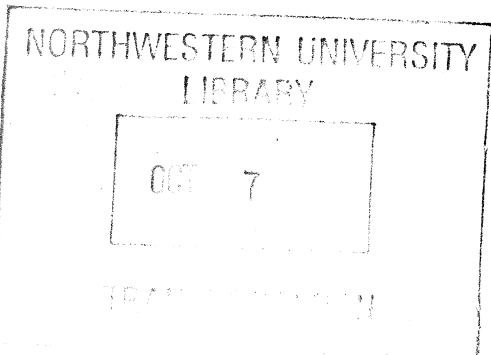
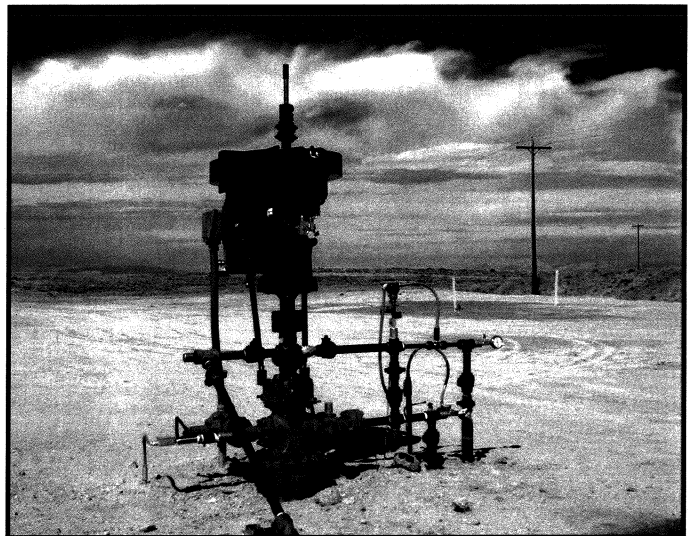
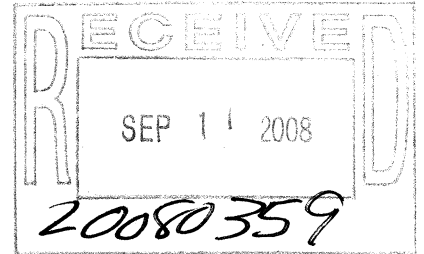


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RIVERTON DOME COAL BED NATURAL GAS AND CONVENTIONAL GAS DEVELOPMENT PROJECT

FINAL ENVIRONMENTAL IMPACT STATEMENT



**BUREAU OF INDIAN AFFAIRS
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August 2008

This Environmental Impact Statement was prepared by Buys & Associates, Inc., an environmental consulting firm in Littleton, Colorado, with the guidance, participation, and independent evaluation of the Bureau of Indian Affairs. The Bureau of Indian Affairs, in accordance with Federal Regulation 40 CFR 1506.5(a) and (b), is in agreement with the findings of the analysis and approves and takes responsibility for the scope and content of this document.

**RIVERTON DOME COAL BED NATURAL GAS
AND CONVENTIONAL GAS DEVELOPMENT
WIND RIVER INDIAN RESERVATION,
FREMONT COUNTY, WYOMING**

**FINAL ENVIRONMENTAL IMPACT STATEMENT
EXECUTIVE SUMMARY**

INTRODUCTION

The Environmental Impact Statement (EIS) for the Riverton Dome Coal Bed Natural Gas (CBNG) and Conventional Gas Development Project analyzes the impacts of construction, drilling, and production operations on natural resources within the Riverton Dome Project Area (RDPA). The RDPA is located on the southeast corner of the Wind River Indian Reservation (WRIR) in Township 1S, Range 4E, Sections 13, 14, 23, 24, 25, 26, 35, and 36; Township 2S, Range 4E, Sections 1, 2, 11 and 12; Township 1S, Range 5E, Sections 17, 18, 19, 20, 29, 30, 31 and 32; and Township 2S, Range 5E, Sections 5, 6, 7, and 8, in Fremont County, Wyoming. It is located approximately five miles southeast of the city of Riverton, Wyoming. From Riverton, the RDPA is accessed by traveling south on Wyoming Highway (WY) 789 to WY 136 and then southeast on WY 135, which is the main road through the RDPA. The RDPA is accessed from the southwest by traveling northeast on WY 789 to WY 136 and then southeast on WY 135. The existing network of roads within the RDPA includes secondary roads (paved two-lane highways, which are mainly state highways), light-duty roads (gravel surface roads), and unimproved roads (dirt and gravel roads and tracks). The RDPA is approximately 13,804 acres in size, of which 12,656 acres of surface and minerals belong to the Eastern Shoshone and Northern Arapaho Tribes (Tribes), and 1,148 acres of surface and minerals are privately owned. Note that the number of acres measured by different methods may vary.

This EIS has been prepared pursuant to the National Environmental Policy Act (NEPA) and addresses three alternatives; the Proposed Action (Alternative A), Alternative B (Existing Leases), and a No Action Alternative (Alternative C), which is required under NEPA. The EIS consists of the following six chapters:

Chapter 1, **Purpose and Need** of the proposed Riverton Dome CBNG and Conventional Gas Development Project, discusses the purpose and need for the proposed project, the environmental analysis process, the relationship of the project to existing policies, plans and programs, actions that authorize the proposed project, and identifies the issues raised during public scoping.

Chapter 2, **Proposed Action and Alternatives**, describes the alternative selection process, the CBNG pilot project, the two action alternatives and the No Action Alternative, alternatives that were considered but eliminated from detailed study, the plan of operations, mitigation measures, and summarizes the environmental impacts of the Proposed Action and alternatives.

Chapter 3, **Affected Environment**, discusses the natural resources that would be affected by the Proposed Action and alternatives. The resources described include geological and mineral resources, paleontological resources, soil resources, climate and air quality, surface water and groundwater resources, vegetation and wetlands, wildlife and fisheries, threatened and endangered species, recreational resources, cultural resources, and visual resources. This chapter also discusses land use, socioeconomics, environmental justice, transportation, health and safety, and noise.

Chapter 4 analyzes the potential **Environmental Consequences** (i.e., impacts) of the Proposed Action and alternatives on each of the resources. It discusses the direct and indirect impacts to the resources present within the RDPA resulting from the Proposed Action (Alternative A), Alternative B, and Alternative C (No Action). It also discusses mitigation measures that may be considered in addition to those identified in Chapter 2.

Chapter 5 discusses the **Cumulative Impacts** of the Proposed Action and alternatives on the human environment. Cumulative impacts are impacts that result from the incremental effect of the proposed development plus other past, present, and reasonably foreseeable future activities (RFFA) in the RDPA and the cumulative impact analysis areas (CIAAs). The CIAAs evaluated for cumulative impacts varies with each resource, as discussed in Chapter 5.

Chapter 6 summarizes **Consultation and Coordination** with the public, including the Eastern Shoshone and Northern Arapaho Tribes, private landowners, Bureau of Indian Affairs, and other federal, state, county, and local agencies potentially affected by the Proposed Action and alternatives.

Existing Environment

Oil and gas development has occurred in the Riverton Dome Field since 1948. There are currently 54 producing oil and gas wells in the RDPA; 53 miles of paved, gravel and unimproved roads; nine miles of existing pipelines (approximately 283 acres of surface disturbance), and 4,243 horsepower (hp) of existing compression.

CBNG PILOT PROJECT

Devon proposed a 20-well pilot CBNG project to the Tribes in 2005 to determine if commercial quantities of CBNG were present, determine the amount of water produced from the wells, evaluate produced water disposal options, and determine the spacing needed to drain the reservoir. To date 10 of the 20 wells have been developed and are successfully producing CBNG. The remaining 10 pilot wells will be developed after the EIS has been completed and a Record of Decision (ROD) is signed.

PROPOSED ACTION AND ALTERNATIVES

Proposed Action (Alternative A)

The Proposed Action (Alternative A) is a maximum development scenario based on the following assumptions:

- The Eastern Shoshone and Northern Arapaho Tribes will approve the additional leases that Devon requested in 2005.
- Forty-acre spacing may be necessary to efficiently produce CBNG from the coal seams.
- Devon's existing leases that do not specifically authorize CBNG development will be modified by the Tribes to authorize CBNG development.

Under the Proposed Action, a maximum of 326 CBNG wells and 20 conventional gas wells may be drilled in the RDPA, if 40-acre spacing is used. However, Devon anticipates that 40-acre spacing for the CBNG wells may only be necessary in certain circumstances where 80-acre spacing would not efficiently produce CBNG from the coal seam.

This EIS analyzes 40-acre spacing to evaluate the maximum potential disturbance, water produced, and compression needed for the proposed project. The actual number of CBNG wells to be drilled by Devon under the Proposed Action is anticipated to range from 163 wells (at 80-acre spacing) to 326 wells (at 40-acre spacing). In addition, up to 20 conventional gas wells may also be drilled as part of the Proposed Action. New pipelines, roads, and facilities also would be constructed. Development is expected to begin in the Summer of 2008 and be completed in 2018. Production is estimated to continue for 30 years.

Approximately 79 miles of new pipelines co-located with proposed roads and approximately 9.8 miles of pipelines parallel to existing roads would be constructed within the RDPA. Gas flow lines from the wells to gathering system lines would average 1,320 feet in length. Disturbance from roads co-located with pipelines would be 478.8 acres, and disturbance from the pipelines parallel to existing roads would be 35.6 acres. The pipelines would be completely reclaimed after pipeline installation has been completed. Seven 0.9-acre Central Delivery Points (CDPs) would be constructed for a disturbance of 6.3 acres. Compressor engines would be added at the existing Riverton Dome Gas Plant, increasing the compression by 9,000 hp.

A total surface disturbance of 1,511 acres, 10.9 percent of the RDPA, would initially result from the Proposed Action. An average of 33 CBNG wells and two conventional wells would be drilled each year during the 10-year development period. As soon as each well is completed, and associated pipeline and facility constructed, reclamation of the disturbed areas that are not needed for production would be initiated. After partial reclamation, disturbance would be reduced to approximately 680 acres or 4.9 percent of the RDPA.

Two methods of produced water disposal would be used: produced water disposal wells and two existing evaporation ponds. The primary method of disposal of produced water from the CBNG wells would be disposal to the existing produced water disposal well in the RDPA. Water would be pumped via pipeline from each well to a CDP and then to the disposal well. The existing disposal well is 12,684 feet in depth and the injection interval is from 12,396 to 12,697 feet. The existing well has been permitted by the U.S. Environmental Protection Agency (EPA) as an Underground Injection Control (UIC) Class II well. The current amount of water that can be injected per day is 12,000 barrels (the well is currently pump limited). The estimated maximum daily capacity is approximately 14,000 barrels (bbl) of water per day. The EPA permit allows an ultimate total of 55 million barrels of water to be injected into the disposal well in a minimum of 12.5 years. Production of produced water from each CBNG well is estimated to be initially 1,000 barrels of water per day (BWPD) at 40- and 80-acre spacing.

Two evaporation ponds have been constructed and also are being used for disposal of produced water from the 10 existing pilot wells. Each pond is approximately 8.0 acres (internal dimension) and has an estimated capacity of 385,000 bbl. Each pond is lined with a 60 millimeter (mil) plastic liner and equipped with a leak detection system. The water in the pond will not be discharged, but will evaporate over time. There will be at least two feet of freeboard (i.e., water would be at least two feet below the top of pond), so that water would not overflow during a 100-year rainfall event. The pond on Tribal surface was permitted through the Bureau of Indian Affairs (BIA) and the Bureau of Land Management (BLM). The pond on private surface was permitted through the Wyoming Oil and Gas Conservation Commission (WOGCC).

To prevent wildlife (especially birds) from entering the evaporation pond, a system of hazing devices, referred to as "Birdavert," (Peregrine, Inc.), has been installed at the pond on Tribal surface. The pond on private surface is used as an "overflow pond". A pipeline near the Tribal

evaporation pond would be used to transfer water to the pond on private surface. All produced water would be treated before it enters the ponds.

Existing Leases (Alternative B)

Under Alternative B, a maximum of 151 CBNG wells would be drilled at 40-acre spacing or 70 wells at 80-acre spacing. In addition, up to 20 conventional gas wells could be drilled under Alternative B. As with the Proposed Action, the initial spacing for each new well drilled is 80-acre spacing. Forty-acre spacing would be utilized if 80-acre spacing would not efficiently produce the CBNG from the formation. The actual number of CBNG wells to be drilled by Devon under Alternative B is anticipated to be between 70 and 151 wells.

A total of 53.2 miles of new pipeline co-located with proposed roads and 9.8 miles of pipelines parallel to existing roads would be constructed in the RDPA. Gas flow lines from the wells to gathering system lines would average 1,320 feet in length. A total of five 0.9-acre CDPs would be constructed for a disturbance of 4.5 acres. An additional 7,000 hp of compression would be used under Alternative B. An average of 33 CBNG wells and two conventional wells would be drilled each year during the 6-year development period of the project.

At 40-acre spacing, the initial (short-term) disturbance would be 858 acres (approximately 6.2 percent of the RDPA [13,804 acres]). The long-term disturbance after interim reclamation would be 373 acres or 2.7 percent of the RDPA.

No Action (Alternative C)

Under the No Action Alternative, required under NEPA, wells would be developed on fee surface and minerals through individual permits authorized through the State of Wyoming on a case-by-case basis. Under a No Action Alternative, a maximum of 24 wells (at 40-acre spacing) may be drilled on private minerals. If 80-acre spacing is utilized, a total of 12 CBNG wells could be drilled.

The No Action Alternative would result in a maximum short-term surface disturbance of 102.0 acres at 40-acre spacing, or 0.7 percent of the RDPA, from well pads, new roads or upgrades of existing roads, production facilities, new pipelines, and additional compression of 1,000 hp. Total surface disturbance would be reduced to 48.0 acres, or 0.4 percent of the RDPA, following interim reclamation.

Estimated disturbance from Alternatives A, B, and C is provided in the table below.

