Chapter 1

Purpose and Need

1 Purpose and Need

1.1 Introduction

This environmental impact statement (EIS) was developed to evaluate the impacts from the Atlantic Rim Natural Gas Project, which is located in Carbon County, Wyoming (appendix M, map M-1). For this project, Anadarko E & P Company, LP (AEPC) and other operators propose developing coal bed natural gas (CBNG) and conventional gas wells on federal land administered by the Bureau of Land Management's (BLM's) Rawlins Field Office (RFO).

Because the operators have not yet identified specific well locations with effective natural gas production, the BLM is unable to evaluate impacts at specific well sites. However, the interdisciplinary team (IDT) can evaluate impacts on a broad, project-wide level. While this field development EIS evaluates the broad project area, specific impacts will be evaluated annually based on site-specific proposals.

The State of Wyoming is a cooperating agency in this EIS with active participation from many agencies including in part the State Planning Office, Wyoming Game and Fish Department, the State Historic Preservation Office, the Wyoming Department of Environmental Quality, and the Wyoming Department of Agriculture. Other cooperating agencies include the Saratoga Encampment Rawlins Conservation District and the Little Snake River Conservation District.

Maps, tables and figures are interspersed throughout the document; consult the table of contents for specific page numbers. Appendices are included behind the text. All maps are included in appendix M. References cited in the document are detailed in the "References Cited" section following chapter 6 in the Final EIS. Definitions of terms can be found in the "Glossary" section located behind the "References" section of the Final EIS.

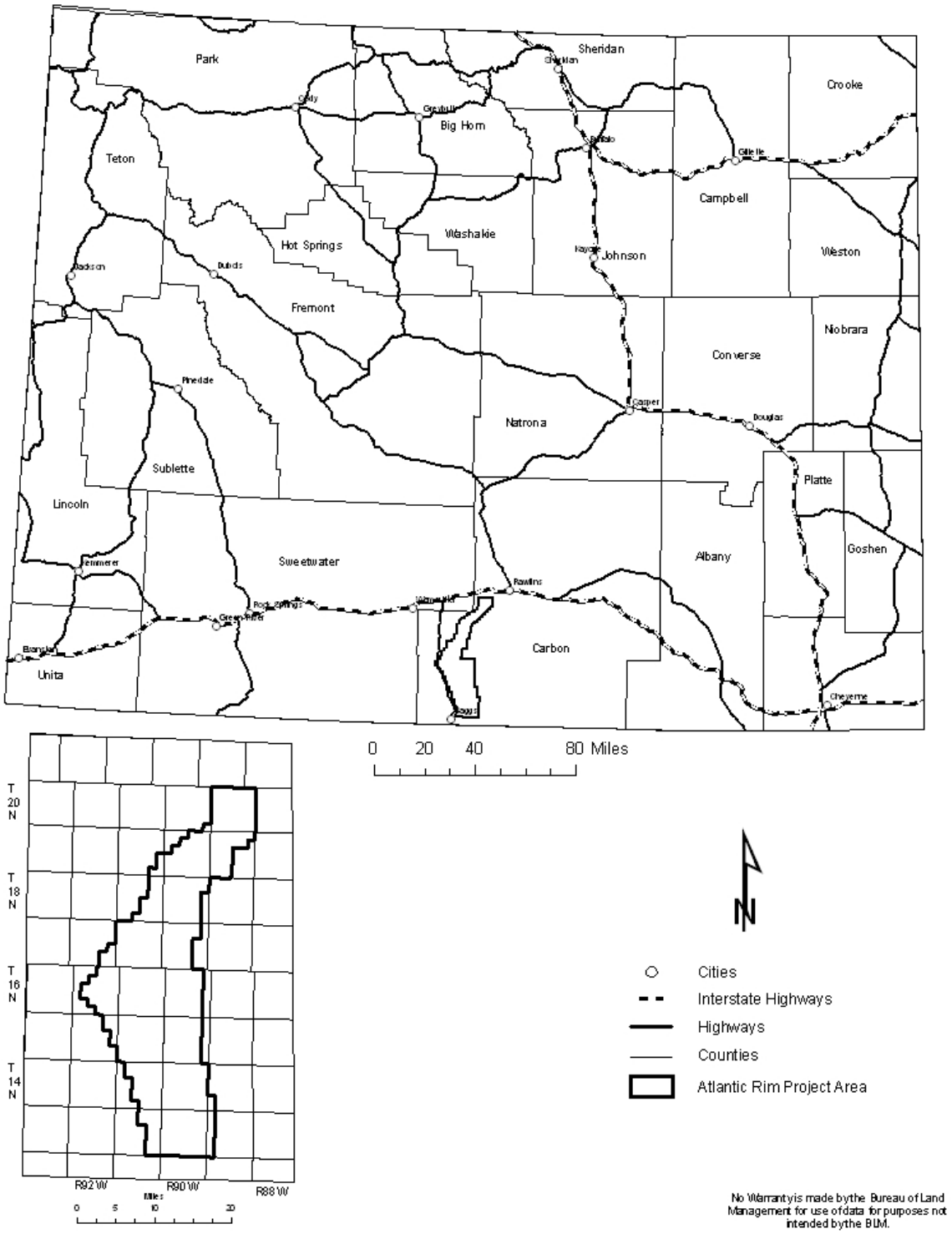
1.2 History of Development

The Atlantic Rim Natural Gas Project began in 2000 when Stone & Wolf LLC proposed drilling 96 CBNG wells. A scoping notice describing the 96-well project was mailed out to the public on February 25, 2000. This original proposal was located within the current boundary of the Atlantic Rim Project Area (ARPA) in the vicinity of the current Cow Creek Pod. During the preparation of the environmental assessment for their CBNG exploration program, Stone & Wolf sold its leaseholds to Petroleum Development Corporation (PEDCO) and Warren Resources Incorporated (WRES). In addition to the Stone & Wolf properties, PEDCO/WRES also acquired additional lease holdings on private and federal lands located north of the original proposed project area. On May 3, 2001 PEDCO/WRES notified BLM that they wished to withdraw their application for the 96-well project.

