for Sparta & Alluvial in 1998

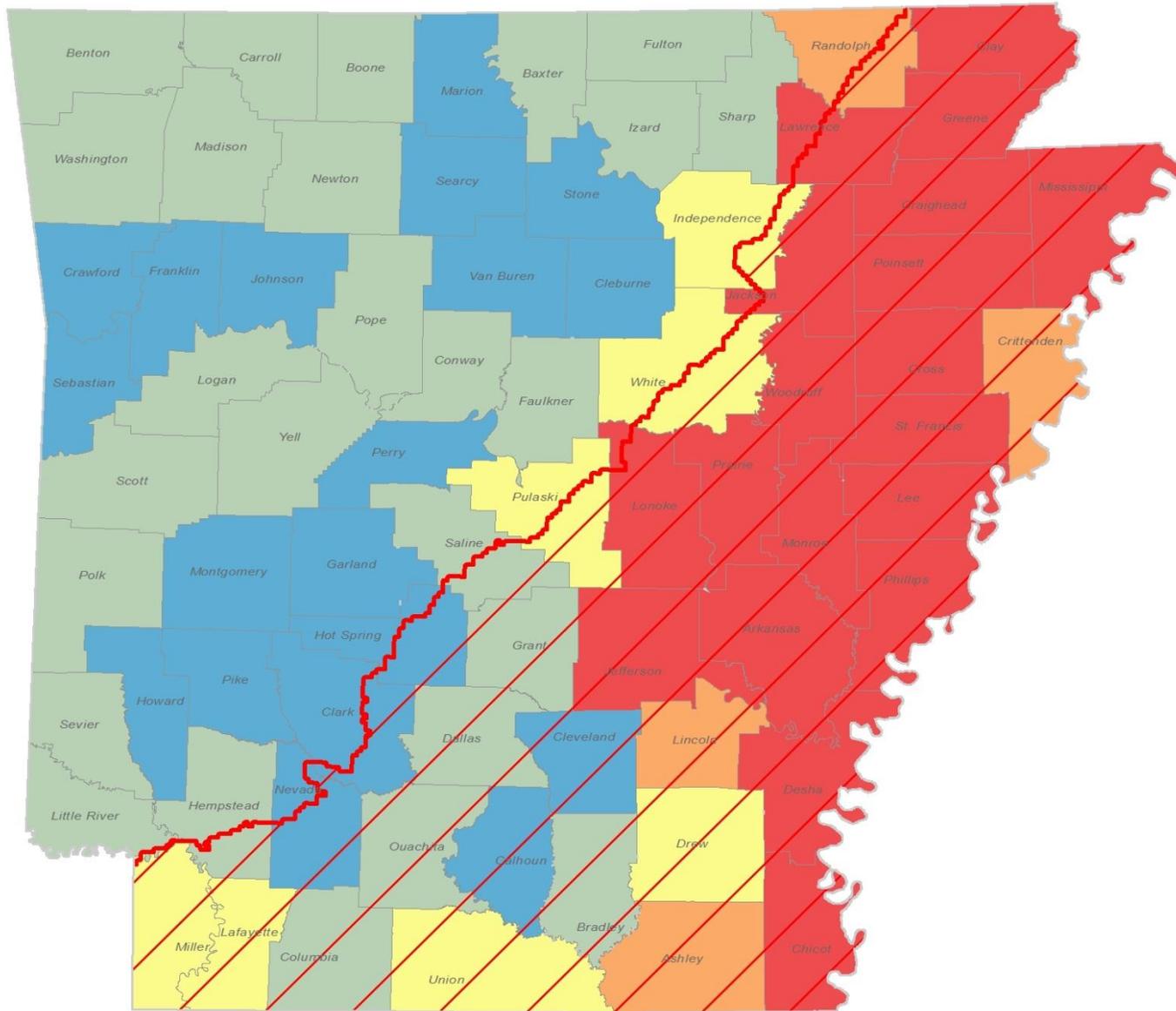
Cache Study Area for Sparta/Memphis Sand & Alluvial in 2009



