

1.0 INTRODUCTION

As the energy needs of the Nation continue to grow, the sedimentary basins in the Interior West have been identified as a significant future supply source to help meet these needs, especially for natural gas. The United States currently uses about 23 trillion cubic feet (Tcf) of natural gas annually. The U.S. produces approximately 19 Tcf of its annual natural gas demand and imports the remaining 4 Tcf. The EIA of the DOE in its *Energy Outlook 2003* reference case projects that the demand for natural gas will rise to just under 35 Tcf by 2025. The Minerals Management Service (MMS) estimated in 2000 that approximately 58 percent of our country's undiscovered natural gas resources (over 362 Tcf) lie under the Outer Continental Shelf. However, production in the shallow water areas of the Gulf of Mexico has been steadily declining – some 13 percent from 1997 through 1999. The study presented here estimates that there are 138 Tcf of natural gas resources and reserves on Federal lands in the Interior West, making it the second largest natural gas resource in the United States after the Outer Continental Shelf. This 138 Tcf is sufficient to heat all of the 55 million homes that use natural gas in the United States for 39 years.

At the same time, the Interior West is one where multiple use interests and attendant environmental issues often intersect. Multiple uses of the Federal lands in this region, which include but are not limited to grazing, forestry, recreation, wildlife habitat, open space, wilderness, rights-of-way, and minerals exploration and production often conflict with each other. The population of the region is growing rapidly, and approximately 22 million people live within 25 miles of Federal lands. Recognizing this situation, Congress directed that quantitative assessments of the Nation's Federal onshore oil and gas resources be analyzed in relation to Federal actions that inhibit access to these resources in order to add clarity to the debate and assist energy policymakers and Federal land managers in making decisions concerning oil and gas resource development.

The studies reported here were conducted to address these needs for a part of the Interior West (figure 1a), comprising the Paradox/San Juan, Uinta/Piceance, Greater Green River, and Powder River basins and the Montana Thrust Belt. About 59 million acres of Federal lands (including split estate) present among the almost 104 million acres in these study areas, were analyzed.

A full set of acronyms used in this report, as well as a glossary, can be found in Appendices 1 and 2, respectively.

1.1 BACKGROUND

Access to Federal lands is probably the most oft-cited issue affecting oil and gas production in the Interior West. The restrictions and leasing stipulations that constrain access to Federal lands in the region are a complicated patchwork of requirements that increase costs and delay activity. They range from areas unavailable for leasing, to areas where the minerals can be leased but the surface of the land may not be occupied in order to recover those resources. There are also limitations on drilling activities due to a variety of environmental considerations.

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Recent attempts to understand the impacts of Federal land management decisions on access to oil and gas resources began with a 1999 National Petroleum Council (NPC) study. In its report¹ on natural gas, the NPC (an advisory committee to the Secretary of Energy) forecast that U.S. demand for natural gas would grow to 29 Tcf in 2010 and would exceed 31 Tcf in 2015.

One of the objectives of the NPC study was to collect and analyze data on land use and natural gas resources for Federal lands in the Interior West to identify opportunities for increasing natural gas supply from this area. The NPC identified the Interior West as a significant future source of gas supply to help meet the anticipated growing demand. However, the NPC also estimated that about 40 percent (137 Tcf) of the potential supply from this region is currently unavailable for leasing or is subject to surface-use access restrictions because of competing uses or environmental considerations. This analysis was based on a limited sample of Federal lands in the region. The NPC report was the first assessment of access constraints associated with Federal land use designations and related environmental stipulations in the Interior West. The report was developed through a cooperative effort of Federal agencies, including the DOE, the BLM, and the U.S. Department of Agriculture-Forest Service (USDA-FS) and industry. Representatives from State and local governments and other stakeholders also participated.

¹ Meeting the Challenges of the Nation's Growing Natural Gas Demand, December 1999, available on the NPC website: <http://www.npc.org/reports/ng.html>.