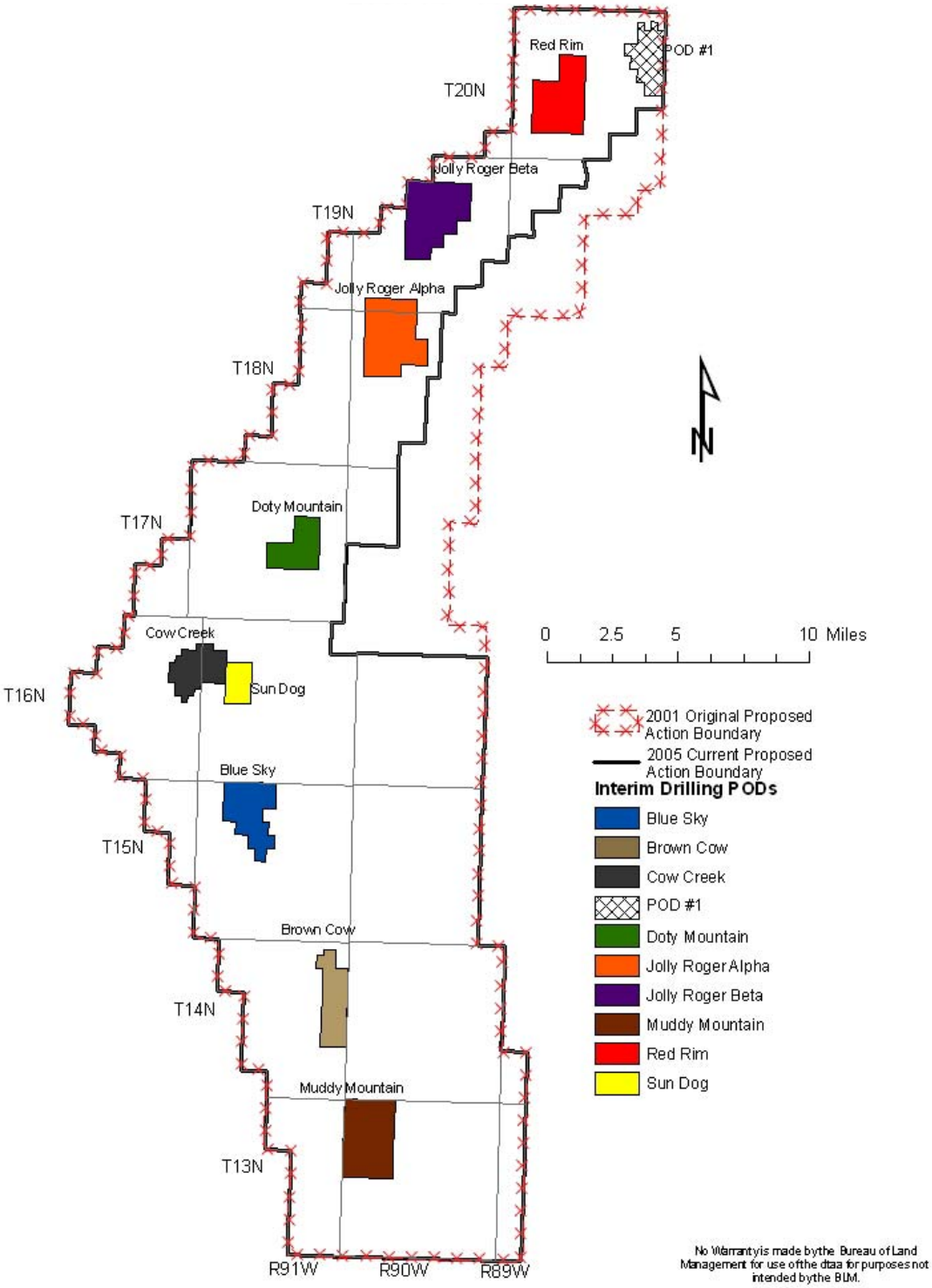
On May 24, 2001, PEDCO/WRES submitted a proposal to the BLM RFO to explore and develop CBNG resources located in Townships 13 through 20 North, and Ranges 89 through 92 West, Carbon County, Wyoming (See outline of 2001 project area on map M-2). Using an estimate of well-spacing of eight wellpads per section (80-acres spacing) throughout the entire project area, the operators projected that a maximum of 3,880 CBNG wells would be needed to efficiently recover the natural gas resource. Drilling was projected to last for approximately 6–10 years, with a life-of-project of 20–30 years. The proposed project area included a mix of contiguous public lands, inholdings of private land, and a "checkerboard" mix of public and private lands. After reviewing the new proposal, the BLM determined that the increase in CBNG well numbers

and the level of development activity could potentially result in significant impacts and that an EIS would be necessary. The scoping period for the Atlantic Rim CBNG project commenced on June 26, 2001 with publication of the Notice of Intent in the Federal Register.

Map M-1. Project Area Map.

