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# Wyoming's Integrated Oil & Gas Management Approach

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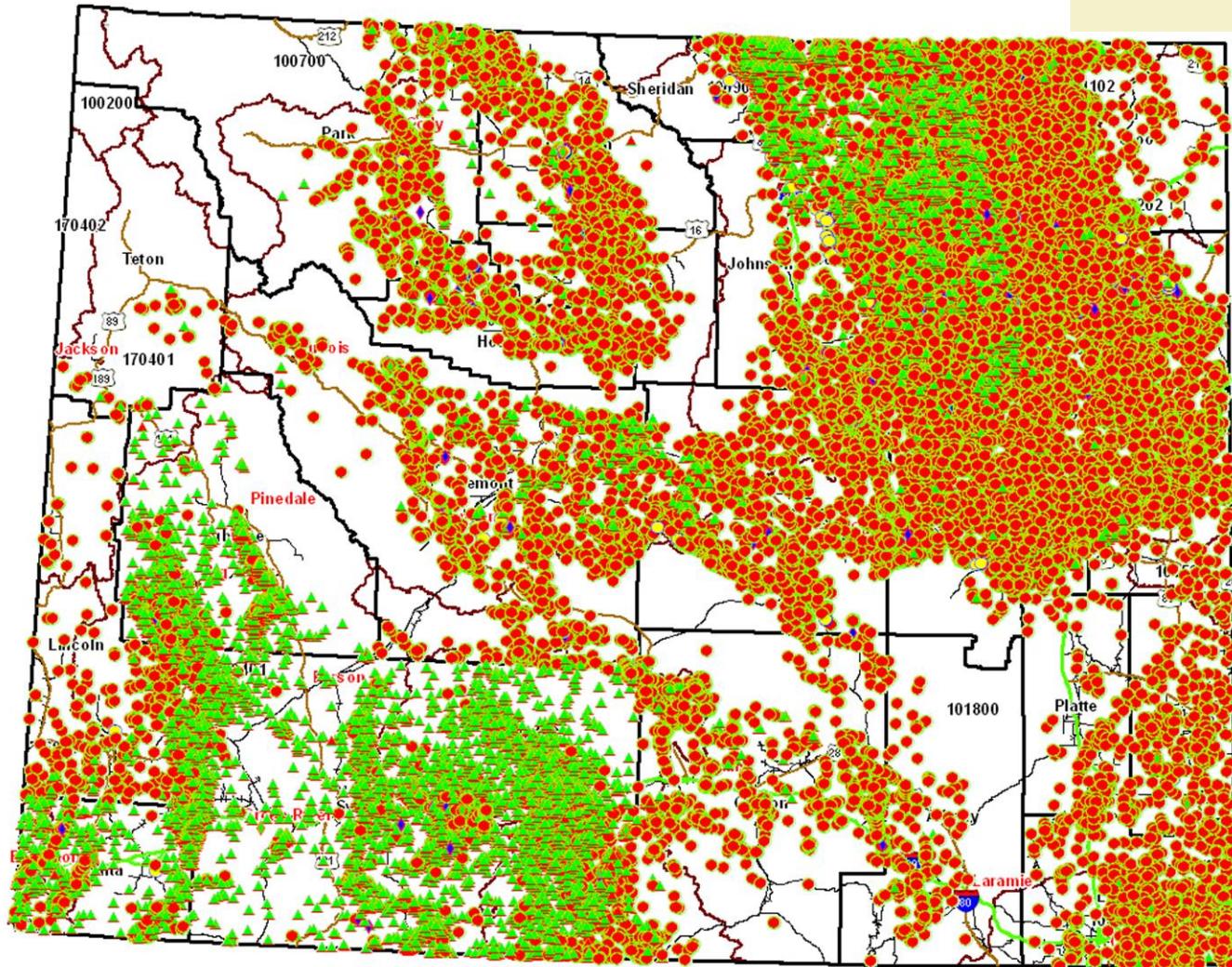
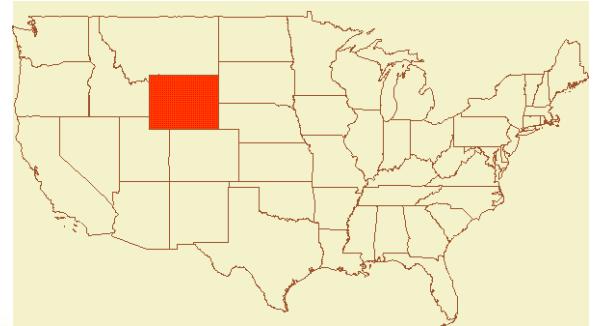


