

EXECUTIVE SUMMARY

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ES.1 INTRODUCTION

Gasco Energy Inc. (Gasco) has proposed to the U.S. Department of the Interior (DOI) Bureau of Land Management (BLM) Vernal Field Office (Vernal FO) to develop oil and natural gas resources within the Monument Butte–Red Wash and West Tavaputs Exploration and Development Areas. The project area is located within Uintah and Duchesne Counties, Utah and consists of approximately 187 sections located in Township 9 South, Ranges 18 and 19 East; Township 10 South, Ranges 14, 15, 16, 17, and 18 East; and Township 11 South, Ranges 14, 15, 16, 17, 18, and 19 East (see Map 1).

Gasco operates the majority of the mineral lease rights underlying both the public and private lands in the project area. The project area encompasses approximately 206,826 acres predominantly in the West Tavaputs Exploration and Development Area with some overlap into the Monument Butte–Red Wash Exploration and Development Area of the Vernal FO. It is located primarily on BLM-administered lands (177,644 acres), but also includes lands administered by the State of Utah (25,451 acres) and privately owned lands (3,731 acres). The project area includes lands within the restored boundary of the Ute Indian Reservation, but no lands administered by the tribe or by the Bureau of Indian Affairs (BIA). Targeted geologic strata lie in the Wasatch, Mesaverde, Blackhawk, Mancos, Dakota, and Green River formations, approximately 5,000–20,000 feet below the earth's surface.

These leases have created contractual rights and obligations between Gasco and the United States, the State of Utah, or private mineral owners. Gasco's purpose for the Proposed Action is to develop these leases and efficiently produce commercial and economic quantities of oil and gas by expanding the Monument Butte–Red Wash and West Tavaputs Oil and Gas Field infrastructure. Gasco estimates that the Proposed Action could yield nearly three trillion cubic feet (Tcf) of natural gas through 2053.

As the administrator for both subsurface and surface resources on public lands in the study area, the BLM is the lead federal agency responsible for preparation of this environmental impact statement (EIS). Some of the area proposed for development was leased prior to the publication of the Vernal FO Record of Decision and Approved Resource Management Plan (Vernal RMP; BLM 2008c). Therefore, surface management guidance is provided by the Vernal RMP and/or by conditions attached to each lease.

ES.2 PURPOSE AND NEED

ES.2.1 PURPOSE

The purpose of BLM's action is to respond to Gasco's proposal and to facilitate action on future plans and applications related to this proposal while reducing environmental impacts. The BLM developed this EIS to provide information to allow the Vernal FO to render an informed decision whether to approve the Proposed Action or another alternative. A decision to approve an action alternative would authorize Gasco to exercise its valid lease rights on BLM-administered lands and/or minerals as described in the selected alternative, subject to Conditions of Approval (COAs) and additional site-specific review and approval as required.

ES.2.2 NEED

The BLM's need for the project is to fulfill its responsibilities under federal laws and federal oil and gas leases to allow leaseholders to develop mineral resources to meet continuing national energy needs and economic demands. The BLM oil and gas leasing program encourages development of domestic oil and gas reserves and the reduction of U.S. dependence on foreign energy sources. Increased development of gas resources on public lands in an environmentally responsible manner is consistent with the Comprehensive National Energy Strategy announced by the U.S. Department of Energy (DOE) in April 1998, the Energy Policy and Conservation Act (42 United States Code [USC] 6201), and the Energy Policy Act of 2005 (Public Law 109–58). Private production from federal oil and gas leases is an integral part of the BLM's oil and gas program under the authority of the Mineral Leasing Act (MLA), as amended by the Federal Land Policy and Management Act (FLPMA), and the Federal Onshore Oil and Gas Leasing Reform Act of 1987.

ES.3 CONFORMANCE WITH BLM LAND USE PLANS AND OTHER LAWS AND POLICY CONSIDERATIONS

The preparation of this EIS is in accordance with National Environmental Policy Act (NEPA) and in compliance with the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508), DOI requirements (Department Manual 516), and guidelines listed in the BLM NEPA Handbook, H-1790-1).

The Proposed Action would be consistent with various federal, state, county, and local laws and regulations. In addition, applicable permits will be acquired as necessary. The proposed wells would be developed in accordance with the MLA and with 43 C.F.R. Part 3100. The MLA (30 USC 181 et seq.) requires that all public lands not specifically closed to leasing be open to lease for the exploration and development of mineral resources. The intent of the MLA and its implementing regulations is to allow and encourage lessees or potential lessees to explore for oil and gas underlying public lands. FLPMA mandates that the BLM manage public lands on the basis of multiple use (43 USC 1701[a][7]). Minerals are identified as one of the principal uses of public lands under Section 103 of FLPMA (43 USC 1702[c]).

The Proposed Action will take place within the Vernal FO, which is managed under the Vernal RMP (BLM 2008c), which allows for the exploration and development of oil and gas resources (including tight gas reservoirs) while protecting or mitigating other resource values. The majority of the proposed project lies within an area that was previously partially developed for oil and gas production and is designated as Category 2 for oil and gas leasing by the BLM. Category 2 areas are open to oil and gas leasing with stipulations to protect sensitive surface resources. As discussed on page 21 of the record of decision (ROD), the RMP does not alter valid existing rights (BLM 2008c). The Proposed Action and alternatives presented in this EIS are consistent with the management decisions of the RMP (BLM 2008c), which covers all of the BLM lands in Uintah, Duchesne, and Daggett counties (and small areas of Grand County).

ES.4 PUBLIC AND AGENCY SCOPING

Public scoping is a process designed to meet the public involvement requirements of NEPA. This cooperative process includes soliciting input from interested agencies (federal, state, and local), organizations, and individuals on issues, concerns, needs, resource uses, resource development,

and resource protection. The scoping process is an excellent method for opening dialogue between the lead agency and the general public about management of the public lands and for evaluating the concerns of those who have an interest in the area.