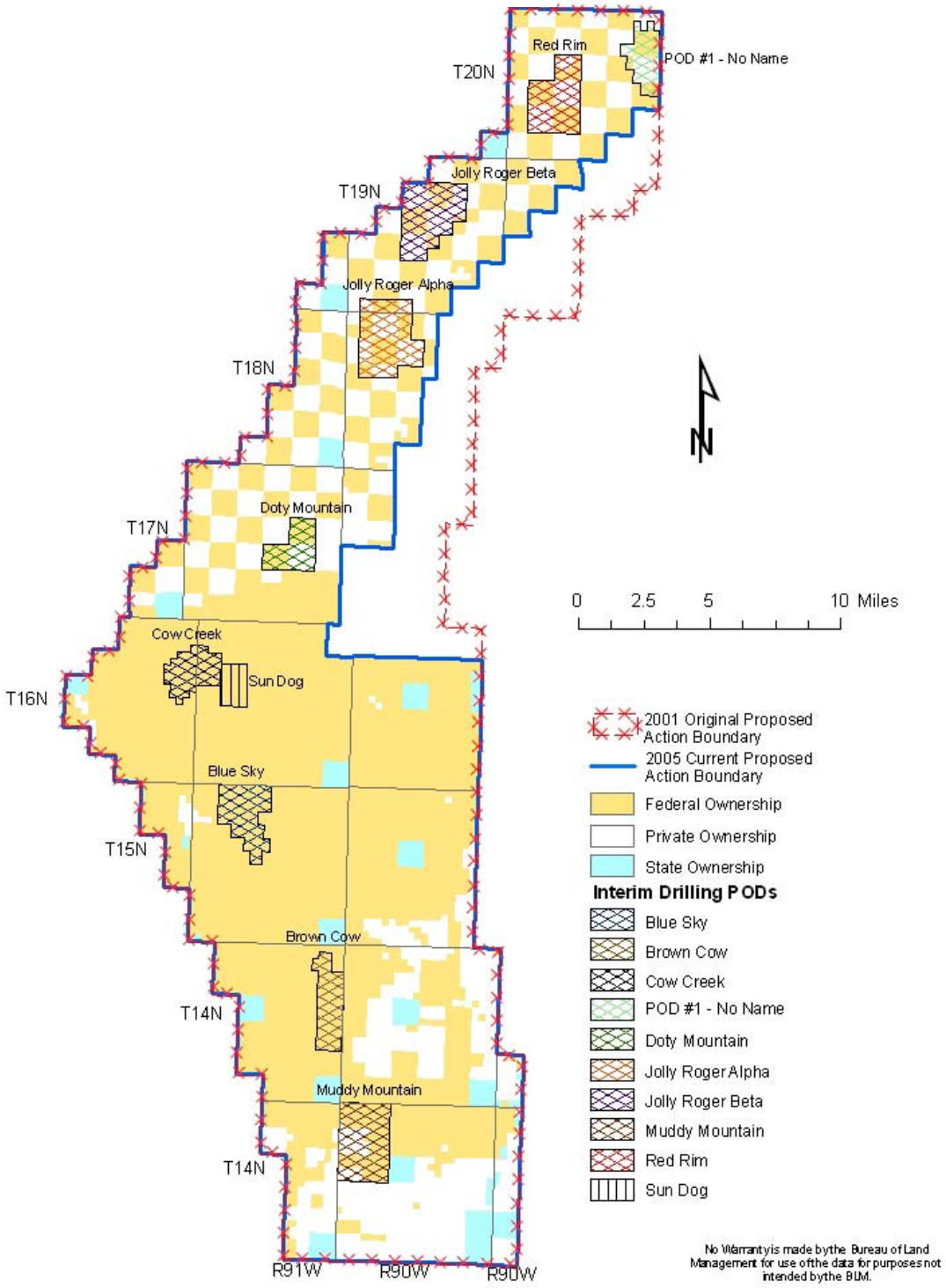


Map M-2. 2001 Project Area.



As described in the Notice of Intent the project area encompassed approximately 310,000 acres and is comprised of a mix of federal, State of Wyoming and private land ownership (See map M-3 Ownership).

Map M-3. Ownership.



In January 2002, the BLM RFO in conjunction with the BLM's Reservoir Management Group (RMG) developed an interim drilling policy for the Atlantic Rim area (appendix A). This would allow the operators to conduct exploratory drilling in a systematic manner for the purpose of

obtaining additional information that would be used to support the geologic information needed for the EIS. The RFO agreed with WRES that exploratory drilling could proceed following site-specific environmental review, concurrently with the preparation of the EIS. The interim exploration drilling program (IDP) was used to describe the interim drilling criteria and allowed a maximum of 200 exploration CBNG wells in nine plan of development (pod) locations; each pod may include development of up to 24 wells (map M-2).

The primary objective of the IDP was to drill, complete, and produce CBNG wells to determine:

- Gas content and productivity of the coals,
- The density of wells needed to effectively dewater coal formations and produce natural gas,
- Whether produced water can be effectively disposed of through re-injection,
- Which drilling and completion techniques are economical,
- Water quality and connectivity to surface waters, and
- The formation size and depths that offer economical gas production.

Environmental assessments for six of the proposed pods (as shown on map M-2) were prepared, decision records issued and implemented. To date the operators have not submitted proposals for the remaining three pods: Pod #1 (No Name), Jolly Roger Beta and Muddy Mountain (See table 1-1).

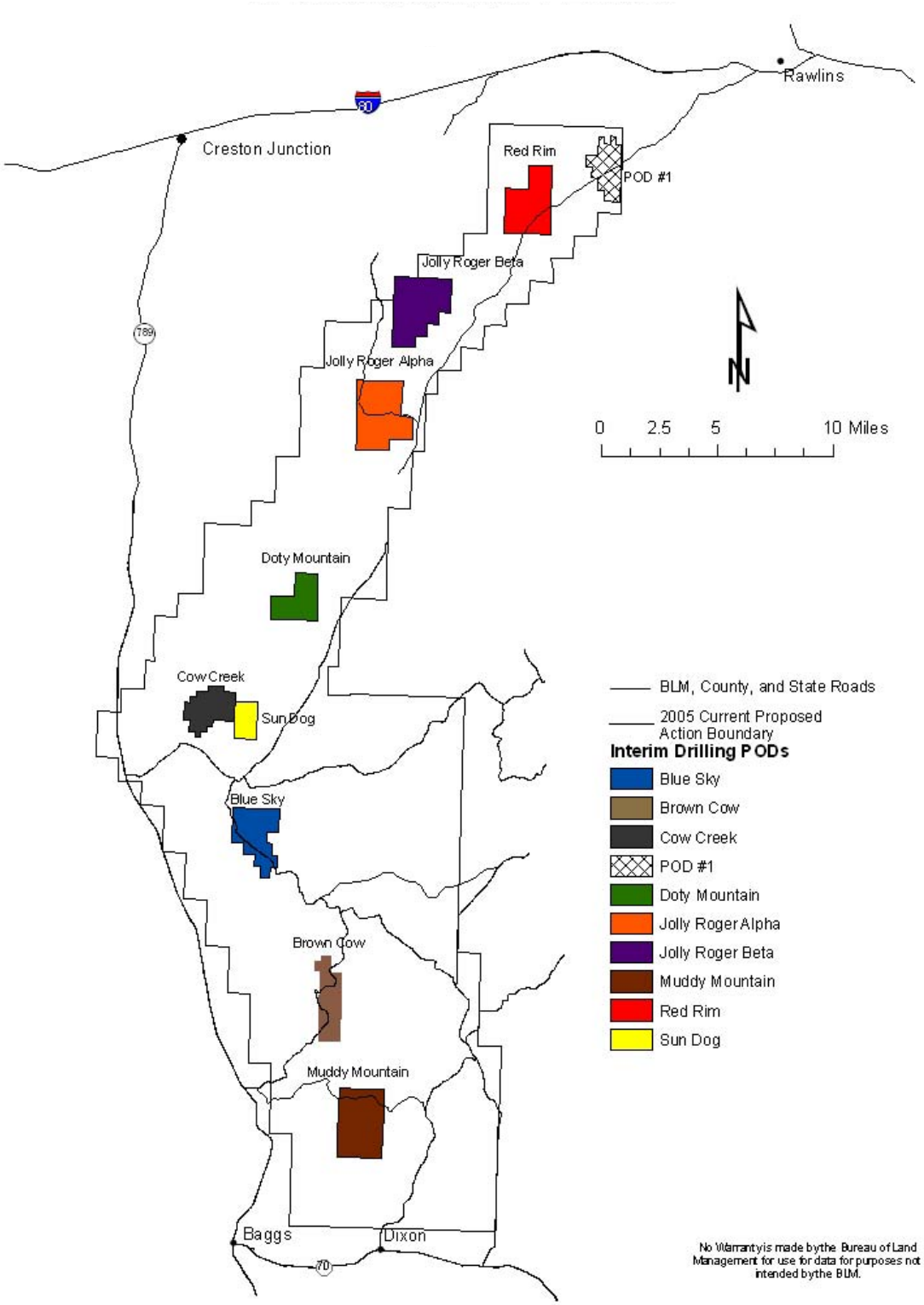
Table 1-1. Current POD Status and General Location.

