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# Holsinger Law, LLC

Lands, wildlife and water law

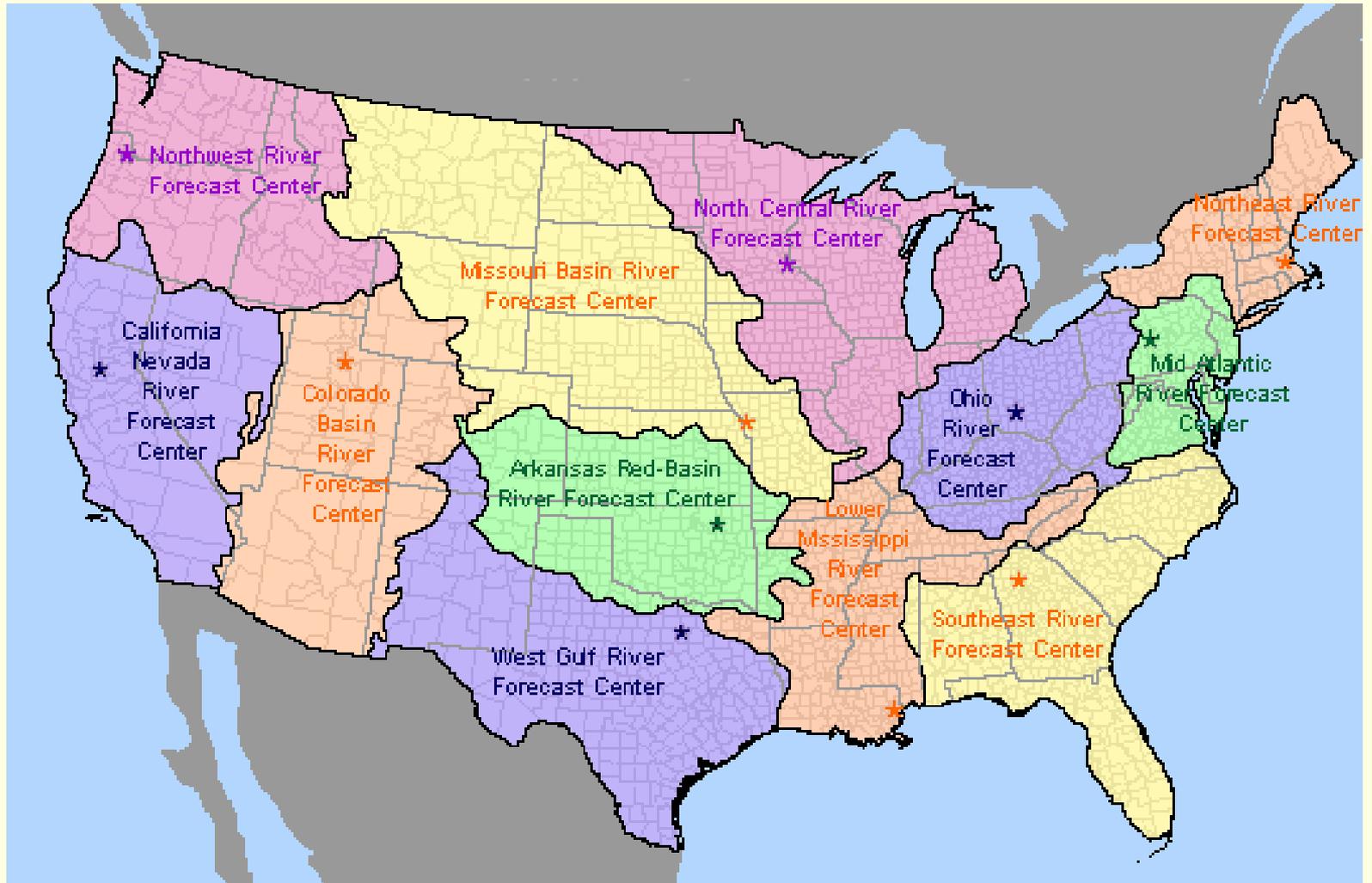
**Water, Oil and Gas:**  
energy production, the  
priority system and  
drinking water supplies

# Water Law in the U.S.

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- Water rights issues increasingly relevant to oil and gas operations
- State Engineers have authority to curtail oil and gas to protect vested water rights
  
- Three systems of laws
  - Riparian states
  - Prior appropriation states
  - Hybrid states

# The Big Picture: Water Rights in the U.S.



# Riparian Rights

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- Developed where water is plentiful (primarily the eastern states)
- Rights to water are attendant to land ownership and position on waterways
- No “priority” of use

# Riparian Rights

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- Landowners adjoining a body of water may make reasonable use of it
- Allotments generally in proportion to frontage on the water source
- Rights cannot be sold or transferred apart from the adjoining land
- Water cannot be transferred out of the basin

# Riparian States

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- Still applies in 29 states, such as:
  - Alabama
  - New York
  - Pennsylvania
  - Virginia
  - West Virginia

# Prior Appropriation States

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- Governs water law in 9 states:
  - Alaska, Arizona, Colorado
  - Idaho, Montana, Nevada
  - New Mexico, Utah and Wyoming

# Other States

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- Some states utilize principles of riparian rights and prior appropriation, including:
  - California, Kansas, Mississippi
  - Nebraska, North Dakota, Oklahoma
  - Oregon, South Dakota, Texas and Washington

# Prior Appropriations in the “Great American Desert”

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- Daniel Webster
- Flooding and drought
- South Platte wagon road
- Snowmelt contributes 90% of water supply
- Water storage captures spring floods for use throughout the rest of the year
- Diversions, storage and irrigation transformed the West



# History and Prior Appropriations

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- 1852: Peoples Ditch, San Luis Valley
- 1870: Union Colony irrigated crops by diverting water into a canal
- 1874: Ft. Collins irrigators dry up the canal
- 1875: Framers of Colorado's Constitution tackled the dilemma by creating the Colorado Doctrine
- 1876: The right to appropriate unappropriated water shall never be denied

# Administration

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- State agencies administer water rights in the priority system, i.e. Departments of Water Resources or State Engineers Offices.
- Interstate allocations of water generally governed by interstate compacts or U.S. Supreme Court rulings.