Table ES-1. Riverton Dome Project Area Summary of Maximum Potential Disturbance

	Existing Disturbance	Proposed Action Alternative A		Existing Leases Alternative B		No Action Alternative C	
		Initial	LOP ¹	Initial	LOP	Initial	LOP
Total (ac)	283	1,511	680	858	373	102	48
% of RDPA	3.2	10.9	4.9	6.2	2.7	0.7	0.4
Compression (hp)	4,243	9,000	9,000	7,000	7,000	1,000	1,000

¹LOP=life of project

Environmental Impacts

The resources analyzed for this EIS include geology; paleontology; minerals; climate and air quality; soil; surface water and groundwater; land use; range resources; vegetation (including

noxious weeds), wetlands; wildlife and fisheries; threatened and endangered species; recreation; cultural resources; socioeconomic and environmental justice; transportation; visual resources; health and safety; noise; and fire management. A description of each of the resources and the potential direct, indirect, and cumulative impacts of the Proposed Action and alternatives on each of the resources are summarized in the following sections. Cumulative impacts refer to the incremental impact of the Proposed Action or alternatives when added to other past, present, and RFFA.

Geology/Minerals/Paleontology

The RDPA is located in the southeastern part of the Wind River Basin. The mineral resources in the RDPA include oil, gas, CBNG, coal, sand and gravel, phosphorite, bentonite, pumicite, and uranium. The Wind River Formation, which underlies the RDPA, is known to produce scientifically important fossils.

Potential direct and indirect impacts to geological resources from construction of roads, pipelines, well pads, and ancillary facilities under the Proposed Action and alternatives include topographic changes and increased seepage of methane. Potential surface disturbance under each alternative is provided in Table ES-1. The disturbance is considered to be minor and long-term under Alternatives A and B, and negligible under Alternative C. The Proposed Action and alternatives would result in the irreversible depletion of gas resources and interfere with the extraction of coal and sand/gravel. However, implementation of Best Management Practices and Applicant-Committed Environmental Protection Measures described in Chapter 2 of this EIS would reduce the impacts of the Proposed Action and alternatives to geological, mineral, and paleontological resources.

The Proposed Action or alternatives, when combined with other oil and gas projects, would contribute to depletion of petroleum resources in the general area. In addition, construction of roads, pipelines, well pads and other facilities, when combined with livestock grazing, construction of the Arapaho Tribe Casino, and residential development would incrementally alter the topographic character of the area. Destruction of fossils from the proposed project would incrementally add to existing and future impacts to fossil resources.

Climate and Air Quality

The RDPA is located in a semi-arid, mid-continental climate regime typified by dry windy conditions, limited rainfall, and long cold winters. Low relative humidity, a high percentage of sunshine, and windy conditions generally contribute to high rates of evaporation typical of the area. The average annual precipitation is nine inches and average temperatures range from 3-33°F in the winter and 49-85°F in the summer. The winds originate predominantly from the west and southwest. The air quality in and surrounding the area is expected to be relatively good due to the limited number of large industrial emission sources and favorable atmospheric dispersion conditions.

The near-field air quality analysis showed that the Proposed Action and alternatives would result in an increase in emissions of nitrogen oxide (NO_x), carbon monoxide (CO), volatile organic carbon (VOC), sulfur dioxide (SO₂), particulate matter (PM₁₀ and PM_{2.5}), and hazardous air pollutants (HAPs). For all alternatives, concentrations of pollutants would be below National Ambient Air Quality Standards (NAAQS). Cancer risk from hazardous air pollutants was less than one in one million for benzene, to slightly greater than one in one million for formaldehyde.

The far-field air quality analysis, which evaluated the western two-thirds of the State of Wyoming, was conducted using the CALPUFF dispersion model. The pollutant concentrations were predicted to occur at levels below National and Wyoming Ambient Air Quality Standards and were predicted to be considerably below all PSD (prevention of significant deterioration) increments. Terrestrial acid deposition is predicted to be considerably below threshold levels of concern for all Class I and Class II areas. Predicted change of acid neutralizing capacity (ANC) at area lakes is less than 0.1 percent and the predicted visibility impairment is less than 1.0 deciview.

Cumulative air quality impacts were assessed for near-field areas (i.e., within 50 km) of the RDPA. The predicted cumulative impacts for all pollutant concentrations assessed were below the NAAQS.

Cumulative air quality impacts also were assessed for far-field areas, defined as 412 km x 400 km, covering portions of Wyoming. Cumulative far-field impacts to air quality were predicted using three years of meteorological data. All ambient air concentrations were below all applicable federal and State of Wyoming standards. Air quality related values (nitrogen and sulfur deposition and lake acid neutralization capacity) were within standards developed by federal land managers. However, the visibility analysis for the cumulative actions indicated that visibility impacts were predicted to be considerably higher than for the proposed action. For example, there were 85 days when visibility degradation would exceed the federal land manager's standards at the Bridger Wilderness. The results agree favorably with the recently completed Pinedale air quality cumulative analysis, where the prediction was 85 days of visibility degradation. Visibility at the other Class I and Class II areas were affected, but comparatively less than within the Bridger Wilderness.

Soil Resources

There are 11 soil complexes within the RDPA, of which the Griffy-Saddle sandy loams and Worland-Oceanet-Persayo complex are the most common; slopes are typically less than 15 percent. The Proposed Action and alternatives could result in soil disturbance up to 1,511 acres, as provided in Table ES-1. Surface disturbance would result in increased soil erosion and increased sediment yield to ephemeral drainages, Beaver Creek, and the Little Wind River. The soil erosion would be greatest under the Proposed Action. Leaks or spills of gas condensate from storage tanks, produced water from sumps, and fuels from vehicles and drilling rigs would result in impacts to soil under all alternatives. Implementation of Best Management Practices and Applicant-Committed Environmental Protection Measures (described in Chapter 2 and 4 of this EIS) would reduce the impacts of the Proposed Action and alternatives to soil resources.

Soil erosion and increased sediment yield would cumulatively add to other past, present and reasonably foreseeable future projects in the vicinity of the RDPA. These projects include livestock grazing, residential and commercial development, other oil and gas development, and sand and gravel mining.

Surface Water and Groundwater

Surface water features within and near the RDPA include Beaver Creek, the Little Wind River, and a number of unnamed ephemeral washes and draws. Streams within the RDPA and vicinity can be classified as ephemeral, intermittent, or perennial. Within the RDPA, the major water-bearing units are Quaternary age unconsolidated deposits, the Wind River Formation,

and to a lesser extent, the underlying Mesozoic, Paleozoic, and Precambrian rocks. Two active water wells, ranging in depth from 315-440 feet, are located within the RDPA. Excessive salinity and sodium content are water quality concerns on the WRIR and in the RDPA. Water quality analysis of Beaver Creek water showed that total dissolved solids, sulfate, and the trace metals iron, lead, and manganese, are currently above EPA standards. The groundwater in the Wind River Formation is characterized as sodium-calcium bicarbonate-sulfate type waters with moderate to very high hardness.

Each CBNG well is expected to initially produce 1,000 bbl of water/day. Since no surface discharge of produced water would occur, produced water would not impact soil, range resources, vegetation, or wildlife. However, water used for drilling and dust control under the Proposed Action would result in a maximum water use of 1.56 million bbl or 200.7 acre-feet. The source of the water to be used for drilling and dust control is an active water well within the RDPA. Water quality would be impacted by the proposed project as a result of erosion from surface disturbance of up to 1,511 acres of soil from construction, drilling, and production operations. Contamination of surface and groundwater could also result from spills at wellheads, pipelines, storage tanks, and tanker trucks.

To prevent accidental contamination from spills of produced water and other stored liquids into Beaver Creek and the Little Wind River, storage tanks would be surrounded by berms capable of holding at least 110 percent of the volume of the tank. Evaporation ponds would have two feet of freeboard to prevent any water from being released during 100-year flood events. The evaporation ponds are lined with a 60 mil thick impermeable liner and the reserve pit is lined with a 12 mil impermeable liner to prevent seepage into the soil and groundwater. Seepage of methane from dewatering of coal seams could allow methane to flow through alluvial deposits or to the surface, where it could have adverse effects on vegetation. Potential impacts would be less under Alternative B and Alternative C. Implementation of Best Management Practices and Applicant-Committed Environmental Protection Measures (described in Chapters 2 and 4 of this EIS) would reduce the impacts of the Proposed Action and alternatives to surface water and groundwater resources.

There would be no potential impacts to drinking water supplies for Riverton, WY or the Beaver Creek housing project.

The Wind River Environmental Quality Commission (WREQC) recently (September 25, 2007) issued Draft Surface Water Quality Standards for the Wind River Reservation for public comment. These standards, when finalized, will be directly applicable to the proposed project.

The Proposed Action and alternatives, when combined with other oil and gas development, livestock grazing, residential and commercial development, and sand and gravel mining, would result in increased sedimentation and runoff rates. Thus, the proposed project would cumulatively add to existing and future sources of water quality degradation within the Beaver Creek and Little Wind River watersheds.

Land Use

Approximately 92 percent of the lands within the RDPA are Tribal lands and the remaining eight percent is privately owned. The primary land uses in the RDPA are livestock grazing, hunting, and petroleum extraction. The surface disturbance identified in Table ES-1 would result in impacts to livestock grazing, hunting and fishing, and wildlife habitat. Implementation of Best Management Practices and Applicant-Committed Environmental Protection Measures

(described in Chapters 2 and 4 of this EIS) would reduce the impacts of the Proposed Action and alternatives to land uses on the RDPA.

The impacts from the proposed project, when combined with other past, present, and RFAA in the CIAA would cumulatively add to existing and future impacts to land uses in the WRIR.

Range Resources

Livestock grazing is the most common activity in the RDPA. There are two grazing allotments in the RDPA, with stocking rates ranging from 13.8 acres/AUM (Animal Unit Month) to 148.8 acres/AUM. An AUM is the amount of forage needed by a 1,000-pound cow and her calf for one month.

The Proposed Action and alternatives would result in direct and indirect impacts to the management of livestock in the RDPA. The initial disturbance of 1,511 acres of vegetation under the Proposed Action would result in reductions and/or changes to available forage, thereby affecting available AUMs. Successful interim reclamation would reduce the long-term soil and vegetation disturbance to approximately 680 acres. Removal of cattle guards and gates would decrease ranchers' ability to control cattle while on allotments. The proposed project could also affect drinking water for the cattle and soil erosion could impact existing vegetation and result in invasion of noxious weeds. Implementation of Best Management Practices and Applicant-Committed Environmental Protection Measures (described in Chapters 2 and 4 of this EIS) would reduce the impacts of the Proposed Action and alternatives to livestock grazing.

Disturbance of 1,511 acres of vegetation used as forage by cattle under the alternatives, when combined with past, present, and reasonably foreseeable future projects would cumulatively add to impacts on range resources.

Vegetation and Wetlands

The RDPA consists of a relatively level, gently sloping valley, with low lying, hilly terrain at elevations ranging from 5,000 feet to about 5,500 feet. Most of the land is open field that is currently used for cattle grazing and oil and gas development. Ninety nine percent, approximately 13,588 acres, of primary vegetative cover in the RDPA is Wyoming big sagebrush. Less than one percent or 199 acres, along Beaver Creek, is shrub-dominated riparian vegetation. Secondary vegetative cover types consist of mixed grass prairie and basin big sagebrush. Sensitive plant species that may be present within the RDPA include Porter's sagebrush, Nelson's milkvetch, and cedar rim thistle.

The Proposed Action would result in direct impact to 1,511 acres of vegetation, of which approximately 1,489 acres would be Wyoming big sagebrush and 22 acres would involve wetlands and riparian habitats. Surface disturbance under Alternatives B and C would be 57 percent and 7 percent of the Proposed Action, respectively. The proposed project would also result in potential loss of topsoil integrity, fragmentation of habitat, contamination of vegetation and soil from accidental spills, and potential introduction or spread of invasive or noxious weeds. In addition, windborne dust from vehicles could affect individual plants within 75 feet of roads. Implementation of Best Management Practices and Applicant-Committed Environmental Protection Measures (described in Chapters 2 and 4 of this EIS) would reduce the impacts of the Proposed Action and alternatives to vegetation and wetlands, and reduce the potential of invasion of noxious weeds.

Future energy development, livestock grazing, sand and gravel mining, residential and commercial development are likely to occur within and near the CIAA, which would add to the vegetation loss, reduction of productivity, and potential for noxious weed invasion in the RDPA. Thus, the Proposed Action and alternatives would incrementally add to the impacts to vegetation resources from other past, present and RFFA in the CIAA.

Wildlife and Fisheries

The RDPA supports a variety of wildlife species including large game animals, raptors, game birds, migratory birds, and reptiles. Beaver Creek, which runs through the southwestern edge of the RDPA and northwest of the RDPA serves as crucial winter range and severe winter relief habitat for the pronghorn. The Beaver Creek area also is used as winter range for mule deer. No white-tailed deer or elk "herd units" are present in the RDPA.

Since Beaver Creek is not a perennial stream along much of its length, it does not contain fish. However, the Little Wind River, north of the RDPA, is an important fishery for the Tribes. The fish species of greatest concern to the Tribes and agencies is the sauger. Several studies have recently been conducted on the sauger by the University of Wyoming. The results of the studies showed that the population of sauger in the Little Wind River, north of the RDPA, is only one of two genetically pure populations of this species in Wyoming. The sauger has been shown to spawn near the confluence of Beaver Creek with the Little Wind River. In addition, other fish species (e.g., burbot and walleye) and numerous species of macroinvertebrates (including the fatmucket mussel) are present in the Little Wind River.

Potential direct and indirect impacts to wildlife and fisheries from the Proposed Action and alternatives include displacement of wildlife species due to noise, increased potential for mortality from collision with vehicles, reduced availability of prey species, reduced reproductive success, electrocution from power lines, fragmentation of wildlife habitat, erosion and sedimentation of aquatic habitats, and potential exposure to contaminants from accidental spills.