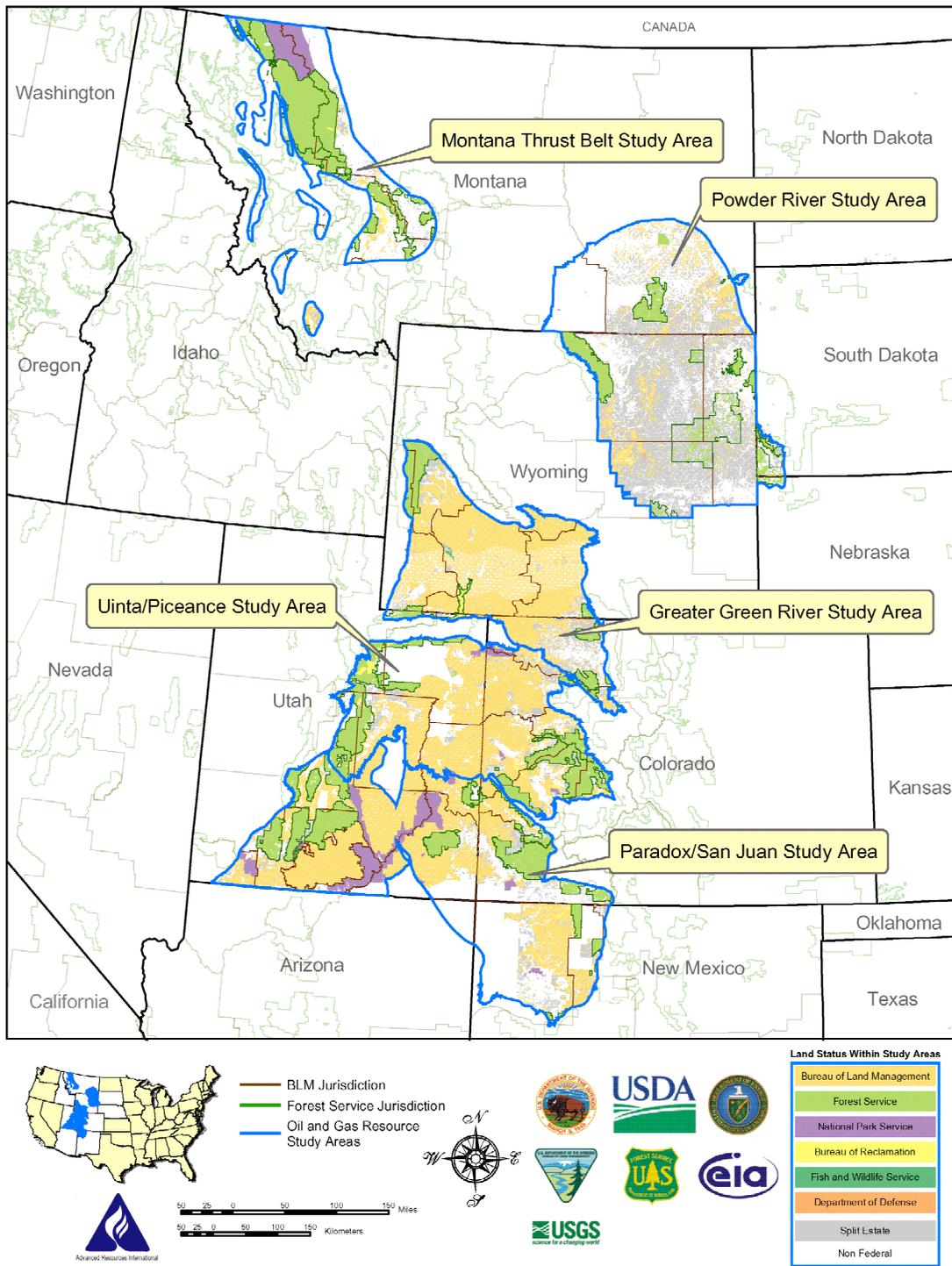


Figure 1a Outline of Study Areas Showing Federal Lands

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In response to the NPC recommendation, DOE, with the cooperation of the Department of the Interior (DOI) and the U.S. Department of Agriculture (USDA), embarked on an effort to assess the relationship between gas resources and land use restrictions on Federal lands. The first area studied was the Greater Green River Basin (GGRB) of Wyoming and Colorado. DOE released its report on this assessment in June 2001². Both the NPC study and the GGRB study were substantially less comprehensive than this study and report. While the GGRB study was being conducted, Congress reauthorized the EPCA in November 2000. Section 604 of this law required a similar study, to be led by DOI in cooperation with the USDA and DOE, which was to include an analysis of undiscovered oil and natural gas resources and proved oil and gas reserves for all onshore Federal lands in the United States. The text of Section 604 and the related conference report are given below.

1.2 ENERGY POLICY AND CONSERVATION ACT LEGISLATION

SEC. 604. SCIENTIFIC INVENTORY OF OIL AND GAS RESERVES

(a) IN GENERAL--The Secretary of the Interior, in consultation with the Secretaries of Agriculture and Energy, shall conduct an inventory of all onshore Federal lands. The inventory shall identify--

(1) the United States Geological Survey reserve estimates of the oil and gas resources underlying these lands; and

(2) the extent and nature of any restrictions or impediments to the development of such resources.

(b) REGULAR UPDATE --Once completed, the USGS reserve estimates and the surface availability data as provided in subsection (a)(2) shall be regularly updated and made publicly available.

(c) INVENTORY --The inventory shall be provided to the Committee on Resources of the House of Representatives and to the Committee on Energy and Natural Resources of the Senate within two years after the date of enactment of this section.

(d) AUTHORIZATION OF APPROPRIATIONS --There are authorized to be appropriated such sums as may be necessary to implement this section³.

Congress further emphasized the urgency of this study during the appropriation process:

² "Federal Lands Analysis, Natural Gas Assessment, Southern Wyoming and Northwestern Colorado, Study Methodology and Results," June 2001, available on the DOE website: http://fossil.energy.gov/techline/tl_ggrb_gas.shtml.

³ Energy Policy and Conservation Act Amendments of 2000, P.L. 106-469, § 604, November 9, 2000.

CONFERENCE REPORT ON H.R. 2217, DEPARTMENT OF INTERIOR AND RELATED AGENCIES APPROPRIATIONS ACT, 2002

