



Water Needs for Oil & Gas Well Drilling and Fracturing

*Association of Western State Engineers
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Update from 2011 AWSE Presentation

- Niobrara play has slowed from 2009-2010
- Parkman/Sussex oil play in east-central Wyoming has picked up (Converse and adjacent counties)
- Focus has shifted from ground water control areas to other areas where ground water is less exploited (until now)
- Time-limited permits for new water wells are more common



Getting water for the oil industry can involve TWUAs

- The recent Niobrara oil play needs water for drilling and completion. To the extent it is occurring in areas with limited water resources, temporary water use agreements make the water available.
- Temporary water use agreements (TWUAs) allow oil and gas drilling operation to acquire needed water from other sources, like irrigation wells or from reservoirs, on a willing-buyer, willing-seller basis.
- W.S. § 41-3-110 contains the only language under which a temporary “change in use” can occur.
- Wyoming has no pure water leasing statute.



The Operable Language of W.S. § 41-3-110:

- (a) Any person shall have the right to acquire by purchase, gift or lease the right to the use of water which may be embraced in any adjudicated or valid unadjudicated water right, or any portion thereof, for a period of not to exceed two (2) years, for highway construction or repair, railroad roadbed construction or repair, drilling and producing operations, or other temporary purposes, ... and further provided, that any temporary transfer shall be allowed only if no other appropriator is injured thereby. (emphasis added)

So, what types of uses have we seen?

- From January 1, 1997 through July 31, 2011 statewide:

◦ Agricultural	13
◦ Domestic	22
◦ Dust Control	35
◦ Flow-through	4
◦ Ground Water Recharge	5
◦ Industrial	204
◦ Irrigation	292
◦ Municipal	95
◦ *Oil and Gas	350
◦ Pipeline Construction	99
◦ *Railroad	14
◦ *Road Construction	149
◦ Snow making	1
◦ Stock	38
◦ <u>*Highway Construction</u>	<u>650</u>
◦ TOTAL	1,971

* - Uses specifically listed in statute make up 59% of temporaries issued



Why are we concerned about groundwater in SE Wyoming?

- Historically, ground water has been important, but a difficult resource to manage. See, *Lawrence J. Wolfe and Jennifer Hager, Wyoming's Groundwater Laws: Quantity and Quality Regulation*, 24 *Land & Water L. Rev.* 39 (1989)
- Recent Niobrara shale-related development is occurring in areas already impacted by high agricultural use – including the state's three ground water control areas
- We know the drilling will occur, so a goal is to allow it to move forward without added stress on the ground water resource
- We do have areas where ground water is available under new permits, but do not want over-exploitation to create new areas of shortage



Overarching question:

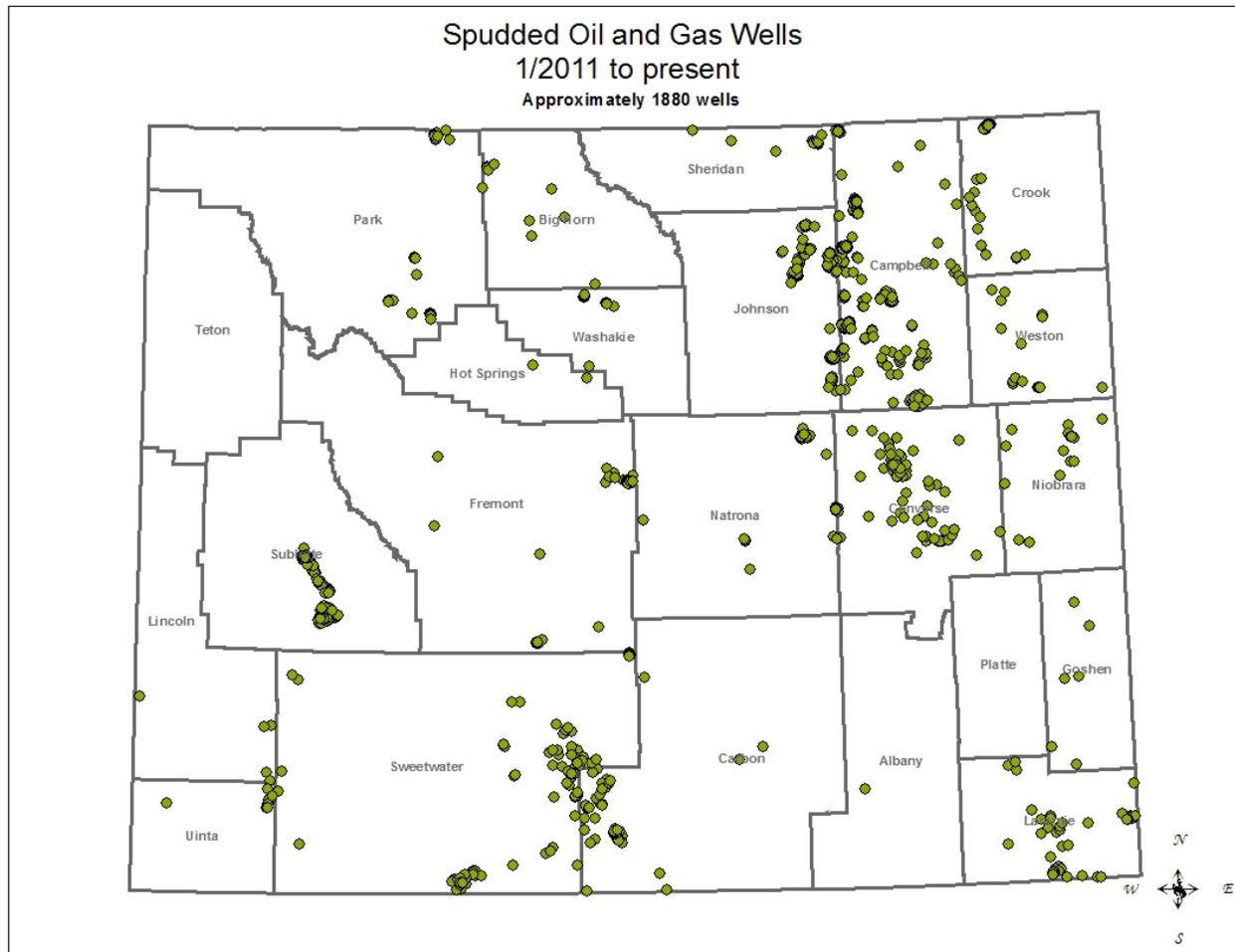
- How can we provide water for temporary uses - such as oil and gas-related activities - but not risk a dramatic increase in overall withdrawals from the groundwater resource? Or, how can we minimize impact to the groundwater resource, protect other appropriators, and meet the needs of the oil and gas play?