The Proposed Action, Alternative B, and Alternative C would result in an initial loss of 1,511 acres, 858 acres, and 102 acres, respectively, of habitat for large game animals, game birds, raptors, migratory birds, and reptiles. If interim reclamation is successful, wildlife habitat disturbance would be reduced to 680 acres, 373 acres, and 48 acres, respectively, under the Proposed Action, Alternative B, and Alternative C (see Table ES-1). The Proposed Action would result in the loss of 123 acres of pronghorn crucial winter range and 21 acres of severe winter relief habitat. Interim reclamation would reduce the loss of crucial winter range and severe winter relief habitat to 92 acres and 16 acres, respectively. Approximately 20 acres of winter/yearlong habitat of the mule deer would be disturbed, under the Proposed Action, by construction and drilling, with a long-term loss of 15 acres.

Soil erosion and sedimentation, as well as contamination resulting from spills into Beaver Creek and the Little Wind River from the Proposed Action and alternatives could impact the sauger and burbot, utilized for food by Tribal members. Of particular importance is the sauger, which spawns near the confluence of Beaver Creek with the Little Wind River. Impacts could include mortality of adults, eggs, and larvae which would reduce the genetically pure sauger population in the Little Wind River. Numerous species of macroinvertebrates, including the fatmucket mussel, in the Little Wind River would also be impacted by the Proposed Action and alternatives. Impacts to the sauger, walleye, and perch, which serve as hosts to the fatmucket, would affect the life cycle of this species and could result in a population decline. Implementation of Best Management Practices and Applicant-Committed Environmental

Protection Measures described in Chapter 2 and 4 of this EIS would reduce the impacts of the Proposed Action and alternatives to fish and wildlife species.

Past, present, and RFFA, including oil and gas operations, livestock grazing, recreation, and other land uses within the CIAA, would reduce the amount of available cover, foraging opportunities, shelter, and breeding areas for wildlife species potentially present in the RDPA. Additional development could preclude wildlife from using areas of more intensive human activity. In general, the severity of the cumulative effects would depend on factors, such as the sensitivity of the species impacted, seasonal intensity of use, type of project activity, and physical parameters (e.g., topography, forage, and cover availability). Fish and wildlife species potentially cumulatively impacted by the proposed project and other RFFA, include large game species (e.g., pronghorn, mule deer), raptors (e.g., golden eagle, ferruginous hawk), sensitive species (e.g., greater sage-grouse, mountain plover, migratory bird species), and fish and macroinvertebrate species in the Little Wind River (e.g., sauger, burbot, fatmucket).

Threatened and Endangered Species

The U.S. Fish and Wildlife Service (USFWS) has identified three Federally listed endangered or threatened species that may occur within the RDPA and may be affected by the proposed project. These species included the black-footed ferret, Ute ladies'-tresses, and desert yellowhead.

The only Federally listed species that is known to occur in the RDPA is the desert yellowhead (threatened). Impacts to the threatened desert yellowhead could include accidental removal or burial of the plant and possibly vandalism, due to the bright yellow flowers.

Future energy development (e.g., Beaver Creek Field), livestock grazing, sand and gravel mining, and residential and commercial development are likely to occur within and near the WRIR, which would cumulatively add to the potential impacts to the desert yellowhead from the Proposed Action and alternatives.

Sensitive Wildlife Species

Sensitive wildlife species that are present or may occur in the RDPA include the greater sage-grouse, white-tailed prairie dog, mountain plover, pygmy rabbit, ferruginous hawk, bald eagle, burrowing owl, and long-billed curlew. Three greater sage-grouse leks have been reported within and near the RDPA. However, only one male has been reported from the lek within the RDPA since 2000. Mountain plovers, ferruginous hawks, burrowing owls, and long billed curlews have not been reported from the RDPA, although suitable habitat is present. Impacts to these species could result from direct habitat loss, degradation of habitat, mortality from collision with power lines or vehicles, and displacement caused by human activities.

Future energy development (e.g., Beaver Creek Field), livestock grazing, sand and gravel mining, residential and commercial development are likely to occur within and near the WRIR. These reasonably foreseeable activities, combined with the Proposed Action or alternatives, would cumulatively add to potential impacts to sensitive wildlife species such as the greater sage-grouse.

Recreation

Recreational activities in the RDPA and WRIR are limited to Tribal members. Hunting and fishing are the most common recreational activities. The Proposed Action, Alternative B and

Alternative C would result in the initial loss of 1,511 acres; 858 acres, and 102 acres, respectively, of hunting habitat within the RDPA. It also could result in the displacement of game animals and decrease in hunting opportunities.

Subsistence hunting opportunities would be adversely impacted if the Proposed Action resulted in the displacement of game species from the RDPA. Since the RDPA is a small portion of the approximately 1.7 million acre WRIR, the impacts from the Proposed Action and alternatives on hunting would be negligible. However, minor impacts to recreational activities within the RDPA would incrementally and cumulatively add to the impacts from other past, present, and reasonably foreseeable activities in the CIAA.

Cultural Resources

Archaeological investigations have indicated that the Wind River Basin has had human occupation for at least 11,000 years from the PaleoIndian periods to the present. To date, only four cultural resource sites have been recorded within the RDPA. Based on consultation with the elders from the Eastern Shoshone and Northern Arapaho Tribes, it has been determined that Traditional Cultural Properties (TCP) are not present within the RDPA based on a meeting with Tribal Elders, March 27, 2007.

Direct impacts to cultural resources may include destruction or damage of archaeological and historical resources as a result of surface and subsurface disturbance during construction, drilling, or reclamation of well locations, facilities, pipelines, and access roads. Direct impacts could also include erosion of cultural resource properties, siltation resulting in burying or degradation of cultural resource sites, and visual impacts to historic structures and prehistoric rock art sites. Indirect effects could include damage or destruction of cultural resources as a result of increased human activity in an otherwise remote area during drilling and production, and as a result of improved public access to these areas provided by access roads. Vandalism of cultural resources, particularly prehistoric rock art, or unauthorized collection at archaeological sites, is also a potential long-term effect. Since cultural surveys are required on the WRIR before any disturbance occurs, impacts from the proposed project are unlikely.

Although destruction of cultural resources are not anticipated from the Proposed Action or alternatives, any impacts to cultural resources within the RDPA would incrementally and cumulatively add to the impacts from other past, present, and reasonably foreseeable activities on the WRIR.

Socioeconomics and Environmental Justice

There are 3,810 Northern Arapaho, 1,630 Eastern Shoshone, 660 other American Indians, and 1,580 non-Indians living on the WRIR. Executive Order 12898 requires Federal agencies to identify and address disproportionately high human health or environmental impacts of their programs, policies, and activities on minority and low income populations. Approximately 20 percent of the minority populations within the WRIR are below the poverty level. Since the Tribal Employment Rights Ordinance requires a minimum of 50 percent employment of Tribal members, the Proposed Action and Alternatives would benefit the Tribes in terms of attaining environmental justice.

Also included within the WRIR is the Beaver Creek Tribal housing area located in T1S:R4E Section 15, which is immediately adjacent to the RDPA. The housing development currently has approximately 73 housing units with additional units proposed.

The socioeconomic impacts from the Proposed Action and alternatives are mainly beneficial to the Eastern Shoshone and Northern Arapaho Tribes, to Fremont County, and to the State of Wyoming. The beneficial impacts include increased employment of Tribal members, increased revenues to the Tribes as royalties and severance taxes, and increased revenues to the State and County. Increased revenues to the Tribes are estimated to be \$19.8 million under the Proposed Action and less under Alternative B. The Tribes would not receive royalties under the No Action Alternative.

Increased employment under the Proposed Action is estimated to be 122 jobs/year for 10 years and 31 jobs/year for the life of the project. Employee compensation under the Proposed Action is estimated to be \$33.5 million during development and \$42.7 million over the life of the project. Increased revenues to the State and Fremont County are estimated to be \$5.6 million and \$6.8 million, respectively.

Negative impacts could include increased demand for law enforcement and emergency response and increased housing demand. As the Beaver Creek Tribal housing area is located directly adjacent to the RDPA, potential air quality impacts are expected to be greater than the potential impacts to more distant populations. However, potential pollutant concentrations that would result from the proposed project are not expected to exceed the NAAQS, which are protective of human health. Furthermore, potential Hazardous Air Pollutants (HAP) emissions are not expected to exceed concentrations for which acute and chronic adverse health effects are expected. However, due to the close proximity of the housing development, the incremental cancer risk from the project would be greater for persons residing in Beaver Creek when compared to more distant communities.

Transportation

The main access to the RDPA is by WY 135, which runs generally north-south through the RDPA. Other highways, which connect to WY 135 to provide access to the RDPA, include WY 136 and WY 789. No county roads directly serve the RDPA. Most of the roads are operator-maintained dirt or gravel roads.

Impacts from the Proposed Action and alternatives would include increased number of vehicles on the roads leading to the RDPA, potential increase in road repairs needed on WY 135, 136, and 789, and increased number of accidents. Implementation of Best Management Practices and Applicant-Committed Environmental Protection Measures described in Chapters 2 and 4 of this EIS would reduce the impacts of increased traffic resulting from the Proposed Action and alternatives in the RDPA.

The impacts from the proposed project, when combined with other past, present, and RFFA in the CIAA would cumulatively add to existing and future impacts from increased traffic on the WRIR.

Visual Resources

The RDPA consists primarily of rolling sagebrush plains, interspersed with hills and rocky ridges. The BIA, as the managing agency for the RDPA, lacks a system for objectively identifying and measuring the visual quality of the landscape. However, the BLM has developed a system for Visual Resource Management (VRM) that provides them with a methodological approach to identify visual (scenic) values, manage those values, and ensure impacts are sufficiently mitigated. In the absence of a BIA visual resource classification system, the BLM's

VRM system has been used to evaluate the scenic quality of landscapes in the RDPA. The RDPA would be equivalent to BLM's Class IV, which allows major modification of the existing character of the landscape. It should be noted, that the VRM system does not take into consideration the spiritual and cultural ties of a person who lives on the WRIR to the land.

The construction and maintenance of natural gas facilities and associated features, such as roads and pipelines, would result in short-term and long-term visual impacts to the RDPA. Short-term visual impacts would primarily be related to construction and drilling activities. Construction activities would increase visual contrasts within the existing landscape by modifying the natural lines, colors, forms, and textures of the area. Drilling activities would typically occur 24 hours per day, and lighting associated with night-time drilling activities would be visible from long viewing distances. Once construction activities are complete, long-term landscape contrasts would result from vegetation removal associated with well pads, pipelines, and roads. These landscape modifications would yield a more industrialized visual setting. Applicant-Committed Environmental Protection Measures, such as no construction near residences to the northwest of the RDPA and use of the lowest intensity lighting as possible on drilling rigs, would decrease the impacts to visual resources.

Although alterations in the landscape of the RDPA (similar to BLM's VRM Class IV areas) are not a high level of concern, an increase in landscape alterations, including changes in form, line, and color, resulting from other past, present, and RFFA will cumulatively and incrementally add to the developed nature of the CIAA.

Health and Safety

Impacts that could occur from the Proposed Action and alternatives include:

- occupational accidents,
- an increase in traffic accidents,
- hazards related fugitive dust from vehicular traffic,
- accidental ignition of fires,
- potential for accidental rupture or damage of pipelines by heavy equipment,
- effects to health and safety related to the use of hazardous materials, and
- accidental spills or releases of hazardous materials.

Conventional gas wells in the RDPA may contain hydrogen sulfide (H₂S), whereas H₂S is not present in CBNG. In general, compliance with 43 CFR Ch. II, subpart 3162.5, and other regulations related to health and safety and environmental protection, would minimize risks to human health and safety. Implementation of Best Management Practices and Applicant-Committed Environmental Protection Measures described in Chapters 2 and 4 of this EIS would reduce health and safety impacts of the Proposed Action and alternatives.

The impacts from the proposed project, when combined with other past, present, and RFFA in the CIAA would cumulatively add to existing and future health and safety impacts on the WRIR.

Noise

The EPA established a 55 A-weighted decibel (dBA) noise level as a guideline for acceptable environmental noise (EPA 1974). Noise levels would be below 55 dBA at about 1,000 feet from the Riverton Dome Gas Plant after the installation of additional compression needed for the Proposed Action and alternatives. Typical noise from a drilling rig would be below 55 dBA at less than 0.25 mile from a rig. Additionally, this level would only last for 7-10 days at any one of the 33 CBNG wells that may be drilled in a year. The noise level would last for 30 days during the conventional well drilling, of which only two wells would be drilled annually. Noise levels would temporarily increase along roads when trucks pass any point along RDPA roads. However, this increased noise would be intermittent in nature. Noise impacts would be minor, since the noise sources would be distant from any populated areas and noise from any one source would decrease below significance levels at short distances from the source. Implementation of Best Management Practices and Applicant-Committed Environmental Protection Measures described in Chapters 2 and 4 of this EIS would reduce the noise impacts resulting from the Proposed Action and alternatives in the RDPA.

The impacts from the proposed project, when combined with other past, present, and RFFA in the CIAA would cumulatively add to existing and future impacts from noise on the WRIR.

Fire Management

The Proposed Action would result in a maximum initial surface disturbance of approximately 1,511 acres or 10.9 percent of the RDPA, and a long-term disturbance of approximately 680.4 acres of vegetation. The disturbance of existing vegetation could result in invasion of noxious weeds, which are more prone to burn in event of an accidental fire. The management guidelines contained in the *Environmental Assessment of the Land Management Activities Proposed by Land Operations, Wind River Agency* (BIA 1984) require that all fires caused by the operator's employees be extinguished as soon as possible. In addition, implementation of Best Management Practices and Applicant-Committed Environmental Protection Measures described in Chapters 2 and 4 of this EIS would reduce the potential for accidental fires resulting from the Proposed Action and alternatives.

The impacts from the proposed project, when combined with other past, present, and RFFA in the CIAA would cumulatively add to existing and future impacts to fire management on the WRIR.

