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### SLIDES: The Role of Groundwater Sampling/Monitoring: COGCC Proposed Rule 609

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# The Role of Groundwater Sampling/Monitoring COGCC Proposed Rule 609

University of Colorado Law School  
Nov 26, 2012

# What is the Purpose of Proposed Rule 609?

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- To document baseline groundwater conditions prior to initiation of oil and gas drilling or facility installation activities
- To ensure no impacts to underground sources of drinking water occurred in the near future from these activities

# How Can Sampling/Monitoring Be Accomplished?

- Groundwater collection:
  - Domestic wells
  - Springs
  - Monitoring wells (optional)



# What will the Sampling Tell Us?

- Baseline conditions in the immediate vicinity of the well/facility site
  - **Will** provide the State and homeowner with sample results
  - **Will** document limited aquifer/domestic well water quality
  - **Will** protect the operator from false claims from homeowners
  - **Will** provide a comfort factor to the homeowner

# What will the Sampling Tell Us? (continued)

- **May** minimize adverse impacts to homeowners if mitigation practices are implemented to address:
  - existing (baseline) contamination that is discovered; or
  - subsequent contamination that is detected after drilling/fracing or facility construction is complete
- **May** help with early detection of an adverse impact from drilling operations and thus aid in early implementation of mitigation practices

# What will the Sampling Tell Us? (continued)

- **Will not** prevent an adverse impact to an aquifer or homeowner
- **Will not** fully characterize water quality of an aquifer or the potentially impacted zone
- **Will not** address data quality issues that are inherent with domestic wells
- **Is not** fool proof! (i.e., two samples may not be enough to detect existing contamination or any potential contamination caused by the drilling activity/facility)

# What Does All This Cost?

- Two GW samples from domestic wells or natural springs:
  - **Analytical costs:**
    - Approx. \$600/sample (basic analytes)
    - Approx. \$500/sample for gas compositional analysis and stable isotope analysis **if** methane detected in the initial basic analytes).
    - Total analytical cost: \$1,200 - \$2,200
  - **Sampling labor/ODCs:** approx. \$1,500 – 2,000
  - **Total Cost:** \$2,700 - \$4,200 per well/facility
  - **Time:** 1 day

**Note:** significant implementation cost (1600 wells/\$4.8M+)





# Issues and Concerns

- Two GW samples may not be enough
  - Operator option: typical investigations include at least one upgradient and two downgradient sample locations
- Proximity to the project site (side gradient is not preferred)
- Proposed rule requires sampling of GW within a half mile radius of the well/facility site (i.e., well head). Operator option: additional sampling along the well lateral which could be as much as 7,000 feet; will increase sampling activity/cost

# Issues and Concerns (continued)

- Access agreements with landowners
- Liability insurance
- Access to the well
  - Pumps, wires, tubing
- Sampling methods
  - Sample drawn from tap
  - Sample drawn from well (EPA preferred method)
- Potential damage to well from sampling process: indemnification, waivers

# Issues and Concerns (continued)

- Questionable data due to unknowns associated with existing wells:
  - Well Records
  - Aquifer in which the well is drawing from
  - Zone of influence
  - Well integrity
  - Well use (private, commercial, drinking, irrigation)
  - Historical water quality
  - Tampering

Note: this is a critical issue that should be considered during rulemaking and at least addressed during sampling planning stages



# How Can an Operator Deal With The Issues and Concerns?

- Collect additional samples (operator option)
  - All wells or a percentage of wells within the half mile radius from the project site
- Utilize wells that are upgradient or downgradient of the project site
  - Could install monitoring wells (operator option)
- Extend radius of concern to include the lateral
- Obtain access agreements with landowners in advance
- Apply for “**exception**” if satisfactory locations are not available or homeowners decline access

# How Can an Operator Deal With The Issues and Concerns? (cont.)

- Make sure consultants (performing the sampling) have sufficient liability insurance
- Well inspections prior to sampling
- Discuss preferred sampling methods with Fed/State agencies
- Perform record searches with State agencies
- Homeowner questionnaire to document well construction details (depth, screen level, installation materials, seals, etc.)

# Monitoring Wells (optional)

- Not required
- In some cases, operators may want to consider installing monitoring wells
  - Drill/install/develop/sample standard monitoring wells:
    - 2 shallow wells (<25 ft): \$13K - \$15K
    - 2 intermediate wells ( $\approx$ 100 ft): \$30K - \$40K
    - 2 deep wells ( $\approx$ 300 ft): \$80K - \$100K

# Questions?

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