Legend

- Crowley's Ridge
- Current Study Areas
- Current Critical Areas
- County Boundary





R:\projects\03015-0003-001\gis\doc\mapreport\20130227_whitepaper\GroundWater\20130227WhitePaper.mxd

Ground Water



Groundwater Availability in Alluvial and Sparta Sand Aquifers

Current Conditions

- Review MERAS documentation
- Run model simulation
- Summarize model results
 - Pumping, recharge, and boundary conditions
 - Water elevation maps
 - Groundwater in storage

Future Conditions

- Incorporate demands out to 2050
- Run model simulations
- Summarize model results
 - Pumping, recharge, and boundary conditions
 - Water elevation maps
 - Groundwater in storage

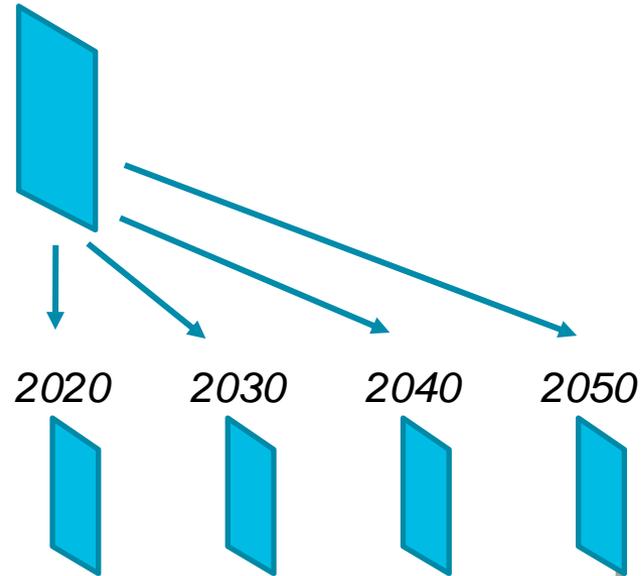
From Water Use Data to Groundwater Availability

County	Pumping
1	7.2
2	6.1
3	4.5

Water Use Projections



Spatial Estimate of Pumping



Historic MERAS Simulation



Future Extended MERAS Simulation

2050 Estimate of GW Availability

Groundwater Availability in Aquifers West of Alluvial and Sparta Sand Aquifers

- Assess baseline and future conditions
- Analysis based on existing information
- Assess water levels, pumping/water use, geology, some estimate of recharge and perhaps loss from aquifers through inter-aquifer flows
- Estimate effects of future demands

USGS Groundwater Availability Study: 3 Future Demand Scenarios

1. Optimized pumping totals from the USGS sustainable yield models
2. Average pumping for each model cell of the Alluvial Aquifer from 2000 to 2005
3. Includes drawdown constraints equal to an altitude of approximately 50 percent of the predevelopment saturated thickness of the alluvial aquifer *

*One of the current water level criteria for an unconfined aquifer as a Critical Ground-Water Area (Arkansas Natural Resources Commission, 2012).

Evaluate Groundwater Drawdown Thresholds and Impact on Supply Need

- Simulate Future Water Use Under Various Aquifer Thresholds
 - Current ANRC target level used to attain sustainable yield
 - Economic-based thresholds
 - Develop a mining related alternative that would estimate the length of time to deplete the resource at current and/or future withdrawal levels
- Determine Supply Need Based on Gaps Between Demand and Acceptable Withdrawal of Groundwater

Groundwater Sub-Group Schedule

Task	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Full Work Group Meeting – Overview of Methodologies	✓								
Sub-group Meeting to Finalize Resource Specific Methodologies			✓						
Full Work Group Meeting (if needed)									
Develop Groundwater Availability Analyses					★				
Full Work Group Meeting									
Present Draft Availability Analysis to Public and Stakeholders across State									
Finalize Availability Analysis									