Consultation and Coordination

A Notice of Intent to prepare an EIS for Coal Bed Natural Gas and Conventional Gas Development on the Wind River Indian Reservation was published in the Federal Register on September 27, 2005 (70 FR 56482). It announced a public scoping meeting and requested comments on the proposed project. Comments on the scoping notice were accepted by the BIA through October 28, 2005. The scoping notice was mailed to federal, state, and local agencies; environmental organizations, the media, companies, landowners, and other interested parties. The public scoping meeting was held at St. Stephens Elementary School on the WRIR on October 12, 2005. A total of 17 written responses were received during the public scoping period in response to the proposed project. The issues raised by the written and oral responses made during the scoping period are summarized in Chapter 1, Section 1.6.

During the preparation of this EIS, the BIA, contractors, and Cooperating Agencies (BLM, Joint Business Council of the Eastern Shoshone and Northern Arapaho Tribes, and EPA) met periodically to discuss issues that arose during the preparation of the EIS and to comment on the preliminary draft EIS. The roles of the Cooperating Agencies were specified in a Memorandum of Understanding (MOU), signed on February 12, 2007. The key individuals that represent the BIA, BLM, EPA, and Eastern Shoshone and Northern Arapaho Tribes are provided in Chapter 6 of this EIS.

Public Participation

The draft EIS was made available to the public for a 60-day public comment period. Thirteen written comment letters and numerous oral comments were received by the public during that timeframe. A summary of the substantive comments and BIA's responses to those comments are included in Appendix H.

BIA Preferred Alternative

Alternative B, Existing Leases, is the BIA's Preferred Alternative for the Riverton Dome CBNG and Conventional Gas Development Project. Alternative B is comprised of the existing leases that Devon has with the Eastern Shoshone and Northern Arapaho Tribes. Most of these leases were authorized under the 1938 Indian Minerals Leasing Act and allow for the development of all mineral estate. The leases in the northern part of the RDPA were authorized under the 1982 Indian Minerals Development Act. The 1982 leases do not specifically authorize the development of CBNG under the terms of the leasing agreements.

Alternative B consists of developing a number of wells ranging from 70 CBNG wells at 80-acre spacing to 151 CBNG wells at 40-acre spacing. The initial spacing for each new CBNG well drilled is 80-acre spacing. Forty-acre spacing would only be utilized, if 80-acre spacing is not sufficient to efficiently produce the CBNG from the formation. The assumption that all CBNG wells would be drilled at 40-acre spacing was used to evaluate the maximum potential disturbance, produced water production, and compression needed for development. The actual number of CBNG wells to be drilled by Devon under Alternative B is anticipated to be between 151 wells at 40-acre spacing and 70 wells at 80-acre spacing, which would result in substantially less disturbance. In addition, up to 20 conventional gas wells could be drilled under Alternative B. The conventional gas wells can be drilled under all of Devon's existing leases with the Tribes.

Alternative B is environmentally preferable to the Proposed Action (Alternative A), since it would result in less than 57 percent of the initial surface disturbance anticipated under the Proposed Action and less than 55 percent of the long-term surface disturbance. The decrease in surface disturbance would result in fewer impacts to natural resources in the RDPA. In addition, the selection of Alternative B incorporates the implementation of various avoidance, minimization, and mitigation measures identified below:

- Applicant-Committed Environmental Protection Measures (Chapter 2, Section 2.8).
- Additional mitigation measures to be considered (Chapter 4, under each resource analyzed).
- Conditions of Approval (Appendix A).
- Reclamation Plan (including Noxious Weed Management Plan) (Appendix B).

- Hazardous Materials Management Plan (Appendix F).
- Wildlife Monitoring and Protection Plan (Appendix G).

These avoidance and minimization measures would reduce the potential environmental impacts resulting from gas development in the RDPA. The BIA also feels that the analyses demonstrate that Alternative B would meet the requirements of 43 CFR 3162(a), which directs the Operators to conduct "*....all operations in a manner which ensures the proper handling, measurement, disposition, and site security of leasehold production; which protects other natural resources and environmental quality; which protects life and property; and which results in maximum ultimate economic recovery of oil and gas with minimum waste, and with minimum adverse effect on ultimate recovery of other mineral resources.*"

However, disclosure of Alternative B as the Agency-Preferred Alternative does not imply that this will be the BIA's final decision. Additional information may be provided to the BIA during the EIS process, including approval of new leases by the Tribes and public comments, which may result in the selection of an alternative in the ROD that combines components of the other alternatives to provide the best mix of operational requirements and mitigation measures needed to reduce environmental harm.

Alternative C (No Action) is the environmentally preferable alternative [40 CFR 1505.2 (b)]. Only a limited number of wells could be approved resulting in fewer impacts than the other alternatives analyzed. Although Alternative C would result in fewer impacts, this alternative does not provide for the continued use of public minerals for oil and gas development consistent with the Report of the National Energy Policy Development Group (2001) and Executive Order 13212 (2001).

Table ES-2 provides a comparison of the impacts for each alternative.

Table ES-2. Summary of Impact Determinations for Alternative A (Proposed Action); Alternative B (Existing Leases) and Alternative C (No Action).

Resources and Impacts	Magnitude and Duration		
	Alternative A (Proposed Action)	Alternative B (Existing Leases)	Alternative C (No Action)
Number of CBNG Wells	326 (range 163-326)	151 (range 70-151)	24 (range 12-24)
Number of Conventional Gas Wells	20	20	2
Acres of Disturbance ¹	1511 acres (ST); 680 acres (LT)	858 acres (ST); 373 acres (LT)	102 acres (ST); 48 acres (LT)
Percent of RDPA ²	10.9% ST; 4.9% (LT)	6.2% ST; 2.7% (LT)	0.74% ST; 0.4% (LT)
GEOLOGY			
Topographic changes	Minor; long-term	Minor; long-term	Negligible
Surface subsidence	Minor; long-term	Minor; long-term	Negligible
Increased seepage of methane	Minor; long-term	Minor; long-term	Negligible
MINERALS			
Irreversible depletion of gas resources	Minor; long-term	Impacts approximately 50% of the Proposed Action	Impacts approximately 7.5% of Proposed Action
Interfere with extraction of coal and sand/gravel	Negligible	Negligible	Negligible
PALEONTOLOGY			
Damage or destroy fossils	Minor; long-term	Impacts approximately 50% of the Proposed Action	Negligible
AIR QUALITY-NEAR FIELD			
Increase in emissions of PM ₁₀ , PM _{2.5} , NO _x , SO _x , CO	Below National Ambient Air Quality Standards for these pollutants	Emissions less than Proposed Action	Emissions considerably less than Proposed Action
Increase in ozone emissions	Ambient air ozone concentrations predicted to be below standards.	Emissions less than Proposed Action	Emissions considerably less than Proposed Action
Hazardous air pollutants (BTEX)	Predicted concentrations below Applicable Significance Criteria	Emissions less than Proposed Action	Emissions considerably less than Proposed Action
AIR QUALITY-FAR FIELD			
Ambient air quality standards	Predicted concentrations are below ambient standards	Predicted concentrations less than Proposed Action	Predicted concentrations considerably less than Proposed Action
Pollutant concentrations	Pollutant concentrations below PSD increments	Predicted concentrations less than Proposed Action	Predicted concentrations considerably less than Proposed Action
Terrestrial Acid Deposition	Acid deposition below thresholds at any Class I or Class II area	Deposition less than Proposed Action	Deposition considerably less than Proposed Action
Aquatic acid deposition	Acid deposition less than 0.1% change in ANC is predicted	Deposition less than Proposed Action	Deposition considerably less than Proposed Action

Resources and Impacts	Magnitude and Duration		
Visibility impairment	No changes in visibility at Class I areas that exceed 1.0 deciview are predicted	Impacts less than Proposed Action	Impacts considerably less than Proposed Action
SOIL RESOURCES			
Soil disturbance	1,511 acres (ST); 680 acres (LT)	858 acres (ST); 373 acres (LT)	102 acres (ST); 48 acres (LT)
Increased soil erosion	Estimated annual soil erosion would increase by 1,088 tons (ST) and 490 tons (LT)	Estimated annual soil erosion would increase by 573 tons (ST) and 369 tons (LT)	Estimated annual soil erosion would increase by 61 tons (ST) and 35 tons (LT)
Soil contamination from spills	Minor; short-term	Approximately 50% of the Proposed Action.	Negligible
SURFACE WATER			
Increased sedimentation and turbidity (with implementation of BMPs)	With implementation of BMPs, estimated sediment increase of 326 tons or 0.13 % to the Little Wind River (ST) and 147 tons or 0.06% (LT)	With implementation of BMPs, estimated increased 172 tons or 0.07 % of sediment to the Little Wind River (ST) and 111 tons or 0.04% (LT)	With implementation of BMPs, estimated increased 20 tons or 0.008 % of sediment to the Little Wind River (ST) and 11 tons or 0.004% (LT)
Potential contamination from leaks and spills	Minor; short-term	Potential of spills is estimated to be approximately 50% of the Proposed Action	Negligible
Increased water use	Maximum potential water use of 299.7 acre-feet or 1.56 million bbl	Maximum potential water use of 99.2 acre-feet or 0.77 million bbl	Maximum potential water use of 15.1 acre-feet or 0.11 million bbl
Impacts to surface water from produced water	No impacts to surface water, since all water injected into disposal wells and/or 8-acre (internal diameter) evaporation ponds	No impacts to surface water, since all water injected into disposal wells or 8-acre (internal diameter) evaporation ponds	No impacts to surface water, since all water injected into disposal wells or 8-acre (internal diameter) evaporation ponds
Impacts to surface water from hydrofracturing in conventional gas wells	Negligible	Negligible	Negligible
GROUNDWATER			
Contamination of groundwater with produced water	Negligible	Negligible	Negligible
Seepage of methane from dewatering coal seams into alluvial deposits potentially contaminating water wells	Potential is not quantifiable	Potential is not quantifiable	Potential is not quantifiable
LAND USE			
Impacts from surface disturbance to livestock grazing, hunting, recreation	Minor; short-term	Minor; short-term	No impacts to Tribal lands; impacts to private land would be negligible

Resources and Impacts	Magnitude and Duration		
RANGE RESOURCES			
Loss of forage	1511 acres (ST); 680 acres (LT)	858 acres (ST); 373 acres (LT)	102 acres (ST); 48 acres (LT)
Reduction in animal unit months (AUMs)	Loss of 98 AUMs (ST); 35 AUMs (LT)	Loss of 52 AUMs (ST); 34 AUMs (LT)	No impacts to Tribal lands; impacts to private land would be negligible
Damage to range facilities (i.e., fences, cattle guards)	Minor; short-term	Minor; short-term	Negligible
VEGETATION/WETLANDS			
Loss of vegetation	1511 acres (ST); 680 acres (LT)	858 acres (ST); 373 acres (LT)	102 acres (ST); 48 acres (LT)
Vegetation fragmentation from roads and pipelines	Minor; short-term (pipelines); long-term (roads)	Minor; short-term (pipelines); long-term (roads)	Negligible
Loss of topsoil integrity	Minor; long-term	Minor; long-term	Negligible
Loss of wetlands	21 acres (ST) (recovery within 2-3 years)	Similar to Proposed Action	18 acres (ST) (recovery within 2-3 years)
Disturbance to sensitive plant species from dust from vehicles	Minor; short-term	Minor; short-term	Negligible
Introduction of invasive and/or noxious weeds into disturbed areas	Minor; long-term	Minor; long-term	Negligible
WILDLIFE AND FISHERIES			
Loss of pronghorn crucial winter and severe winter relief habitat	123 acres crucial winter range (ST); 21 acres of severe winter relief habitat (ST)	28 acres of crucial winter range (ST); 20 acres of severe winter relief habitat (ST)	Negligible to minor
Loss of mule deer winter/year-long range	20 acres (ST); 15 acres (LT)	Negligible to minor	Negligible to minor
Disturbance to pronghorn from noise in crucial winter or severe winter relief habitat	Moderate; short-term	Minor; short-term	Minor; short-term
Loss of prey habitat for raptors	1511 acres (ST); 680 acres (LT)	858 acres (ST); 373 acres (LT)	102 acres (ST); 48 acres (LT)
Nest abandonment by birds, mortality of eggs or fledglings	Minor; short-term	Minor; short-term	Negligible
Increased potential for electrocution from powerlines	Minor; long-term	Minor; long-term	Negligible
Habitat fragmentation	Minor; long-term	Minor; long-term	Negligible to minor
Increased predation	Minor; short-term	Minor; short-term	Negligible to minor
Collisions with project vehicles	Minor; short-term	Minor; short-term	Negligible to minor
Impacts of increased sediment in Little Wind River to sauger, burbot and aquatic macroinvertebrates	Minor; long-term	Minor; long-term	Negligible to minor

