

Unconventional Gas Development on Public Lands in the United States

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May, 2013



Topics:

- **Federal Regulatory Perspective**
- **Leasing, Permitting, Inspection, Enforcement and Reclamation**

Federal Regulatory Perspective Unconventional Gas Development



Federal Regulatory Perspective Unconventional Gas Development

- All of the Federal Laws and Regulations that apply to conventional natural gas development also apply to unconventional natural gas development.



Federal Regulatory Perspective Unconventional Gas Development

- Development of oil and gas, including unconventional gas, is regulated by complex set of Federal, State and local laws that address every aspect of exploration and operation.
- Development on Federally-owned lands is managed primarily by the Bureau of Land Management and U.S. Forest Service



Federal Regulatory Perspective Unconventional Gas Development

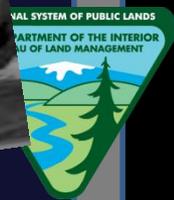
- Private or state-owned minerals:
 - Are governed by state regulations and are enforced by state agencies.
 - Additionally, states have been granted “primacy” for the enforcement of certain Federal Laws and regulations; such as the Clean Air and Clean Water Acts.
 - The Federal government retains regulatory oversight over these programs.



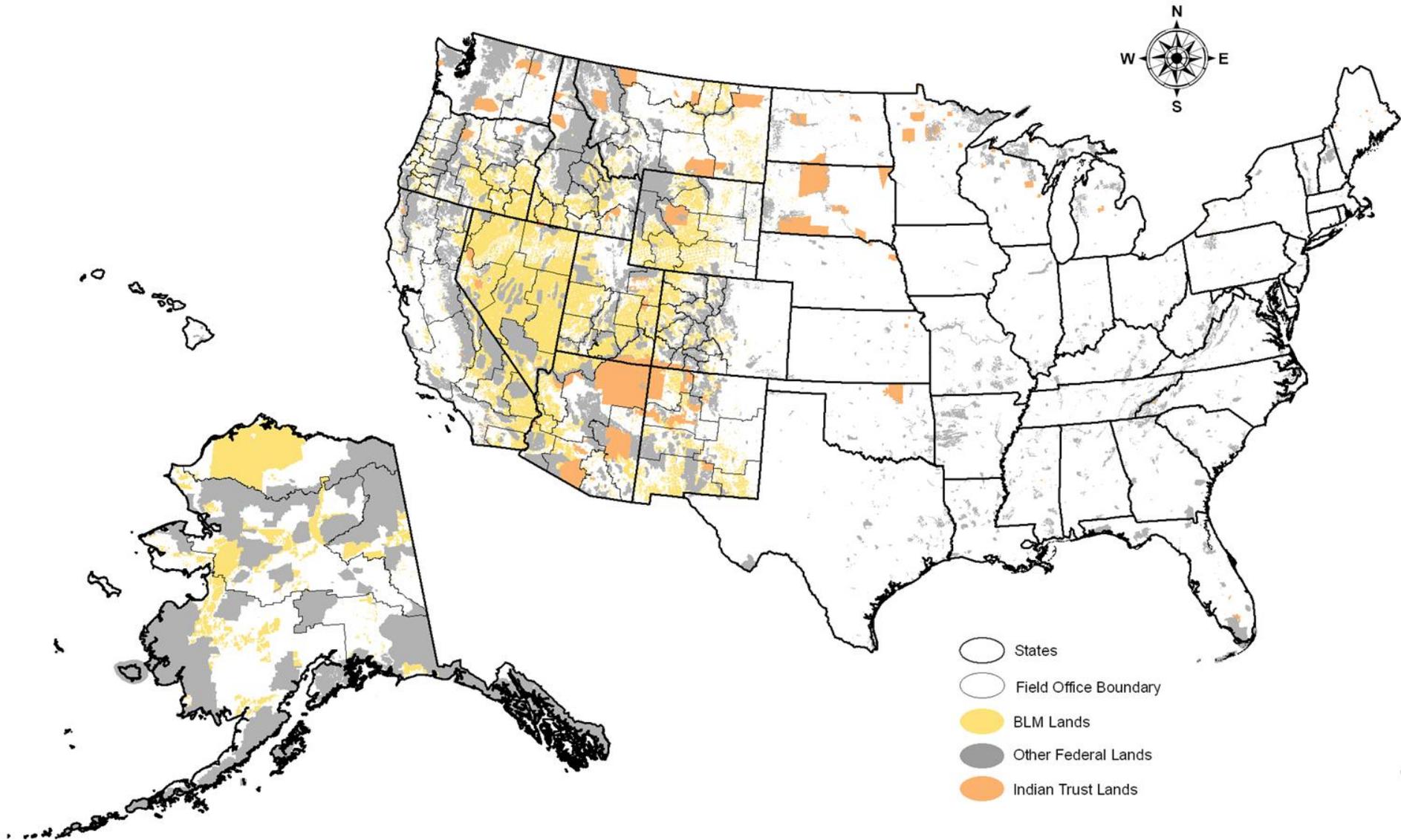
United States

Bureau of Land Management

Managing public lands for multiple-use