EPA/States Oil and Gas Emissions Summit

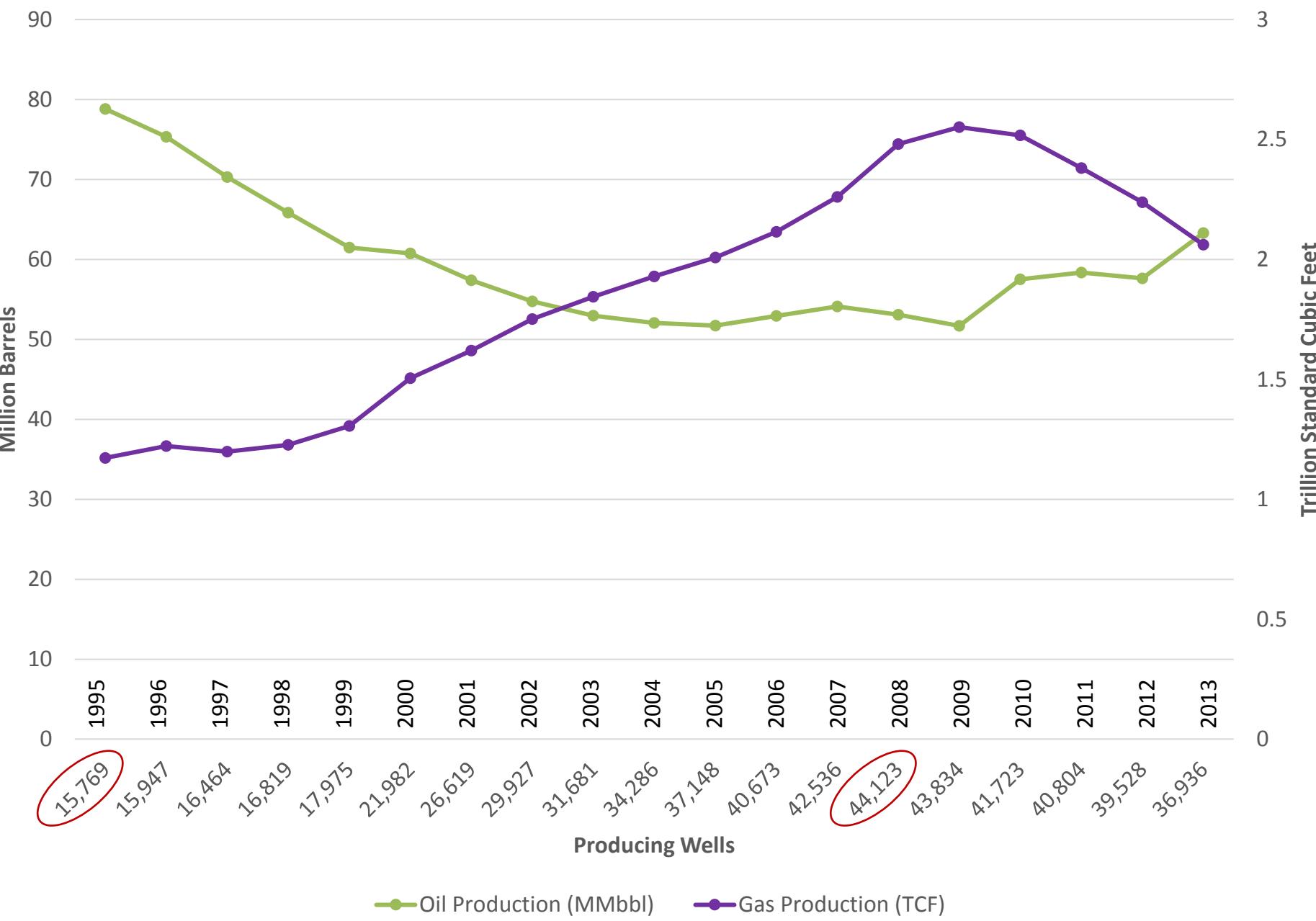
November 4, 2014