Resources and Impacts	Magnitude and Duration		
Impacts from produced water to sauger, burbot and aquatic macroinvertebrates	No impacts under normal conditions, since no produced water is discharged to the surface	No impacts under normal conditions, since no produced water is discharged to the surface	No impacts under normal conditions, since no produced water is discharged to the surface
THREATENED AND ENDANGERED SPECIES			
Impacts to black-footed ferret	None	None	None
Impacts to Ute ladies'-tresses	None	None	None
Impacts to desert yellowhead	Negligible	Negligible	Negligible
SENSITIVE WILDLIFE SPECIES			
Impacts to greater sage-grouse from habitat loss, increased predation, decreased reproductive success, noise, etc.	Minor; short-term	Minor; short-term	Negligible
Increased potential for raptor electrocution from power lines	Minor; long-term	Minor; long-term	Negligible
Impacts to mountain plover from loss and fragmentation of nesting and foraging habitat	Minor; short-term	Minor; short-term	Negligible
Impacts to white-tailed prairie dog from habitat loss and fragmentation, and loss of forage	Minor; long-term	Minor; long-term	Negligible
RECREATION			
Reduced hunting opportunities from noise and traffic	Minor; short-term	Minor; short-term	Negligible
CULTURAL RESOURCES			
Potential loss or damage to cultural resources	1511 acres (ST); 680 acres (LT)	858 acres (ST); 373 acres (LT)	102 acres (ST); 48 acres (LT)
Disturbance to areas of spiritual value	Minor; long-term	Minor; long-term	No impact, since private land
SOCIOECONOMICS			
Increased employment (beneficial)	Average 122 jobs/yr. for 10 years (development); Average 31 jobs/yr for LOP ³ (production)	Average 122 jobs/yr for six years (development); Average 31 jobs/yr for LOP (production)	Approximately 74 jobs for one year (development); 23 jobs/yr for LOP (production)
Increased employee compensation (beneficial)	\$33.5 million (undiscounted) during development; \$42.7 million over LOP	\$20.1 million(undiscounted) during development; \$37.1 million over LOP	\$2.0 million during development; \$31.0 million over LOP
Increased revenues to the Shoshone and Arapaho Tribes (beneficial)	\$19.8 million (estimated)	\$7.8 million (estimated)	No benefit to Tribes, since private minerals
Increased revenues to State and Fremont County (beneficial)	\$5.6 million/yr to Wyoming; \$6.8 million/yr to Fremont County	\$2.7 million/yr to Wyoming; \$3.3 million/yr to Fremont County	Revenues substantially less (not quantified)
Increased demand for law enforcement and emergency response	Minor; short-term	Minor; short-term	Negligible
Increased housing demand	Negligible	Negligible	Negligible

Resources and Impacts	Magnitude and Duration		
Environmental Justice	Under TERO ⁴ 50% employment would be Tribal members	Under TERO 50% employment would be Tribal members	Under TERO 50% employment would be Tribal members within the WRIR boundary
TRANSPORTATION			
Increased traffic on area roads	WY 135 (8.1%); WY 136 (13.5%); WY 789 (0.8%) for 10 years	Similar to Proposed Action, but for the six-yr. development phase	Similar to Proposed Action, but for the one-year development phase
VISUAL RESOURCES			
Changes in landscape as a result of gas development	Moderate; long-term	Moderate; long-term	Minor; long-term
HEALTH AND SAFETY			
Increased traffic accidents	Estimated increase from <1 to 1.5 additional traffic accidents on WY 135, 146, and 789 for 10 years	Estimated increase from <1 to 1.5 additional traffic accidents on WY 135, 146, and 789 for six years	Estimated increase from <1 to 1.5 additional traffic accidents on WY 135, 146, and 789 for one year
Increased worker accidents	Estimated 6.2 accidents/yr. for 10 years	Estimated 6.2 accidents/yr. for six years	Estimated 6.2 accidents during the one-year development period
FIRE MANAGEMENT			
Increased potential for accidental fires during development	Minor; short-term	Minor; short-term	Negligible

¹ ST=Short-term; LT=Long-term.
² RDPA=13,804 acres.
³ LOP=Life of the Project.
⁴ TERO=Tribal Employment Rights Ordinance

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Volume II: Air Quality Technical Support Documents

Emissions Inventory
Near-Field Air Quality Technical Support Document
Far-Field Air Quality Technical Support Document

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1.0 PURPOSE AND NEED

1.1 PROJECT DESCRIPTION AND LOCATION

1.1.1 Description

Devon Energy and Production Company, L.P., hereafter referred to as "Devon", has notified the Wind River Agency of the Bureau of Indian Affairs (BIA) and the Lander Field Office of the Bureau of Land Management (BLM) that it intends to drill and develop Coal Bed Natural Gas (CBNG) and Conventional Gas wells on the Wind River Indian Reservation (WRIR) in central Wyoming (**Figure 1-1**). The proposed exploration and development wells, access roads, pipelines, and other ancillary facilities are located on Tribal (Tribal surface/Tribal minerals) and fee (private) lands (fee surface/fee minerals). Facilities located on Tribal surface and Tribal minerals would be permitted by BIA/BLM. Facilities located on privately owned surface and privately owned minerals would be permitted by the Wyoming Oil and Gas Conservation Commission (WOGCC).

1.1.2 Location

The Riverton Dome Project Area (RDPA) is located in Township 1S, Range 4E, Sections 13, 14, 23, 24, 25, 26, 35, and 36; Township 2S, Range 4E, Sections 1, 2, 11, and 12; Township 1S, Range 5E, Sections 17, 18, 19, 20, 29, 30, 31 and 32; and Township 2S, Range 5E, Sections 5, 6, 7, and 8, in Fremont County, Wyoming. The RDPA is located approximately five miles southeast of the city of Riverton, Wyoming. The main accesses to the various development areas within the RDPA are also shown in **Figure 1-1**. From the city of Riverton, the Riverton Dome Field is accessed by traveling south on Wyoming Highway (WY) 789 to WY 136 and then southeast on WY 135, which is the main road through the RDPA. The RDPA is accessed from the southwest by traveling northeast on WY 789 to WY 136 and then southeast on WY 135.

The existing network of roads within the RDPA includes secondary roads (paved two-lane highways, which are mainly state highways), light-duty roads (gravel surface roads that are maintained), and unimproved roads (dirt and gravel roads and tracks that are generally not maintained). Within the RDPA, there are a total of 53 miles of roads (**Figure 1-2**). Devon anticipates that future development in the RDPA would likely be concentrated within and near existing development areas rather than in outlying areas where development currently does not exist.

1.1.3 Project Background

Drilling and natural gas production activities have been conducted within the RDPA by Devon and their predecessors since 1948. The field was first drilled in the 1950s, prior to promulgation of the National Environmental Policy Act (NEPA), as an oil field. There have been several leaseholders in the RDPA, the most recent of whom prior to Devon was Snyder Oil Corporation. NEPA analyses conducted for more recent developments include individual environmental assessments (EAs) for each well associated with each Application for Permit to Drill (APD). Two of the existing CBNG wells in the RDPA field were drilled by Devon's predecessors. The third CBNG well was drilled by Devon. Those three wells are in the same area as the 10 pilot wells (a complete description of the CBNG pilot well program is provided in Section 2.3). Two of the wells are producing CBNG, and a third well has had some mechanical problems.

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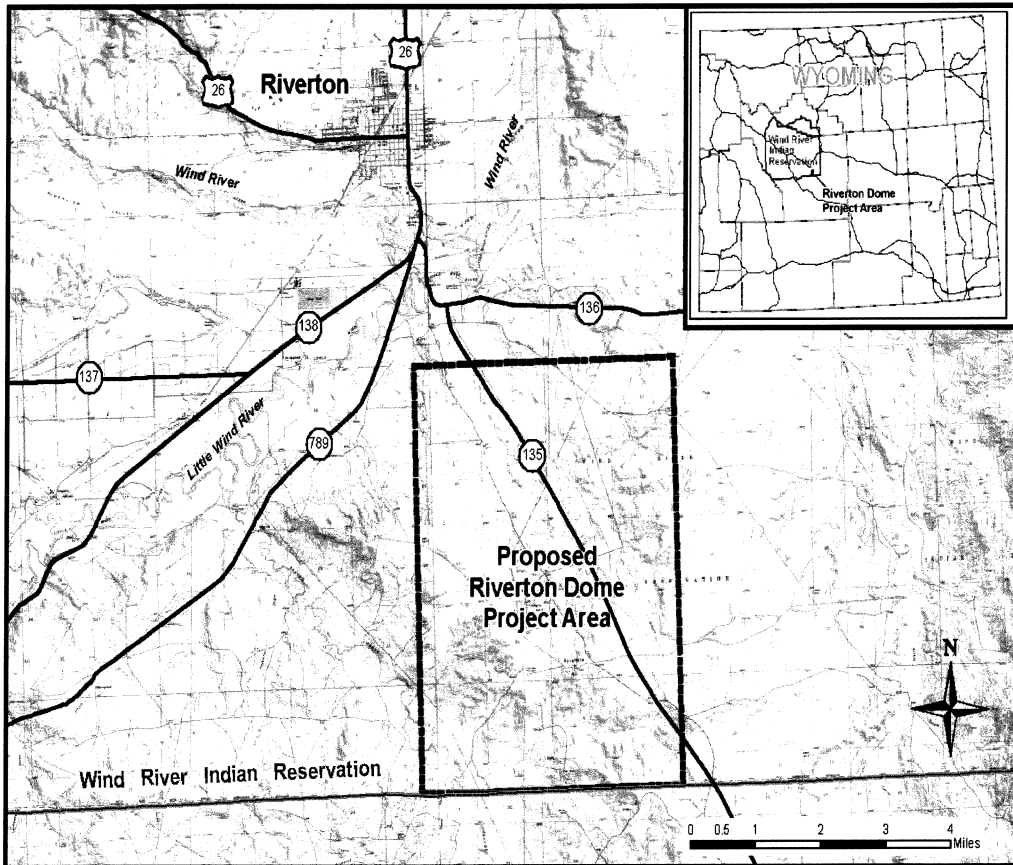
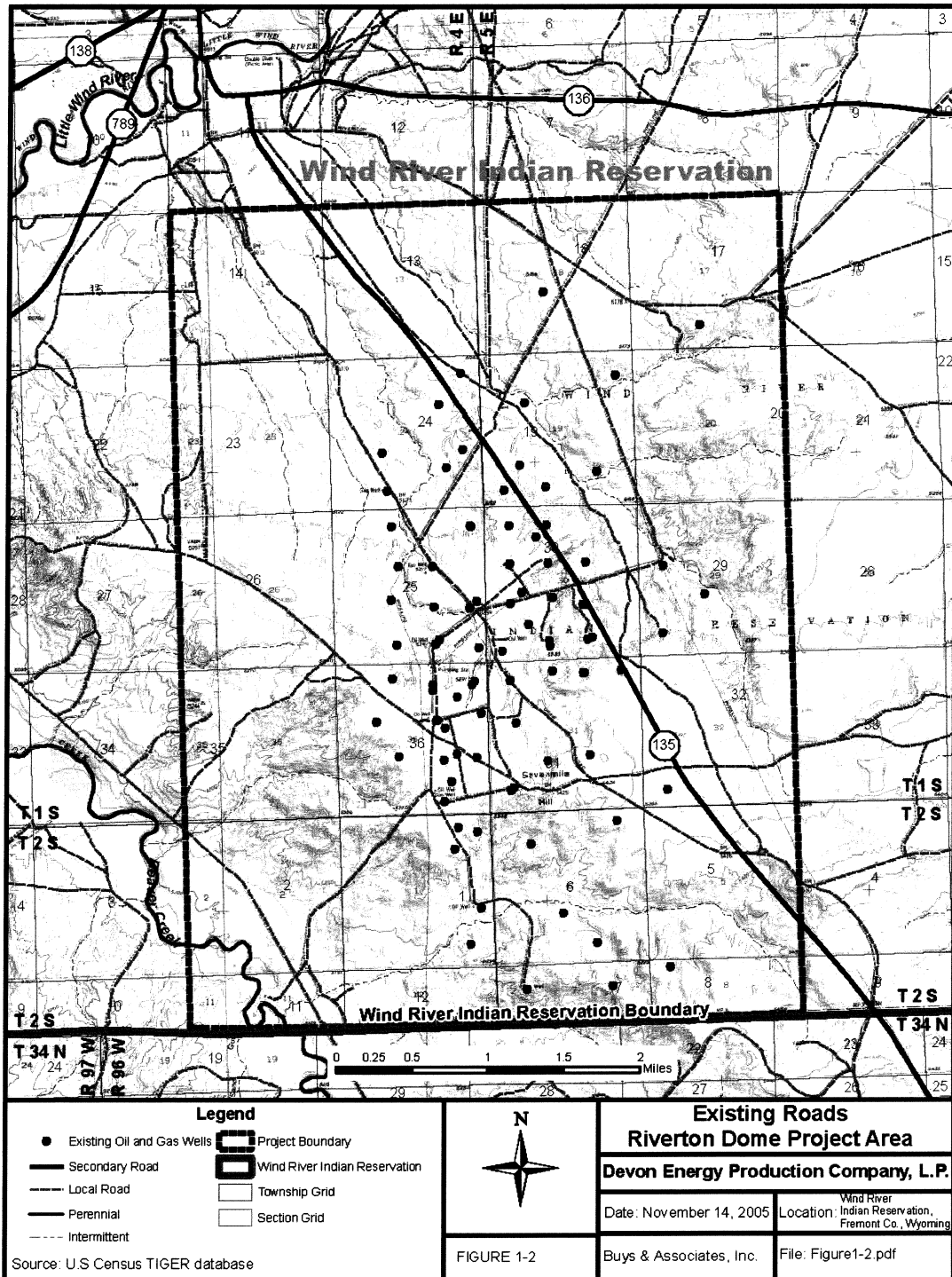


Figure 1-1. Location of Riverton Dome Project Area, Wind River Indian Reservation, Fremont County, Wyoming

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There are currently 54 producing oil and gas wells in the RDPA, along with 9.8 miles of existing pipeline and 4,243 horsepower (hp) of existing compression. The status of the existing wells in the RDPA is summarized in **Table 1-1** and displayed on **Figure 1-3**.

Table 1-1. Natural Gas Fields within the RDPA

Field Name	Producing Wells	Inactive Wells (includes dry holes)	Total Wells
Conventional Gas	33	5	38
Oil	9	2	11
Coal Bed Natural Gas	2	1	3
Coal Bed Natural Gas Pilot Wells	10	0	10
TOTAL	54	8	62

1.1.4 Land Status

The RDPA encompasses approximately 13,787 acres of mixed Tribal and private lands, based on information provided by Devon. Surface ownership within the RDPA consists of 12,639 Tribal acres and 1,148 fee acres. These numbers vary less than 0.1 percent from the area calculated by GIS, which is 13,804 acres. All mineral ownership beneath Tribal lands is Tribal, and all mineral ownership below fee lands is private. All Tribal lands in the RDPA are “lands held in trust by the U.S. for the Tribes.”