# Perfecting a Water Right

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- Intent
- Diversion
- Beneficial Use
- Vesting (permit or decree)

# Diversions

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- Surface water
  - Direct flow
  - Storage
- Ground water
  - Tributary
  - Nontributary
  - Not-nontributary (designated basins)

# Beneficial Use

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- Beneficial use is the basis, the measure and the limit of the right
- No right to waste water
  - Duty of water
  - Reasonable use
- Beneficial use is evolving but generally related to agricultural, municipal, industrial and now environmental (instream flows) and recreational (kayaks and rafting)

# Colorado Water Laws





# Administration

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Surface and tributary ground water rights are administered in priority by the SEO

Tributary ground water is connected to surface water

Nontributary ground water is not connected and is not administered in priority

# Administration

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- “Calls” in areas under administration
- In over-appropriated basins, junior appropriators may not receive their full allocation--if any
- May depend upon time of year – typically the irrigation season, but ISFs or other issues
- Companies can pull from a free river, i.e. not under administration

# Administration

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- Colorado Department of Natural Resources
  - Colorado Division of Water Resources
  - State Engineer, Dick Wolfe, P.E.
  - 7 Division Offices
  - Water Commissioners
  - Dam Safety

# State Engineer's Office

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- Exclusive authority to “administer, distribute, and regulate the waters of the state.” C.R.S. 37-92-501
- Authority to shut down oil and gas wells if not in compliance with water laws
- Where wells could impact water rights, significant efforts required to replace depletions, including SEO permitting and water court approvals

# Water Decrees

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- Upon issuance of a decree from the water court, the right is added to a tabulation of priorities
- First in time, first in right
- Priority is determined by:
  - The date of the application, and
  - The date on which the appropriation was initiated

# The Priority System can adapt with the times

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- First to use for a beneficial use has right to that quantity of water for that purpose. Later users have junior rights to the remaining water so long as they do not injure the senior rights
- Beneficial use is evolving but generally related to agricultural, municipal, industrial and now environmental (instream flows) and recreational (kayaks and rafting)

# Existing v. Future Water Rights

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- Absolute water rights
- Conditional Water Rights
  - Reasonable diligence

# Water Rights are Property Rights

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- Unconnected to land ownership (but place of use)
- Conveyed by deed
  - Should be specifically enumerated
- Due diligence
  - Title
  - Decreed uses

# Colorado Water Plan

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- May 14, 2013 Hickenlooper Executive Order
- Address the gap between supply and demand (could exceed 500k af by 2050)
- Drought conditions cause of concern
- Buy and dry is not acceptable
- Quality must be considered as well as quantity
- CWCB to submit a draft plan by December 10, 2014
- Align state role in water project permitting and reviews and streamline approvals for projects that stress conservation, innovation and collaboration and promote smart land use, healthy watersheds, demand-management, etc.
- CWCB to assemble panels to develop recommendations and offer recommendations for legislation

# Quantifying Water Rights

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- Water rights have defined quantities (in cubic feet per second (c.f.s.) or acre-feet (af))
- 1 cfs = 448.83 gpm (+/-10 barrels per minute)
- 1 cfs = 1.9835 af/day
- 1 million gallons = 3 af
- 1 af = 325,851 gallons
- 1 bbl = 42 gallons

# Transfers of Water Rights

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- When sold, a water right retains its original appropriation date. Only that portion of the water historically consumed can be transferred or changed
- Flood irrigation for hay, for example, is not 100% efficient or consumptive. Water that returns to the system, i.e. return flows, may not be transferred or sold as other appropriators rely upon those return flows

# Changes of Water Rights

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- A water right holder may change a right without losing priority date so long as consumptive use is quantified and no injury results
- Change of use v. change of place of use
- Other appropriators entitled to preservation of conditions present when they received the right *Farmers High Line v. City of Golden (CO 1954)*

# Abandonment

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- Water rights may be lost by a period of nonuse by abandonment.
- Agencies and competing appropriators are becoming more aggressive in asserting claims of abandonment
- Abandonment requires intent, but intent may be shown by an unreasonable period of nonuse

# Access to Water

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- Constitutional rights and condemnation
- Rights of ways and water storage
- Private lands v. public lands