The BLM has conducted public and internal scoping to solicit input and identify the environmental concerns and issues associated with the proposed project. A Notice of Intent (NOI) was published in the *Federal Register* on February 10, 2006. The BLM then prepared a scoping information packet and provided copies of it to federal, state, and local agencies, the Ute Tribe, and members of the general public. Announcements of scoping opportunities were made in various local news media. The BLM conducted a public scoping and information open house on February 27, 2006, in Vernal, Utah; February 28, 2006, in Duchesne, Utah; and March 2, 2006, in Price, Utah. The Vernal FO received numerous letters commenting on the proposed EIS during the scoping period. The contents of these letters may be found in the project administrative record. The issues of concern raised during scoping, including the potential impacts resulting from the project, are summarized below.

ES.5 IDENTIFIED ISSUES

As noted above, issues to be addressed in the EIS were identified by the public and the agencies during the scoping process. Eighteen issues were identified during scoping and are summarized below. Other resource and use issues are identified in the BLM ID team checklist (Appendix A).

ISSUE 1: ALTERNATIVES

What is the viability of a reduced number of wells? How will impacts to other operators and leases in the Uinta Basin be addressed? What best management practices (BMPs) are technically and/or economically feasible? How will access routes be varied to protect resources? How will the Green River, Nine Mile Canyon, and special designation areas be protected?

ISSUE 2: AIR QUALITY

How will the impacts of increased airborne dust, industrial particulates, magnesium chloride, and other dust-abating chemicals be mitigated?

ISSUE 3: CULTURAL RESOURCES

How will prehistoric and historic cultural resources, especially those located in and around Nine Mile Canyon, be protected? How will consultation with cultural preservation groups be incorporated?

ISSUE 4: MITIGATION

What BMPs will be included in the Proposed Action and all alternatives? What will be done to maximize restoration and remediation following surface disturbance?

ISSUE 5: NATIVE AMERICAN CONSULTATION

What cultural importance do local tribes place on the project area?

ISSUE 6: NOISE

How will noise from construction and operation be minimized?

ISSUE 7: PROCESS

How will the EIS best convey project information, especially information that is conceptual? What reasonable foreseeable actions will be examined in the EIS?

ISSUE 8: PUBLIC HEALTH AND SAFETY

How will public health and safety issues resulting from increased travel, potential chemical spills or fires, and increased access in the project area be minimized?

ISSUE 9: PURPOSE AND NEED

Are the stated purpose and need of the project valid?

ISSUE 10: RECREATION AND VISUAL

How will the effects of the extraction industry on recreational resources and opportunities (as well as the recreation industry) be mitigated? How will visual impacts in the project area be reduced?

ISSUE 11: SOCIOECONOMICS

How will the direct and indirect impacts to recreation and the recreation industry be balanced with the positive impacts brought by the extraction industry?

ISSUE 12: SOILS

How will long-term impacts to biological soil crusts and other soil types be mitigated?

ISSUE 13: SPECIAL DESIGNATIONS

How will areas of critical environmental concern (ACECs) and Wild and Scenic Rivers (WSRs) be protected?

ISSUE 14: TRANSPORTATION

How will direct and indirect impacts from traffic be minimized?

ISSUE 15: WILDLIFE/THREATENED AND ENDANGERED SPECIES

How will wildlife resources, threatened and endangered species, and habitat be protected?

ISSUE 16: VEGETATION

How will vegetation resources be protected, maintained, or restored? How will the spread of noxious weeds be mitigated?

ISSUE 17: WATER QUALITY

How will water resources be managed to protect and maintain water quality?

ISSUE 18: WILDERNESS CHARACTERISTICS

How will wilderness resources and attributes be protected?

ES.6 PUBLIC COMMENTS AND MEETINGS ON THE DRAFT EIS

A legal Notice of Availability (NOA) was published in the *Federal Register* on October 1, 2010, announcing the availability of the Draft EIS. An NOA was also posted on the BLM website (http://www.blm.gov/ut/st/en/fo/vernal/planning/nepa/_gasco_energy_eis.html).

A 45-day comment period was held from October 1, 2010, to November 15, 2010, during which the public and other stakeholders could provide comments to the Vernal FO about the Draft EIS. Three public meetings were held by the BLM in Price, Duchesne, and Vernal, Utah, during the comment period to allow interested persons an opportunity to learn about the Gasco Proposed Action and alternatives, discuss concerns with resource specialists, and submit comments on the Draft EIS. The BLM extended the comment period until December 30, 2010, to allow the public to review updated air quality model technical support documents and an errata sheet containing minor revisions to the Draft EIS.

During the 90-day comment period, the Vernal FO received 4,170 letters commenting on the EIS. In preparing the Final EIS, the BLM considered all comments. Appendix P provides responses to all substantive comments received on the Draft EIS. Copies of all letters may be found in the project administrative record. Appendix P also contains a description of the comment analysis and response process.

ES.7 ALTERNATIVES

In addition to the Proposed Action, five alternatives to the Proposed Action have been addressed in the EIS: the No Action Alternative, a reduced development alternative, a full development alternative, a directional drilling alternative, and a new alternative developed in response to agency and public comment on the Draft EIS. The elements and impacts of this new alternative (Alternative F) are contained entirely within the range of Alternatives A through E, so adding it does not introduce significant new information that would require the preparation of a Supplemental EIS. These alternatives are described below and compared in Table ES-1. The BLM has identified Alternative F as their preferred alternative.