Hydrogeologic Setting

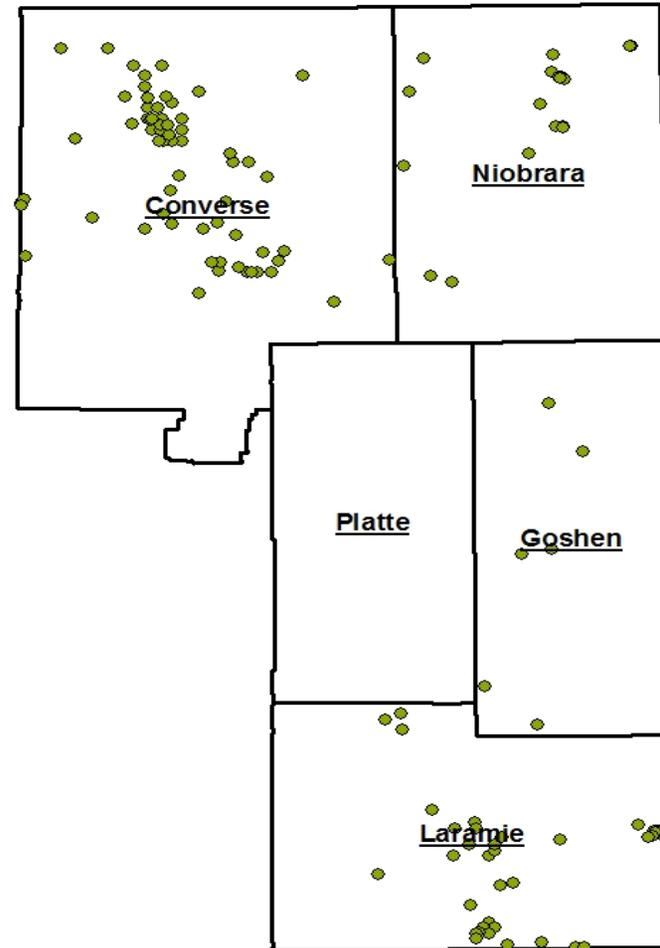
- The hydrogeologic setting is similar in Laramie, Goshen and Platte Counties.
 - Quaternary Alluvium and Terrace deposits
 - High Plains Aquifer system (all \ll 1,000 ft)
 - Ogallala Formation
 - Arikaree Formation
 - White River (Brule and Chadron) Formation
 - Lance Formation (Lance/Fox Hills can be $>$ 1,000 ft)
- Converse County & Central Wyoming
 - Lance/Fox Hills south – Ft. Union North (\sim 1,200 ft depth)