1.2 PURPOSE OF AND NEED FOR ACTION

The Tribes have leased the RDPA to Devon for the production of hydrocarbon fuels. By approving these leases, the BIA is required to examine the environmental consequences, alternatives and mitigation associated with the development.

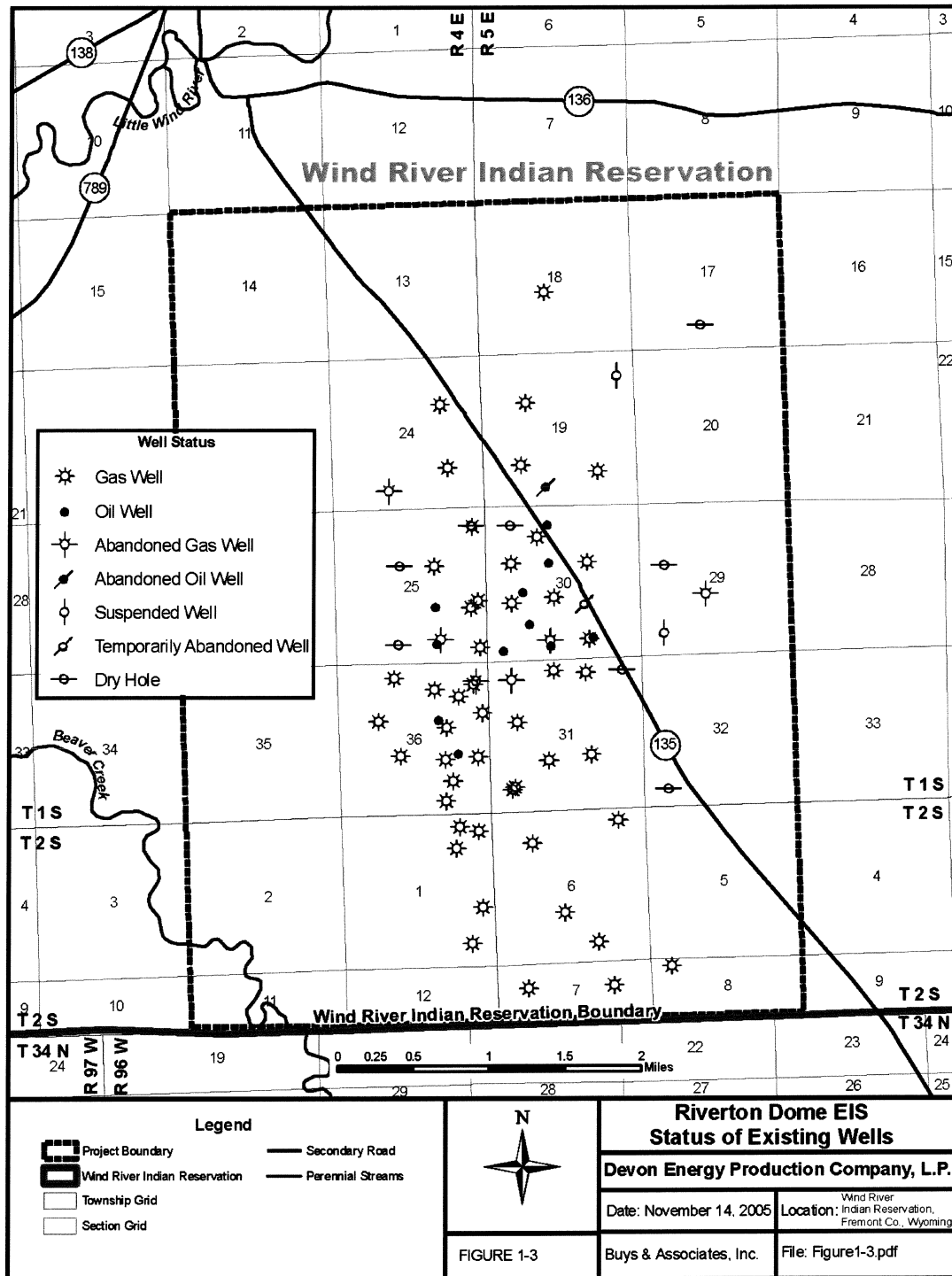
1.2.1 Bureau of Indian Affairs

The BIA has the responsibility to act as trustee for Federally recognized Tribes and individual Indians in the development of their lands and to protect Indian resources of all types. The BIA assists the Eastern Shoshone and Northern Arapaho Tribes within the WRIR and individual Indian mineral owners in the development of their mineral resources as a source of income and employment. The BIA also encourages the Tribes to enter into mineral leases for the development of their trust lands, with the goal of maximizing their best economic interest and minimizing any adverse environmental or cultural impacts from the development and sale of their resources (25 CFR Part 211).

The statutes and regulations that the BIA follows for leasing on Tribal lands include the 1916 Act, the Indian Mineral Leasing Act of 1938, and the Indian Mineral Development Act of 1982. Additional information on these acts is provided in Section 1.5.2.

As with Federal and State government, tax and royalty revenues from mineral resources, particularly natural gas, are important sources of income for Tribal governments.

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These revenues help fund a variety of Tribal services including:

- infrastructure construction and improvements,
- housing,
- law enforcement,
- road maintenance,
- environmental programs,
- educational assistance, and
- economic development, planning, and social services, such as programs for children and the elderly.

Revenues from natural gas are the largest single source of revenue for the Tribes, and represent a significant portion of total income for Tribal members.

1.2.2 Eastern Shoshone and Northern Arapaho Tribes

The WRIR is home to the Eastern Shoshone and Northern Arapaho Tribes. Each tribe is governed by a business council consisting of six individuals elected by all Tribal members. The two councils are the Shoshone Business Council and the Arapaho Business Council. Each Business Council oversees day-to-day business of their Tribe. A Joint Business Council (JBC), consisting of the council members of each of the Tribes, meets to decide matters that affect both of the Tribes.

The following procedure is used by the BLM and BIA for processing APDs on Indian lands. The BLM will process APDs, Master Development Plans, and Sundry Notices on Tribal and allotted oil and gas leases, and Indian Mineral Development Act mineral agreements in a manner similar to Federal leases. For processing such applications, the BLM considers the BIA to be the Surface Management Agency (SMA). Operators are responsible for obtaining any special use or access permits from the BIA.

In accordance with regulations found in Onshore Oil and Gas Order Number 1, within 10 days of receiving a Notice of Staking (NOS), the BLM will review it for required information and schedule a date for the onsite inspection in coordination with the BIA, Tribes, and operator, including the private surface owner in the case of split estate minerals. When choosing the NOS process, failure to submit an APD within 60 days of the onsite inspection will result in the NOS being returned to the operator. Within 10 days of receiving an APD, the BLM will notify the operator as to whether or not the APD is complete. The BLM will ensure that the SMA (the BIA on Indian lands) is provided a copy of the APD. The BIA in turn provides the BLM with surface use mitigation measures that will be used in BLM's NEPA process and will be applied to the permit. The operator has 45 days after receiving notice from the BLM to provide any additional information necessary to complete the APD, or the APD may be returned to the operator. Within 30 days after the operator has submitted a complete APD, including incorporating any changes that resulted from the onsite inspection, the BLM will approve, defer the action, or deny the APD. An APD is valid for two years from the date that it is approved, or until lease expiration, whichever occurs first.

Cultural surveys are required prior to all surface disturbance, including road and pipeline construction, drilling operations, and sand and gravel removal. Tribal elders and tribal monitors

participate in the cultural surveys to ensure that tribal artifacts, burial sites, and spiritual areas are not disturbed.

In addition, under the Wind River Law and Order Code, the Wind River Tribal Court handles some civil and criminal cases arising on the WRIR.

1.2.3 Bureau of Land Management

Exploration and development of Tribal oil and gas reserves by private industry is an integral part of the BLM's oil and gas program under the authority of the Indian Mineral Development Act of 1982 (25 U.S.C. § 2101 et seq.); the Indian Mineral Leasing Act of 1938 (25 U.S.C. §§ 396a to 396g); the Act of August 21, 1916 (39 Stat. 519); and the Federal Oil and Gas Royalty Management Act of 1982 (96 Stat. 2447).

The BLM oil and gas program encourages environmentally sound development of Tribal oil and gas reserves. Natural gas is an integral part of the U.S.' and the Tribes' energy future due to its availability and presence of existing market delivery infrastructure. By further developing domestic reserves of clean burning natural gas, the U.S. would reduce its dependence on foreign energy. The environmental advantages of burning natural gas rather than oil or coal were emphasized by the U.S. Congress and the President when the Clean Air Act Amendments of 1990 were signed into law.

The existing Tribal leases in the Riverton Dome Field encourage development of domestic oil and gas resources and reduce the dependence on foreign energy sources (BLM 2005). The production of Tribal oil and gas resources provides income in the form of lease royalty payments to the Eastern Shoshone and Northern Arapaho Tribes, and tax revenue to the Tribes, state, and county.

The BLM also determines if the proposed project meets the goal of the National Energy Policy Act. The primary goal of the National Energy Policy Act is to develop energy supplies from diverse sources including domestic oil, gas, and coal in addition to hydropower and nuclear power (BLM 2005).

1.2.4 Need for Gas Development

The purpose and need for the Riverton Dome CBNG and conventional gas development project is to allow Devon to develop its leases on the WRIR.

Exploration and production of natural gas, including CBNG, is in accordance with this country's National Energy Policy, Executive Order 13212. The Executive Order calls for federal agencies *"to develop a national energy policy designed to help the private sector, and, as necessary and appropriate, State and local governments, promote dependable, affordable, and environmental sound production and distribution of energy for the future."*

The National Petroleum Council (NPC), whose role is to advise, inform and make recommendations to the Secretary of Energy related to matters involving the oil and gas industry, issued a report in 1999 entitled *"Natural Gas: Meeting the Challenges of the Nation's Growing Natural Gas Demand"* (NPC 1999). The report predicts that U.S. natural gas consumption would increase by 32 percent between 1998 and 2010, which would constitute a seven trillion cubic-foot increase in the Nation's need for natural gas. Much of the incremental demand is projected for use in the generation of electricity. By allowing Devon to exercise its

rights to drill and produce from their leases, the company would supply natural gas to help support the public's growing demand for energy.

1.2.5 The Operator

Devon proposes to further develop natural gas resources within the RDPA by increasing the total number of wells and ancillary facilities, where economically feasible. This proposal would extend recovery of natural gas from the RDPA, thus allowing Devon to continue to provide natural gas for distribution to consumers. The proposed exploration and development would benefit consumers by increasing natural gas supplies.

The leases that Devon has acquired are of two types. Those leases under the Indian Minerals Leasing Act of 1938 allow for development of all mineral estate including CBNG, whereas those Devon leases based on the Indian Minerals Development Act of 1982, do not specifically authorize the development of CBNG under the terms of agreement. Devon has requested that the 1982 leases be modified to allow for development of CBNG, and that the proposed leases (not yet granted) be written to allow for the development of CBNG.

1.3 ENVIRONMENTAL ANALYSIS PROCESS

Drilling for gas within the RDPA has been successful since 1948. This success has resulted in a request by Devon to the BIA, the lead agency for NEPA analyses conducted on Tribal land, for an expansion of drilling and production activity within the RDPA. The BIA advised Devon that an environmental impact statement (EIS) would be required in view of Devon's plans to drill up to 326 CBNG wells and 20 conventional gas wells, and construct ancillary facilities at levels not analyzed in previous environmental analyses.

The purpose of this EIS is to provide the BIA with the information needed to make a final decision that is based on facts relevant to the Proposed Action and alternatives. The EIS analyzes the effects of construction, operation, and reclamation of well pad locations, access roads, production facilities, pipelines, and other associated facilities on natural resources and land use within the RDPA. It also documents analyses conducted on the Proposed Action and alternatives in order to identify and disclose the environmental impacts and mitigation measures necessary to address issues raised during the scoping process. The EIS also provides a vehicle for public review and comment on the Proposed Action and alternatives, the environmental analysis, and conclusions about the relevant issues.

The BIA, as directed by NEPA and the Council on Environmental Quality (CEQ) regulations (40 CFR, Parts 1500-1508), analyzes actions on Tribal lands as to their impact on the human environment. The analysis is undertaken to determine whether approval of the Proposed Action would result in unnecessary or undue degradation of the environment. The analysis uses a process dictated by NEPA and CEQ regulations for evaluating and disclosing the potential environmental consequences of the Proposed Action and alternatives.

The evaluation of the Proposed Action and the alternatives was developed through an interdisciplinary field review with representatives from Devon, the BIA, the Cooperating Agencies [i.e., JBC of the Eastern Shoshone and Northern Arapaho Tribes (JBC); the BLM; and the Environmental Protection Agency (EPA)], and the project contractor (Buys & Associates, Inc.). The Cooperating Agencies received copies of the preliminary drafts of the EIS, reviewed and commented on the early drafts of the EIS, participated in meetings to discuss the preliminary drafts of the EIS, and evaluated draft responses to the public comments on the Draft and Final EIS.

Factors considered during the environmental analysis process regarding the Proposed Action and the alternatives include the following:

- The location of environmentally suitable well pads, access roads, pipelines, and other production and ancillary facilities that best meet other resource requirements and minimize surface impacts, yet honor Devon's lease rights within the RDPA;
- A determination of impacts resulting from the Proposed Action and alternatives on the human environment, when conducted in accordance with applicable regulations; and
- The development of mitigation measures necessary to avoid or minimize these impacts.

An EIS is not a decision document. The decision regarding the project will be documented in a ROD signed by the Regional Director, Rocky Mountain Region, BIA and by the Superintendent of the BIA Wind River Agency. The BIA's decision will relate primarily to trust lands administered by the BIA. The BLM, JBC, and EPA, as Cooperating Agencies, will have input into the decision-making process.

This EIS will guide the implementation of the selected alternative and will facilitate preparation of additional environmental analyses within the RDPA and adjacent lands. Prior to surface disturbance at well sites and associated roads, pipelines, and ancillary facilities located on Tribal surface and minerals or private surface and private minerals, additional site-specific analyses may be required.