ES.7.1 ALTERNATIVE A: PROPOSED ACTION

Under Alternative A (the Proposed Action), Gasco would drill 1,491 new natural gas production wells, and construct associated access roads, water supply pipelines, and gathering lines within the Riverbend, Wilkin Ridge, and Gate Canyon areas (see Map 2). Based on an average drilling rate of 100 wells per year and assuming that the drilling program would begin in 2011, it is anticipated that the 1,491 proposed wells would be drilled by approximately 2026. The total number of wells would depend largely on geology, economic factors, and lease restrictions. The wells would be drilled to recover gas reserves from the Wasatch, Mesaverde, Blackhawk, Mancos, Dakota, and Green River formations at depths of 5,000–20,000 feet. At the end of each

well's productive life (approximately 30 years), it would be plugged and abandoned and the affected area reclaimed. Thus, the total life of the project would be approximately 45 years. Although some wells may be drilled directionally from the same pad, each well was conservatively assumed to have its own pad for the purposes of analysis.

The extent of this proposed development and prospective nature of the natural gas resources is based on two-dimensional (2D) seismic data, geologic information, and data derived from exploratory wells drilled to date. The well density needed to develop the resource is expected to vary depending on the geologic characteristics of the formation being developed. The highest surface density assumed for this EIS's programmatic analysis is 1 well pad per 40 acres (in some areas of the Wasatch and Mesaverde formations), but the exact surface density would be defined during on-site review and permitting.

Approximately 325 miles of new road would be constructed to access the proposed wells. Gas would be transported via pipeline and related facilities to either intrastate or interstate pipelines. Depending on site-specific conditions, pipelines and collector lines would either be laid on the ground surface, typically next to a road, or trenched and buried. If dry, the wells would be plugged and abandoned as required by the surface management agency (SMA) and authorizing officer (AO). The construction of new compressor facilities is not proposed as part of the Proposed Action. However, gas treatment capacity would be expanded by a total of approximately 21,000 horsepower at two existing gas plants to handle the increased production. Any produced water would be disposed of in a licensed evaporative facility proposed as part of this action (see Section 2.2.4).

The primary source of water drilling would be recycled and treated production water. Water for drilling would also come from a Newfield pipeline supplied by a Green River well (Water Right No. 41-3530), the Myton water dock facility (Temporary Water Right Application No. 001458BWHITE), the Duchesne Valley Water Treatment Plant, recycled drilling water, and other available sources as they become available and are needed. The volume of water to be recycled would be dependent on the amount of drilling and completion activity in the field. Water from each source would be trucked to the locations where it is needed. Approximately 4,439 acre-feet would be required during the 15-year drilling and completion phase of the project. Of this total, approximately 4,151 acre-feet would be reclaimed produced water or water recovered from previous drilling operations. Approximately 6% (288 acre-feet, or 0.19 acre-feet per well) would be fresh water. Drilling under this alternative is expected to produce about 19,570 barrels of water per day at peak development. To dispose of this water, up to twenty 450 × 650-foot evaporation basins would be constructed on BLM land within a single facility of approximately 143 acres, which would include associated roads, tanks, headworks, and other facilities (see Map 3).

The Proposed Action includes applicant-committed protection measures and BMPs for cultural and paleontological resources, invasive weeds management, road construction and maintenance, vegetation disturbance and reclamation, pipeline spill prevention, erosion reduction, range resources, hazardous materials and emergency response, special status plants, breeding raptors and nest sites, bald eagle wintering areas, mountain plover breeding habitat, Mexican spotted owl habitat, and sage grouse leks and nesting areas.

ES.7.2 ALTERNATIVE B: REDUCED DEVELOPMENT

Alternative B was developed to respond to sensitive resource and land use issues in the project area expressed during public and agency scoping. Under Alternative B, natural gas development on federal leases would be implemented in a phased manner through surface disturbance restrictions imposed by the BLM. Maximum new annual surface disturbance would be limited to 485 acres per year on federal land. Under Alternative B, Gasco would drill 1,114 new gas production wells, and construct associated access roads, water supply pipelines, and natural gas gathering lines (see Map 4). Unless otherwise noted, management actions under this alternative would be the same as the Proposed Action. However, well pad locations would be either precluded from development or developed at a lower density in sensitive areas. These exclusions or reduced development densities include the following:

- No well pads would be located within 0.5 mile of known active raptor nests.
- No well pads would be located within 1,000 feet of an active sage-grouse lek.
- No well pads would be located within the existing Pariette and Lower Green River ACECs.
- No well pads would be located below the rim of Nine Mile Canyon within Nine Mile Canyon ACEC.
- No well pads would be located in areas of Nine Mile Canyon ACEC where no existing oil and gas leases are present.
- 160-acre surface spacing would be used for wells in all areas of Nine Mile Canyon ACEC where the above provision does not apply, and within areas proposed for the expansion of Nine Mile Canyon ACEC during the RMP revision process.
- 160-acre surface spacing would be used for wells within the Four Mile Wash area proposed as an ACEC during the Vernal RMP revision process (BLM 2005a).
- 160-acre surface spacing would be used for wells within the Myton Bench/Coyote Basin area proposed as an ACEC during the Vernal RMP revision process.
- No well pads would be located in areas currently managed under the BLM's Visual Resource Management (VRM) system as Class II.
- No well pads would be located on BLM-administered land within approximately 1,500 feet of river segments deemed suitable for designation under the Wild and Scenic Rivers Act, as measured from the river centerline.
- No wells would be located in areas previously inventoried as having an appearance of naturalness and having the ability to offer opportunities for solitude and primitive/unconfined recreation (BLM 2007e).

The construction of new compressor facilities is not proposed as part of this alternative. However, treatment capacity would be expanded by a total of approximately 15,600 horsepower at two existing gas plants to handle the increased production.

Water for drilling would come from the same sources indicated for the Proposed Action. A total of 3,317 acre-feet of treated and recycled water would be required under Alternative B. Of this total, 3,102 acre-feet (94%) would be treated and recycled production water, and 215 acre-feet (6%) would be fresh water.

