1.0 INTRODUCTION

1.1 BACKGROUND

EOG Resources, Inc. (EOG) has notified the Bureau of Land Management's (BLM) Vernal Field Office that it proposes to fully develop natural gas resources underlying oil and gas leases owned, at least in part, by EOG within the Chapita Wells/Stagecoach Area (CWSA) in Uintah County, Utah. It is EOG's intent to explore and develop all potentially productive subsurface formations underlying the land in the CWSA. The formations include, but are not limited to, the Green River Formation, Wasatch Formation, Mesaverde Group (including the Blackhawk Formation), and the Mancos. EOG is the designated operator, as a result of owning 100 percent of the working interest in the leasehold or due to contractual agreements with other working interest owners, for nearly all of the CWSA. EOG's lease rights include the right to occupy and use as much of the surface as is reasonably necessary to explore, develop, operate, and produce the subsurface oil and gas resources.

The CWSA consists of approximately 31,872 acres in an existing gas producing region located in T8S/R22E, T9S/R22E, T9S/R23E and T10S/R23E, Uintah County, Utah, located on lands owned by the United States, the State of Utah, the Northern Ute Indian Tribe, Ute Tribe allottees, and other private land owners. The CWSA contains the Chapita Wells Unit and the Stagecoach Unit in addition to non-unitized lands. The general location of the CWSA is shown in Figure 1-1, Appendix A.

As of March 1, 2004, the CWSA contained 325 gas producing wells, approximately 121 miles of roads, and 115 miles of pipeline. An additional 161 wells, 26 miles of access road, and 26 miles of pipeline were approved in the Decision Record and FONSI for the *Environmental Assessment, Chapita Wells Unit Infill Development, Uintah County, Utah* (1999 Chapita Wells EA) (BLM 1999). As of March 1, 2004, 100 wells approved by the 1999 Chapita Wells EA decision remained to be drilled and/or constructed in the CWSA. Fifty-five of these previously approved wells will be new locations and 45 are expected to be twins drilled from existing locations. There are currently no oil wells or produced water disposal wells in the CWSA.

EOG proposes to drill a total of up to 627 new gas wells to the Green River, Wasatch, Mesaverde, Mancos "B," and, possibly, other formations. Of the planned wells, 473 will be new locations and 154 are expected to be twins drilled from existing locations, representing approximately 25 percent of the total new wells that would be drilled.

Federal lands in the proposed CWSA are under the jurisdiction of the BLM Vernal Field Office. The Vernal Field Office has determined that the proposed project constitutes a major Federal action requiring the development of an Environmental Impact Statement (EIS). This EIS serves two purposes:

- It provides the basis for analyzing and disclosing impacts resulting from the level of development proposed within the CWSA.
- It identifies approval conditions and mitigation measures to be implemented within the CWSA.

1.2 PURPOSE AND NEED

In this FEIS, the Proposed Action is BLM's approval of EOG's proposal to fully develop natural gas resources within the CWSA. The purpose of the Proposed Action is to respond to EOG's proposal and to facilitate action on future plans and applications related to this proposal.

This Federal action is needed because its implementation would:

- Allow EOG to develop natural gas pursuant to EOG's rights under valid existing oil and gas leases granted by the BLM, State of Utah, Bureau of Indian Affairs and private owners within the CWSA in order to increase the available supply of natural gas by a daily delivery up to 175 million cubic feet, with an ultimate production volume of between 650 billion cubic feet and 850 billion cubic feet;
- Further define drilling and completion techniques necessary to produce hydrocarbons from reservoirs in the Green River, Wasatch, Mesaverde, Mancos "B", and possibly other formations;
- Provide data with which to evaluate future well spacing;
- Provide data for use in evaluating the level of activity of future drilling in the project area;
- Generate Federal, State, Ute Tribe, or Ute Tribe allottee taxes and royalty revenues;
- Support local economies by providing and maintaining employment opportunities and expanding the tax base;
- Contribute to available natural gas supply for the national market;
- Reduce dependence on potentially unstable foreign sources of energy;
- Contribute to the available supply of a clean-burning fuel;
- Ameliorate price increases for natural gas, because production in the United States is not currently keeping pace with the increase in demand, a circumstance that if left uncorrected may cause the price of natural gas to continue to increase.