U.S. Public and Indian Lands



Federal Oil and Gas Regulatory Authorities Affecting Natural Gas Development

- **Federal Land Policy and Management Act**
 - Mandates multiple resource use and sustained yield for future generations
- **National Environmental Policy Act (NEPA)**
 - Requires thorough analysis for environmental impacts
- **Mineral Leasing Act of 1920**
 - Initiated the granting of leases for development of leasable minerals



Federal Oil and Gas Regulatory Authorities Affecting Natural Gas Development

- **Federal Oil and Gas Royalty Management Act**
 - **Regulates royalty management and Inspection and Enforcement**
- **Federal Oil and Gas Leasing Reform Act**
 - **Regulates quarterly competitive oil and gas lease sales**
- **A myriad of other Policies & Regulations**



Federal Oil and Gas Leasing

(Includes Unconventional Gas)



Leasing

Land Use Planning

- Lays the Foundation for Land Management
- Balances Resource Use and Protection
- Resolves Resource Conflict
- Involves the Public



Leasing

Land Use Planning

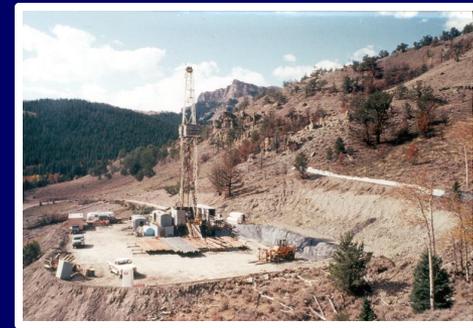
Planning Decisions Designate:

- Areas Closed to Leasing.
- Areas Open to Leasing with standard terms and conditions.
- Areas open to leasing with Moderate Constraints:
 - Seasonal Restrictions
 - Restricted Surface Use
- Areas open to leasing with Major Constraints:
 - No surface occupancy
 - Multiple overlapping constraints