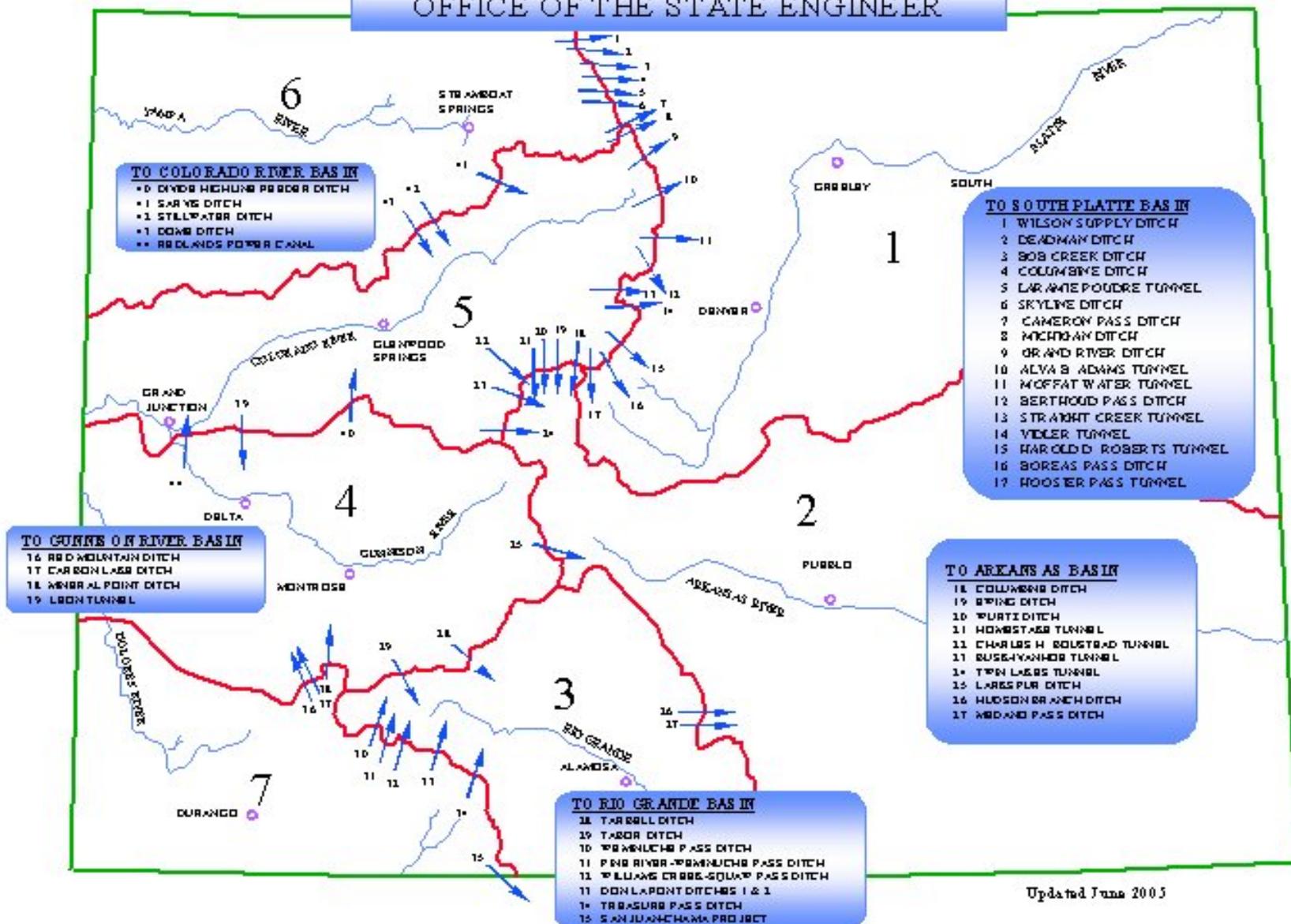
# Transbasin Water Rights

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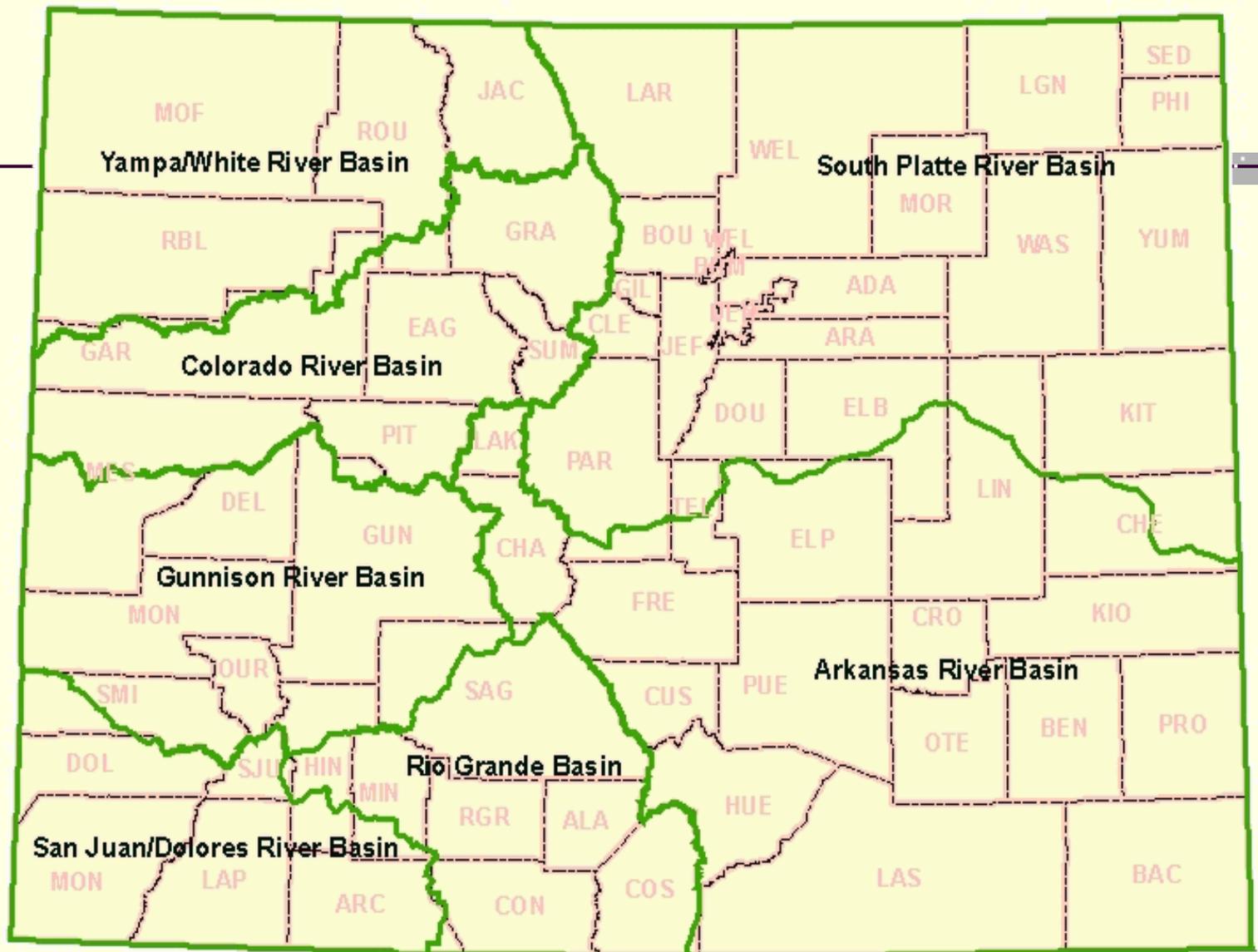
- Water exported to another basin can be used to extinction
- Different injury analysis
- Not subject to abandonment
- Highly valuable

# TRANS MOUNTAIN DIVERSIONS

## OFFICE OF THE STATE ENGINEER



Updated June 2005







# Interstate Issues

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- Colorado one of two headwaters states
- Subject to 12 interstate compacts and two U.S. Supreme Court decrees
- 1922 Colorado River Compact, 1948 Upper Colorado River Compact....
- Compacts and water storage are Colorado's best insurance policies

# Other Agencies and Entities

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- Colorado Water Conservation Board
- Colorado Water Resources and Power Development Authority
- Colorado Water Quality Control Division
- USFS, BLM, USFWS, Army Corps, EPA

# Federal Claims on Water

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- Federal reserved water rights
- Bypass flows
- Wilderness water rights
- Wild and Scenic Rivers
- Antiquities Act
- Endangered Species Act
- National Park Service Acts

# International Water Issues

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- 1944 Mexican Treaty:
  - Allocated certain quantities and quality of water on the Colorado River, agreements related to the Rio Grande
  - International Boundary and Water Commission administers boundaries, treaties and agreements between Mexico and the U.S.