Similarly, produced water would be disposed of as described for the Proposed Action. Drilling under this alternative is expected to produce about 18,840 barrels of water per day at peak development. This water would be disposed of in an evaporative facility with approximately 20 basins on 135 acres.

ES.7.3 ALTERNATIVE C: FULL DEVELOPMENT

Alternative C was developed to analyze the effects of a maximum development scenario in the project area. To develop this alternative and because of the programmatic nature of this analysis, it was assumed that all leases would be developed, with well pads located across the project area in a more-or-less evenly spaced (40–160 acre) pattern and capitalizing on existing roads where possible. Under Alternative C, it is estimated that 1,887 new gas production wells would be drilled, and associated access roads, water supply pipelines, and natural gas gathering lines would be constructed. Well pad spacing in a given area would vary based on terrain and sensitive resources; however, it is assumed that areas meeting one or more of the following criteria would generally be developed at a lower surface spacing (typically 160-acre) than the rest of the project area (see Map 5):

- Topographically rough terrain with slopes in excess of 40 degrees
- Areas within 0.5 mile of known active raptor nests
- Areas within 1,000 feet of an active sage-grouse lek
- Lands that fall within the existing Pariette and Lower Green River ACECs
- Land that falls within the Four Mile Wash area proposed as an ACEC during the Vernal RMP revision process (BLM 2005a)
- Areas classified as VRM Class II Areas within approximately 0.25 mile of the banks' high-water marks along segments deemed suitable for designation under the Wild and Scenic Rivers Act
- Lands estimated to have a high probability of cultural sensitivity based on the predictive modeling used for the Vernal RMP (BLM 2008c)

It is assumed that no surface disturbance would occur in areas identified in the lease terms and conditions as No Surface Occupancy (NSO) or closed to oil and gas leasing. The construction of new compressor facilities is not proposed as part of this alternative. However, treatment capacity would be expanded by a total of approximately 26,400 horsepower at two existing gas plants to handle the increased production.

Water for drilling would come from the same sources indicated for the Proposed Action. A total of 5,619 acre-feet of water would be required under this alternative. Of this total, 5,254 acre-feet (94%) would be treated and recycled production water and 365 acre-feet (6%) would be fresh water.

Similarly, produced water would be disposed of as described under the Proposed Action. Drilling under this alternative is expected to produce about 24,560 barrels of water per day, at peak development. This water would be disposed of in an evaporative facility with up to approximately 38 basins on 271 acres. These facilities would be the same as those described for the Proposed Action, but would be scaled to accommodate the higher amount of produced water from this alternative's greater number of wells.

ES.7.4 ALTERNATIVE D: NO ACTION

Under the No Action Alternative, the proposed natural gas development on BLM lands as described in the Proposed Action would not be implemented. However, under this alternative, natural gas exploration and development is assumed to continue on federal, state, and private lands, albeit at a much smaller scale. Activity on federal lands would come from exploratory projects previously approved by BLM, and is assumed to also come from other subsequent authorizations by BLM, such as approval of wells to meet unit and/or lease obligations, authorization of single-well Environmental Assessments, and approval of wells that meet the requirements of Applications for Permits to Drill (APDs) approval via Categorical Exclusions under the Energy Policy Act of 2005. In addition, some development is assumed to continue on State of Utah and private lands, subject to the approval of Utah Division of Oil, Gas, and Mining (UDOGM) or the appropriate private landowner. Reasonable access across public lands to proposed well pads and facilities on state and private lands could also occur under the No Action Alternative.

The No Action Alternative forms the baseline against which the potential impacts of the Proposed Action and the other action alternatives are compared. Thus, although it includes actions assumed to occur in the absence of approval of any of the action alternatives, it does not authorize any of the development assumed for the purposes of analysis.

This alternative mirrors past production trends and mineral development activities in the project area, except for areas where previously approved projects are in place, which assume higher density drilling. For purposes of analysis in this EIS, it is assumed that under the No Action Alternative approximately 368 new wells, including necessary facilities, would be developed within the project area in the next 15 years. For the sake of conservative analysis, it is assumed that each well would be placed on an individual pad; no directional drilling is anticipated. The construction of new compressor facilities is not expected as part of this alternative. However, treatment capacity would be assumed to expand by approximately 5,200 horsepower at existing gas plants to handle the increased production.

Water for drilling (1,096 acre-feet) would come from the same sources indicated for the Proposed Action. Of this total, 1,025 acre-feet (94%) would be treated and recycled production water, and 71 acre-feet (6%) would be fresh water.

Similarly, produced water is assumed to be disposed of as described for the Proposed Action. Drilling of the 368 wells under this alternative is expected to produce about 4,780 barrels of water per day, at peak development. This water would be disposed of in an evaporative facility with up to eight basins on 57 acres.

ES.7.5 ALTERNATIVE E: REDUCED DEVELOPMENT WITH DIRECTIONAL DRILLING

Alternative E was developed to respond to sensitive resource and land use issues in the project area expressed during public and agency scoping. Under Alternative E, well pad locations would be precluded from sensitive areas or would occur at a lower density in those areas, and surface impacts would be reduced throughout the field by developing multiple gas wells from each well pad. Like Alternative B, natural gas development on federal leases would be implemented in a phased manner. Under Alternative E, Gasco would drill 1,114 new gas production wells from a total of 328 pads, and construct associated access roads, water supply pipelines, and natural gas gathering lines (see Map 7). Unless otherwise noted, management actions under this alternative

would be the same as the Proposed Action. However, well pad locations would be either precluded from, or developed at a lower density in, sensitive areas. These exclusions or reduced development densities include the following:

- No well pads would be located within 0.5 mile of known active raptor nests.
- No well pads would be located within 1,000 feet of an active sage-grouse lek.
- No well pads would be located within the existing Pariette and Lower Green River ACECs.
- No well pads would be located below the rim of Nine Mile Canyon within the existing Nine Mile Canyon ACEC, or in areas of Nine Mile Canyon ACEC where no existing oil and gas leases are present.
- 160-acre downhole spacing, or approximately 540 acre surface spacing, would be used for wells in all areas of Nine Mile Canyon ACEC where the above provision does not apply, and within areas proposed for the expansion of Nine Mile Canyon ACEC during the Vernal RMP revision process.
- 160-acre downhole spacing, or approximately 540 acre surface spacing, would be used for wells within the Four Mile Wash area proposed as an ACEC during the Vernal RMP revision process.
- 160-acre downhole spacing, or approximately 540 acre surface spacing, would be used for wells within the Myton Bench/Coyote Basin area proposed as an ACEC during the Vernal RMP revision process.
- No well pads would be located in areas currently managed under the BLM's VRM system as Class II.
- No well pads would be located on BLM-administered land within approximately 0.25 mile of river segments deemed suitable for designation under the Wild and Scenic Rivers Act, as measured from the high-water mark on each bank.
- No wells would be located in areas that the BLM has inventoried and found to have wilderness characteristics (BLM 2007e).

The construction of new compressor facilities is not proposed as part of this alternative. However, treatment capacity would be expanded by a total of approximately 15,600 horsepower at two existing gas plants to handle the increased production.

Water for drilling (5,040 acre-feet) would come from the same sources indicated for the Proposed Action. A total of 3,317 acre-feet of water would be required under this alternative. Of this total, 3,102 acre-feet (94%) would be treated and recycled production water, and 215 acre-feet (6%) would be fresh water.

Similarly, produced water would be disposed of as described for the Proposed Action. Drilling under this alternative is expected to produce about 19,220 barrels of water per day at peak development. This water would be disposed of in an evaporative facility with approximately 19 basins on approximately 135 acres.

ES.7.6 ALTERNATIVE F: AGENCY PREFERRED ALTERNATIVE

Alternative F was developed in response to comments received during the public comment period. It was designed to incorporate directional drilling to reduce surface impacts while still allowing the proponent to use some vertical drilling by careful planning of the placement of

surface facilities to obtain data in areas where formation details are lacking, especially in the southern and western portions of the project area. It was also designed to avoid development in the Green River's floodplain and Nine Mile Canyon, and to restrict evaporative pond acreage for water disposal.

Under Alternative F, Gasco would drill approximately 1,298 new gas production wells from a total of 575 pads, and construct associated access roads and natural gas gathering lines (see Map 8). Unless otherwise noted, management actions under this alternative would be the same as those described for the Proposed Action.

The following limitations on development and surface disturbance would apply:

- No well pads would be located within any 100-year floodplain shown on Map 29.
- No well pads would be located within 0.5 mile or line of sight of the Green River, whichever is less.
- No well pads would be located within 2.0 miles of the Sand Wash campground/boat launch, or Desolation Canyon.
- No surface disturbance would be permitted in riparian or wetland areas.
- No well pads or surface disturbance would be located below the rim of Nine Mile Canyon within the existing Nine Mile Canyon ACEC.
- No wells pads or surface disturbance would be located inside core conservation areas that were developed in 2009 for the cactus species *Sclerocactus brevispinus* as a result of the Castle Peak/Eightmile Flat EIS consultation.
- Surface spacing would be no denser than one pad per approximately 160 acres in areas where the above provisions do not apply.

Gasco would construct evaporative ponds limited to the capacity sufficient to dispose of water from the first five years of proposed development. For the purposes of this analysis, it is assumed that this would include approximately 78 acres of evaporative ponds. At the end of five years, the ponds would be revisited to determine if they can be reclaimed or must exist into the future. However, it is assumed at this time that they would remain in operation for the life of the project. Water disposal above this interim capacity would be addressed through scaled back drilling (to stay within what the ponds can handle) or through alternative water disposal methods. Water injection to the Garden Gulch member of the Green River Formation has been identified as a potential disposal method following the five-year period; however, it would require additional analysis prior to implementation, because current feasibility is unproven. Gasco is currently working on several Underground Injection Control program permits for future disposal wells in the project area, in coordination with the U.S. Environmental Protection Agency (EPA). The success of these wells will not be known until permitting is completed and wells are developed and tested. However, should they prove effective, they could be a primary method of water disposal under Alternative F. Water for drilling would be from the same sources indicated for the Proposed Action. A total of 3,865 acre-feet of water would be required under this alternative. Of this total, 3,614 acre-feet (94%) would be treated and recycled production water, and 251 acre-feet (6%) would be fresh water. Produced water disposal needs would be similar to those for the Proposed Action. As under the Proposed Action, trucks would be used to transport water throughout the field.

Table ES-1. Comparison of Alternatives

	Alternative A (Proposed Action)	Alternative B (Reduced)	Alternative C (Full)	Alternative D (No Action)	Alternative E (Directional)	Alternative F (Agency Preferred)
Proposed new wells	1,491	1,114	1,887	368	1,114	<u>1,298</u>
Proposed new well pads	1,491	1,114	1,887	368	328	<u>575</u>
Proposed new roads (miles)	325	274	526	72	106	<u>198</u>
Proposed new pipeline (miles)	431	393	861	316	216	<u>316</u>
Water use over life of plan (acre-feet) (<i>treated-recycled water / fresh water</i>)	<u>4,439</u> (4,151/288)	<u>3,317</u> (3,102/215)	<u>5,619</u> (5,254/365)	<u>1,096</u> (1,025/71)	<u>3,317</u> (3,102/215)	<u>3,865</u> (3,614/251)
Well site surface disturbance (acres) ¹	5,666	4,233	7,171	1,398	1,370	<u>2,415</u>
New road disturbance (acres)	1,182	996	1,913	262	386	<u>720</u>
New pipeline disturbance (acres)	522	476	1,044	383	262	<u>383</u>
Evaporative facility surface disturbance (acres)	<u>143</u>	<u>135</u>	271	57	<u>135</u>	<u>78</u>
Evaporative ponds (#)	<u>20</u>	<u>20</u>	38	8	<u>19</u>	<u>12</u>
Generator size at evaporative facility (horsepower [hp])	2,700	1,980	3,420	720	1,980	<u>1,084</u>
Maximum compression requirements (hp)	21,325	15,608	26,439	5,156	15,608	<u>18,186</u>
Total Disturbance (acres)²	7,584	5,685	9,982	2,055	2,174	<u>3,604</u>