EA/Pod Name	Date of ROD	General Location
Pod#1 No Name	No proposal submitted	T20N-R89W
Red Rim	04-30-2004	T20N-R89W
Jolly Roger Alpha	12-14-2004	T18 &19N-R90W
Jolly Roger Beta	No proposal submitted	T18 &19N-R90W
Doty Mountain	02-06-2004	T17N-R91W
Doty Mountain Fee[1]	06/17/2006	T17N-R91W
Blue Sky	7-26-2002	T15N-R91W
Sun Dog/Cow Creek	12/21/2001 & 6-26-2002	T16N-R90 & 91W
Brown Cow	12-12-03 Phase I	T14N-R90 & 91W
Muddy Mountain	No proposal submitted	T14N-R90W

Note:
[1] This activity is outside of the BLM's jurisdiction of development.

In December 2002, WRES entered into a partnership with AEPC for the proposed development of the ARPA. At that time, AEPC became the lead proponent in the ARPA development process. In February 2005, the boundary of the ARPA was redrawn to the one illustrated on map M-4, reducing the size of the project area by approximately 40,000 acres. In the spring of 2006, the BLM approved right-of-way access across public land so that the AEPC could access their private land and develop private minerals. This pod is known as Doty Mountain Fee on private land. In September 2006 the BLM approved the Brown Cow II Pod, submitted by AEPC.

Map M-4. 2005 Proposed Action Project Area.



1.2.1 Project Location and Ownership

The Atlantic Rim area is located within the administrative boundary of the BLM RFO. The proposed ARPA is generally located in Townships 13 through 20 North, and Ranges 89 through 92 West, Carbon County, Wyoming. The total project area encompasses approximately 270,080 acres, of which 173,672 acres are federal surface; 14,060 acres are State of Wyoming lands; and 82,348 acres are private surface (table 1-2 and map M-3).

Table 1-2. Surface Ownership within the Atlantic Rim Project Area.

Area	Acres	% of Project Area
Federal	173,672	64
State	14,060	5
Fee	82,348	31
Total	**270,080**	**100**

Surface ownership does not always correspond to mineral ownership. As detailed in tables 1-2 and 1-3, the BLM-RFO manages more mineral estate than surface estate within the ARPA. Within the ARPA about 5 percent of the surface are owned by the State of Wyoming and associated mineral estate. The BLM does not control or authorize mineral development on private or state lands except for areas where BLM controls the mineral rights. Approximately 2 percent of the ARPA is a combination of private land surface with underlying federal mineral estate. In addition to administering the federal lands with underlying federal minerals the BLM has the authority to manage the federal mineral estate when the surface may be held in private ownership. Because proposals to remove federal minerals are considered actions subject to federal approval, the BLM must comply with National Environmental Policy Act (NEPA) before authorizing such actions. In cases where development is proposed on private or state lands, but access through BLM-managed lands is necessary, BLM will conduct the appropriate level of NEPA analysis, including cumulative impacts resulting from the private actions, prior to authorizing the right-of-way.

Table 1-3. Mineral Ownership within the Atlantic Rim Project Area.

Area	Acres	% of Project Area
Federal	179,438	66
State	12,384	5
Private	78,258	29
Total	**270,080**	**100**

1.2.2 Project Description

AEPC of Houston, Texas, has submitted a proposal to the BLM RFO that they and other operators[a] (including Double Eagle Petroleum and Mining Company and WRES) propose exploring and developing CBNG resources located within the administrative boundary of the BLM RFO. Approximately 1,800 wells would produce CBNG from coal formations in the Mesaverde group, and 200 wells would produce natural gas from deeper formations. Because of the geologic formations and what is known about their strata the operators assume one well / bore hole for each pad. The Wyoming Oil and Gas Conservation Commission (WOGCC) has

[a] AEPC and the other operators are referred to as *operators* through the remainder of this EIS.

approved producing well spacing density for the Mesaverde Group of 8 wells per 640 acres (township section). The operators estimate this spacing should be adequate for the most economic recovery of the gas resource. Drilling is expected to occur over approximately 20 years, with an estimated life-of-project of 30–50 years.

As summarized in section 1.2.1, interim exploration drilling has taken place within the ARPA with BLM approval. Table 1-4 describes IDP Pods and well status.

Table 1-4. Status of Well Development within PODs.

POD#	Name	Acres	Wells Approved				Project Status
			Gas	Injection	Monitor	Total	
1	Not Planned	-x-x-	0				Dropped by Proponent
2	Red Rim	Pending	16	2		18	Approved 4/30/04
4	Jolly Roger Alpha	5,120	26	2	1	29[1]	Approved 12/14/04
3	Jolly Roger Beta	-x-x-	0				Not Proposed to Date
5	Doty Mountain[2]	1,920	24	2		26	Completed
7	Blue Sky	1,921	23	2	1	25	In-fill Drilling in Progress
6	Sun Dog	1,000	10	1		11	Completed
6	Cow Creek	2,050	14	1	1	16	Completed
8	Brown Cow	800	24	2		26	Completion Expected Fall 2006
9	Muddy Mtn.						On Hold— Environmental Concerns

Notes:
[1] Number may decrease.
[2] Doty Mountain Fee not included, BLM approval was for right-of-way access only.