Leasing

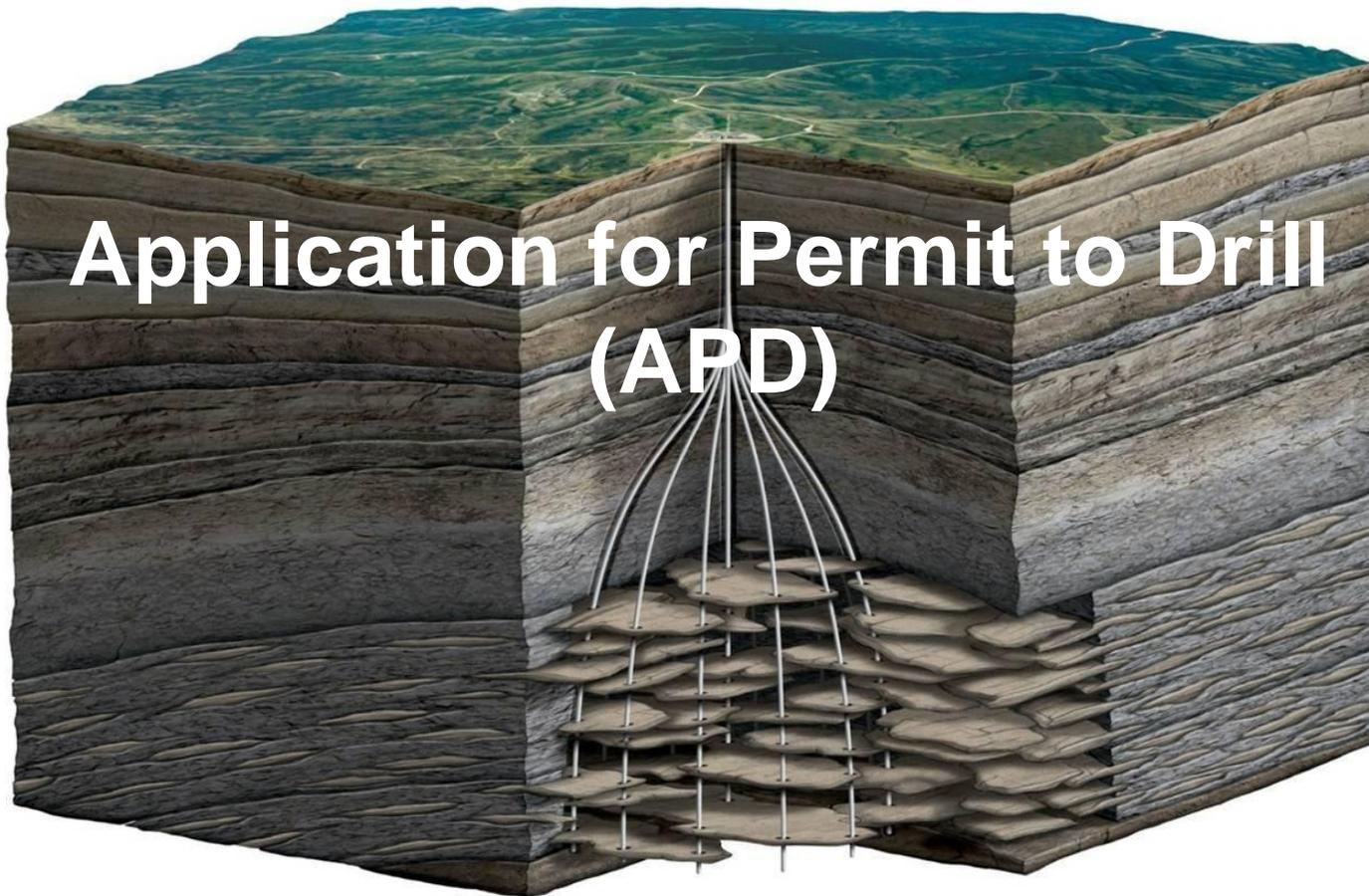
Parcel Nomination and Review Process



- **Allows industry and the public-at-large to nominate parcels for lease**
- **BLM conducts an environmental review, which includes:**
 - **An Interdisciplinary review team**
 - **Assuring compliance with the land use plan**
 - **Parcel visits may occur**
 - **A public review and comment process**
 - **A public protest process**
 - **Protests are resolved before the parcel is offered for lease**

Well Permitting (Includes Unconventional Gas)

Application for Permit to Drill
(APD)



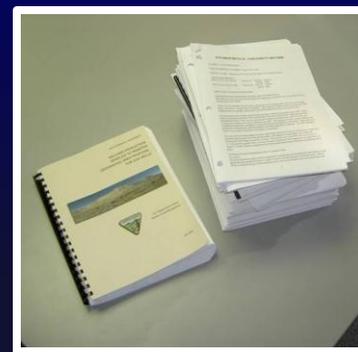
Well Permitting

Review and Approval of the Operator's APD

The National Environmental Policy Act

- Requires environmental analysis

Depending on APD impacts,
Environmental Review may require:



- Determination of NEPA Adequacy - quick
- Environmental Assessment – few months
- Environmental Impact Statement - requires thorough analysis which may take 4-6 years to complete.

Inspection and Enforcement



Inspection and Enforcement

Types of Inspections:

- Drilling



- Production



- Workover



- Records Verification



- Abandonment



- Undesirable Events

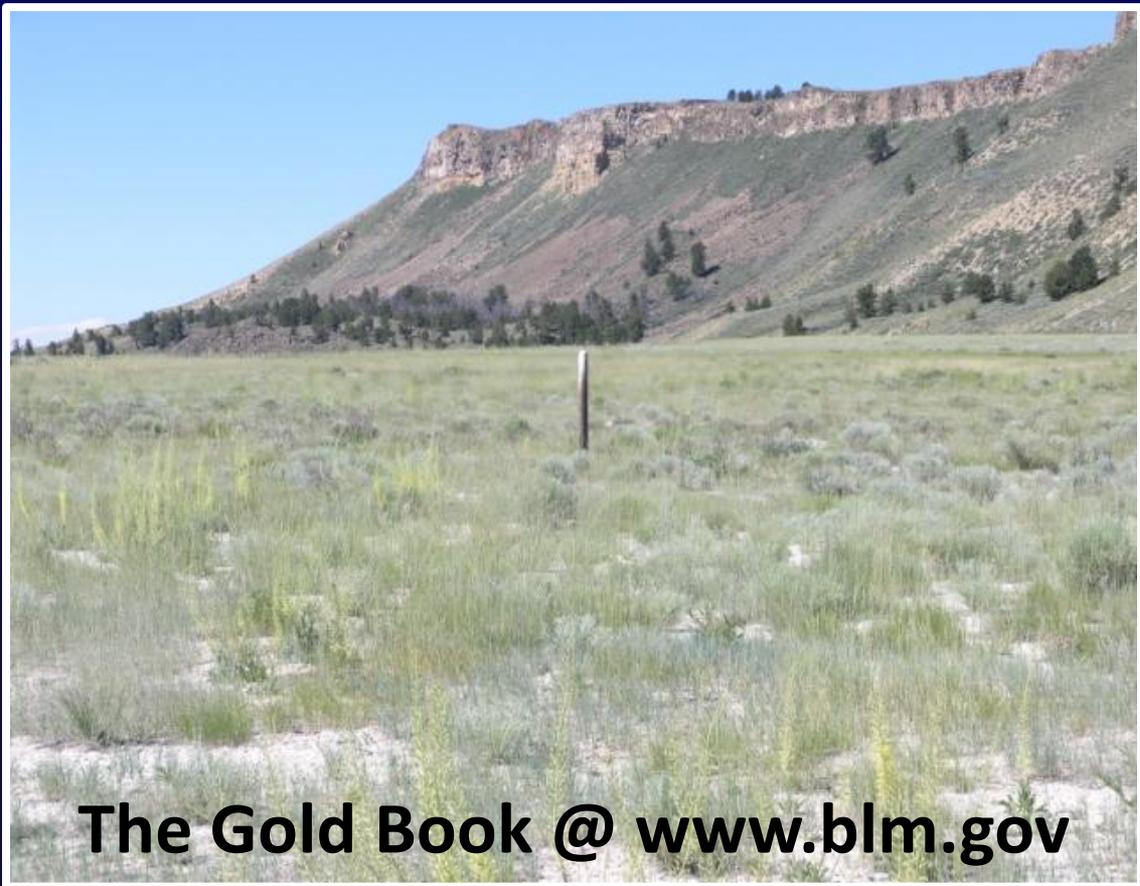


- Environmental



Reclamation

Restoring the Healthiness of the Habitat & Landscape



The Gold Book @ www.blm.gov



Reclamation

Key Concept:

- Energy Development must be seen as a temporary, not a permanent use of the land and water - Its footprint must be minimal.