JOINT EXPLANATORY STATEMENT OF THE COMMITTEE OF CONFERENCE

The managers agree to the following:

...In light of recent attacks on the United States that have underscored the potential for disruptions to America's energy supply, the managers believe this project should be considered a top priority for the Department⁴.

1.3 THE NATIONAL ENERGY POLICY, MAY 2001

The President's comprehensive National Energy Policy, issued May 2001, outlined more than a hundred recommendations to diversify and increase energy supplies, encourage conservation and improve energy distribution. The policy recommends a balanced approach that emphasizes renewable energy production and conservation as well as traditional fossil fuel production. Oil and natural gas was a major component of the President's policy, in particular, examining ways to increase access to these resources. The Policy noted that some Federal lands, otherwise available for leasing have been legislatively or administratively withdrawn from leasing. The Vice-President's National Energy Policy Development Group recommended:

“...that the President direct the Secretary of the Interior to examine land status and lease stipulation impediments to Federal oil and gas leasing, and review and modify those where opportunities exist (consistent with the law, good environmental practice, and balanced use of other resources).

- Expedite the ongoing Energy Policy and Conservation Act study of impediments to federal oil and gas exploration and development, and
- Review public lands withdrawals and lease stipulations, with full public consultation, especially with the people in the region, to consider modifications where appropriate⁵.”

1.4 APPROACH

A Steering Committee of senior staff from the participating agencies was formed to develop an effective process to complete the inventory. The Steering Committee identified five major geographic areas that had the greatest oil and natural gas development potential for analysis in the inventory. The five areas are the Paradox/San Juan Basins, the Uinta/Piceance Basins, the Greater Green River Basin, the Powder River Basin, and the Montana Thrust Belt (figure 1a). These five study areas contain most of the natural gas and much of the oil resource under public ownership in the onshore United States. The study areas are defined by the aggregation of the USGS oil and gas resource plays for each area. The energy resource and land status and stipulation data for these areas have been incorporated into a Geographic Information System (GIS) that allows derivative mapping and statistical analysis.

