



Land Farm





Health impacts

- Individuals from several states report health impacts including neurological symptoms, respiratory conditions, tumors, skin rashes, nosebleeds, and pain.
- Observed livestock effects include reports of stillbirths, low or no milk production, birth defects, low fertility, and smaller litters, as well as death from poisoning.

Wildlife Habitat



Wildlife impacts

- Habitat destruction and fragmentation
- Noise and light
- Contamination of air and water
- Erosion and sedimentation
- Poaching
- Traffic

Wildlife impacts

- Over 25 million acres of big-game habitat in the Rockies has already been leased by the Bureau of Land Management.
- Mule deer numbers declined in one area in the Pinedale anticline by 30 percent overall during a seven-year research project which ran from 2000-2007.
- Sage grouse show reduced breeding populations in breeding areas within 3 miles of active drilling and within 2 miles of existing wells. Eventually they stop using these breeding areas.



Regulatory issues

Exemptions in federal statutes:

- Clean Air Act
- Clean Water Act
- Safe Drinking Water Act
- Resource Conservation and Recovery Act
- CERCLA/Superfund law

Regulatory issues

“....many of the state regulatory schemes date from earlier waves of resource extraction, and have not kept pace with changed technologies, nor with a deepening concern for public health and the environment.”

University of California-Hastings College of the Law,
Center for State and Local Government Law

Solutions

- CU Law School: Intermountain Oil and Gas BMP project lists thousands of BMPs
- State and federal agencies
- Academic research
- Private companies

Technical innovation

- Capturing air emissions
- Reducing, recycling, or reusing toxic substances
- Using non-toxic substitutes
- Closed-loop pitless drilling instead of pits
- Preventive maintenance and leak prevention
- Well clustering, centralized operations, remote telemetry, piping systems

Results of greener approaches

- Wells fractured with non-toxic fluids were found by Amoco in some cases to produce more gas and cost less to fracture.
- Comparisons have found closed loop drilling to create cost savings of up to \$180,000 per pit.
- Devon Energy spent \$15,000 to capture methane emissions from a well and sold the methane for \$35,000.
- In Alaska a company reduced drilling costs by more than half by reusing drilling fluid.

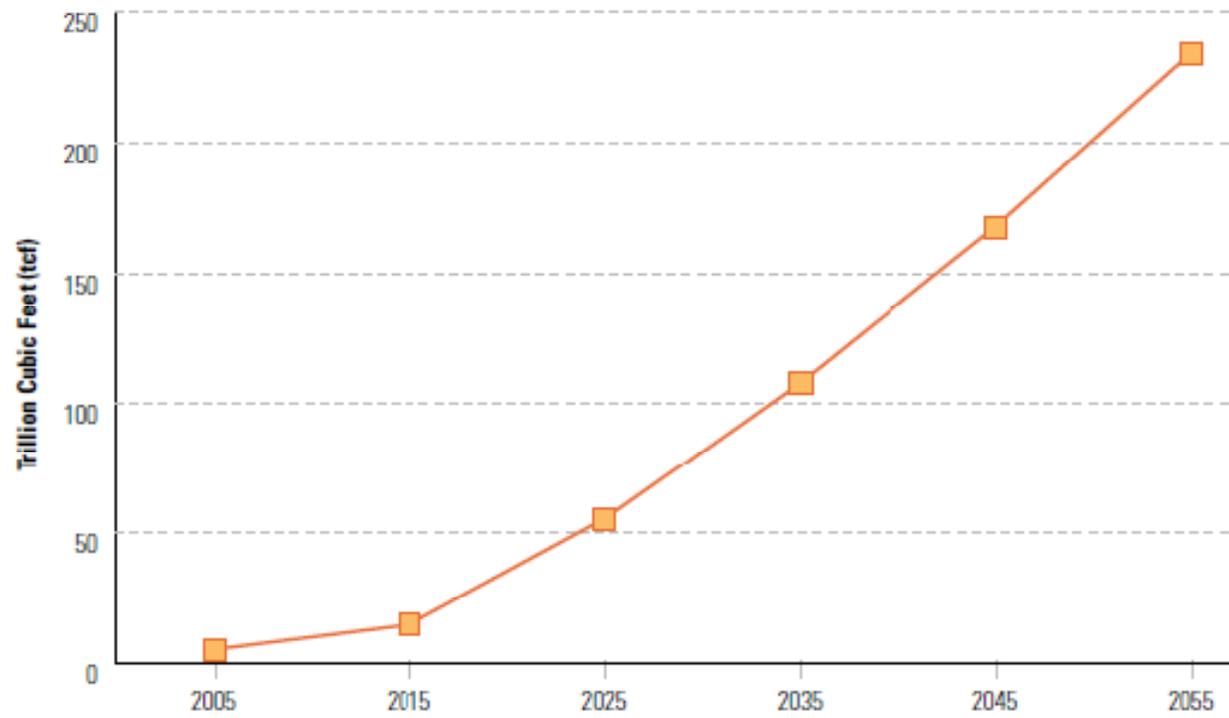
Williams: Hayes Gulch Project

- Two years of planning led to 14-months of drilling instead of 3 years.
- Closed loop pipe system
- Clustered wells and centralized fracturing operation
- Less roads, pads, noise, emissions, dust
- Recycled 100% of produced water
- Eliminated 12,500 truck trips

Efficiency

An aggressive natural gas efficiency program could cumulatively save more than 234 trillion cubic feet of natural gas over the next 50 years.

Natural Gas Savings from Efficiency Measures



“America does not have to choose between a clean and healthy environment and a healthy, growing economy. We can and must have both.”

-- Williams