¹ Surface disturbance for Alternatives A, B, C, and D, the vertical drilling alternatives, is calculated at 3.8 acres per well. Surface disturbance for Alternatives E and F, the directional drilling alternatives, is calculated at 4.2 acres per well.

² Slightly less than total of separate disturbances due to overlapping in calculation of road and pipeline disturbance areas with well site surface-disturbance areas in the geographic information system (GIS) database.

ES.8 AFFECTED ENVIRONMENT

The project area is located in the Uinta Basin—part of the Colorado Plateau Province in northeastern Utah. The Uinta Basin is bordered to the north by the Uinta Mountain Range, which is the only major east-west oriented mountain range in the U.S. States. The eastern and southern boundary of the basin is formed by the Tavaputs Plateau of the Book Cliffs, and the western boundary is formed by the Wasatch Mountains. The center of the basin lies at an elevation between 5,000 and 5,500 feet. The vegetation within the Uinta Basin is primarily shrub/scrub, with some areas of evergreen forest, grasslands, and barren land. The average annual precipitation for the Uinta Basin is less than 8.5 inches. However, the basin contains a number of rivers and streams. The southern slopes of the Uintas are drained by Current Creek, the Duchesne River, Lake Creek, the Uinta River, Ashley Creek, and Big and Little Brush Creeks.

The southern portion of the basin contains fewer streams that are much smaller in volume than those in the northern region. The Green River flows through the Uintas at Split Mountain and across the Uinta Basin in a southwesterly direction.

The project area encompasses approximately 206,826 acres of land within Duchesne and Uintah Counties—in the southern part of the Uinta Basin. The project area spans a distance of approximately 27 miles east to west, and 14 miles north to south. Several segments of the project's southern boundary are defined by Nine Mile Creek, and most of the eastern boundary of the project area is defined by the Green River. The town of Vernal is approximately 25 miles northeast of the project boundary, and Duchesne, Utah, lies approximately 13 miles to the northwest.

Chapter 3 presents the potentially affected existing environment (i.e., the physical, biological, social, and economic values and resources) of the project area as identified in the BLM ID team checklist (Appendix A) and presented in Chapter 1. A total of 31 resources of concern identified in the checklist are brought forward for analysis in Chapter 4: air quality, ACECs, cultural resources, environmental justice, Native American religious concerns, threatened, endangered or candidate animal species, threatened, endangered or candidate plant species, wastes (hazardous or solid), county transportation plan, floodplains, lands/access, rangeland health, invasive and non-native species, vegetation including special status plants, water quality, wetlands/riparian zones, WSRs, livestock grazing, woodlands/forestry, fish and wildlife including special status species, soils, recreation, visual resources, geology/minerals/energy production, paleontology, fuels/fire management, socioeconomics, wilderness characteristics, and waters of the United States. Some of the resources of concern described in the checklist have been combined into single sections for purposes of consolidating analysis, so a total of 16 resource sections are presented in Chapter 3.

ES.9 ENVIRONMENTAL CONSEQUENCES

In general, the nature of environmental consequences would be similar under all six alternatives, but the magnitude of those consequences would vary among them. The magnitude would vary according to the number of wells, roads and related facilities constructed, and their placement relative to various environmental resources located within the project area.

Alternative A is the applicant's Proposed Action for extracting natural gas. Alternatives B, C, and E were developed in response to issues brought forward during the agency and public scoping process. These alternatives generally incorporate the same construction, operational, decommissioning, and reclamation components as the Proposed Action, but with additional considerations applied to actions taking place on federal lands. Alternative F was developed in response to comments received during the Draft EIS public comment period. The BLM has identified Alternative F as the Agency Preferred Alternative because it best addresses the issues raised about impacts to a number of resources, while meeting the purpose and need for the project. The Proposed Action and Alternative C would have greater positive impacts to local economies, depending on resource extraction success, than Alternatives B, E, and F (reduced development and directional drilling scenarios) and the No Action Alternative, but create more adverse impacts to physical, biological, and social resources.

Alternatives B, E, and F were developed to respond to sensitive resource and land use issues in the project area expressed during public and agency comment periods. Alternative B would be the most restrictive of the solely vertical drilling resource extraction alternatives (Alternatives A, B, C, and the No Action Alternative). Of the action alternatives (the Proposed Action and Alternatives B, C, E, and F), Alternatives B, E, and F would have the least beneficial impact to resource extraction-based economies. Alternative B would have less potential to adversely impact physical, biological, and social resources than the Proposed Action and Alternative C, but more than the No Action Alternative, Alternative E, and Alternative F.

Alternative C was developed to analyze the effects of a maximum development scenario in the project area. Alternative C offers the greatest potential benefits to local economies from resource extraction, but would result in greater adverse impacts to physical, biological, and social resources than the other alternatives.

Under the No Action Alternative, the proposed natural gas development on BLM lands as described in the Proposed Action would not be implemented; however, natural gas exploration and lease production would continue, including exploratory drilling projects previously approved by the BLM, and would likely continue on State of Utah and private lands as well. In general, the No Action Alternative would have the least potential to adversely impact physical, biological, and social resources, but would have the least potential for positive impacts to local economies that depend on resource extraction.