1.3 Purpose of and Need for Action

Exploration and development of federal oil and gas leases by private industry are an integral part of the BLM's oil and gas leasing program under authority of the Mineral Leasing Act of 1920 as amended, the Mining and Minerals Policy Act of 1970, the Federal Land Policy and Management Act of 1976 (FLPMA), the National Materials and Minerals Policy, Research and Development Act of 1980, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987. Under its authority to issue oil and gas leases and consistent with the RMP, the RFO has leased federal minerals within the entire ARPA.

The BLM oil and gas leasing program encourages development of domestic oil and gas reserves. Natural gas (including CBNG) is an integral part of the United States' energy future due to its availability and the presence of the existing market delivery infrastructure. By developing domestic reserves of clean-burning natural gas, the U.S. would reduce dependence on foreign energy, such as natural gas from Mexico and Canada. The environmental advantages of burning natural gas, rather than oil or coal, were emphasized by the U.S. Congress and by the President when the Clean Air Act Amendments of 1990 were signed into law. In addition, the Energy Policy acts of 2001 and 2005 emphasize the development of domestic natural gas reserves for supply and economic stability.

To meet the growing demand for energy, the National Petroleum Council projects that U.S. domestic gas production will increase from the 2002 level of 18 trillion cubic feet (TCF) to 21 TCF in 2025. Any shortfall in domestic supply will be met by imports of foreign natural gas, primarily from Canada. A portion of the increase in domestic supply is projected to be met by growth in production from nonconventional sources, including CBNG, from the Rocky Mountain region. Nonconventional production in the Rocky Mountain region (including Wyoming) is projected to increase to 3.8 TCF in 2020 from the 2000 level of 3.1 TCF (EIA 2001). In addition, the Report of the National Energy Policy Development Group states that 90 percent of electric power generation capacity additions between 1999 and 2020 are projected to be natural-gas-fueled. The quantity of natural gas consumed for power generation is expected to triple from 1999 to 2020 (NEP 2001). Production from the proposed Atlantic Rim Natural Gas Project could help meet this demand.

The purpose of, and need for, this proposed natural gas development is to develop, produce, and market natural gas products. This natural gas is needed to meet the national domestic energy demand. This proposal is consistent with the National Energy Act of 2005 and the National Energy Policy (President's Plan).

1.4 Relationship to Policies, Plans, and Programs

When analyzing environmental impacts, other policies, plans, and programs were considered. For this EIS, the Great Divide Resource Management Plan (RMP) and other EISs within the immediate vicinity of the ARPA were considered, as explained below.

1.4.1 Conformance with the Great Divide Resource Area Management Plan EIS and Record of Decision

The BLM's Great Divide RMP and its Record of Decision (ROD) (USDI-BLM 1990) directs management of the federal lands within the project area. The Great Divide RMP reviewed all public lands in the resource area and deemed them suitable for oil and gas leasing and development, subject to certain stipulations. The proposed project is in conformance with management objectives and actions provided for in the ROD, and as detailed on pages 30–32 of the Record of Decision and Approved Resource Management Plan for the Great Divide Resource Area. The Great Divide RMP is currently undergoing revision as the Rawlins RMP.

1.4.1.1 Management Objectives

Management objectives identified in the Great Divide RMP that are applicable to the Proposed Action and alternatives include the following:

- To provide opportunity for leasing, exploration, and development of oil and gas while protecting other resource values.

1.4.1.2 Management Actions

Management actions identified in the Great Divide RMP that are applicable to the proposed action and alternatives include:

- The entire planning area is open to oil and gas leasing, subject to stipulations needed to protect resources. This action is in conformance with the Great Divide RMP.

1.4.2 Relationship to Other Plans and Documents

Other environmental analyses and plans completed or planned for completion in the immediate vicinity of the ARPA (map M-5) include the following documents:

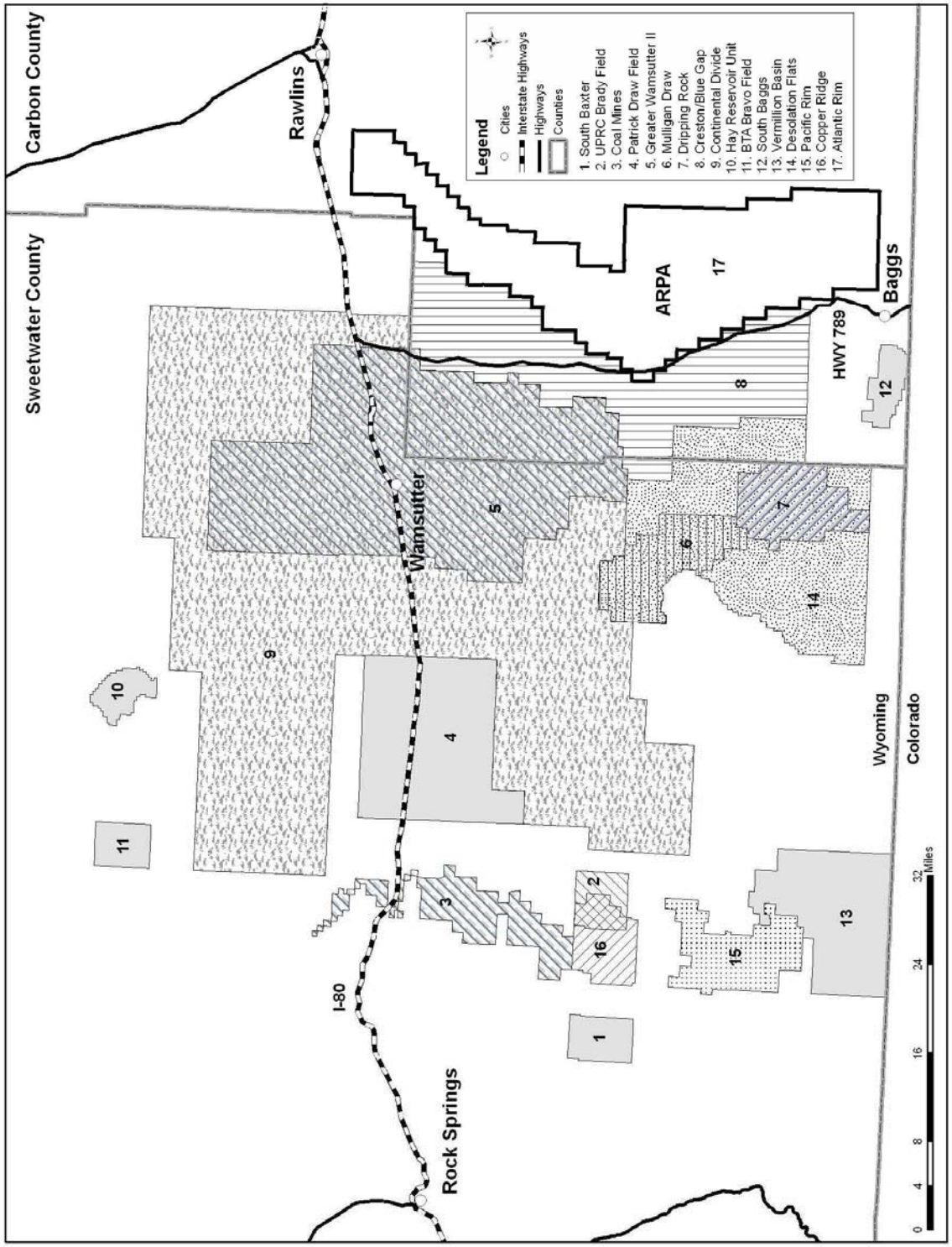
Little Snake River Conservation District (LSRCD) Watershed Management Plan. The Proposed Action is located within the LSRCD. The LSRCD is a subdivision of the State of Wyoming that receives its statutory authority from Title 11, Chapter 16 of the Wyoming Statutes (WS). Statutory authorities and responsibilities of conservation districts include the development of comprehensive plans for range improvement and stabilization; soil and water conservation; flood control; and the development of ordinances, rules, and regulations to implement conservation plans. Conservation is defined as "...development, improvement, maintenance, preservation, protection and use of natural resources, and the control and prevention of flood water and sediment damages, and the disposal of excess waters" (WS 11-16-102 [iv]). The District is participating in this EIS process as a cooperating agency.

Continental Divide—Creston Natural Gas Field Development Project Environmental Impact Statement. This natural gas development project area is generally located in Townships 14 through 24 North and Ranges 91 through 98 West in Carbon and Sweetwater counties. The total project area includes approximately 1.1 million acres. The proposal includes drilling and developing up to 8,950 wells with 40–acre downhole well spacing per section in limited areas. Associated facilities include additional roads, gas and water collection pipelines, compressor stations, and any electrical/power system development.

This oil and gas development proposal partially overlays earlier field development EIS's that analyzed natural gas development at a less intense level. The Continental Divide / Wamsutter II project approved 2,130 wells and was issued in May, 2000. The combined project area is generally located in Townships 15 through 23 North, Ranges 91 through 99 West, in Sweetwater and Carbon Counties, Wyoming. The total combined area encompasses approximately 1,061,200 acres and is still drilling wells under the original proposal.

The Creston Blue Gap EIS was approved on October 4, 1994, and provided an assessment of the environmental consequences of a natural gas development located immediately west of the Atlantic Rim area. The BLM's decision allowed a maximum of 275 wells on 250 locations on a 160-acre spacing pattern.

Map M-5. Mineral Development Projects in the Vicinity.



1.5 Authorizations and Permits

The proposed federal, state, county, and local authorizations and permits required to implement the Atlantic Rim Natural Gas Project are listed in table 1-5.

Table 1-5. Federal, State, and County Authorizing Actions.

Agency	Nature of Action
Department of Interior	
Bureau of Land Management (Rawlins Field Office)	Approves Applications for Permit to Drill (APDs); Sundry Notices and Reports on Wells (sundry notices); production facilities; disposal of produced water, gas venting or flaring; and well plugging and abandonment for federal wells Grants right-of-ways to operators for gas field development actions on BLM surfaces outside of federal lease or unit boundaries and to third party applicants (i.e., non-unit operator or non-lease holder) both within and outside of the unit boundary Reviews inventories of, and impacts to, cultural resources affected by undertakings and consults with the state Historic Preservation Office and the Advisory Council on Historic Preservation as required by the Wyoming State Protocol Reviews impacts on federally listed or proposed for listing threatened or endangered species of fish, wildlife, and plants, and consults with U.S. Fish and Wildlife Service Grants Unit Area Agreement and subsequent actions relative to the unit
Bureau of Land Management (Reservoir Management Group)	Administers drainage protection and protection of correlative rights on federal mineral estate
U.S. Fish and Wildlife Service	Reviews impacts on federally listed or proposed-for-listing, threatened or endangered species of fish, wildlife, and plants. Coordinates impacts to migratory birds
Department of the Army	
U.S. Army Corps of Engineers	Issues (Section 404) permit(s) for placement of dredged or fill material in, or excavation of, waters of the U.S. and their adjacent wetlands

Table 1-5. Federal, State, and County Authorizing Actions.

Agency	Nature of Action
Wyoming Department of Environmental Quality (WDEQ)	
Water Quality Division	Issues Wyoming Pollution Discharge Elimination System (WYPDES) permits for discharging wastewater and storm water runoff Oversees conformance with all surface water standards, permits to construct, and permits to operate Issues permits to construct settling ponds and wastewater systems including groundwater injection and disposal wells for non oil and gas uses. Regulates disposal of drilling fluids from abandoned reserve pits Provides administrative approval for discharge of hydrostatic test water
Air Quality Division	Issues New Source Review (NSR) permits: all pollution emissions sources including compressor engines and portable diesel and gas generators
Wyoming State Engineer's Office	
	Issues permits to appropriate ground and surface water Issues temporary water rights for construction permits to appropriate surface water
Wyoming State Historic Preservation Office	
	Provides consultation concerning inventory of, and impacts to, cultural resources
Carbon County	
	Grants small wastewater system permits, where applicable Issues driveway access permits where new roads intersect with county roads Prepares road use agreements and oversize trip permits when traffic on county roads exceeds established size and weight limits or where the potential for excessive road damage exists Issues construction and conditional use permits for all new structures Administers zoning changes where applicable Provides control of noxious weeds Issues permits to bore or trench county roads or for any crossing or access off a county road

Table 1-5. Federal, State, and County Authorizing Actions.