1.4 RELATIONSHIP TO POLICIES, PLANS, AND PROGRAMS

The RDPA is located completely within the administrative boundaries of the WRIR (see **Figure 1-1**). The documents that direct management of Tribal lands within the RDPA are summarized in the following sections.

1.4.1 Environmental Assessment of Land Management Activities

The document that presently analyzes and directs management of Tribal lands within the RDPA located within the BIA administrative area is the Finding of No Significant Impact/Decision Record (FONSI/DR) and approved EA of the Land Management Activities Proposed by Land Operations, Wind River Agency (BIA 1984).

1.4.1.1 Management Objectives

The primary management objective in the above-referenced EA for Land Management that is applicable to the Proposed Action and alternatives within the BIA administrative area, is to provide guidance and stewardship for programs and activities affecting natural resources on the WRIR in the following areas: exploration, production, and marketing of oil, natural gas, and gravel (BIA 1984).

1.4.1.2 Management Actions

Management actions applicable to the Proposed Action and alternatives within the BIA administrative area are to ensure a level of production that:

- Maximizes the best economic interest of the Tribes (25 CFR Part 211).
- Protects long-term uses.

- Protects the land base.
- Ensures prudent development and conservation of Tribal minerals.

1.4.1.3 Conformance with EA of Land Management

The EA of Land Management Activities Proposed by Land Operations, Wind River Agency (BIA 1984) is a general document that addresses forest management, range management, oil and natural gas, irrigation, and soil conservation/crop production issues on the WRIR. General guidance with specific stipulations for endangered species, geophysical operations, and irrigation actions are included in the document.

The Riverton Dome CBNG and Conventional Gas Field Development Project is in conformance with management objectives provided in the EA for Land Management, subject to the implementation of the mitigation measures identified in Chapter 2 of this EIS, and additional mitigation measures derived through the analysis of impacts in Chapter 4, Environmental Consequences.

1.4.2 Draft Wind River Land Use Development Plan

The Eastern Shoshone and Northern Arapaho Tribes' zoning ordinance has been in effect since the 1970s. A land use plan to coordinate development on the WRIR for the next 20 years is under development by the Eastern Shoshone Tribe with input from the New'e Development Corporation Board, Eastern Shoshone Tribal Council, and the Northern Arapaho Tribal Council. The overall goal of the land use plan "is to develop long-range planning, policies, ordinances, and management documents that will further the Tribes' ability to provide a self-sufficient community and economy" (Cottenoir 2003).

The overall land use goals of the draft plan are:

- Residential
 - Provide suitable housing areas that contain a cost-effective infrastructure.
 - Provide Tribal members with a development process.
- Agriculture
 - Protect and preserve agricultural lands.
- Commercial
 - Designate commercial land use for large and small businesses.
- Industrial
 - Provide land for industrial opportunities for both Tribes and surrounding municipalities.
- Public Use
 - Improve public and recreational areas on the reservation.
- Economic Development
 - Provide opportunities for employment on the reservation.

Strategic plan goals in the draft plan are:

- Environmental and Natural Resources
 - Provide a plan to conserve and preserve future resources.
- Transportation

- Support regional transportation planning and decision-making.
- Zoning
 - Modify current Tribal zoning laws, as necessary, to further protect property and encourage orderly development.

1.4.3 Wyoming BLM Guidelines for Surface-Disturbing and Disruptive Activities

The Wyoming BLM guidelines for oil and gas surface-disturbing (i.e. the Gold Book) may be incorporated into specific proposals for development within the RDPA at the discretion of the BIA. The purposes of these guidelines are: (1) to reserve, for the BLM, the right to modify the operations of surface and other activities resulting in disturbance of the land for the purposes of protecting the environment, and (2) to inform a potential lessee of the requirements that must be met when using BLM-administered lands.

1.4.4 Memoranda of Understanding

1.4.3.1 BIA/BLM/MMS Memorandum of Understanding

The 1997 Memorandum of Understanding (MOU) (BLM MOU WO 600-9111, December 12, 1997) established among the BIA, BLM, and Minerals Management Service (MMS) of the Department of the Interior (DOI) outlines the roles and responsibilities of each of these agencies with respect to minerals management on Tribal lands.

1.4.3.2 BIA/BLM/EPA/JBC

The BIA, BLM, EPA, and the JBC signed a MOU on January 30, 2007 that addresses agency and Tribal cooperation during the preparation of the Riverton Dome CBNG and Conventional Gas Development EIS. The MOU specifies that these agencies will serve as Cooperating Agencies for this EIS and outlines the roles and responsibilities of each agency. The document states that these agencies were appointed by the BIA as Cooperating Agencies, since each has specific areas of expertise that will benefit the preparation of this EIS.

The role of the BIA, as lead agency, is to coordinate with and consult with the JBC, BLM and EPA throughout the preparation of the EIS, particularly during scoping and the development of the Draft EIS.

1.5 AUTHORIZING ACTIONS

Federal, Tribal, State, and local actions that may be required to implement the Riverton Dome Natural Gas Development Project are listed in **Table 1-2**. The list is an overview and is not intended to be exhaustive or all-inclusive.

Table 1-2. Authorizing Actions of Federal, Tribal, State, and Local Governments

Agency	Nature Of Action
Department Of The Interior (DOI)	
Bureau of Indian Affairs (Wind River Agency)	Grants Rights-of-way (ROWS) to operators and third party applicants for oil and gas field development actions on Tribal surface.
	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.
	Reviews inventories of, and impacts to cultural resources affected by the Proposed Action, and consults with Wyoming State Historic Preservation Office (SHPO), Tribes, and Advisory Council on Historic Preservation (ACHP).
	Approves leases on Tribal land within the Wind River Indian Reservation.
	Approves Communitization Agreements involving Indian acreage.
Bureau of Land Management (Lander Field Office)	Approves APDs, with the concurrence of the SMA, Sundry Notices and reports on wells, production facilities, disposal of produced water, gas venting or flaring, and well plugging and abandonment for Federal and Indian wells as part of the agency's trust responsibilities.
	Administers the approval and subsequent actions of Federal and Indian oil/gas agreements, including unit and communitization agreements.
	Approves spacing applications for Indian minerals.
	State BLM Office, Reservoir Management Group
Administers drainage protection and protection of correlative rights on Federal and Indian 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 for the BIA. Manages wildlife on the WRIR at the request of the Tribes. The USFWS also reviews and provides comments on potential impacts to migratory birds.
ENVIRONMENTAL PROTECTION AGENCY (EPA)	
Office of Air and Radiation	Oversees the air and radiation protection activities of the EPA including national programs, technical policies, and regulations. Implements the Federal Clean Air Act programs on Indian country lands in Wyoming including all lands within the exterior boundary of the WRIR.
American Indian Environmental Office	Coordinates the EPA-wide effort to strengthen public health and environmental protection on Indian lands, with a special emphasis on building Tribal capacity to administer their own environmental programs.
Office of Environmental Justice	Serves as a focal point for implementation of Executive Order 12898, which requires each Federal agency to conduct its programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons from participation in, denying persons the benefits of, or subjecting persons to discrimination under such programs, policies, and activities, because of their race, color, or national origin. This includes ensuring meaningful involvement in decision making by those individuals and populations covered under this Order.. See (1) at the end of this table for a more detailed description of Environmental Justice.

Agency	Nature Of Action
Office of Solid Waste and Emergency Response	Provides policy, guidance, and direction for the land disposal of hazardous wastes, underground storage tanks, solid waste management, and encouragement of innovative technologies, source reduction of wastes and the Superfund Program. EPA implements the Resource Conservation and Recovery Act and the Comprehensive Environmental Response, Compensation and Liability Act on Indian country lands in Wyoming, including all lands within the exterior boundaries of the WRIR.
Office of Water	Responsible for the EPA's water quality activities including development of national programs, technical policies, and regulations relating to drinking water, water quality, groundwater, pollution source standards, and the protection of wetlands. Implements the Federal Clean Water Act programs on Indian country lands in Wyoming including all lands within the exterior boundary of the WRIR.
	EPA directly implements the Safe Drinking Water Act which includes issuance of applicable Underground Injection Control permits on Indian lands in Wyoming, including all lands within the exterior boundaries of the WRIR.
DEPARTMENT OF THE ARMY	
U.S. Army Corps of Engineers	Issues permit(s) (Section 404 of the Clean Water Act) for placement of dredged or fill material in waters of the U.S. and their adjacent wetlands.
EASTERN SHOSHONE AND NORTHERN ARAPAHO TRIBES	
Wind River Environmental Quality Commission	In conjunction with the EPA, the Wind River Environmental Quality Commission (WREQC) is responsible for ensuring adherence to Tribal environmental policies and regulations. WREQC also assists the EPA in administering the Clean Air Act and Clean Water Act on the WRIR.
Office of the Tribal Water Engineer	The Office of the Tribal Water Engineer is responsible for direct oversight and administration of the Wind River Water Code. The agency works in conjunction with the Wind River Water Resources Control Board and the Shoshone-Arapaho Tribes JBC.
Tribal Fish and Game Department	The Tribal Fish and Game Department is responsible for the administration of the fish and game program, which includes the issuing of hunting and fishing licenses and the enforcement of regulations, according to the Reservation Fish and Game Code.
Tribal Cultural Representatives	The Tribal Cultural Representatives are responsible for conducting cultural resource inventories on the WRIR in coordination with the the respective Tribal governments.
Tribal JBC	The JBC is responsible for the review and approval of all actions as they relate to Tribal Trust Land. The JBC is the main authority for the administration of all joint programs and makes decisions regarding Real Property and Natural Resource Management on the WRIR. The JBC approves ROW and APD applications, and coordinates cultural activities with Elders. The JBC is responsible for approving any zoning changes.
WYOMING STATE HISTORIC PRESERVATION OFFICE (SHPO)	
SHPO	Provides consultation concerning inventory of, impacts to, and mitigation measures for cultural resources, if applicable.
WYOMING STATE ENGINEER'S OFFICE	
State Engineer	Issues permits for State ground water and surface use water rights on fee lands.
	Issues temporary water rights for construction permits to utilize State surface water rights on fee lands.
WYOMING OIL AND GAS CONSERVATION COMMISSION	

Agency	Nature Of Action
WOGCC	Serves as primary authority for drilling on privately held mineral resources.
	Has authority to allow or prohibit flaring or venting of gas on privately owned minerals.
	Regulates drilling and plugging of wells on privately owned minerals.
	Approves directional drilling of wells on privately owned minerals.
	Administers rules and regulations governing drilling units of wells on privately owned minerals.
	Grants gas injection well permits for wells on privately owned minerals.
FREMONT COUNTY	
Fremont County	Grants small wastewater system permits, where applicable.
	Issues driveway access permits where new roads intersect with county roads.
	Prepares road use agreements and/or oversize trip permits when traffic on county road(s) exceeds established size and weight or where the potential for excessive road damage exists.

(1) "Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies. *Fair treatment* means that no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal state, local, and tribal environmental programs and policies. *Meaningful involvement* means that: (1) potentially affected community residents have an appropriate opportunity to participate in decisions about a proposed activity that will affect their environment and/or health; (2) the public's contribution can influence the regulatory agency's decision; (3) the concerns of all participants involved will be considered in the decision-making process; and (4) the decision makers seek out and facilitate the involvement of those potentially affected." (WRA January 2, 2008).

1.5.1 Regulatory Jurisdiction

This section summarizes several areas of law that could affect the Proposed Action, and considers which regulatory authorities would have jurisdiction. These legal areas, which include Federal environmental statutes, transportation, oil and gas leasing, well spacing, and fish and wildlife, are the major areas considered, but do not represent all of the laws that could potentially affect the Proposed Action. **Table 1-3** summarizes the jurisdictional issues with respect to the Proposed Action. Additional issues not discussed here may arise as the Riverton Dome Coal Bed Natural Gas and Conventional Gas Field Development Project is implemented.

Table 1-3. Regulatory Jurisdiction

	Tribal Surface/Tribal Minerals	Private Surface/Private Minerals
Environmental Statutes	EPA directly implements the federal environmental protection programs for all Indian country lands in Wyoming including all lands within the exterior boundary of the WRIR.	EPA directly implements the federal environmental protection programs for all Indian country lands in Wyoming including all lands within the exterior boundary of the WRIR.
Transportation	BIA for BIA roads or easements. The State for ROWs granted to the State by the Secretary of the Interior.	The State for ROWs granted to the State by the Secretary of the Interior. The County for private ways of necessity.
Oil and Gas Leasing	JBC/ BIA	Private landowner
Surface Permitting	JBC/ BIA	WOGCC
Well Spacing	BLM	WOGCC
Fish and Wildlife	The USFWS Lander Fish and Wildlife Conservation Office assists the Tribes and Tribal Fish and Game in managing their fish, wildlife, and migratory bird resources.	USFWS for threatened and endangered species.

1.5.2 Oil and Gas Leasing

The BIA is responsible for assisting the Tribes and individual Indian mineral owners in the development of their mineral resources as a source of income and employment. The JBC is the Tribal governmental entity that is responsible for permitting surface activities on tribal lands. Mineral agreements on Indian lands may be governed by three different laws and associated regulations:

- Act of August 21, 1916 (1916 Act), and attendant regulations on leasing of ceded land in the WRIR, Wyoming for oil and gas mining (25 CFR 227).
- Indian Mineral Leasing Act of 1938 (IMLA) and attendant regulations dealing with leasing of Tribal lands for mineral development (25 CFR 211) and 25 CFR 212 addressing leasing of allotted lands for mineral development.
- Indian Mineral Development Act of 1982 (IMDA) and attendant regulations (25 CFR 225), which govern minerals agreements for the development of Indian-owned minerals.

Selected provisions of these acts are detailed in **Table 1-4**.