1.3 THE EIS DECISION FRAMEWORK

This EIS was prepared in accordance with the National Environmental Policy Act (NEPA) and in compliance with the Federal Land Policy and Management Act (FLPMA), Council of Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [C.F.R.] Parts 1500-1508), U.S. Department of the Interior (USDOI) requirements (Department Manual 516, Environmental Quality), and guidelines listed in the BLM NEPA Handbook, H-1790-1 (BLM 1988b) and in the BLM NEPA Guidebook (BLM 2004a).

According to the terms of the Mineral Leasing Act of 1920, the BLM is the agency authorized to manage Federal mineral interests underlying Federal or split estate lands. Approximately 71 percent of the surface of the CWSA and 88 percent of the mineral interests underlying the CWSA are owned by the United States and administered by the BLM. Therefore, the BLM is the lead agency in this process, and Federal jurisdiction of the CWSA natural gas development project is assumed by the BLM, which will issue a Record of Decision (ROD) for this EIS.

Within the ROD, the BLM decision maker (i.e., the Vernal Field Office Manager) will determine:

- Whether the analysis contained within this document is adequate for the purposes of

reaching informed decisions regarding CWSA Project development;
- Whether the Proposed Action or No Action Alternative involve the potential for significant impacts;
- Whether to approve the Proposed Action, select a different alternative, or a combination of alternatives;
- Whether the Proposed Action and No Action Alternative are in conformance with applicable land and resource management plans and programmatic plans developed under NEPA, FLPMA, CEQ regulations, USDOI Department Manual 516, BLM NEPA Handbook H-1790-1 (BLM 1988b), BLM NEPA Guidebook (2004a);
- The Conditions of Approval (COAs) that may be attached to the ROD.

The BLM decision will only apply to Federal lands. However, the analyses in this EIS consider the impacts for all proposed activities regardless of surface ownership. The appropriate Surface Management Agency (SMA) may use the analyses in this EIS to help render its permitting decisions.

During the public scoping process for the DEIS, Uintah County, the Bureau of Indian Affairs, Uintah and Ouray Agency (BIA), and Ute Indian Tribe were contacted and invited to be cooperating agencies on this EIS. Uintah County has participated as a Cooperating Agency throughout the EIS process. The BIA became a Cooperating Agency on May 17, 2006. The Tribe did not respond to BLM's invitation to participate as a Cooperating Agency. Copies of the DEIS and this FEIS were submitted to the BIA and Ute Indian Tribe for their review and comment. As discussed further in Section 1.5.3, the BIA will, under its authority, issue its own decision for the portion of the CWSA natural gas development project on Ute Tribe and Ute Tribe allotted land.

1.4 SUBSEQUENT DECISIONS TO BE MADE

If the BLM decides to approve the proposed CWSA gas development project, the BLM is required to review and act on Surface Use Plans (SUP), which are an integral component of APDs and ROW applications, which seek approval to construct pipeline, flowline, road, or other ancillary facilities associated with project development. Submission and approval of such applications are required prior to surface disturbance. Final approval for all actions on Federal surface associated with this project would be given only after on-sites and the APD and/or ROW grant process are completed. The APD and ROW grant processes are discussed further in the following sections.

1.4.1 APD Process

The operator can initiate the APD process either by filing an APD or a Notice of Staking (NOS). The NOS consists of an overview of the operator's proposal, including a location map and a sketched site plan. The APD includes the site-specific SUP and drilling program. The detailed information required to be submitted for each APD is identified in Onshore Oil and Gas Order No. 1 and 43 CFR 3162.3.

The BLM has authority to approve a project proponent's APD, including both the SUP and subsurface drilling program, and apply appropriate mitigation measures for affected resources, as necessary, on BLM-administered lands. Prior to approving an APD, the BLM must conduct an onsite inspection of the well pad, access road, pipeline route, and/or other areas of proposed surface use during which mitigation measures would be developed to protect potentially impacted resources on BLM-administered lands. The onsite inspection could, for example, include site-specific surveys for cultural and paleontological resources or

threatened and endangered species if the potential for these resources exists on or near the proposed disturbance. At a minimum, the inspection team would include the BLM's Authorized Officer (AO) and a representative of the project proponent. After the onsite inspection is performed, the project proponent would submit the APD or would revise the APD. Additional mitigation measures (e.g., adjusting the proposed locations of well sites, roads, and pipelines to avoid a sensitive resource; identifying specific construction methods to be employed; or identifying additional reclamation standards) may be added as COAs to protect affected resources. The BLM's approval of the drilling program to be implemented on BLM-administered lands includes assessing plans for protecting groundwater and other subsurface resources.