Alternative E was developed to respond to sensitive resource and land use issues in the project area expressed during public and agency scoping. It proposes the same amount and pattern of development as Alternative B, except that surface impacts would be reduced by developing multiple gas wells from each well pad. The reduced development proposed under Alternative E would have one of the smallest potentials for positive impacts to resource extraction-based economies. Because the increased cost of directional drilling could make the project infeasible under some economic conditions, this alternative may not be implementable. Of the action alternatives, Alternative E would have the least potential to adversely impact physical, biological, and social resources.

Alternative F (Agency Preferred Alternative) was developed in response to comments received during the Draft EIS public comment period. It was designed to incorporate directional drilling to reduce surface impacts while still allowing the proponent to use some vertical drilling. It avoids development in the Green River floodplain and Nine Mile Canyon, and restricts evaporative pond acreage for water disposal. There would be reduced development under Alternative F, but more development than under Alternatives B and E. Of all the reduced development alternatives, Alternative F offers the greatest potential to local economies from resource extraction while still protecting the physical, biological, and social resources.

Table 2-9 near the end of Chapter 2 summarizes the potential impacts to each resource of concern under each alternative. Detailed descriptions of the impacts under each alternative are provided in Chapter 4, along with a discussion of the cumulative impacts, irretrievable and irreversible commitments of resources, and unavoidable adverse impacts that would result from implementation of the alternatives.

ES.10 MITIGATION MEASURES

Gasco would comply with all regulatory requirements, BLM policy guidelines, standard operating practices, and applicant-committed BMPs that would be applied under all alternatives (Section 2.1, Table 2-1).

Potential mitigation measures are also proposed for individual resources in Chapter 4. Potential mitigation includes additional means, measures, or practices not incorporated into the Proposed Action or alternatives that would further reduce or eliminate impacts. The selection of these proposed mitigation measures will be decided in the ROD for the Final EIS.

ES.11 AGENCY COORDINATION AND CONSULTATION

ES.11.1 SECTION 106 AND GOVERNMENT-TO-GOVERNMENT CONSULTATION

ES.11.1.1 SECTION 106 CONSULTATION

During the 2006 scoping period, the National Trust for Historic Preservation (NTHP), Nine Mile Canyon Coalition (NMCC), and Southern Utah Wilderness Alliance (SUWA) made individual requests for consulting party status per 36 CFR 800.2(5). The BLM sent a formal response to these entities on September 12, 2006, indicating that Section 106 consultation would be conducted via the NEPA public involvement process. The combined process was announced in the BLM's Federal Register Notice, and each party was sent a copy of the DEIS. Comment letters on the Draft EIS were received from all three entities, who again requested consulting party status per 36 CFR 800.2(5).

Based on comments generated during the public comment period on the Draft EIS, the BLM decided to initiate a separate Section 106 process. On January 26, 2011, the BLM consulted with the Utah State Historic Preservation Officer (SHPO) regarding a preliminary area of potential effects (APE) and a proposed list of invitees to participate in the Section 106 process. The following were invited to participate as consulting parties: SHPO, Advisory Council on Historic Preservation (ACHP), Gasco Energy Inc. (proponent), Carbon County, Duchesne County, Uintah County, State Institutional Trust Lands Administration, Utah Public Lands Policy and Coordination Office, NTHP, NMCC, Colorado Plateau Archaeological Alliance, SUWA, Utah Rock Art Research Association, Utah Professional Archaeological Council, Utah Statewide Archaeological Society, Ute Mountain Ute Tribe, Goshute Indian Tribe, White Mesa Ute Tribe, Laguna Pueblo Tribe, Southern Ute Tribe, Ute Indian Tribe, Santa Clara Pueblo Tribe, Hopi Tribe, Zia Pueblo Tribe, Navajo Nation, Northwest Band of Shoshone Tribe, and Eastern Shoshone Tribe.

The first meeting of the consulting parties was held in March 2011. During this meeting, the new Agency Preferred Alternative (Alternative F) was introduced, the APE was finalized based on feedback from the consulting parties, and it was determined that a Class I literature review was needed to continue the consultation process. It was also determined in subsequent meetings that due to the phased approach to Section 106 consultation for the Gasco project, and because the BLM could not fully determine effects to historic properties prior to approval of the undertaking, it would be appropriate to develop a Programmatic Agreement (PA) pursuant to 36 CFR 800.14(b)(1)(ii) of the ACHP's regulations implementing Section 106 of the National Historic Preservation Act (NHPA), as amended [16 U.S.C. 470 (f)].

A Draft PA and Preconstruction Plan and a Class I inventory was provided to consulting parties in May 2011, during the third consulting parties meeting. The preliminary Final PA was sent with a consultation request to the 12 previously identified tribes on May 30, 2011. The Hopi, Eastern Shoshone, and Ute Indian tribes participated in the PA process via phone or in person. In June 2011 the SHPO concurred with the delineation of the APE. After making revisions based on consulting party feedback, the BLM provided a revised version at the fourth consulting parties meeting, held in June 2011. Final corrections were made via email following that meeting. In July 2011, the BLM asked the consulting parties to indicate who would be signatories to the PA. Gasco Energy Inc., the ACHP, the BLM, the Utah School and Institutional Trust Lands Administration (SITLA), and the Utah SHPO indicated that they would sign the PA. The NTHP, SUWA, the NMCC, and the Colorado Plateau Archaeological Alliance declined to sign the PA. The Hopi Tribe also indicated that they would not be signing the PA, but that participation of the ACHP had resolved their concerns over the project. The Navajo Nation submitted a letter declaring that the undertaking may impact Navajo traditional cultural resources and asking that their Traditional Cultural Program be informed about any discoveries of habitation sites, plant gathering areas, human remains, and objects of cultural patrimony. The requested notification will occur through the implementation of the PA.