# Recap: the Big Picture



# Demand Increasing, Water Use Scrutinized

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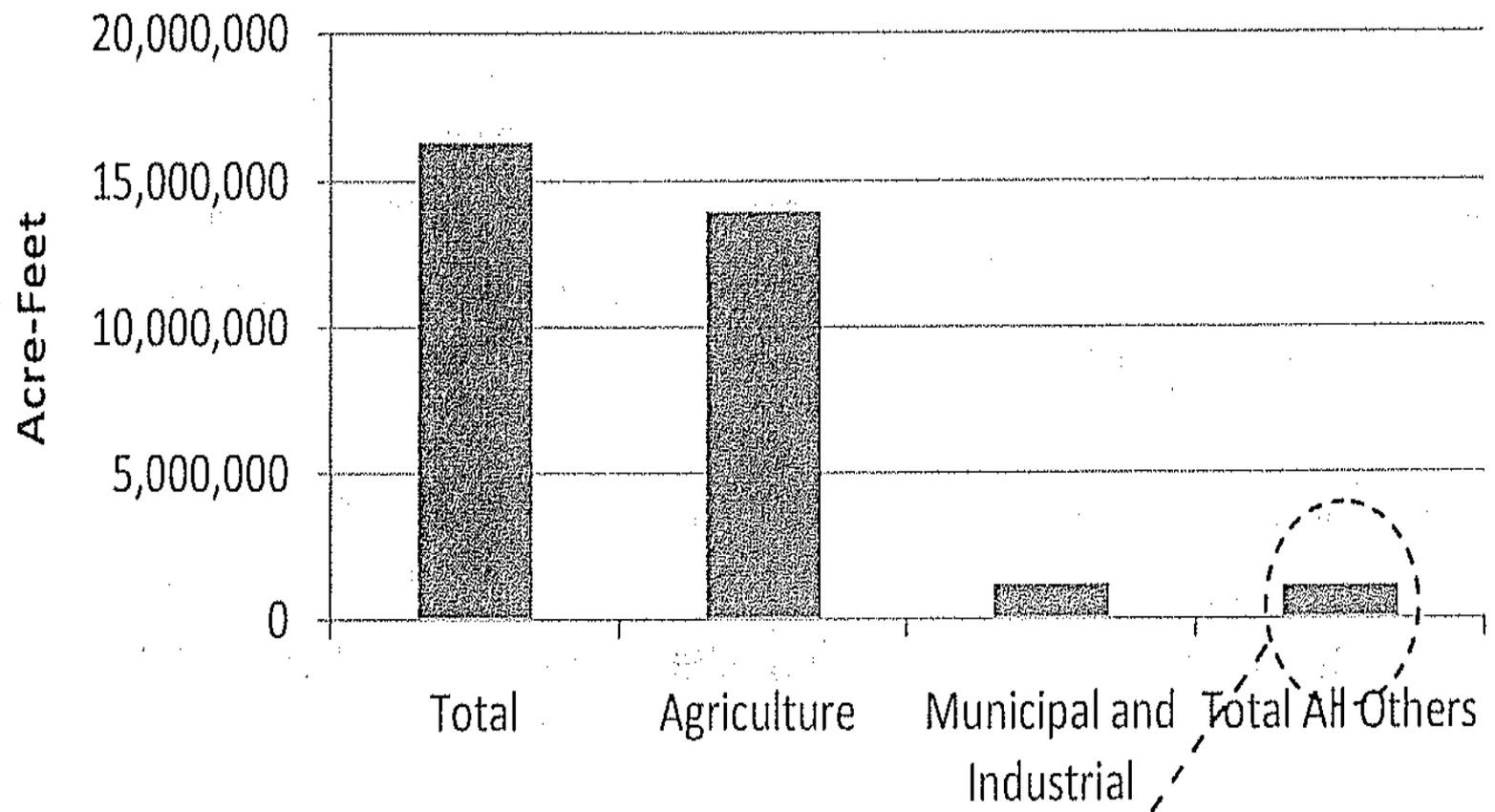
- Agricultural use amounts to nearly 95%
- Rising municipal, industrial, environmental and recreational demands
- Permitting and environmental hurdles: virtually no new water storage over the past three decades
- Ag dry-up
- Water use is highly scrutinized
- Regulatory agencies are paying more attention to industrial uses

# Water use in Colorado

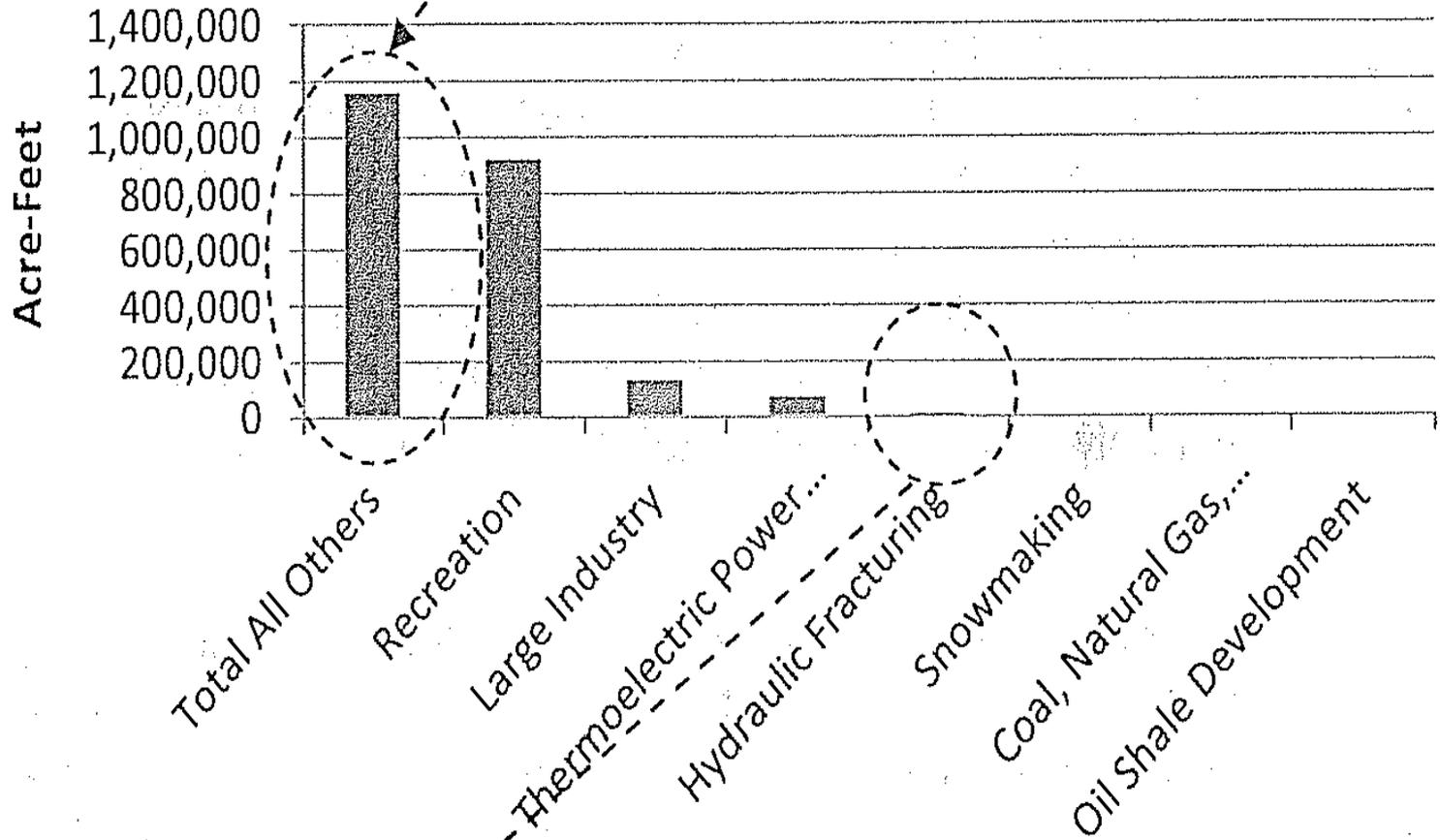
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- 2012 water use
  - Agricultural: 86 percent
  - Hydraulic Fracturing: less than one-tenth of one percent

# Amount of Water Currently Diverted Annually for all Uses in Colorado



## Amount of Water Currently Diverted Annually, Breakdown of All Others-Type Uses



# Tips for Frac Water Sources

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- Understand the water rights system where you are operating by state; basin and locality
- Work with good counsel and water engineers
- Contact State Engineer's Office and/or counsel and water engineers for questions on permitting and water rights
- Due diligence on water supplies
  - Title to water rights
  - Decreed for industrial purposes