Table 1-4. Provisions of Acts Governing Mineral Leases on Indian Lands

Provision	1916 Act and 25 CFR 227	1982 IMDA and 25 CFR 225	1938 IMLA and 25 CFR 211, 212
Lease Form	Standard BIA	Flexible with 20 point checklist	Standard DOI
Royalty	Minimum 12.5% of value less that used for production.	No minimum set. Cost of production recognized by regulations.	Minimum 12.5%
Rent	\$1.25 per acre	Flexible	\$2.00 per acre
Lease term	20 years	Flexible	Held by Production

Provision	1916 Act and 25 CFR 227	1982 IMDA and 25 CFR 225	1938 IMLA and 25 CFR 211, 212
			(HBP) ¹
Aggregate per lease acreage	10,240	No maximum	640
Inspection by Tribe or BIA	Developer required to allow	Developer required to allow	Developer required to allow
Operations and financial	In accordance with DOI regulations. Diligence and prevention of waste specified.	Economic Assessment required prior to approval of agreement.	Diligence, protect lease from drainage, prevention of waste specified

Source: Schumacher, 1994

¹HBP means that a lease is in effect as long as the well produces in "paying" quantities.

The lease(s)/agreement(s) on Tribal land analyzed in this EIS have been negotiated under either the 1938 and 1982 Acts. Full text versions of the applicable regulations are available for review at <http://www.access.gpo.gov/nara/cfr/>.

The BIA encourages the Tribes and Tribal individuals to enter into mineral leases for the development of their trust lands with the goal of maximizing their best economic interest and minimizing any adverse environmental or cultural impacts for the development and sale of their resources. The leasing of Tribal minerals is governed by the following objectives:

- Orderly and timely resource development.
- Environmental protection.
- Minimal cultural impacts associated with development.

These objectives are accomplished through proper planning and oversight of development operations by agencies of the DOI, including BIA, BLM, and MMS (for collection of royalties). The principal objective of these agencies is to ensure that there are no detrimental effects from the development of mineral resources on Indian lands (Aguilar 1994).

In addition, the United States, through legislation, court decisions, and executive orders, has established the scope of the Federal trust on Indian lands. Government officials managing Indian assets are held to the highest responsibility and trust and the most exacting fiduciary standards to discharge their trust in good faith and fairness. As such, the BIA has the responsibility to act as trustee for the Indian Tribes and individual Indians in the development and protection of Indian resources of all types.

1.6 ISSUE IDENTIFICATION AND ISSUE STATEMENTS

Public input is important in establishing the level and scope of the NEPA analysis of the Riverton Dome Coal Bed Natural Gas and Conventional Gas Development Project. The public was encouraged to participate during the scoping process to help identify the scope of the analysis needed, alternatives to the proposed action, other issues or concerns that should be analyzed, mitigation measures, and any other comments or ideas to help ensure the completeness of the analysis process.

Many people living in the vicinity of the RDPA attended the public scoping meeting held at the St. Stephens Elementary School in St. Stephens, Wyoming on October 12, 2005. Oral

comments on the Proposed Action were made by the public during the meeting. Comments received during the public meeting were transcribed by a court reporter. The BIA reviewed and analyzed the written and oral comments received during the scoping comment period. A total of 14 written comments were received in response to the scoping notice. Additional information on the public meeting is provided in Chapter 6 (Consultation and Coordination).

The process for identifying issues to be addressed in this EIS involved two steps. First, specific comments were arranged into groups of common concerns. Second, a primary issue statement was prepared for each group of comments. The issues raised were used to define the scope of this NEPA analysis. These key issues were used to analyze environmental effects, prescribe mitigation measures, or both. Other issues were raised, but were not included in the following list because they involved standard parts of a NEPA analysis (e.g., the analysis must consider an adequate range of alternatives, discussion of the roles of Federal, State, and local agencies in authorizing and/or permitting the project, description of surface and mineral ownership and split estate lands). The 17 key issues that comprised the overall scope of the NEPA analysis are summarized below.

It is noted here that several of the scoping comments addressed surface discharge of produced water, which was presented as a disposal option in the Public Scoping Notice in September 2005. However, Devon has agreed to eliminate surface discharge of produced water as an option for water disposal, and will dispose of produced water into injection wells and evaporation ponds.

Issue 1: The effects of the proposed development of gas resources on aquatic wildlife.

Comments expressed concerns about the effects the Proposed Action may have on the local population of sauger (*Sander canadense*) and fatmucket (*Lampsilis siliquoidea*) in the Little Wind River and Wind River adjacent to the RDPA. Sauger, a native river fish and popular sport fish, is a species of concern and has the potential to be listed as an endangered species, given the recent declines in population and threats to the species' habitat. Recent research has determined that the sauger population in the Wind River drainage is genetically pure and limited to approximately 4,000 to 5,000 adults. The principal spawning site of the sauger in this area of Wyoming has been identified in a 1 to 2 mile-section at the confluence of Beaver Creek and the Little Wind River, approximately 4 miles west of the RDPA. Changes in water quality due to development of gas resources and discharge of produced water may adversely impact the sauger population. **Note:** Produced water will not be discharged to surface drainages.

The fatmucket, a native mollusk, has also been observed at the confluence of Beaver Creek and the Little Wind River. Little research has been conducted regarding the fatmucket, but preliminary studies indicate that there may be a correlation between sauger and fatmucket occurrence.

Issue 2: The effects of the proposed development of gas resources on soils in the RDPA.

Comments expressed concerns about the Proposed Action increasing the loss of beneficial topsoil, the difficulties in arid climates of reclamation and revegetation, and the potential for widespread erosion and channel incising to occur in drainages, should surface discharge of produced water be chosen as a disposal method. Erosion control measures and revegetation strategies should be disclosed and implemented. **Note:** Surface discharge of produced water will **not** occur.

Issue 3: The effects of the proposed development of gas resources on air quality within and near the RDPA.

Various public and agency comments expressed concerns about the effects of the proposed gas development on air quality with respect to the National Ambient Air Quality Standards (NAAQS) and PSD Class II increments from criteria pollutant emissions. These concerns included the cumulative impact from the Proposed Action plus other sources in the near-field area, including Peak Sulfur, the Beaver Creek Gas Field, and development in the Pinedale area, including the Jonah field.

Concerns were also expressed about the potential effects of hazardous air pollutants (HAP) from condensate tanks, flares, and gas processing equipment that may affect the health of people at nearby residences. Concern was also expressed about venting of methane and other gases and their potential effects to air quality. Another comment suggested that “dispersion modeling” should be completed as part of the air quality assessment. Finally, a comment addressed the need to evaluate air quality issues with respect to at-risk Class I areas in the region.

Issue 4: The effects of the proposed development of gas resources on surface water and groundwater in the RDPA.

Commenters requested a discussion of water quality, water quantity, and sediment input impacts to Beaver Creek, Little Wind River and Wind River. Impacts identified for discussion related to surface disturbance (especially due to surface disposal of produced water from CBNG wells), spills of produced fluids and hazardous materials, and loss of containment from pits and tanks. Comments also expressed concerns about produced water and its potential effects on residences nearby and on wildlife.

The comments requested a presentation of baseline water quality for surface and groundwater in the RDPA. A thorough discussion of the various options for disposal of produced water was also requested. Comments expressed concerns about the effects on local aquifers of gas well completion, formation fracturing with chemicals, well operation, and injection of wastewater and other fluids into disposal wells.

A buffer zone around natural springs, wetlands and riparian areas was recommended by one commenter so that these areas would be protected.

It was also recommended that stormwater management in the RDPA should be evaluated to protect water quality from stormwater runoff. Methods to protect water from stormwater runoff were also suggested.

Issue 5: The effects of the project on environmental justice.

One commenter stated that environmental justice concerns are a significant component of the socioeconomic, cultural, and spiritual resource analyses in this EIS, since the proposed project is on the WRIR. The commenter requested that a commitment to employment of Tribal members be considered, since year-round and seasonal unemployment are known to be substantial on the WRIR. The commenter provided steps to consider for the analysis of environmental justice.

Issue 6: The effects of the proposed development of gas resources on rangeland resources.

Comments expressed concerns about potential conflicts between gas drilling and production activities with grazing, of both wildlife and domestic animals, in the RDPA and mitigation measures that could address those impacts.

Issue 7: The effects of the proposed development of gas resources on wildlife and wildlife habitat.

Comments expressed concerns that the proposed project would impact wildlife and their habitats. General groups of species for which concerns were expressed include big game (mule deer and antelope), sage-grouse, and waterfowl. The effects that were identified specifically included fragmentation of habitats, wildlife displacement (both direct and indirect), effects on herding patterns and migration, decreased lek attendance by sage-grouse, waterfowl mortality due to entrapment in evaporation ponds, increased presence of perching structures for raptors, and powerline electrocutions. Within the RDPA, the use of the area by big game was highlighted. Finally, a comment requested a discussion of the potential use of pesticides to control potential West Nile virus outbreaks as a result of mosquito breeding in evaporation ponds.

Issue 8: The effects of the proposed development of gas resources on special status species, including threatened, endangered, candidate, or sensitive species of plants and animals.

Commenters requested a discussion of potential impacts to special status species, including species of plants and animals listed as threatened or endangered, proposed for or identified as candidates for listing as threatened or endangered, or identified as sensitive by the State of Wyoming. Some respondents noted the need for the analysis to comply with Section 7 of the Endangered Species Act (ESA) and disclose the results of Section 7 Consultation in the EIS. Specific concerns were raised concerning the protection of greater sage-grouse and sage-grouse habitat and highlighted the fact that a portion of the area (south of Riverton) has been identified as a priority conservation area for sage-grouse.

Issue 9: The effects of the proposed development of gas resources on recreational opportunities and cultural resources.

Respondents expressed concerns about the degree to which the proposed project would alter the existing recreational setting and hunting and fishing activities in the area. Additional comments addressed the need for an analysis of the impacts to cultural and archaeological artifacts in the area, including an analysis of cultural sites already impacted by existing development.

Issue 10: The EIS should address noise impacts.

Respondents commented on the need for the EIS to address issues related to noise, and its impact on nearby residents and communities. Impacts of noise on wildlife should also be considered, and mitigation to minimize noise should be explored.

Issue 11: The effects of the proposed development of gas resources on the local economy.

Comments requested an analysis of the effects the proposed project would have on the local economy in terms of new employment, taxes, and royalties that would be generated. Some comments expressed concerns about potential impacts to the cultural values and lifestyle of the WRIR residents as a social impact. The NEPA analysis, it was noted, should include a thorough cost-benefit analysis to assess whether economic benefits outweigh environmental and social/cultural impacts. In addition, the request was made to include all lease agreements and a thorough presentation of the law guiding Tribal oil and gas development in the EIS.

Issue 12: The effects of the proposed development of gas resources on the health and safety of nearby residents.

Concerns were raised regarding the potential health and safety impacts of surface discharge of produced water that would likely flow near residential development in the area. Comments requested a full disclosure of the potential health and safety issues related to CBNG development including the release of hydrogen sulfide. The EIS should address existing and proposed safety and emergency plans, as well as disaster impact radii and potential impacts to water, human life, wildlife, cultural and historic preservation. **Note:** There is no hydrogen sulfide associated with CBNG and no surface discharge of produced water.

Issue 13: The EIS should adequately evaluate all produced water disposal methods and potential impacts.

The concern was raised that the scoping notice indicated that evaporation ponds were the preferred method of produced water disposal. Multiple comments indicated that a meaningful consideration of the costs and benefits of all of the various water disposal methods should be undertaken and that surface disposal, in all cases, should not be the first priority. In addition, a comment was made that BIA has an obligation to ensure that water which could be usefully employed for other uses is not wasted and, as such, the EIS should consider alternatives including injection for later use and treatment for productive use. In addition, comments requested that the EIS discuss the many potential impacts of dewatering such as coal seam fires, methane seepage, lowering of the water table, stream sedimentation, and cross-aquifer contamination.

In addition, concerns were raised about the potential for surface discharged waters to contaminate subsurface waters and the potential for produced water to reach Beaver Creek and the Little Wind River. A full disclosure of the constituents of produced water was also requested.

The Public Scoping Notice (September 2005) indicated that one of the options for disposal of the produced water was surface discharge. A National Pollutant Discharge Elimination System (NPDES) permit application had been submitted to the EPA for approval. However, Devon withdrew the permit application and committed to disposing of all produced water by use of produced water disposal wells and evaporation ponds. The primary disposal option has become the produced water disposal wells. The secondary disposal option, evaporation ponds, would be used as a back-up during maintenance or exceeding the capacity of the injection well. Chapter 2 of this EIS discusses water disposal in greater detail.

Issue 14: The EIS should adequately address the cumulative impacts of the Proposed Action plus other oil and gas development projects in the region.

Comments were provided that requested that cumulative impacts be addressed in the EIS for the proposed project plus other oil and gas exploration and production projects in the region. Other projects identified that could be part of the cumulative impacts assessment included the present development in the RDPA, as well as the Jonah II, Pinedale Anticline, Riverton East, Beaver Creek, and Atlantic Rim CBNG projects. Finally, a comment suggested that the cumulative impacts assessment include reasonably foreseeable projects in the region.

Issue 15: There is a need for a programmatic EIS to address the issue of development of resources on the WRIR as a whole.

Comments were provided suggesting that a programmatic “resource development” EIS be prepared prior to any further development on the WRIR.

Issue 16: Guidance documents and leases predate CBNG development.

Concerns were raised that guidance documents, specifically the BIA’s Environmental Assessment of Land Management Activities (1984), do not address CBNG development and are, therefore, not valid in light of the impacts related to CBNG development. Concerns were also raised that the various lease stipulations, standards, terms and Conditions of Approval fail to adequately address the issues uniquely associated with CBNG production. A full disclosure of Devon’s leases was requested.

Issue 17: The EIS should consider various mitigation measures to reduce the environmental effects of CBNG development.

Mitigation measures identified in the comments included:

- Directional drilling, horizontal drilling, and/or phased development should be considered to reduce the concentration/density of wells.
- Development should utilize best available technologies and practices to maximize gas production and minimize environmental impacts.
- Locate new pipelines adjacent to roads where possible.
- Construct the least number of pads and least amount of new roads possible.