⁴ Congressional Record, October 11, 2001, House, p. H6526.

⁵ National Energy Policy, Report of the National Energy Policy Development Group, May 2001.

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1.5 ROLES OF THE AGENCIES

The EPCA designated the Departments of Interior, Agriculture, and Energy as responsible for the inventory. The Steering Committee provided guidance for conducting the studies, decisions concerning critical parameters, a review of the methodology developed by the one of the firms contracted for the inventory⁶, and a review of the results.

The Secretary of the Interior designated the BLM to be the lead agency for the EPCA inventory. The BLM maintains the oil and gas lease stipulation information for lands under its jurisdiction, as well as land status data for all Federally owned lands within the United States.

The USGS, also a bureau of the DOI, contributed its assessments of undiscovered, technically recoverable oil and natural gas. The primary source of the oil and gas resource information used in this study was the USGS National Assessment of Oil and Gas Resources.

The Secretary of Agriculture designated the USDA-FS, its primary land management agency, to contribute its information regarding oil and gas lease availability and leasing stipulations for lands within the National Forest System.

The DOE, as author of the above-mentioned GGRB report, contributed its expertise and experience in guiding the design and analysis process for the EPCA inventory. DOE's EIA contributed its analysis of proved reserves estimates for Federal lands.

During the course of this study, members of the EPCA Steering Committee and contract personnel visited field offices within the various basins. BLM and USDA-FS personnel from over 70 offices (table 1a) participated in these visits. The purpose of these visits was to inform BLM and USDA-FS officials about the studies and to solicit input concerning lease stipulations and other issues of concern regarding oil and gas development. Data collection was performed during and following the field visits.

1.6 INTENDED USE

The EPCA inventory has been designed to be useful to a wide range of interests. In a broad sense, it gives a picture of where oil and gas is estimated to occur and an idea of what statutory and administrative constraints limit exploration and development. The EPCA inventory can be used by land management agencies to identify areas of high resource potential and then to examine land management decisions that affect access to those resources on Federal lands. Both the public and the land managers will have information about the magnitude of oil and natural gas losses due to access limitations which may be utilized in conjunction with other information about other resource values and the environment.

The highly detailed stipulation data, brought together here for the first time, can be used in conjunction with the resource data by Congress, industry, environmental organizations, and other interested parties for a variety of analyses. Land withdrawals and oil and gas lease stipulations are designed to protect or mitigate adverse impacts to other valuable land resources. Land management agencies can analyze this information together with existing policies and procedures

⁶ The principal firms contracted for the EPCA inventory were Advanced Resources International, Arlington, VA, and Premier Data Services, Denver, CO.

and look for opportunities to improve and enhance the decisions in their land use planning, leasing, and permitting processes. Agencies also can use this information to prioritize the need for additional data and analyses, and to identify where opportunities may exist for improving access to oil and gas resources. Overall, the EPCA inventory will provide additional information to help resolve development issues. It can help land management agencies to be more responsive to the needs of their customers.

The primary product of the EPCA inventory is a GIS database composed of many layers of geographic data referenced by longitude and latitude. An important caution applies to the use and interpretation of the undiscovered energy resources.

The caution is that the *precise* locations of undiscovered oil and natural gas resources are uncertain. Without extensive exploratory drilling, the assessment process is highly probabilistic. Therefore, specific assumptions were made concerning the undiscovered oil and natural gas resources within the inventory area. Over the last several decades, the USGS methodology has been the government's standard for oil and gas resource estimation. The assessment process is a peer-reviewed statistical process that takes into consideration all available information to gain an understanding of the petroleum geology of the provinces being assessed. The USGS geologists using this information define the number of potential oil and gas plays within the provinces. The geologist then develops a probability distribution, which estimates the likelihood that a certain number and size of oil and natural gas accumulations are present within the province. There is additional uncertainty regarding the likelihood that a certain volume of oil and natural gas within each play is present. Therefore, for the purpose of the EPCA inventory it was assumed that there was a uniform distribution of the resources within a given play. It is important to note that for these reasons, the EPCA analysis does not imply that the locations of accumulations of undiscovered oil and natural gas resources are known to occur under specific land parcels.