After drilling, routine well operations would not require approval. However, the BLM would have approval authority for operational activities that may alter the specifications of an approved APD, certain subsequent well operations, disposal of water produced from Federal leases, and new surface disturbances (e.g., workover pits). The BLM also retains the authority to approve plugging and abandonment of wells, gas venting, gas flaring, and certain measures for handling production. Other permits, approvals, authorizing actions, and consultations required by Federal, State, and local agencies are discussed in Section 1.5.

1.4.2 Rights-of-Way Process

Operators and third party project support contractors are required to submit a ROW application to obtain approval to construct a road, pipeline, or ancillary facility located on BLM-administered lands outside of the lease or unit on which the proposed project is to be conducted. APDs and Sundry Notices are often acceptable as applications for ROW grants for off-lease facilities if they provide sufficient detail of the entire proposal. Most of the proposed project would lie within the unit boundaries of the Chapita Wells Unit and the Stagecoach Unit; however, Project development would require that EOG secure the necessary ROWs to facilitate access by road and transportation of produced gas to processing facilities outside of the unit boundaries. Tribal and allotted land ROWs will be approved by the Uintah and Ouray Superintendent.

1.5 LAND STATUS AND CONFORMANCE WITH PLANS AND STIPULATIONS

1.5.1 Land and Mineral Status

The proposed wells, pipelines, access roads, and ancillary facilities would be constructed on approximately 31,872 acres of land in the CWSA. Approximately 22,693 acres (71 percent) are Federal lands administered by the BLM, 6,577 acres (21 percent) are owned by the Ute Tribe and/or its allottees and administered by the BIA, 1,914 acres (6 percent) are owned by the State of Utah and administered by the Utah State School and Institutional Trust Lands Administration (SITLA), and 688 acres (2 percent) are privately owned. **Table 1-1** provides a summary of CWSA acreage by surface owner and proposed single and twin well numbers.

Mineral ownership within the CWSA is summarized in Table 1-2 and illustrated in Figure 1-2, Appendix A. The majority of minerals within the CWSA are owned by the Federal government. There are a total of 774.5 acres of Indian minerals subject to three different leases within the entire CWSA, all of which are located in T9S:R22E.

Table 1-1. CWSA Acreage and Proposed Well Numbers by Surface Owner

Surface Owner	Acreage in CWSA	Percent of Total CWSA	Number of Well Locations		Total Number of Wells
			New, Single Well Locations	Twin Wells from Existing Locations	
BLM	22,693	71	382	97	479
State of Utah	1,914	6	24	0	24
Ute Tribe/Allottee	6,577	21	64	50	114
Private	688	2	3	7	10
Total	31,872	100	473	154	627

Table 1-2. Mineral Ownership within the CWSA

Mineral Owner	Acreage in CWSA*
BLM	28,022
State of Utah	2,674
Ute Tribe/Allottee	774
Private	563
Total	32,033

*Slight discrepancies from surface ownership due to rounding and map irregularities.

1.5.2 Conformance with Federal Management Plans, NEPA Documents, and other Federal Policies

Policies for development and land use decisions for Federal lands and minerals within the CWSA are contained in five Federal documents:

1) The Final Environmental Impact Statement on the Book Cliffs Resource Management Plan (BLM 1984);

2) The Record of Decision and Rangeland Program Summary for the Book Cliffs Resource Management Plan (Book Cliffs RMP) (BLM 1985);

3) The Environmental Assessment for Oil and Gas Leasing in the Book Cliffs Resource Area (1988 Oil and Gas Leasing EA) (BLM 1988a), an amendment to the Book Cliffs RMP;

4) EA No. 1997-48, Environmental Assessment, Chapita Wells Unit, Uintah County, Utah (BLM 1998); and

5) EA No. UT-080 1999-32, Environmental Assessment, Chapita Wells Unit Infill Development, Uintah County, Utah (BLM 1999).

Management objectives within the Book Cliffs RMP ROD and the 1988 Oil and Gas Leasing FONSI include leasing oil and gas resources, tar sands, oil shale, and Gilsonite, while protecting or mitigating impacts to other resource values. As such, the proposed CWSA natural gas development project is consistent with the management decisions contained in those documents.