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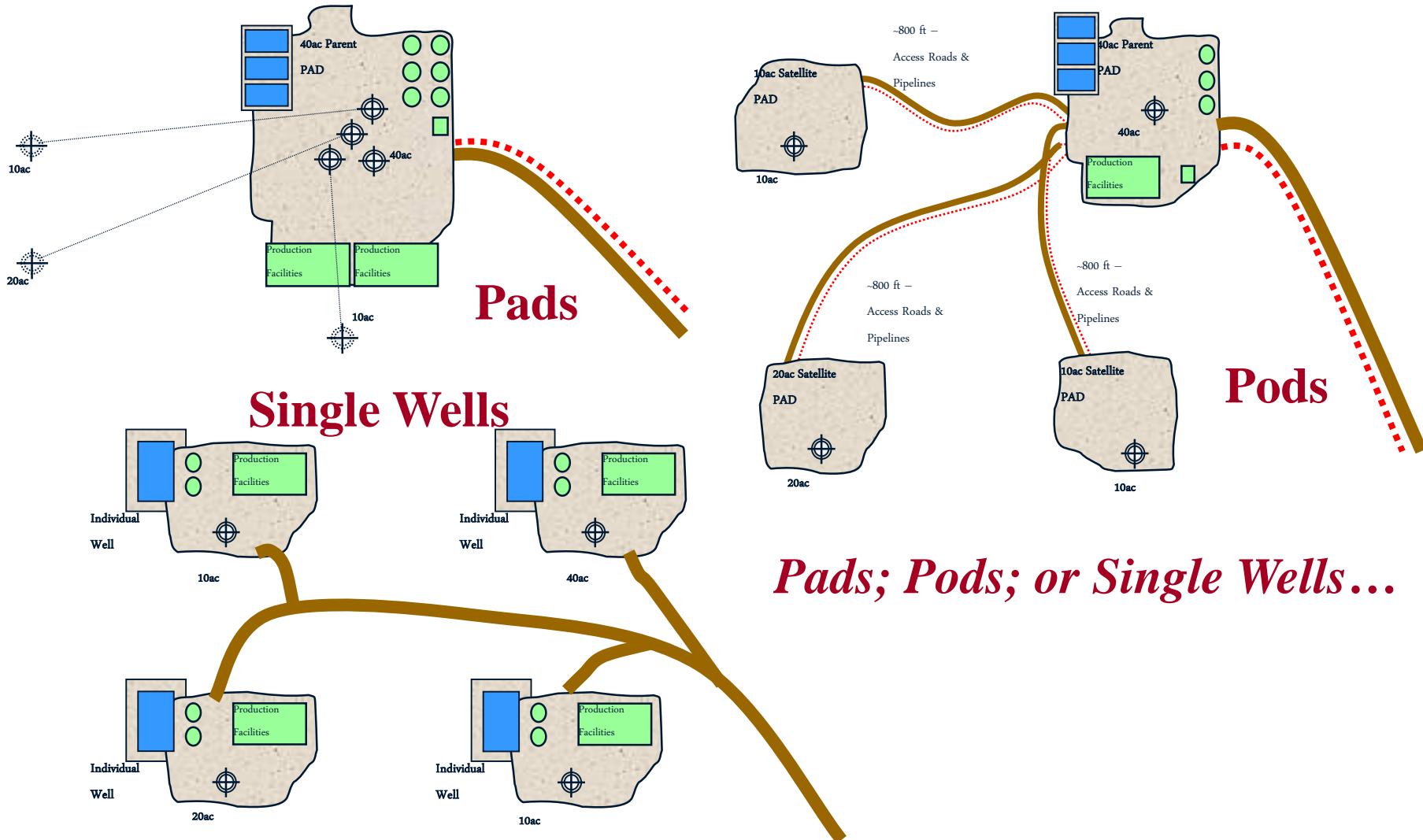
# Producing Well Sites