1.7 PRODUCTS/FUTURE DIRECTION

The tables, data, maps (GIS products), and this summary report, which describes the methodology, applied standards, results, and land access issues, are available on CD-ROM and from the DOI (<http://www.doi.gov>) or BLM website (<http://www.blm.gov/>).

EPCA Section 604 requires that all Federal lands of the onshore United States be inventoried. The Steering Committee anticipates that the EPCA inventory will be expanded in the future to additional areas where Federal lands overlie undiscovered resources, ultimate recovery appreciation (reserves growth), and proved oil and gas reserves. The information and analysis for already-studied areas will be updated as sufficient new information warrants.

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Paradox/San Juan Study Area	Greater Green River Study Area
Albuquerque, NM BLM Field Office	Ashley NF
Ashley NF	BLM Wyoming State Office
Bureau of Reclamation	Bridger-Teton NF
Carson NF	Bureau of Reclamation
Cedar City, UT BLM Field Office	Fishlake NF
Cibola NF	Kemmerer, WY BLM Field Office
Dixie NF	Lander, WY BLM Field Office
Durango, CO BLM Field Office	Little Snake, CO BLM Field Office
Farmington, NM BLM Field Office	Medicine Bow-Routt NF
Fishlake NF	Pinedale, WY BLM Field Office
Grand Junction BLM Field Office	Rawlins, WY BLM Field Office
Grand Mesa/Uncompahgre/Gunnison NF	Rock Springs, WY BLM Field Office
Grand Staircase-Escalante National Monument	Powder River Study Area
Kanab, UT BLM Field Office	Big Horn NF
Manti-La Sal NF	Billings, MT BLM Field Office
Moab, UT BLM Field Office	BLM Montana State Office
Monticello, UT BLM Field Office	BLM Wyoming State Office
Price, UT BLM Field Office	Black Hills NF
Richfield, UT BLM Field Office	Buffalo Gap National Grasslands
Rio Grande NF	Buffalo, WY BLM Field Office
San Juan NF	Casper, WY BLM Field Office
Santa Fe NF	Custer NF
St. George, UT BLM Field Office	Miles City, MT BLM Field Office
Uncompahgre, CO BLM Field Office	Nebraska NF
Uinta/Piceance Study Area	Newcastle, WY BLM Field Office
Ashley NF	Oglala National Grasslands
BLM Utah State Office	South Dakota BLM Field Office
Bureau of Reclamation	Thunder Basin National Grasslands
Fishlake NF	Montana Thrust Belt Study Area
Glenwood Springs, CO BLM Field Office	Beaverhead-Deerlodge NF
Grand Junction, CO BLM Field Office	Bitterroot NF
Grand Mesa/Uncompahgre/Gunnison NF	BLM Montana State Office
Gunnison, CO BLM Field Office	Bureau of Reclamation
Little Snake, CO BLM Field Office	Butte, MT BLM Field Office
Manti-La Sal NF	Dillon, MT BLM Field Office
Medicine Bow-Routt NF	Flathead NF
Moab, UT BLM Field Office	Gallatin NF
Price, UT BLM Field Office	Helena NF
Richfield, UT BLM Field Office	Kootenai NF
Salt Lake, UT BLM Field Office	Lewis and Clark NF
Uinta NF	Lewistown, MT BLM Field Office
Uncompahgre, CO BLM Field Office	Lolo NF
Vernal, UT BLM Field Office	Missoula, MT BLM Field Office
White River NF	
White River, CO BLM Field Office	

NF = National Forest

Table 1a

BLM and Forest Service Offices Contacted for the Inventory