The proposed project would also be required to comply with the following Federal policies related to riparian habitats, floodplains, and drainages:

- Book Cliffs RMP, page 17, stipulation 7: No surface disturbance or occupancy will be allowed within riparian habitat. This stipulation may be waived by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impact can be mitigated.
- Book Cliffs RMP, page 17, stipulation 8: No surface disturbance or occupancy will be allowed within the 100 year floodplain of the following creeks: Bitter, Evacuation, Hill, Sweetwater, and Willow; and the Green and White Rivers. This stipulation may be waived by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.
- Utah Instruction Memorandum No. 93-93: No surface use will be allowed within 100 meters of riparian areas unless it can be shown that: 1) there is no practicable alternative; 2) all long-term impacts are fully mitigated; or, 3) construction is an enhancement to the riparian areas.
- Executive Order 11988: If the only practical alternative requires the siting in the floodplain, the action shall be modified in order to minimize potential harm to or within the floodplain; reduce the risk of flood loss; minimize the impact of floods on human safety, health, and welfare; and, restore and preserve the natural and beneficial values served by floodplains.

1.5.3 Conformance with Local Management Plans and Policies

The BIA is a Cooperating Agency on this EIS. A formal management plan does not exist for the Uintah and Ouray Indian Reservation. The elected Ute Tribe Business Committee and the BIA determine approval of land use activities on Tribal lands. Production from Tribal leases provides royalties, tax revenues, and surface access and use fees to the Tribe, which contributes to the Tribe's economic independence. The Proposed Action is consistent with the BIA's regulatory responsibilities, which include promoting the economic development objectives of the Northern Ute Tribe under its government-to-government relationship with, and trust responsibility to, the Tribe. Thus, the range of the BIA's reasonable alternatives is limited to those that would serve the Tribe's economic development objectives consistent with the trust responsibility. The BIA will, under its authority, issue its own decision for the portion of the CWSA natural gas development project on Tribal land.

There are no comprehensive State of Utah plans for the CWSA. SITLA has leased all of the State lands within the CWSA for oil and gas production. Because the objectives of SITLA are to produce funding for the State school system, and because production on Federal leases could lead to further interest in drilling State leases in the area, the Proposed Action is consistent with the objectives of the State.

The Proposed Action is consistent with the *Uintah County General Plan* (Uintah County Plan) (Uintah County 2005), which encompasses the CWSA. The Uintah County Plan emphasizes multiple-use public land management practices, responsible use, and optimum

utilization of public land resources. Multiple-use is defined in the plan as including, but not limited to, the following historically and traditionally practiced resource uses: grazing, recreation, timber, mining, oil and gas development, agriculture, wildlife habitat, and water resources, as they become available or as new technology allows. As previously discussed, Uintah County is a Cooperating Agency on this EIS.

1.5.4 Other Authorizing Actions, Statutes, and Regulations

Oil and gas development on Federal lands is managed by numerous laws and regulations that affect resource recovery and surface management. The more important regulations relating to minerals development on BLM surface include:

- *Mineral Leasing Act (1920) (30 United States Code [USC] 181-263, as amended)* – Authorizing the Secretary of the Interior to issue leases for the extraction of certain minerals (currently coal, phosphate, sodium, potassium, oil, oil shale, Gilsonite, and gas), including leases beneath National Forest surface.

- *Mineral Leasing Act for Acquired Lands (1947)(30 USC 351-359 as amended)* - Stating that all deposits of coal, phosphate, oil, oil shale, gas, sodium, potassium, and sulfur that are owned or may be acquired by the United States shall be leased by the Secretary of the Interior under the same provisions as contained in the mineral leasing laws.

- *Mining and Minerals Policy Act (1970) (30 USC 21)* - Emphasizing the need for the ongoing development of stable domestic mining and minerals industries.

- *Federal Land Policy and Management Act (FLPMA) of* 1976 (43 U.S.C. 1701 et seq.) as modified – Stating that the BLM consider multiple uses for the lands it administers. FLPMA specifies that the BLM consider the land's inherent natural resources as well as its mineral resources when making land management decisions.

