Class V: Aquifer Storage and Recovery (ASR) in Region 8

Craig Boomgaard, P.G., PMP
USEPA Region 8
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Region 8 (R8) – Class V

• Primacy States – North Dakota, Utah, Wyoming

• Direct Implementation (DI) – Colorado, Montana, South Dakota, Indian Country
Colorado vs. Florida ASR

• Injection Zone Lithology: Colorado - Sandstone; Florida - Limestone

• Transmissivity (ft²/day)
  • Colorado Arapahoe Formation - 400 to 1,200
  • Florida Upper Floridan - 5,000 to 10,000

• Total Dissolved Solids (TDS) mg/L
  • Colorado Arapahoe Formation 100 – 1,000
  • Florida Upper Floridan 500 - 2,000+

• Mobilization Concern: Colorado Arapahoe—uranium; Florida - arsenic

*Data Source: Various USGS Publications*
Regulatory Oversight Methodology

• Prior to 2011 R8 (DI) authorized by rule (RA) all ASR projects
• From 2011 to 2012, R8 staff reviewed all of the existing DI ASR facilities triggered by a HQ initiative to examine this well class.
  • Confirmed current operational status
  • Coordinated with ORD, R8 Toxicologist, and Drink Water team
  • Reviewed submitted data with an eye toward new MCLs and constituents including disinfection by products
  • Requested additional data as needed using 144.27 authority
• All except one facility remained under RA, one Permit/Close
• Most banked water instead of true ASR
R8 Methodology (continued)

• In 2015, R8 saw a resurgence of interest in ASR in Colorado
  • One new and two requesting restart of dormant systems
  • Authorize cycle testing under RA
  • Results of cycle testing determine next steps
  • Coordination with team
R8 Methodology (continued)

• Source water treatment – surface or groundwater
  • Chlorine, chloramine, no disinfection
  • \textbf{N-nitrosodimethylamine} (NDMA) - 7 ng/L \{ppt\}, THMs, haloacetic acids
• Degradation analyses

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Why do we care about NDMA?

• Drinking water source aquifer
• Very difficult to treat/remove
• Characteristics
Summary of ASR in R8

• RA cycle testing and evaluate
• Examine source water and treatment methods
• Test for DBPs, especially NDMA
• Keep up with new constituents
Questions?

Craig Boomgaard, P.G., PMP
Boomgaard.Craig@epa.gov
303.312.6794