Statewide O&G Activity



SE Wyoming O&G Activity

Spudded Oil and Gas Wells
1/2011 to present
Approximately 145 wells

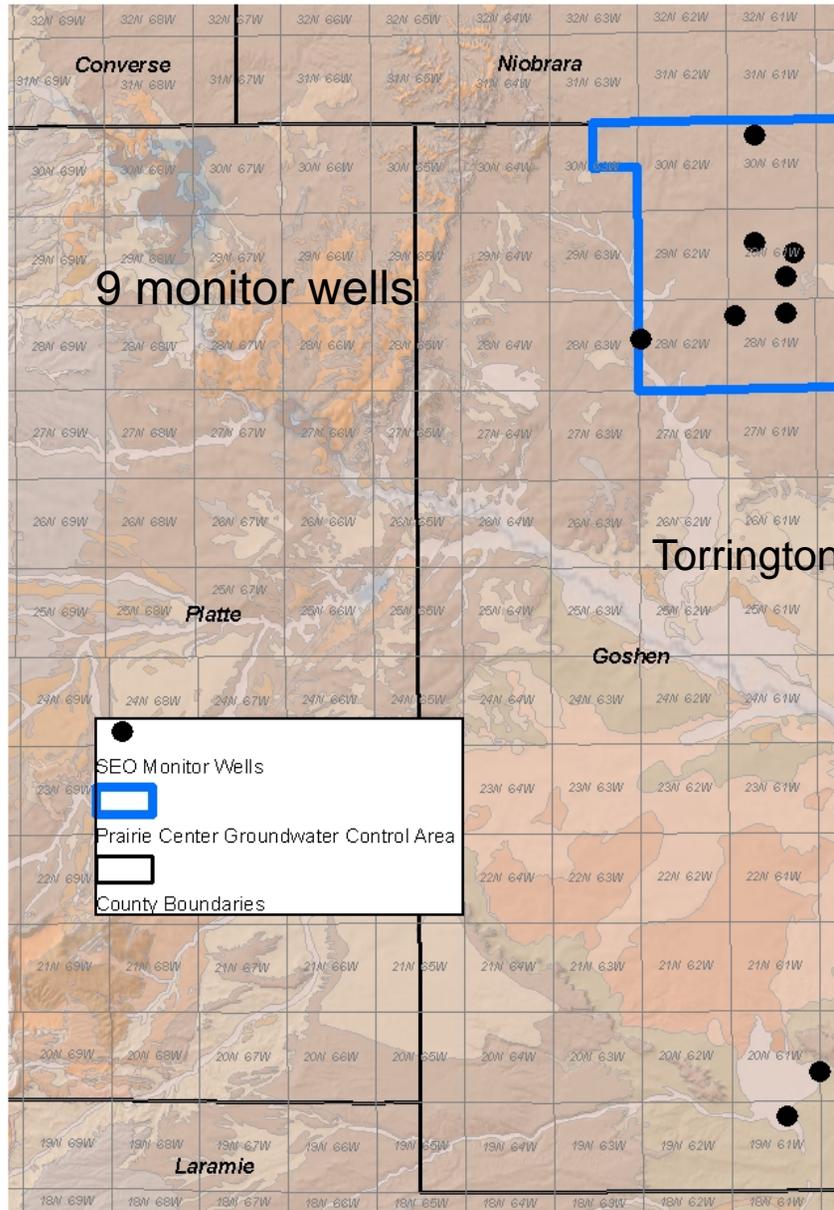




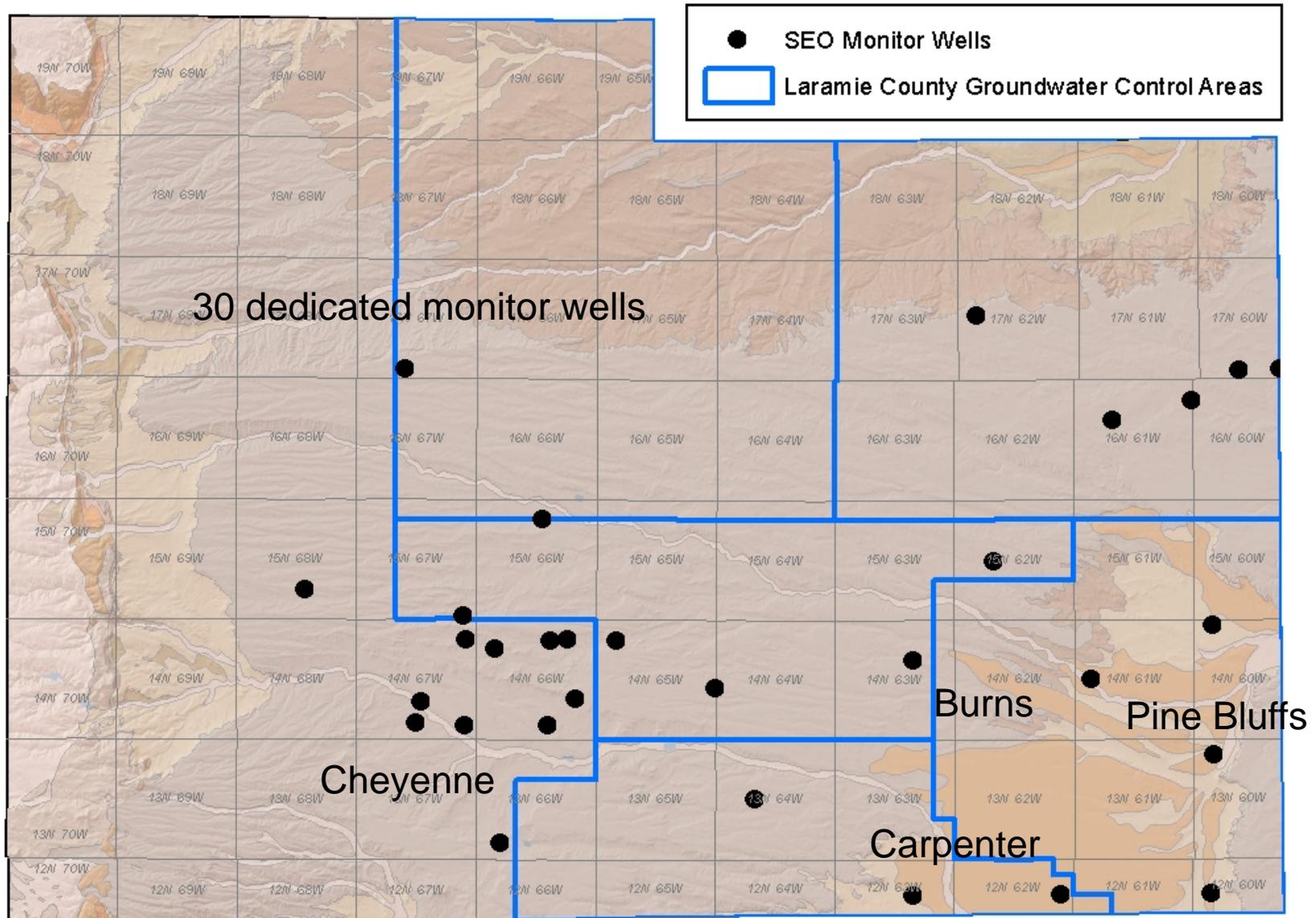
Groundwater Control Areas

- Niobrara Shale play is located in an area that includes WY's only three groundwater control areas.
 1. **Prairie Center Control Area** (~northeast 1/8 of Goshen County; established December 2, 1977)
 2. **Laramie County Control Area** (~ eastern 2/3's of Laramie County; established September 2, 1981)
 3. **Platte County Control Area** (~mid 1/2 of Platte County; established February 1, 1982)

Prairie Center Groundwater Control Area



Laramie County





Control Areas (Continued)

- Under W.S. § 41-3-912, the Board of Control may designate a control area for the following reasons:
 - Use of groundwater is approaching a use equal to the current recharge rate;
 - Groundwater levels are declining or have declined excessively;