Private exploration and production from Federal oil and gas leases is an integral part of BLM's oil and gas leasing program under authority of the Mineral Leasing Act and FLPMA. The BLM's oil and gas leasing program encourages development of domestic oil and gas reserves and the reduction of U.S. dependence on foreign energy sources. In addition, the following applicable BLM regulations, orders, notices, standard conditions of approval, and general requirements constitute the range of standard procedures and environmental protection measures that are applied to individual operators and projects and are authorized by 43 CFR 3160:

Onshore Oil and Gas Orders:

- Onshore Order No.1 - Approval of Operations
- Onshore Order No. 2 - Drilling Operations
- Onshore Order No. 3 - Site Security
- Onshore Order No. 4 - Measurement of Oil
- Onshore Order No. 5 - Measurement of Gas
- Onshore Order No. 6 - Hydrogen Sulfide Operations
- Onshore Order No. 7 - Disposal of Produced Water
- Onshore Order No. 8 - Well Completions/Workovers/Abandonment (Proposed Rule)
- Onshore Order No. 9 - Waste Prevention and Beneficial Use of Oil and Gas (Not Published)

- Notices to Lessees
- BLM General Requirements for Oil and Gas Operations on Federal and Indian Lands.

A general listing of agencies that could also be involved in the implementation of the Proposed Action or alternatives, and their respective regulatory authority, is provided in **Table 1-3**.

Table 1-3. Permits, Approvals and Authorizing Actions Required for the Proposed EOG Chapita Wells/Stagecoach Area Gas Development Project.

Issuing Agency / Authorizing Action or Permit Approval Name	Nature of Permit, Approval, or Authorizing Action	Applicable Project Component
USDOI – Bureau of Land Management		
Permit to Drill, Deepen, or Plug Back (APD) and Sundry Notice, plugging and abandonment, venting, and flaring	Controls drilling and production for oil and gas on Federal onshore leases	Wells and production facilities
ROW Grant and Temporary Use Permit	ROW grant on BLM-managed lands	Gas pipelines, roads, facilities, etc. on BLM-managed lands
Cultural Resource Use Permit	Archaeological surveys, limited testing, and data recovery (excavation) of sites on public lands	All surface-disturbing activities
Paleontological Resource Use Permit	Survey and limited surface collection during site field work on public lands	Surface-disturbing activities
Pesticide Use Permit	Control of pests	Wells, roads, and ancillary facilities
National Noxious Weed Act Compliance	Controls noxious weeds	Any occurrence of noxious weeds on and near project facilities
Material Sales	Sales of sand, gravel, and riprap	Construction activities
U.S. Bureau of Indian Affairs		
Tribal/allotted Land Activities	In coordination with the Northern Ute Tribe, the BIA has authority for approving any and all activities associated with the alternatives on Tribal/allotted lands.	All surface-disturbing activities.
U.S. Department of Army Corps of Engineers		
Permit to Discharge Dredged or Fill Material	Authorized placement of fill or dredged material in waters of the United States or adjacent wetlands	All surface disturbing activities affecting waters of the United States or wetlands, such as roads and pipeline crossings of streams

Issuing Agency / Authorizing Action or Permit Approval Name	Nature of Permit, Approval, or Authorizing Action	Applicable Project Component
USDOI – U.S. Fish and Wildlife Service (USFWS)		
Endangered Species Act Compliance (Section 7)	Protects threatened and endangered species	Any activity potentially affecting listed or proposed Threatened or Endangered species
Migratory Bird Treaty Act	Protects migratory birds	All surface-disturbing activities
Bald Eagle Protection Act	Protects bald and golden eagles	All surface-disturbing activities
Advisory Council on Historic Preservation (ACHP)		
Cultural Resource Compliance (Section 106)	Protects cultural and historic resources; coordinated with the Utah State Historic Preservation Officer (SHPO)	All surface-disturbing activities
Environmental Protection Agency Region 8 (EPA)		
Underground Injection Control Permit	Authorizes and has regulatory control of Underground Injection Control (UIC) wells through EPA	UIC wells
Air Quality Permits	Oversight of air quality issues and permits in Tribal Airshed	Emissions-generating equipment
U.S. Department of Transportation		
Construction and operation of natural gas pipelines	Prescribes minimum safety requirements for pipeline facilities and the transportation of gas, including pipeline facilities	Natural gas pipelines
Utah Department of Transportation		
Transport Permit	Authorizes oversize, over length, and overweight loads	Transportation of equipment and materials on State highways
Encroachment Permit	Authorizes pipeline crossings or access roads tying into State or Federal highways	Construction of pipeline across State or Federal highways; construction of projects roads that tie into State or Federal highways