## 1995 - 2013 Gas and Oil Production



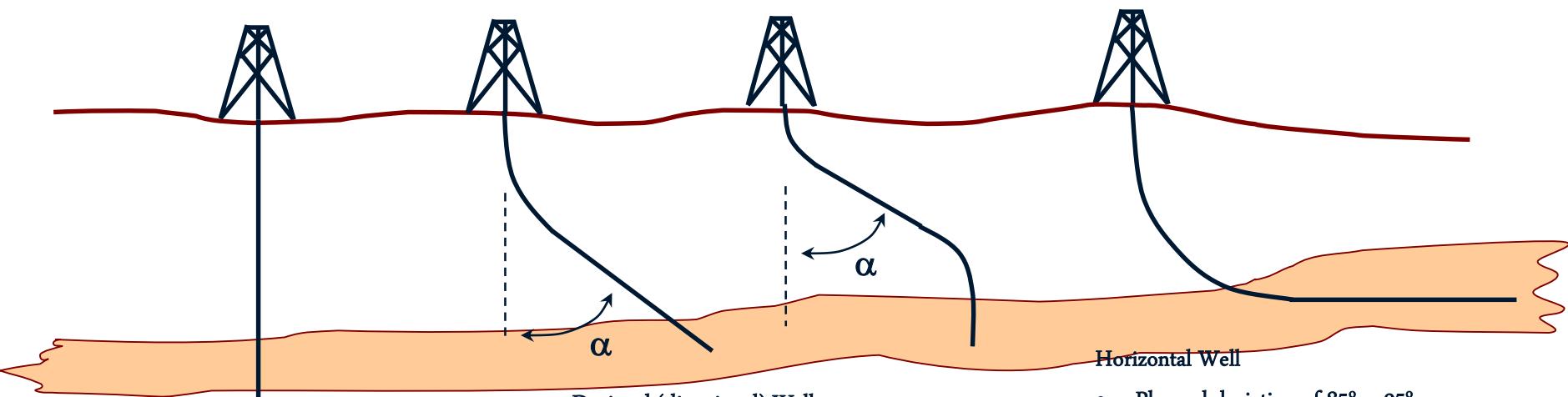
# Development Options



# Directional Drilling

## At the basic level:

- A deviated (or directional) well is a well that has been intentionally deviated from vertical. The deviation (or inclination) is measured from the vertical.
- A horizontal well is a deviated well with an inclination at or near  $90^\circ$



### Vertical Well

- Some unintentional deviation
- Typical inclination  $< 3^\circ$

### Deviated (directional) Well

- Planned deviation from vertical
- Planned direction (azimuth)
- Inclination up to  $85^\circ$