1) Pre-Development:
Planning



2) Development Phase:
Minimize Impacts



3) Reclamation Phase:
Restore Topography &
Vegetation



3 years



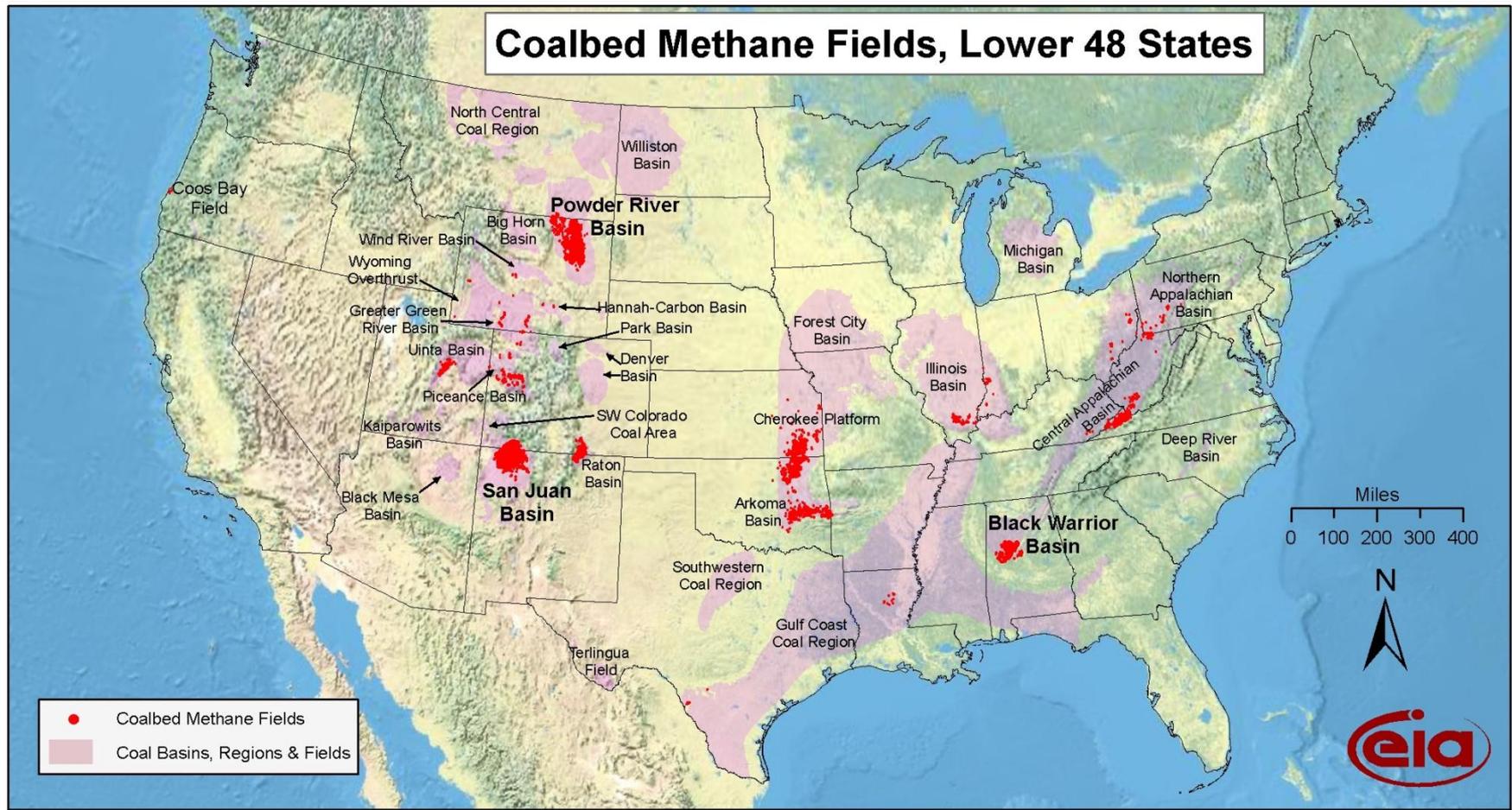
10 years



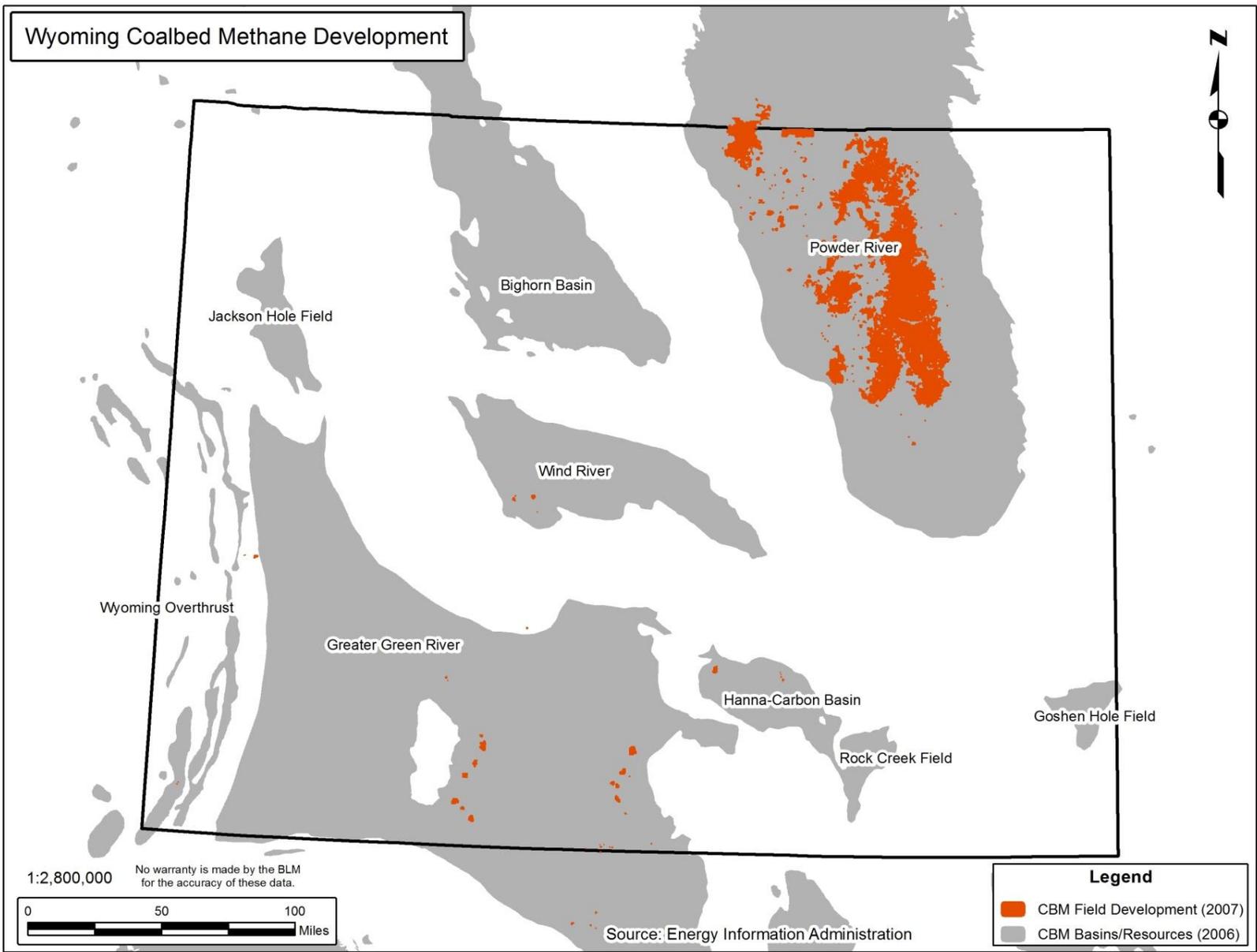
**.... Attain
final use
of the
Land for
other
activities**



Coalbed Methane (CBM) in U.S.



Wyoming Coalbed Methane



Coalbed Methane (CBM) in Wyoming

- **Powder River Basin:**
 - **Geologic Region: 120 miles east to west and 200 miles north to south**
 - **Supplies 40 percent of coal in the U.S.**
 - **Currently: 33,000 CBM wells**
 - **Depth of most wells: 200 ft. – 1,200 ft.**
 - **80 acre spacing**
 - **CBM reserves estimated as much as 25 TCF**
 - **Initial water production lowers the hydrostatic head above coal allowing methane desorption from the coal**



Coalbed Methane Production Issues

- **Water Quantity and Quality**
 - **Water Quantity**
 - **Wells may produce over 17,000 gal./day**
 - **Local water tables may depleted.**
 - **Water handling is controversial:**
 - **Surface discharge can change ephemeral drainages to perennial flow.**
 - **Impoundments are frequently needed to control or restrict surface flow.**
 - **Water Quality**
 - **Some produced water is naturally high in salinity and sodium adsorption ratio or SAR.**
 - **Saline water adversely affects plant growth.**



Coalbed Methane Production Issues

- **Conflicts with Coal Extraction**
 - CBM development and coal mining in close proximity poses inherent safety hazards to CBM workers and coal miners.
 - CBM development precludes the opportunity to conduct coal mining until gas production has ceased.
 - To minimize these issues BLM places a controlled surface use stipulation on all oil and gas leases issued within existing coal leases, which prohibits oil and gas development until the both lease holders and BLM concur on a safe plan of development.



Other Unconventional Gas Development Issues

- **Shale Gas:**
 - **Issues with shale gas development within the Niobrara Formation of eastern Wyoming**
 - **Horizontal well bores cross multiple lease boundaries causing royalty allocation problems.**
 - **Drilling requires large volumes of fresh water.**
 - **Some wells may be in the vicinity of In Situ uranium mining operations.**
 - **Radio active water is potentially being re-injected into gas bearing zones.**



Other Unconventional Gas Development Issues

- **Tight Sand Formations:**
 - Like Coalbed Methane, Tight Sands produce large volumes of water
 - The water is high in Total Dissolved Solids (TDS) content
 - Without expensive treatment processes the produced water is not suitable for:
 - Surface discharge
 - Drilling or well completion operations
 - Gas production requires extensive high-pressure hydraulic fracturing (fracking)





The End