Issuing Agency / Authorizing Action or Permit Approval Name	Nature of Permit, Approval, or Authorizing Action	Applicable Project Component
Utah Department of Environmental Quality		
Fugitive Dust Control	Control fugitive dust emissions	Construction of facilities and vehicle traffic
Solid and Hazardous Waste Control	Regulates storage, transportation, and disposal of solid and hazardous wastes	Construction, drilling, and production operations
Utah Division of Water Rights		
Change in Nature of Use Application	Authorizes change of use on water rights	Non-consumptive and consumptive water uses
Stream Alteration Permit	Approves construction plans	Perennial stream crossings
Utah School and Institutional Trust Lands Administration (SITLA)		
Compliance with Rules	Compliance with applicable general and program rules	Facilities on SITLA lands
Utah Division of State History, Antiquities Section		
Antiquities Annual Permit: Blanket Permit to Conduct Archaeological Investigations	Regulates all archaeological investigations on State and private lands	All surface-disturbing activities on State and private lands
Antiquities Projects Permit (Excavation)	Regulates all archaeological excavations on State and private lands	All surface-disturbing activities on State and private lands
Utah Division of State History Preservation Section (SHPO)		
Section 106 Cultural Resources Consultation	Determines significance of cultural resources potentially affected by surface-disturbing activities	All surface-disturbing activities
Utah Division of Oil, Gas, and Mining		
Permit to Drill, Deepen, or Re-enter and Operate an Oil and Gas or Disposal Well	Approves drilling on all lands within the State	Wells (production and disposal) on State land
Permit to Flare Gas	Regulates flaring up to 30 days of testing or 50 million standard cubic feet (MMscf), whichever is less on State land	Flaring of gas wells on State land

Issuing Agency / Authorizing Action or Permit Approval Name	Nature of Permit, Approval, or Authorizing Action	Applicable Project Component
Disposal facility permit	Waste disposal on State land	Waste and disposal facilities on State land
Occupational Safety and Health Administration (OSHA)		
Safety Regulations for Oil and Gas Activities	Regulates oil and gas activities to protect public safety	All Proposed Action and alternative components
Uintah County		
Conditional Use Permit	Authorizes extraction and processing on private lands	Any project activities in residential or critical environment zones
Road Use Permit	Authorizes overweight and over length loads on county roads	Transportation of equipment and materials on county roads
Road Opening Permit	Authorizes pipeline crossings, routing of pipelines parallel to county roads, and tying a project access road into a county road	Pipelines or project roads that cross or intersect with a county road
Solid Waste Ordinance	Regulates disposal of wastes in the County	Construction and operational waste
Building Permit	Controls construction of all structures in the County	Construction of all buildings in Uintah County
Noxious Weed Act Compliance	Controls listed noxious weeds	Any occurrence of noxious weeds on and near project facilities

1.5.5 Conformance with Federal Leases

EOG operates the oil and gas lease rights underlying all lands in the CWSA with the exception of portions of Section 32, T8S/R22E. There is no designated operator for the SESE Section 32. The SESE Section 32 involves Tribal surface and Federal minerals and is not currently leased. EOG is the designated operator of depths from the surface to the base of the Wasatch Formation underlying the remainder of Section 32. As the designated operator of oil and gas leases in the CWSA, EOG is responsible for ensuring that lease stipulations are followed during well development.

Many of the leases covering BLM-administered minerals within the CWSA were issued before the Book Cliffs RMP was approved and, therefore, do not contain stipulations other than the standard lease terms at the time of issuance. A few of the BLM-administered oil and gas leases for the CWSA were issued with at least one of the stipulations summarized below:

- Stipulations for lands in oil shale withdrawal, Executive Order (EO) 5327 of April 15, 1930*;*
- Federal Coal Leasing Amendments Act of 1976*;*
- Surface Disturbance Stipulations;
- Seasonal restrictions to protect raptor species and habitat including ferruginous hawk and golden eagles;
- Seasonal restrictions to protect crucial pronghorn (antelope) habitat;
- Surface disturbing activities restrictions during wet and muddy periods to prevent critical to severe soil erosion;
- Potential site for the reintroduction of the black-footed ferret; and
- Threatened and Endangered Species Act stipulations*.*

Complete information about these BLM-administered leases and their associated stipulations is available for review at the BLM's Vernal Field Office and Utah State BLM Office. These Federal lease stipulations have been modified by COAs that were applied to APDs for wells located on BLM-administered leases covering lands within the CWSA in order to strengthen the protection of potentially affected and site-specific environmental resources. In addition, similar COAs have been applied to APDs for wells on BLM-administered leases containing no lease stipulations. Some non-Federal oil and gas leases issued within the CWSA contain similar stipulations that act to protect the environmental resources of the areas to which they apply.