Agency	Nature of Action
Wyoming Oil and Gas Commission	
	Acts as primary authority for drilling on state and privately held mineral resources, and secondary authority for drilling on federal lands
	Holds authority to allow or prohibit flaring or venting of gas on privately or state-owned minerals
	Regulates drilling and plugging of wells on privately or state-owned minerals
	Issues Aquifer Exemption Permits
	Approves directional drilling
	Administers rules and regulations governing drilling units
	Issues water injection well permits
	Grants gas injection well permits
	Administers drainage protection and protection of correlative rights on private/state mineral estates

1.6 Public Participation

Scoping for the Atlantic Rim Natural Gas project was initiated on June 26, 2001. The State of Wyoming; federal agencies; state and local government representatives; municipalities; Native American Tribes; grazing permittees; lease and right-of-way holders; landowners within the ARPA; local media; and other agencies, industry representatives, individuals, and organizations were sent a scoping notice and other information by mail. Two public meetings were held during scoping at Baggs and Rawlins Wyoming. Fifty-seven comments were received in the form of letters, emails, and faxes from the public including citizens; interested federal, state, and local agencies; advocacy groups; and various corporations. These comments were used to determine key issues, resource conflicts and concerns, alternatives, and the scope of the analysis. Key issues and concerns are listed in table 1-6 in section 1.7. Interested agencies were invited to participate as cooperating agencies. The State of Wyoming, Little Snake Conservation District, and Carbon County Commissioners requested and received Cooperating Agency status.

The Draft Atlantic Rim EIS was released in December 2005. The 60-day comment period resulted in over 59,400 individual comments including approximately 59,100 emails and 300 hardcopy comments. Comments were received from state, federal, and local agencies; environmental advocacy groups; landowners; leaseholders; oil and gas companies; and the public. Comments received were reviewed and substantive comments responded to. Those letters and emails with substantive comments are provided as appendix N, with comment responses provided as appendix O.

Comments were used to develop Alternative D and to modify, clarify, and correct the Final EIS, as appropriate.

1.7 Issues and Concerns

During the scoping period for the Atlantic Rim Natural Gas Project, thirteen issues and concerns were brought up by the stakeholders referenced in section 1.6. These issues and concerns are summarized below in table 1-6, along with a reference to the section in this EIS where they are addressed. Comments to the Draft EIS developed two additional key issues, directional drilling / well spacing and phased development.

Table 1-6. Key Issues and Concerns Identified during the Scoping Period

Issue	Description of Issue	Where Is Issue Addressed?
1. Increased traffic	Increased traffic on existing county, state, and BLM roads can result in: ▪ Increased traffic hazards, ▪ Higher maintenance costs, ▪ The need to upgrade roads, and ▪ More intensive transportation planning.	Section 4.13
2. Adverse socioeconomic impacts to local communities	Impacts to local communities include: ▪ Demand for housing that might exceed local capabilities, ▪ Demand for local services—such as medical, retail, and civic—beyond the capacity of the community to deliver, and ▪ The need to expand local government services and presence without corresponding revenue/compensation from increased development.	Section 4.12

Table 1-6. Key Issues and Concerns Identified during the Scoping Period

Issue	Description of Issue	Where Is Issue Addressed?
3. Impacts to surface water hydrology and groundwater resources.	The following could impact surface water: ▪ Production of large amounts of water from coal formations with corresponding discharges into the Colorado River system would affect water quality and local and non-local government agreements. ▪ The project might also cause changes in water quality and the presence of sensitive fish species within Muddy Creek. ▪ Continuous surface water discharges into ephemeral and intermittent stream courses could increase erosion. The following could impact surface hydrology: ▪ Increased road density could cause higher overland flows. ▪ Higher overland flows could increase erosion and correspondingly increase salt and sediment delivery within the Colorado River system. ▪ Increased erosion from higher overland flows could adversely impact water quality. Impacts to groundwater resources include: ▪ Sedimentation/excess salts to the Colorado River system, ▪ Potential changes in groundwater aquifers due to the reduction of hydrostatic pressure in the coal seams and re-injection, ▪ Decrease or elimination of water, which can have a serious adverse effect on habitats and dependent populations of plants and wildlife who use the local wells, springs, and seeps.	Sections 4.4 and 4.8, and Alternatives C and D
4. Impacts to sensitive soils	Impacts to sensitive soils would need to be mitigated by maintaining and preserving sensitive soils that have: ▪ Difficult reclamation potential, ▪ High runoff potential, and ▪ Excess salt.	Sections 4.3 and 4.5 and Alternatives C and D

Table 1-6. Key Issues and Concerns Identified during the Scoping Period

Issue	Description of Issue	Where Is Issue Addressed?
5. Impacts to air quality	Drill rig emissions and production activities could cause the following impacts to air quality: ▪ Regional haze and ▪ Increased dust and emissions levels, particularly within Class I airsheds associated with nearby wilderness areas.	Sections 4.2 and 4.4
6. Viability of reclamation	The following reclamation should be ensured: ▪ Successful and timely reclamation, ▪ Control of noxious weed invasions, ▪ Immediate soil stabilization, ▪ Interim reclamation within the first growing season, and ▪ Monitoring of reclamation success with adaptive management in difficult areas.	Sections 4.4 & 4.5 Appendix B BMP H-4 in appendix H Alternatives C and D
7. Potential conflicts with livestock management operations	Potential conflicts with livestock management operations could include: ▪ Reduced forage availability, ▪ Increased livestock disturbance and harassment, ▪ Reduced viability of range improvement projects, and ▪ Compromised range/vegetation quality.	Sections 4.3, 4.5, and 4.6, and Alternatives C and D
8. Impacts to cultural resources	Impacts to cultural resources and resulting risks to significance criteria established by the National Historic Preservation Act could include: ▪ Historic trails and ▪ Sites eligible for inclusion in the National Register of Historic Places.	Section 4.11 and Alternative C