 - Conflicts are occurring or are foreseeable between water users;
 - The waste of water is occurring or may occur;
 - Other conditions exist or may arise that require regulation for the protection of the public interest.



Options

- Enter into a **Temporary Water Use Agreement** with an existing appropriator
- Submit a **new application** (application will be subject to the Control Area processes outlined in W.S. § 41-3-932 if in a control area and will be reviewed by the Advisory Board who will then provide a recommendation to the State Engineer)
- **Buy an active existing water right** and petition the BOC or State Engineer for a change in use under W.S. § 41-3-104

TEMPORARY OIL & GAS WATER

-New permits - Primarily issued in areas where resource competition is less, and water is more available. Usually time-limited.

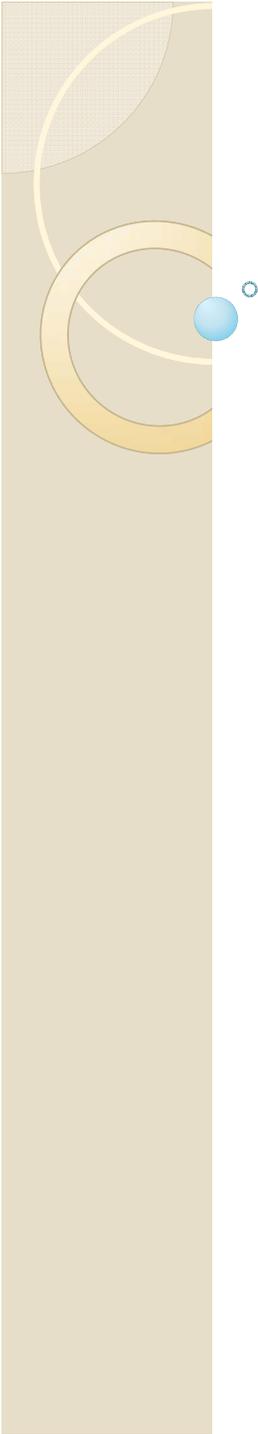
-Temporary Use Agreements – Primarily used where supplies are tighter, and water is less available.