### Horizontal Well

- Planned deviation of  $85^\circ - 95^\circ$
- Planned azimuth

# Integrated “Toolbox”

Regulations

Guidance

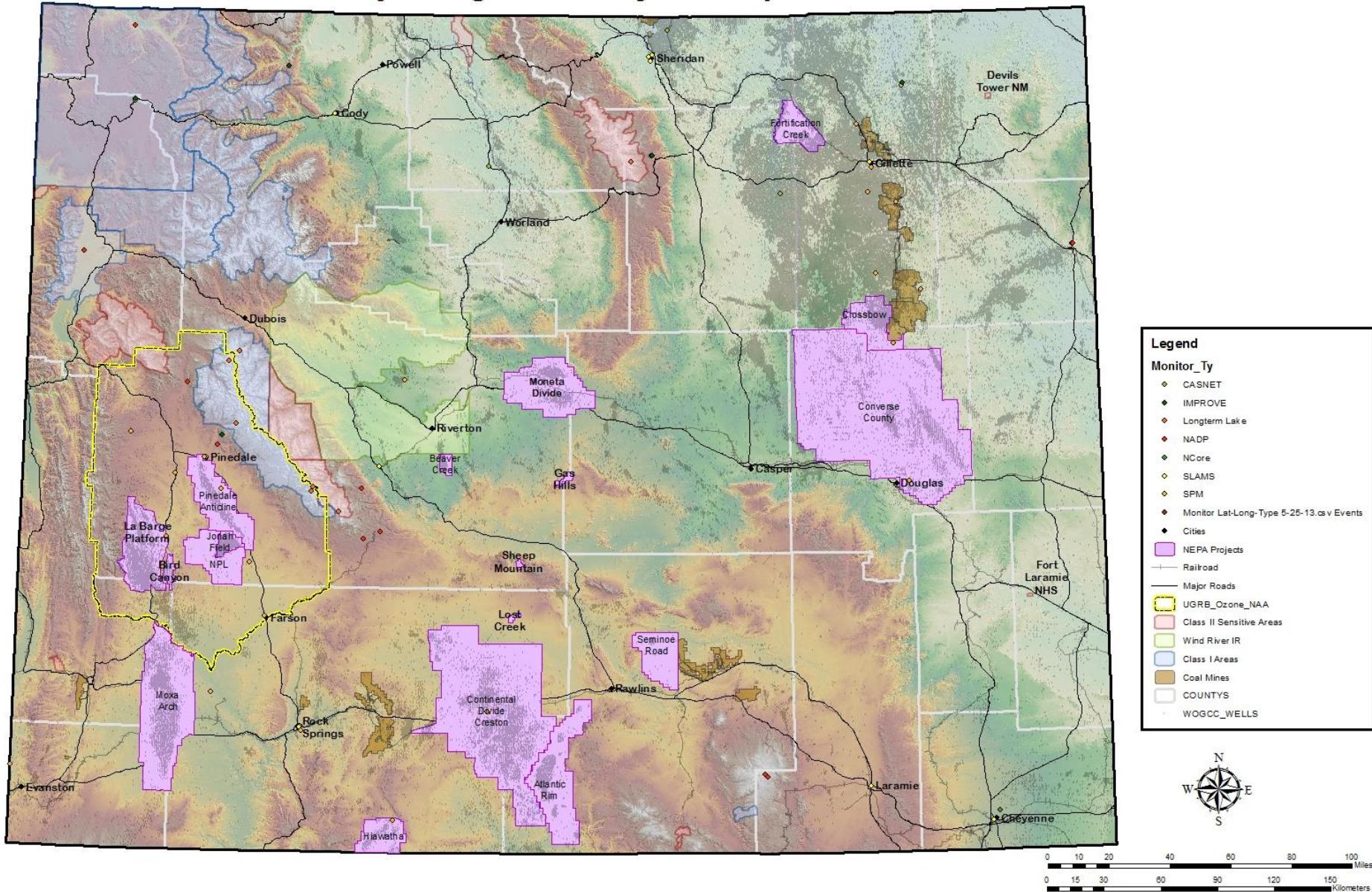
NEPA  
Coordination  
Monitoring

Permitting  
Modeling  
Compliance



Inventory

# Wyoming NEPA Projects Map



# O&G Production Facilities Permitting Guidance



WYOMING DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY



## Legend

JPAD/NPL   UGRB   CDA   Statewide

- ◆ June 1997
- ◆ November 1998 rev
- ◆ January 2000 rev
- ◆ August 2001 rev
- ◆ July 2004 rev
- ◆ August 2007 rev
- ◆ March 2010 rev
- ◆ September 2013 rev