Table 1-6. Key Issues and Concerns Identified during the Scoping Period

Issue	Description of Issue	Where Is Issue Addressed?
9. Impacts to wildlife habitats	To mitigate impacts to wildlife habitats—including those supporting big game, greater sage-grouse, and raptors—the following needs were identified: ▪ Protecting and maintaining crucial winter range for big game, critical winter habitat, and nesting/brood-rearing habitats for sage-grouse; ▪ Maintaining the viability of leks for sage-grouse; ▪ Maintaining raptor populations using timing and disturbance restrictions; ▪ Collecting further information on big game migration corridors; and ▪ Maintaining migration corridors as viable routes for big game.	Section 4.7 and Alternatives C and D
10. Potential impacts to listed or proposed-for-listing threatened and endangered plant and animal species	Impacts to these species include: ▪ Potential depletions to the Colorado River; ▪ Effects on downstream listed, threatened, and endangered species; ▪ Critical habitats, which must be maintained; and ▪ Compliance with Endangered Species Act.	Section 4.8 and Alternatives C and D
11. Potential impacts to sensitive plant and wildlife species	To mitigate impacts to sensitive species—including bluehead sucker, roundtail chub, and flannelmouth sucker—the following needs were identified: ▪ Supporting habitat for sensitive fish species within Muddy Creek and ▪ Preserving or improving supporting habitats including water flows and quality.	Section 4.8 and Alternatives C and D
12. Cumulative effects of project when combined with neighboring projects	Cumulative impacts from drilling and development activities were identified as a concern when combined with other ongoing and proposed developments on lands adjacent to the Atlantic Rim Project Area including: ▪ The area covered by the RFO, ▪ The Red Desert, and ▪ The Greater Green River Basin.	Section 5.2 and Alternatives C and D

Table 1-6. Key Issues and Concerns Identified during the Scoping Period

Issue	Description of Issue	Where Is Issue Addressed?
13. Potential conflicts between mineral development and recreation	The following potential conflicts between mineral development and recreation were identified: ▪ Presence of local, regional, and nationally important big game populations; ▪ Traditional use of land for recreational hunting and wildlife viewing; ▪ Visual resources; and ▪ Risk of decreased recreational opportunities due to the impacts of big game and wildlife populations.	Sections 4.7, 4.9, 4.10, and 4.12 and Alternative C
14.Well spacing and directional drilling (developed from comments to the Draft EIS)	The following conflicts were identified for well spacing and directional drilling: Directional drilling would reduce the surface impact of the proposed action by reducing the number of well pads but allowing for maximum recovery of the gas resource. Directional drilling is not feasible within the project area due to the geology and shallow depth of the target coals ; Wellpad spacing must be 80 acres / wellpad to allow for maximum economic recovery of the resource; 160 acre / wellpad spacing is not close enough to release the natural gas; More than four wellpads / section in portions of the ARPA exceeds the recommendations of the Wyoming Game and Fish Department for oil and gas development.	Alternative D
15. Phased development (developed from comments to the Draft EIS)	The following conflicts were identified for phased development: Phased development as presented in the Draft EIS as Alternative B conflicts with the BLM's policy of allowing reasonable access to private lands across federal lands; Phased development would unreasonably restrict the right of leaseholders by preventing development of some leases for periods ranging from 7 to 14 years.	Alternative B is moved into the section "Alternatives Considered and Eliminated From Detailed Study."

1.8 Issues that Drive Alternative Development

The BLM identified a range of alternatives based on issues, concerns, and opportunities identified from public comments to project scoping and the Draft EIS, interdisciplinary interaction between resource professionals, and collaboration with cooperating and interested agencies. These issues are detailed in section 1.7 “Issues and Concerns”.

Alternative B was responsive to Issue 9, impacts to wildlife habitat and Issue 13, conflicts between mineral development and recreational activities. This alternative proposed that natural gas development activities would be restricted to one of three zones within the ARPA boundary at any one time. Each zone would be open to construction and development of natural gas processing facilities for 7 years at which time construction and development activities would cease. Gas extraction and processing would continue, while construction and development activities would move to another zone. The intent of the alternative was to focus disturbance activities into a smaller area while the remainder of the project area would be less disturbed and less impacted at any one time than under the Proposed Action. Alternative B was analyzed in the Draft EIS and subsequently moved to “Alternatives Considered and Eliminated from Detailed Study”, section 2.3.

Alternative C was developed to be responsive to Issue 3, impacts to surface water hydrology and groundwater resources; Issue 4, impacts to sensitive soils; Issue 6 successful reclamation; Issue 7 conflicts with livestock management; Issue 8, impacts to cultural resources; Issue 9 impacts to wildlife and habitat; Issue 10 impacts to listed or proposed-for-listing threatened and endangered plant and animal species; Issue 11 impacts to sensitive plant and wildlife species; Issue 12 cumulative effects of project when combined with neighboring projects; and Issue 13, potential conflicts between mineral development and recreational opportunities. It proposed to develop natural gas resources while aggressively mitigating impacts to sensitive resource values using additional development protection measures. Comments received to the Draft EIS indicated that due to the stringent nature of the restrictions and the reduced number of surface locations for drilling the alternative was likely not economically feasible nor capable of maximizing the recovery of the natural gas resource.

Alternative D was developed following the Draft EIS and is responsive to Issue 3, impacts to surface water hydrology and groundwater resources; Issue 4, impacts to sensitive soils; Issue 6 successful reclamation; Issue 7 conflicts with livestock management; Issue 9 impacts to wildlife habitat; Issue 10 impacts to listed or proposed-for-listing threatened and endangered plant and animal species; Issue 11 impacts to sensitive plant and wildlife species; Issue 12 cumulative effects of project when combined with neighboring projects; and Issue 14 well spacing and directional drilling. BLM recognized that these impacts can be reduced by limiting the amount of initial disturbance combined with timely reclamation. BLM’s evaluation of IDP development activities determined that average initial and long term disturbance could be reduced by approximately 18% from the Proposed Action (e.g. 60 ft. wide roads vs. 80 ft. width). Alternative D addresses these issues by establishing an unreclaimed surface disturbance cap of 7,600 acres with the goal of averaging 6.5 acres disturbance per well pad within the project area overall and less than 6.5 acres disturbance per well pad in sensitive resource areas.