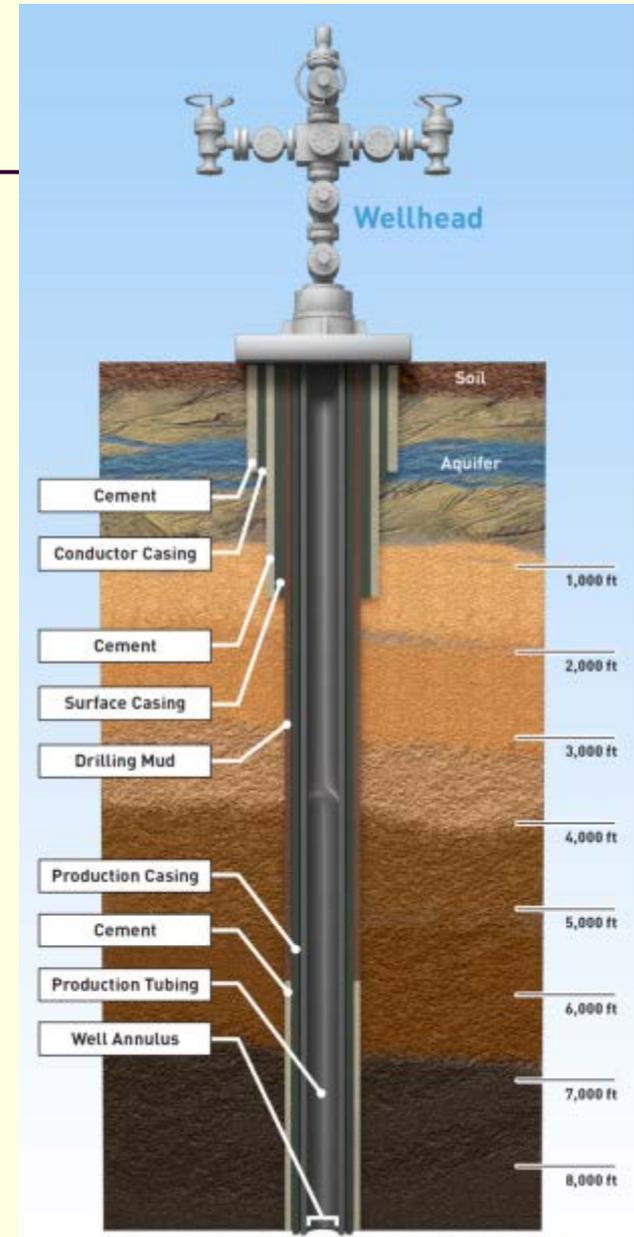
# Drinking Water Supplies Protected by Layers of Steel and Concrete

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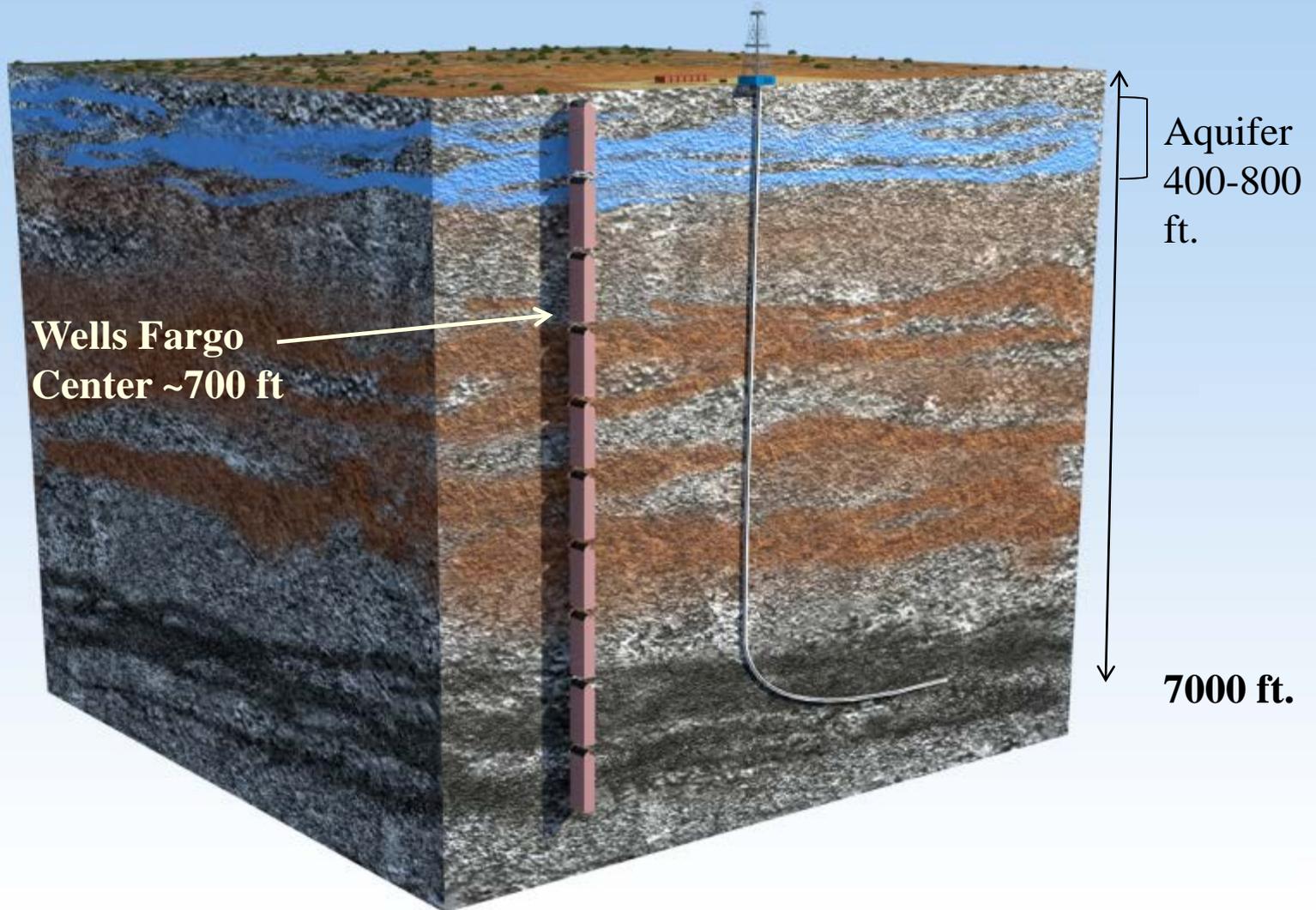
- Drill to 1,400 feet
- Install casing and fill to surface with cement
- Drill through down to 7,000 feet
- Install steel pipe and cement
- Drill horizontally
- Install another steel pipe and cement
- Install tubing when ready to produce