The PA was signed on August 31, 2011. The signing of the Gasco PA and its implementation concludes the Section 106 process. Appendix Q contains a copy of the signed PA.

ES.11.1.2 GOVERNMENT-TO-GOVERNMENT CONSULTATION

On February 9, 2011, the Vernal FO mailed a certified notification letter, along with a Gasco project summary and APE map, to 15 different tribal representatives from 12 different federally recognized Native American tribal organizations. The goals of contacting tribal organizations for the proposed Gasco EIS were 1) to notify tribal authorities of Vernal FO issuance of the NOA to invite public comment for the proposed project; 2) to identify tribal organizations that may attach religious and cultural significance to historic properties within the Gasco project area; and 3) to document traditional values associated with these types of properties in accordance with various federal environmental laws. The Pueblo of the Laguna responded that the undertaking would not have a significant impact. The Hopi Tribe responded with concerns that the proper Section 106 process be followed for this project, and encouraged the continued participation of the ACHP in the Section 106 consultation. In April 2011, the BLM met with the Hopi Tribe to discuss this project (among others). The tribe expressed concern over lack of previous contact for the project, and requested a copy of the Class I survey. The Hopi requested and were provided with a copy of the Class I survey. On May 31, 2011, the tribe provided a summary of their review, stating that they appreciated the ACHP participation in the ongoing Section 106 process. In May 2011, the preliminary final PA was sent with a consultation request to the 12 previously identified Tribes. The Hopi, Eastern Shoshone, and Ute Indian tribes participated in the PA process via phone or in person. The Pueblo of the Laguna responded that the undertaking would not have a significant impact. In July 2011, the BLM met with the Hopi Tribe. It was indicated during that meeting that the Hopi would not be signing the PA, but that participation of the ACHP had resolved their concerns over the project. The Navajo Nation submitted a letter declaring that the undertaking may impact Navajo traditional cultural resources and asking that their Traditional Cultural Program be informed about any discoveries of habitation sites, plant gathering areas, human remains, and objects of cultural patrimony. The requested notification will occur through the implementation of the PA.

ES.11.2 SECTION 7 CONSULTATION

The BLM formally consulted with the U.S. Fish and Wildlife Service (USFWS) in accordance with Section 7 of the Endangered Species Act (ESA), which requires federal agencies to evaluate their actions with respect to any species that are proposed or listed as endangered or threatened, and their critical habitat, if any has been formally designated. Consultation meetings between the BLM and the USFWS to discuss the Gasco project included several agency-agency meetings and numerous teleconferences. Based on an agreement between the BLM and USFWS, the information on threatened, endangered, and candidate species within the EIS is being used as the biological assessment (BA) for this project. As such, this EIS has been used by the USFWS to prepare their biological opinion (BO). The final BO was signed on December 22, 2011, and is included as Appendix S.

ES.11.3 OTHER AGENCY COORDINATION

In their formal comments on the Draft EIS and in subsequent meetings, the EPA requested that the BLM conduct project-specific modeling for 1) 1-hour nitrogen dioxide (NO₂) impacts from the generator engine and well site sources; 2) impacts from the evaporation pond complex and generator for the following hazardous air pollutants (HAPs), benzene, toluene, ethylbenzene, xylene and methanol; and 3) ozone. In response to the EPA's request, the BLM agreed to conduct project-specific modeling for each request except ozone, which was considered regionally in the Greater Natural Buttes Supplement to the Draft EIS (GNB SDEIS) (BLM 2011a) and has been incorporated in this EIS by reference. Multiple conference calls and face-to-face meetings were held with the EPA to discuss evaporation pond concerns and modeling options. In addition, the EPA has had the opportunity to review the administrative Final EIS to ensure their concerns were addressed adequately. The BLM also incorporated by reference the results of short-term near-field analysis contained in the GNB SDEIS (BLM 2011a) as it related to 1-hour NO₂ impacts.

ES.12 NEXT STEPS/ DECISIONS TO BE MADE AFTER THE EIS

Publication of the NOA by the EPA and the BLM of the Final EIS in the *Federal Register* initiates a required minimal 30-day availability period. During this time, the ROD may be prepared to document the selected alternative and any conditions of approval. Any comments received during the 30-day availability period may be addressed in the ROD. If comments identify new circumstances or relevant information, the decision maker must determine whether minor changes can be made to the existing EIS or whether a supplement to the Final EIS must be written. The ROD will be signed by the AO, the BLM's Green River District manager. The BLM decisions will apply only to public lands and leases.

Within the ROD, the BLM decision-maker (i.e., the BLM AO) will determine

- whether the analysis contained in the EIS is adequate for the purposes of reaching informed decisions regarding the Proposed Action and alternatives;
- whether the Proposed Action should be approved or whether a different alternative or a combination of alternatives should be selected;

- whether the Proposed Action and alternatives are in conformance with applicable land and resource management plans; and
- the COA that may be attached to the ROD.

If the BLM decides in the ROD to authorize the project, then it will be required, as part of its management responsibilities under the MLA and the FLPMA, to review and act on APDs and right-of-way (ROW) applications. These applications would seek approval to construct wells, pipelines, flowlines, roads, or other ancillary facilities associated with project development. Submission and approval of such applications are required prior to surface disturbance. Consequently, the ROD to be issued following this EIS will not directly authorize any surface disturbance on BLM surface or minerals without an appropriate surface use application and site specific BLM review.

Prior to approving an APD or ROW, the BLM will conduct an on-site inspection of the proposed well pad, access road, and/or other areas of proposed surface use. During the site-specific review, the need for specific mitigation measures would be identified.