# O&G Emissions Inventory Development



- ◆ Inventories began in 2004
  - Annual, Production Facilities
  - Jonah and Pinedale Anticline Development area
  - 8 Emission Sources, 7 Pollutants
- ◆ Winter Inventories began in 2007
  - Upper Green River Basin
- ◆ Inventory evolution circa 2008
  - Annual, Production Facilities & Midstream Facilities
  - Upper Green River Basin & Statewide
  - 14 Emission Sources, 25 Pollutants

# O&G Emissions Inventory

## Level of Effort

- ◆ O&G Production and Midstream Facilities
  - Annual Inventories Collected
    - 1,305 from 2004 – 2013
    - Includes 2008 & 2011 Statewide Inventories
  - UGRB Winter Inventories Collected
    - 635 from 2007 – 2014
  - Each inventory can contain information for one to several thousand individual production facilities

# O&G Emissions Inventory Data Management

- ◆ OGGER (Oil & Gas Emissions Reporting) Data System
  - Access to data from Wyoming Oil & Gas Conservation Commission
  - Store emissions data
  - Nonpoint data flow to EPA EIS
- ◆ Query Wizard (<http://qrywiz.wyo.gov/>)
  - Quality assured actual emissions inventory data
  - Public access without formal information request

# www.WyVisNet.com

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Wyoming Air Quality Monitoring Network

Live Sites Data Image Gallery Ambient Standards Glossary Contact Us

Air Quality Data and Image Monitor Locations

Map | Satellite

16 Lovell

30 Thunder Basin National Grassland

31 Campbell County

31 Yellowstone National Park

31 Shoshone National Forest

31 Bighorn National Forest

31 Daniel Sown

26 Boulder

36 Big Piney

36 Juel Spring

39 South Pass

30 Casper

23 Converse County

31 National Forest

31 National Forest

29 Rock Springs

29 Moxa Arch

27 Rock Springs

37 Sinclair

33 Sheep Ridge

36 Rock Springs

36 Rock Springs

37 Medicine Bow National Forest

35 Laramie

35 Cheyenne NCo

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1-Hr O<sub>3</sub> (ppb) 8-Hr Avg O<sub>3</sub> (ppb) 1-Hr NO<sub>2</sub> (ppb) 24-Hr Avg PM<sub>10</sub> (µg/m<sup>3</sup>) 24-Hr Avg PM<sub>2.5</sub> (µg/m<sup>3</sup>) 1-Hr Wind Speed (mph)

Choose a monitoring site


# Studies

- ◆ Upper Green Winter Ozone Study
  - Monitoring to aid in the understanding of ozone formation
- ◆ EPA Office of Research & Development
  - Mobile monitoring studies and diffusion tube monitoring studies
- ◆ Extended Hydrocarbon Analyses
  - Generate emissions factor groups by similar field and formation
- ◆ Produced Water Tank Study
  - Field sampling to research and quantify emissions
- ◆ Emissions Inventory Study
  - Field sampling to assess combustor control effectiveness and quantify emissions from fugitive sources
- ◆ Produced Water Pond Study
  - Field sampling to research and quantify emissions

# Websites/Links/Contact

- ◆ Inventory Web Page: <http://deq.state.wy.us/aqd/ei.asp>
- ◆ Actual Emissions Web Page:  
<http://deq.state.wy.us/aqd/Actual%20Emissions.asp>
- ◆ Oil & Gas Production Facilities Guidance Document (September 2013):  
[http://deq.state.wy.us/aqd/Resources-New%20Source%20Review/Guidance%20Documents/September%202013%20FINAL\\_Oil%20and%20Gas%20Revision\\_UGRB.pdf](http://deq.state.wy.us/aqd/Resources-New%20Source%20Review/Guidance%20Documents/September%202013%20FINAL_Oil%20and%20Gas%20Revision_UGRB.pdf)
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