# Casing

- Multiple layers of casings
  - Cement
  - Conductor Casing
  - Cement
  - Surface Casing
  - Drilling Mud/Cement
  - Production Casing
  - Production Tubing
- Slide courtesy of COGA



# Drilling Distance



# Spectacular Track Record

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- Drilling to depths of 6,000 to 12,000 feet
- Fracturing has been used for 70 years
- Since 1947, 1.2 million wells have been fractured in the U.S.
- More than 2.5 million wells worldwide
- Hydraulic fracturing has never contaminated groundwater or harmed, hurt or killed anyone

# Contamination?

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- In the past 70 years in the U.S., there have possibly been three contaminations
- *Gasland* debunked—Some areas have had methane in their water for a long time (e.g. “burning springs”)
- Gas contamination can be tested like DNA
- EPA found that every case was bioorganic—not oil and gas

# Produced Water

- Water produced in association with oil and natural gas production comprises 80% of the oil and gas industry's residual waste requiring management and disposal.
- Management of produced water constitutes a large cost to the industry



Image courtesy of "COGCC"

# Water Quality

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- Quality of produced water varies from high quality water, suitable for beneficial uses, to low quality water that must be managed as waste
- Measuring Water Quality
  - Total Dissolved Solids (TDS)
  - Electric Conductivity (EC)
  - Sodium Absorption Ratio (SAR)

<b>Water Quality (TDS mg/l)</b>	<b>Basin</b>
<2,000 (Many Beneficial Uses)	<ul style="list-style-type: none"><li>■ Denver Basin</li><li>■ Williston Basin</li><li>■ Powder River Basin</li></ul>
2,000 – 10,000 (Limited Use)	<ul style="list-style-type: none"><li>■ Raton Basin</li></ul>
> 10,000 (No Beneficial Use)	<ul style="list-style-type: none"><li>■ San Juan Basin</li><li>■ Uinta Basin</li><li>■ Piceance Basin</li></ul>

# Two Primary Federal Laws

## Clean Water Act (“CWA”)

- NPDES permitting system

## Safe Drinking Water Act (“SDWA”)

- Underground Injection Control Program (“UIC”)



# The winding road: regulatory compliance

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# Safe Drinking Water Act

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- SDWA is the main federal law that ensures the quality of America's drinking water.
- EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards.
- SDWA was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply

# Drinking Water Standards

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- Water that meets federal drinking water standards is generally considered to be high quality.
- It is common for permits under a variety of environmental regulatory programs to reference federal drinking water standards, including shallow injection pursuant to the UIC program
- EPA sets standards for roughly 90 contaminants in drinking water under the SDWA

# SDWA - Underground Injection Control Program (“UIC”)

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- EPA categorizes usable quality groundwater as Underground Sources of Drinking Water under 40 CFR 144.3:
  - Less than 10,000 mg/l of TDS
  - Currently supplies or contains a sufficient quantity of groundwater to supply a public water system
  - Not an exempt aquifer
    - Producing formation hydrocarbons
    - Already Contaminated
    - At a depth or formation unsuitable for use as an aquifer
    - Located over class III mining area subject to collapse

# Permitting of Injection Wells

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- State may issue permits if the EPA grants the state “primacy”
- State must demonstrate that its regulations sufficiently meet the minimum standards of the EPA
- In some states, the EPA and state may jointly administer the UIC program

# Disposal and Treatment of Produced Water

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- Underground Injection Control
  - Class II Wells
  - Class V Wells
- Surface Management
  - Evaporation/Impoundment
  - Treatment
  - Discharge into surface streams
  - Beneficial use

# Permitting/Regulation of Class II and V Wells

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- Can be written for a single well or for a an area of surface land on which the wells can be drilled
- Typically, the oil and gas agency has primacy for Class II wells.
- Typically, the water quality or public health agency or EPA has primary for Class V wells.

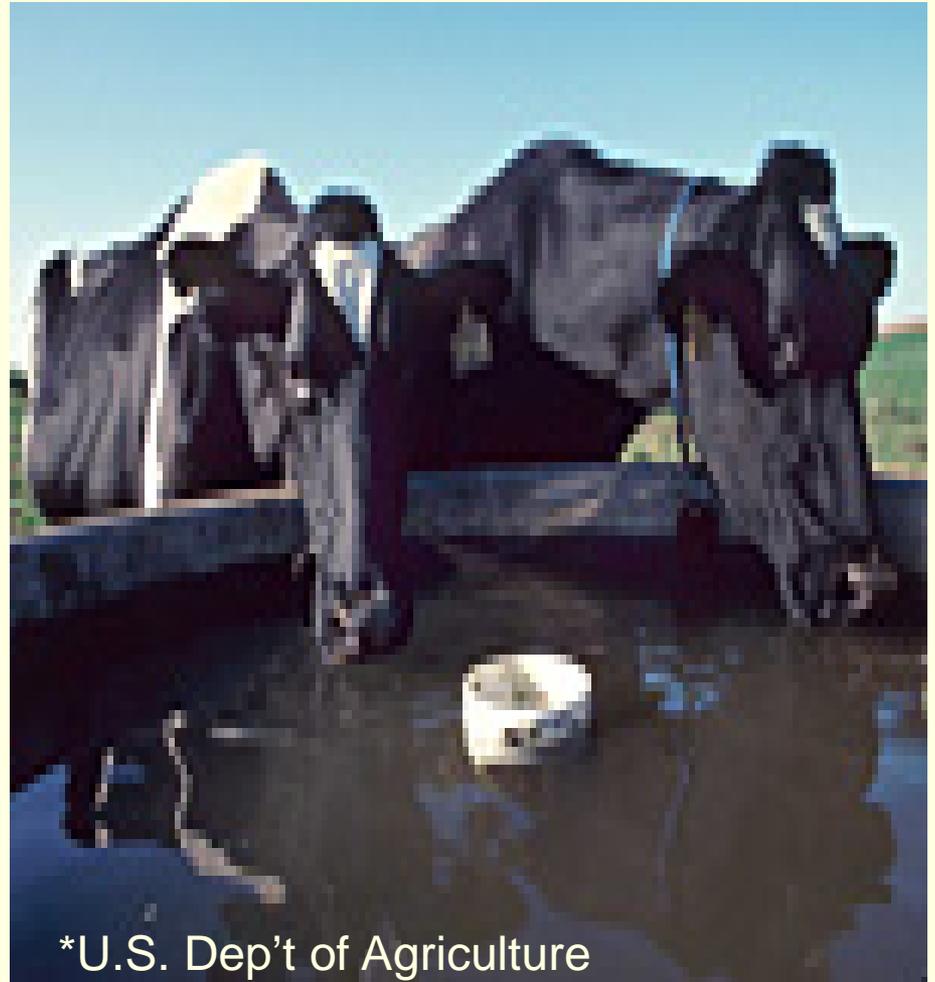
# Discharge

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- Operators must obtain a NPDES permit or State equivalent before discharging produced water
- Pre-treatment is required to meet EPA effluent standards, unless the produced water quality already meets CWA standards

