

Technical Workshop on Well Construction/Operation and Subsurface Modeling

April 16-17, 2013

US EPA Research Triangle Park Campus
"C" Building Auditorium
Research Triangle Park, NC

April 16: Well Construction/Operation

- 8:00 am **Registration/Check-in**
- 8:30 am **Welcome and Introductions** *Ramona Trovato, US EPA*
- 8:40 am **Opening Remarks** *Glenn Paulson, Science Advisor, US EPA*
- 8:45 am **Purpose of Workshop and Industry Perspective** *Workshop Co-Chairs:
Jennifer Orme-Zavaleta, US EPA
Kris Nygaard, ExxonMobil Production Company*

Session 1: Well Design and Construction to Protect Drinking Water

- 8:55 am **Panel:**
- **Proposed Analysis from the Well File Review** *Jeanne Briskin
and Nathan Wiser, US EPA*
 - **Geophysical Logging for Characterization of Fresh- and Saline Water Flow Zones in the Fractured Bedrock of the Northern Appalachian Basin** *John Williams, USGS*
 - **An Overview of Well Construction and Well Integrity Related to Hydraulically Fractured Wells** *Talib Syed,
TSA, Inc.*
 - **Oil and Gas Well Cementing** *D. Steven Tipton,
Newfield Exploration Company*
 - **Zonal Isolation Methods Available to Operators for Groundwater Aquifer Protection** . *Anthony Badalamenti,
Halliburton Energy Services, Inc.*

Questions of Clarification

Break (10 minutes)

Facilitated discussion among workshop participants focusing on key questions:

- What current techniques are designed to prevent leaks through production well tubulars and fluid movement along the wellbore?
- What factors are typically used to ensure adequate confinement of fluids that can move?
- How are ground water resources identified and documented prior to and during production well installation?
- What is the breadth of approaches?

- 12:20 pm **Summary of Session 1** *Workshop Co-Chairs:
Jennifer Orme-Zavaleta, US EPA
Kris Nygaard, ExxonMobil Production Company*

- 12:30 pm **Lunch (on your own) and Poster Session**

Session 2: Well Operation and Monitoring to Protect Drinking Water

2:00 pm

Panel:

- **Wellbore Integrity: Failure Mechanisms, Historical Record, and Rate Analysis**.....*Anthony Ingraffea, Cornell University*
- **eWCAT (electronic Well Control Assurance Tool) and Process Safety**..... *Marco op de Weegh, Shell Exploration & Production Company*
- **Well Integrity and Long-Term Well Performance Assessment** *Bill Carey, Los Alamos National Laboratory*
- **Open Questions Regarding Well Construction and Hydraulic Fracturing** *Courtney Hemenway, Hemenway Groundwater Engineering, Inc.*

Questions of Clarification

Break (10 minutes)

Facilitated discussion among workshop participants focusing on key questions:

- What testing is conducted to verify issues do not exist prior to, during and after hydraulic fracturing?
- What testing or monitoring techniques ensure adequate confinement?
- What is the breadth of approaches?

4:45 pm

Summary of Session 2 *Workshop Co-Chairs:
Jennifer Orme-Zavaleta, US EPA
Kris Nygaard, ExxonMobil Production Company*

4:55 pm

Closing Remarks..... *Ramona Trovato, US EPA*

5:00 pm

Adjourn

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April 17: Subsurface Modeling

8:30 am **Introduction to Day Two** *Workshop Co-Chairs:*
Jennifer Orme-Zavaleta, US EPA
Kris Nygaard, ExxonMobil Production Company

Session 3: Subsurface Modeling of Fluid Migration to Identify and Understand Potential Impact on Aquifers

- 8:35 am **Panel:**
- **Evaluating Scenarios of Potential Subsurface Impact Using Computational Models** *Stephen Kraemer, US EPA*
 - **Analysis of Feasibility of Extensive Fracture Development and Fault Activation Induced by Hydraulic Fracturing**..... *George Moridis, Lawrence Berkeley National Laboratory*
 - **Modeling of Leakage in Potential Failure Scenarios in Shale Gas Systems** *George Moridis, Lawrence Berkeley National Laboratory*
 - **Emergence of Delamination Fractures around the Casing During Wellbore Stimulation** .*Arash Dahi Taleghani, Louisiana State University*
 - **Abandoned Wells as Potential Leakage Pathways: Lessons Learned from CO₂ Geological Storage** *Michael Celia, Princeton University*

Questions of Clarification

Break (10 minutes)

Facilitated discussion among workshop participants focusing on key questions:

- *What additional potential failure scenarios not covered in the EPA study progress report should be investigated?*
- *What are the most important parameters and appropriate level of complexity for a model that studies the severity of the potential impact of hydraulic fracturing on drinking water resources?*
- *What are the advantages and disadvantages of different modeling approaches?*
- *What well performance data (e.g., microseismic testing, pressure, tracer or other) are available to EPA that would be useful to build and evaluate the model?*

12:15 pm **Summary of Session 3** *Workshop Co-Chairs:*
Jennifer Orme-Zavaleta, US EPA
Kris Nygaard, ExxonMobil Production Company

12:25 pm **Closing Remarks** *Glenn Paulson, US EPA*

12:30 pm **Adjourn**

Poster Session

Well Design and Construction in Texas

Travis Baer, Railroad Commission of Texas

Colorado's Regulations on Wellbore Integrity and Hydraulic Fracturing

Stuart Ellsworth, CO Oil and Gas Conservation Commission

Simple Groundwater Modeling of Transport Pathways in Unconventional Natural Gas Plays

Tom Myers, Great Basin Hydrology

Long Term Risk of Potable Aquifer Contamination via Fracking Fluids

George Pinder, University of Vermont

Nonisothermal Multiphase Multicomponent Reactive Transport in a Deforming Fractured Porous Media

Robert Podgorney, Idaho National Laboratory

Modeling Near Wellbore Leakage Pathways in Shale Gas Wells: Investigating Short and Long Terms Wellbore Integrity

Saeed Salehi, University of Louisiana at Lafayette