GARFIELD COUNTY: LESSONS LEARNED ABOUT OIL AND GAS DEVELOPMENT

AirWaterGas Seminar Series

CU Boulder
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The Piceance Basin in Garfield County
Garfield County Oil and Gas Wells
Garfield County has 12 Active Drilling Rigs
Annual Drilling Activity

Annual Well Start Totals

- 2000: 190
- 2001: 251
- 2002: 245
- 2003: 417
- 2004: 585
- 2005: 799
- 2006: 1005
- 2007: 1304
- 2008: 1688
- 2009: 768
- 2010: 910
- 2011: 881
- 2012: 498
- 2013: 44

Garfield County
The Drilling Process
The Drilling Process, Cont’d

WELL BORE
The following diagrams are vertically distorted in order to depict a wellbore. The wellbore dimensions are in inches and the cross-section is in feet of depth.

Courtesy of Stuart Ellsworth, Colorado Oil and Gas Conservation Commission
The Drilling Process, Cont’d

PLACE & CEMENT SURFACE CASING
To protect and isolate aquifers

Courtesy of Stuart Ellsworth, Colorado Oil and Gas Conservation Commission
CEMENT PRODUCTION CASING
To isolate hydrocarbons to producing formations by cement and steel casing.
The Drilling Process, Cont’d

PREPARE FOR PRODUCTION
Perforate and run tubing

Bradenhead valve monitoring during frac’ing per Rule 341

WELLHEAD
GROUND SURFACE
CEMENTED CONDUCTOR
AQUIFER(S)
CEMENT SURFACE CASING
CEMENT PRODUCTION CASING PERFORATIONS
PRODUCING FORMATIONS

Courtesy of Stuart Ellsworth, Colorado Oil and Gas Conservation Commission
What Accompanies Drilling

- Point of Production
- Gas Gathering and Compression Systems
- Gas Treatment Facilities
What Accompanies Drilling, Cont’d

- Access Roads
- Centralized Liquids Management / Injection Wells
- Communications Towers
- Laydown / Storage & Contractors Yards
- Gravel Extraction Increase
- Remote Industrial Support Offices
What Accompanies Drilling, Cont’d

- Workforce Housing / Temporary Employee Housing
3 Stages of Development

1. Development Phase

*Short-lived, labor-intensive, peak impact*

Drilling operations, Garfield County
Natural Gas Well Pad,
Pinedale Anticline, WY
Photo by Richard Waite, 2008
Slide Courtesy Meghan Thoreau
3 Stages of Development, Cont’d

2. Production Phase

Long-lived, small-steady labor force

Slide Courtesy Meghan Thoreau
3 Stages of Development, Cont’d

3. Reclamation Phase

Long-lived, small-steady labor force

Final Reclamation, Garfield County
Quality of Life impacts.. and solutions

- A story of how it was *way back in 2005*

- Lessoned learned

- Fewer quality life impacts in 2012
Garfield County Regulations

- No industry specific regulations or separate natural gas code
- All ‘industrial’ types of uses are reviewed with one set of regulations with some limited exceptions to O&G
- No longer require Special Use Permits (SUPs) for drilling as of early 1990’s - now a “use by right” left to COGCC
- Recent local regulatory changes related to nat. gas:
  - Pipelines (threshold levels)
  - Temporary Employee Housing
  - Remote and centralized hydraulic fracturing sites
Facilities that are appurtenances to oil/gas development activities (compressors, etc.) are considered appropriate in all land uses so long as they meet the respective mitigation requirements of the ULUR to maintain compatibility with surrounding land uses.
Regulated Natural Gas Infrastructure

- Water Treatment Plant
- Temporary Employee Housing
- Water Gathering Site (Tank Batteries for Produced Water)
- Communications Tower / Facilities
- Water Storage / Evaporation Facilities
- Natural Gas / Water / Produced Water Pipelines
- Drill Cuttings / Fluids Recycling Facilities
- Mineral Waste Disposal Areas
- Industrial Support Facility: Field Offices
- Laydown Yards
- Compressor Stations
- Warehouse Storage Facilities
- Injection Wells
- Contractors Yards
- Construction Materials Mine
- Natural Gas Treatment Facility
Where do solutions to quality of life impacts come from?

- Communication is Key!!!

- Industry and local government commitment to working together
  - Planning/permitting
  - Problem resolution on a daily basis
Quality of Life impacts...and solutions

- Heavy Traffic
  - Water pipelines, Centralized completions facilities

- Speeding/reckless driving
  - Enforcement, Zero tolerance policies, Industry funding for sheriff’s overtime

- Road dust/mud
  - Industry/county cooperative dust control program, New COGCC regs, Stormwater regs address mud, Frequent street sweeping
Quality of Life impacts...and solutions

- **Odors (Volatile Organics)**
  - Combustors, improved water treatment, green completions, Closed loop drilling and completions for vapor recovery

- **Emissions (Air Quality)**
  - Tighter regulations, produced water management systems reduce truck usage, Baseline Monitoring
Quality of Life impacts... and solutions

- Noise
  - Barriers,
  - Improved site planning
  - new regs

- Lights
  - Barriers, Improved site planning, new regs
Quality of Life impacts...and solutions

- Industry/residential interface
  - Companies working with communities in advance for better planning
Where do solutions to quality of life impacts come from?

- **Energy Advisory Board**
  - Panel of residents, governments, citizen groups, and Industry
  - Monthly meetings, filmed for local access TV

- **Community Counts, nonprofit organization**
  - communitycountscolorado.com
  - 24/7 access to energy companies
  - Problem resolution

- **Oil and Gas Liaison (Local Government Designee)**
  - ‘All of the above’ approach
  - Work closely with residents, industry and governments
  - Facilitate problem resolution
  - Review permit applications
  - Participate in state rulemaking process

- **COGCC and other regulatory agencies**

- **Open Dialog/Industry Partnerships**