# Beneficial Use of Produced Water

- Agricultural Use
  - Stock Watering
  - Crop Irrigation
  - Sub-Surface Crop Irrigation
- Wildlife and Wetland Habitat
- Industrial Uses
  - Reuse in for oil and gas e&p
  - Dust suppression roads and surface mining
  - Cooling Water for power generation
  - Source of Steam for turbines
- Domestic and Municipal Use



\*U.S. Dep't of Agriculture

# Produced Water in Colorado

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- Water quality
- Water rights
- SEO Rules and Petitions
- Challenges to the Rules and Judicial Review
- Recent Legislation



# Produced Water from Coal Bed Methane (CBM) Wells

*Vance v. Wolfe*, 205 P.3d 1165 (Colo. 2009)

- CBM wells remove water to release gas
- This process puts water to a “beneficial use”
  - Thus, CBM wells require a permit from the SEO and must replace depletions where tributary to a natural stream

# Impact of Vance v. Wolfe

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- 40,000 oil and gas wells now need water well permits?
- SEO to curtail oil and gas wells for injury to vested water rights?
- Loss of \$600 million annual revenue from severance and ad valorem taxes?

# Gunning for Certainty

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# Produced Water Legislation

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- HB 09-1303
- SB 10-165
- HB 11-1286
  - CBM and some conventional oil and gas incorporated into water well permitting and priority system



# HB 09-1303

- Amends Groundwater Management Act § 37-90-137
  - Authorizes SEO to adopt rules for administering the withdrawal of nontributary groundwater to facilitate mineral mining
- Interested Parties have the right to cross-examine during the rule-making
  - Judicial Review of the Rules is pursuant to the APA in water court
- Nontributary water is not subject to the priority system



# Senate Bill 10-165

- Except for CBM wells, no well permit is required unless the nontributary groundwater removed is put to a beneficial use
- Except for CBM wells, no permit is required if the nontributary groundwater being removed will be used only by operators within the geologic basin where removed to facilitate or permit the mining of minerals



# HB 11-1286

- Amends § 37-90-137
  - Clarifies and confirms SEO authority to adopt rules, delineate boundaries and undertake adjudicatory actions
  - Judicial Review of the Rules or appeals pursuant to the APA
  - Rebuttable presumption where injury asserted in water court

# SEO Rules

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- Rules and Regulations for the Determination of the Nontributary Nature of Ground Water Produced Through Wells in Conjunction with the Mining of Minerals
- 2 CCR 402-17
- \$3 million effort
- Extensive engineering and geologic analysis

# SEO Rules

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- Nontributary determinations
- Permits often not required
- No need to be administered in priority
- No need for SWSPs or Augmentation Plans

# Nontributary Ground Water

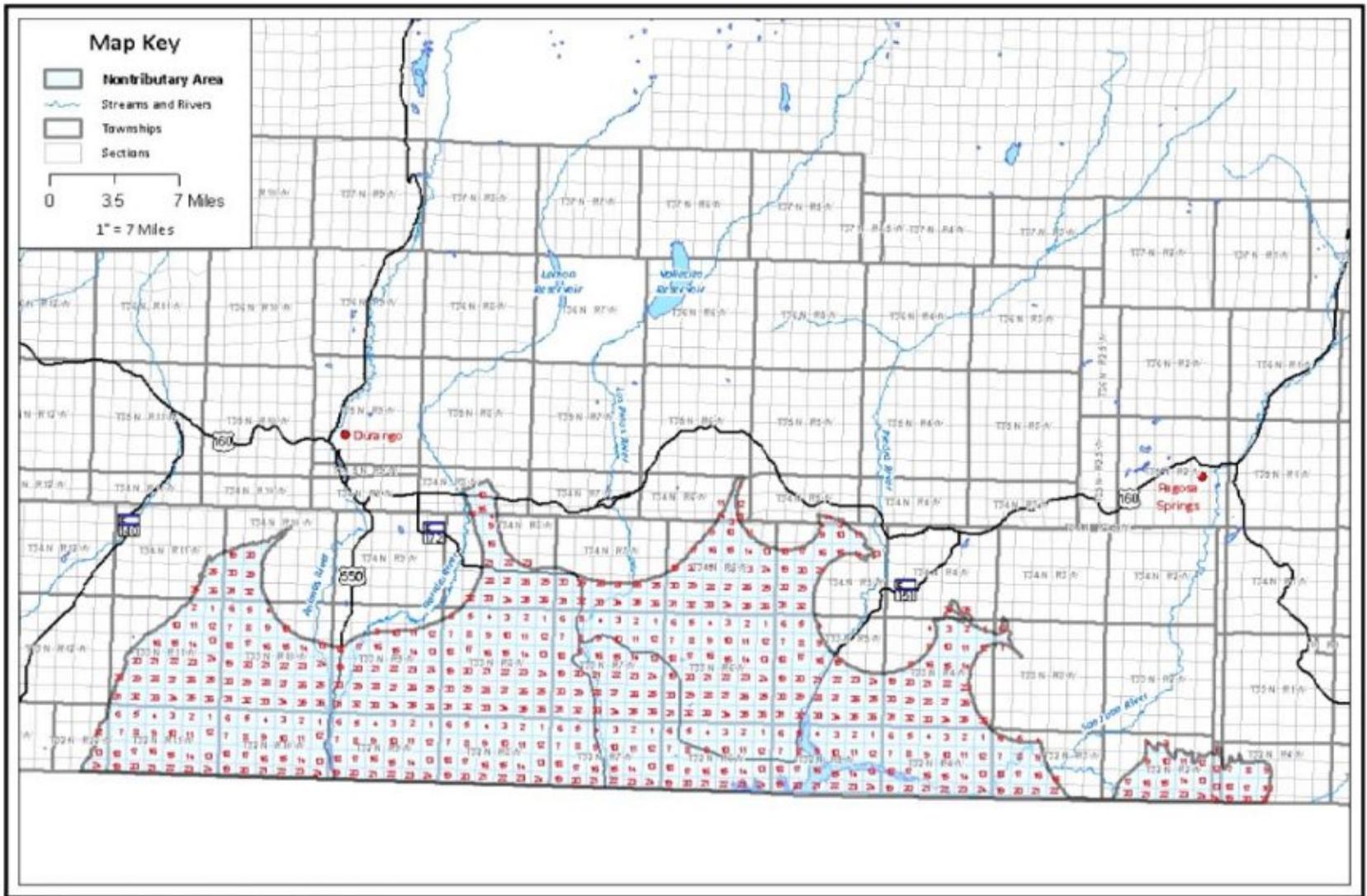
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- “...ground water, located outside the boundaries of any designated ground water basins in existence on January 1, 1985, the **withdrawal of which will not, within one hundred years of continuous withdrawal, deplete the flow of a natural stream**, including a natural stream as defined in sections 37-82-101 (2) and 37-92-102 (1) (b), **at an annual rate greater than one-tenth of one percent of the annual rate of withdrawal...**”

# Basin-Specific Rules: Rule 17.7.D

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- Nontributary boundaries delineated in formations in:
  - Denver Julesberg
  - Piceance
  - Northern San Juan
  - Paradox
  - Sand Wash



PROPOSED COLORADO GROUNDWATER RULES FOR THE 2010S



State of Colorado – Division of Water Resources  
Produced Nontributary Ground Water Rules; 2 CCR 402-17  
Nontributary Ground Water in the Northern San Juan Basin  
Fruitland Formation

Map  
A-2



Type of Well	Permit Required?	SWSP Required?	Augmentation Required?
<b>Nontributary:</b> Conventional	No (unless water is put to beneficial use)	No	No
<b>Nontributary:</b> CBM	Yes	No	No
<b>Tributary:</b> Conventional	Yes	Yes	Yes
<b>Tributary:</b> CBM	Yes	Yes	Yes

APPROVED WELL LOCATION

LA PLATA COUNTY

SE 1/4 SW 1/4 Section

Township 32 N Range 7 W New Mex P.M.