Policy Memos & Guidance

- **February 12, 2010** Policy Memorandum: Issuance of Temporary Use Agreements (TUAs) in Ground Water Control Areas (revised November 1, 2010)
- **July 28, 2010** Policy Memorandum: Control Area Advisory Board Review for Miscellaneous Use Applications in Ground Water Control Areas
- **August 2, 2010** Guidance: OBTAINING TEMPORARY WATER SUPPLIES
- **September 23, 2010** Policy Memorandum: Issuance of Temporary Water Use Agreements (TWUAs) Outside the Ground Water Control Areas

<http://seo.state.wy.us/>



WATER AVAILABLE UNDER TWUAS IN LARAMIE COUNTY

As of July 1, 2011,

74 Temporary Water Use Agreements Totalling 3,978 Acre-feet available for sale

Lands removed from irrigation: ~3,000 Acres

Total sold under these agreements: 371 Acre-feet

(of which about 217 AF are reported as export)

So, only about one in ten gallons of water available under temporary use agreements has actually been sold

Industry sources indicate approximately 12 – 15 acre-feet (3.9-4.9 million gallons) of water are needed for drilling and completion of Niobrara oil wells.



2012 Numbers:

- **Laramie County Oil & Gas TWUAs**
- Number 38
- Acre-Feet 4757.84
-
- **Expiring On or Before Sept 30, 2012**
- Number 23
- Acre-Feet 3135.55
-
- **Continuing Beyond Sept 30, 2012**
- Number 15
- Acre-Feet 1622.29



More 2012 Numbers:

- **Statewide Oil & Gas TWUAs**
- Number 83
- Acre-Feet 7785.26
-
- **Expiring On or Before Sept 30, 2012**
- Number 38
- Acre-Feet 4687.23
-
- **Continuing Beyond Sept 30, 2012**
- Number 45
- Acre-Feet 3098.03



Water Demands for O&G Drilling and Development

- 2144 actively spudded wells between September 1, 2011 to September 1, 2012
- Average of 10 AF per well site (Oil and gas well drilling, dust abatement, construction, Sanitary and Potable)
- 415 Active Time Limited Permits for Oil and Gas Well Drilling, dust abatement and construction.
- 2144 wells X 10 AF/well = 21440 AF used for Oil and Gas Well Drilling, dust abatement and construction.



Fun Math

- Assume One Truck = 5,000 gal (close)
- One AF = 325,800 gal = 65 Trucks
- A 130-acre pivot can sell 130 AF (assumed) in one water year (could be more, depending on use)
- $130 \text{ AF} \times 65 \text{ Trucks per AF} = \underline{8,450}$ Truckloads off your field that year!
- That's over 42 million gallons



Interesting Export Implications

W.S. 41-3-115 (b) None of the water of the state either surface or underground may be appropriated, stored or diverted for use outside of the state or for use as a medium of transportation of mineral, chemical or other products to another state without the specific prior approval of the legislature. Provided, however, neither approval by the legislature nor compliance with the application procedures under subsections (m) through (r) of this section shall be required for **appropriations** that will transfer or use outside the state less than one thousand (1,000) acre-feet of water per year.

So, is it 1,000 AF per well? Per reservoir? Per plan of development?



Challenges

- The SEO has been challenged for not issuing new permits for Oil and Gas drilling water on two applications in the Laramie County Control Area (LCCA)
- ***Two appeals of SE endorsements are ongoing – looks like a “public interest” test (updated for this 2012 presentation)***
- All but one of half a dozen new applications for O&G water have been recommended for denial by the local Control Area Advisory Board
- The State Engineer views such new uses as “temporary,” given the nature of O&G drilling and exploration
- Laramie County is also now home to the “Ogallala Aquifer Initiative,” and NRCS EQIP program intended to buy and retire ground water irrigation rights (their intent is to retire 3,000 acres from irrigation to reduce stress on the aquifer). Obviously, these groups are against issuance of new permits for O&G drilling.
- Some municipalities are interested in selling water – even though they are under their own conservation restrictions.



Update on Public Interest Tests....

- Public Interest hearings were held on two cases, known as “Four Quarters Land and Livestock,” and “Ruppert.”
- Both hearings resulted in allowing some water for oil and gas purposes.
- A copy of the Four Quarters final decision will be handed out for discussion.
- Special thanks to a few members of AWSE whose previous work, or counsel, helped in the analysis process.
- Immediately after the public interest results were complete, a separate order was issued for the LCCA restricting permitting large wells. This order is also available for discussion.



THANK YOU!

**For additional information, please call
the State Engineer's Office at
(307)777-6150**