DISTANCES FROM SECTION LINES

    Ft. from South Section Line

    Ft. from West Section Line

UTM COORDINATES (Meter, Zone: 13, NAD83)

    Easting:                      Northing:                     

ENVER, CO 80202

203 904-1351

TO USE A WELL PERMITTED BY THE COGCC

ISSUANCE OF THIS PERMIT DOES NOT CONFER A WATER RIGHT

CONDITIONS OF APPROVAL

Well shall be used in such a way as to cause no material injury to existing water rights. The issuance of this permit does not ensure that no injury will occur to another vested water right or preclude another owner of a vested water right from obtaining relief in a civil court action.

Construction of this well is subject to the permitting requirements of the Colorado Oil and Gas Conservation Commission ("COGCC"). Therefore, the well owner is not required to demonstrate compliance with the Water Well Construction Rules 17.7.CSR-402-2.

Well pursuant to CRS 37-66-137(7)(b) for the use of a well permitted by the COGCC (APU Document #05-037-09341) for the dewatering of geologic formations by withdrawing nontributary water to facilitate oil/gas production. If oil/gas production ceases, all diversion of ground water from the well shall cease immediately and production of water from the well may resume only if a new water well permit is obtained for this well.

Well owner shall mark the well in a conspicuous place with the State Engineer well permit number or with the applicant's designation, ARCO UTF 32-7-8 #2, and take the necessary means and precautions to preserve these markings.

Use of ground water produced during the operation of the oil/gas wells is limited to industrial. All necessary discharge permits and approvals from the Colorado Department of Public Health and Environment, Water Quality Control Division or the COGCC shall be obtained prior to use of ground water pursuant to this permit. The State Engineer may request water quality data or information at any time to determine if the requirements of use to senior appropriators are met.

Maximum pumping rate of this well shall not exceed 7 GPM.

Annual amount of ground water to be withdrawn shall not exceed 11.3 acre-feet.

Production from this well is limited to the hydrostratigraphic zone, pursuant to Rule 17.7.D.2 regarding coated methane production zones, of the Northern San Juan Basin: Fruitland Formation, from which the applicant is producing ground water associated with the production of oil/gas.

Water meter or other recognized method acceptable to the Division Engineer must be used to measure the total amount

# Subsequent Petitions under the Rules

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- Raton CBM
  - Las Animas County
  - Pioneer, XTO, El Paso and Red River Ranch Holdings
- North Park
  - Niobrara
  - EOG
- DJ Basin (3)
  - Sussex & Shannon Members of Pierre Shale
  - Boulder and Weld Counties
  - Noble, Encana and KP Kauffman
- Piceance CBM
  - Mallone Well Field in Southeastern Garfield County
  - Encana

# Current Status

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- SEO has issued well permits for over 5,000 CBM wells
- Thousands of wells can operate without permits or administration
- Some companies filed applications in water court for water rights for produced water
- SWSPs with the SEO
- Applications in water court for augmentation plans

# *But Challenges to the Rules...*

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# Consolidated Cases

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- 6 separate challenges consolidated into Division 1 Water Court
- Challenge SEO's authority to (among other things):
  - Promulgate the Rules
  - Determine nontributary vs. tributary groundwater
- The Challenges raise issues for oil & gas companies
  - What legal effect do the Rules have on water rights applications when nontributary/tributary boundaries are implicated?
  - Does an applicant have to prove the basin-specific findings of tributary/nontributary delineation?
  - If the Rules are found to be valid, does a well permit sufficiently protect the user's water right in a nontributary well?



# The Other Cases

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- Three other cases have been filed that significantly overlap with the consolidated cases, but were not consolidated
  - Two in Division 7; one in Division 1
- These cases may be postponed until a final ruling is given for the “Consolidated Cases”
  - Status currently uncertain

# Consolidated Cases

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- Case No. 10CW89
- Final Judgment and Decree
- September 8, 2011

# Water Quality Sampling and Monitoring

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- COGA Voluntary Baseline Groundwater Quality Sampling Program
  - First statewide voluntary groundwater quality monitoring program for oil and gas
  - Collect data before and after drilling at individual well sites
  - Collect from two existing groundwater features within ½ mile of new oil and gas well pads or additional wells on existing well pads

# COGA Voluntary Program

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- First sample will be collected before drilling begins
- Second sample will be collected within 1-3 years after drilling is completed
- Lab results provided to each landowner within 3 months of collection
- With landowner consent, lab results and data posted through COGCC

# FracFocus

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- In a single year, more than 200 companies have registered over 15,000 well sites
- Chemical Disclosure Registry
- Transparency
- Groundwater protection

# [www.Fracfocus.org](http://www.Fracfocus.org)

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- Who participates?
- Where does water come from?
- What chemicals are disclosed?
- How much water is used?
- Can contamination occur?

# FracFocus by state

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- Colorado: effective Apr. 1, 2012
- Wyoming: effective Sep. 15, 2012 (requires pre-fracking disclosure)
- Montana: effective Aug. 26, 2011  
(alternatively, may submit information to the Board of Oil and Gas Conservation)
- Utah: effective Nov. 1, 2012
- New Mexico: effective Feb. 15, 2012
- North Dakota: Nov. 9, 2011

# A few twists and turns?



# COGCC Rules on Groundwater Sampling and Monitoring

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- Hearing started November 14, 2012
- Public Testimony
- No more fracking in Colorado
  - People are dying
- Other existing programs
  - Piceance Basin
  - Northern San Juan Basin

# States Oppose Federal Regulation

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- Governor Mead urges feds to abandon attempts to regulate fracking
- “Wyoming can do it better.”
- Congressional Western Caucus



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**Light at the  
end of the  
tunnel?**

# Concluding Thoughts

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- Complex federal and state regulatory scheme
- Water rights issues for source water and end uses
- Federal and state water quality issues
- Disposal options vary
- Opportunities for innovative use and reuse of produced water



Questions or Comments?

# Holsinger Law, LLC

lands, wildlife and water law

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