1.6 PUBLIC INVOLVEMENT

On September 16, 2004, the BLM briefed the State of Utah Resource Development Coordinating Committee (RDCC) on the CWSA Proposed Action and BLM's intention to prepare this EIS.

The BLM conducted public and internal scoping to solicit input and identification of environmental issues and concerns associated with EOG's Proposed Action. The public scoping process was initiated on October 1, 2004 with the publication of a Notice of Intent (NOI) in the Federal Register. The BLM prepared a scoping information notice and provided copies to Federal, State, and local agencies, the Ute Tribe, and general public. Announcements of the scoping opportunities were sent to the Vernal Express, Uintah Basin Standard, Deseret News, Denver Post, and Salt Lake Tribune for publication; local Vernal, Utah radio stations for announcement; and Channel 6 (i.e., the local Vernal television

station), for announcement. These announcements included information on a public scoping and information open house, which was held at the Western Park Conference Center in Vernal, Utah on October 19, 2004. The official scoping period ended November 1, 2004. However, to ensure that the public was provided adequate scoping opportunity, a second public scoping and information open house was held at the Western Park Conference Center on November 30, 2004. Issues identified for the DEIS during the public scoping period are listed in Section 1.6.1.

1.6.1 Issues Identified During Public Scoping

The following written comments were received during the public scoping period. Public response to the notices and meetings included nine letters from the following agencies, organizations, and people:

- Laura Lindley, Bjork, Lindley, Little, P.C., Denver, Colorado.
- LaVonne J. Garrison, Trust Lands Administration, Salt Lake City, Utah.
- Jayne Belnap, United States Geological Survey, Moab, Utah.
- Larry H. Robinson, Rifle, Colorado.
- John Harja, Resource Development Coordinating Committee, Governor's Office of Planning and Budget, Salt Lake City, Utah (2 letters received).
- Stephen Bloch, Southern Utah Wilderness Alliance, Salt Lake City, Utah.
- Henry Maddux, U.S. Fish and Wildlife Service, United States Department of the Interior, West Valley City, Utah.
- Larry Svoboda, Office of Ecosystem Protection and Remediation, Environmental Protection Agency, Region 8, Denver, Colorado.

Environmental issues/comments identified in the scoping letters (and relevant to EIS analyses) are summarized below:

Issue/Comment: The EIS should include a detailed Purpose and Need statement.

Issue/Comment: The EIS should consider a reasonable range of alternatives that will meet the Purpose and Need, and should address resource and environmental issues and public concerns.

Issue/Comment: The EIS should describe existing conditions within the analysis area.

Issue/Comment: The EIS should adequately address resource and environmental consequences of the alternatives, including mitigation and cumulative effects.

Issue/Comment: The EIS should include tables, maps, figures, charts, photos, an alternative matrix, and other methods of clearly and concisely presenting relevant information and analyses.

Issue/Comment: The EIS should address nearby connected or related actions.

Issue/Comment: The EIS should adequately address the cumulative impacts of the proposed project plus other oil and gas development projects in the region, and should adequately address reasonable foreseeable development.

Issue/Comment: The EIS should fully analyze the socioeconomic effects of the proposed gas development.

Issue/Comment: The EIS should analyze impacts to Tribal trust resources and should consult with the appropriate Tribal governments.

Issue/Comment: The EIS should address environmental justice.

Issue/Comment: The EIS should address strategies to reduce pollution and to comply with objectives of the 1990 Pollution Prevention Act.

Issue/Comment: The EIS should analyze the effects of the proposed development on soil resources and soil erosion potential in the CWSA.

Issue/Comment: The EIS should analyze the effects of the proposed development on water resources; identify relevant water resource policies, regulations or statutes that are applicable to the proposed gas development project; and should include a description of water quality monitoring programs.

Issue/Comment: The EIS should analyze potential impacts to floodplain and riparian areas, and should include an alternative that prohibits/avoids gas development/surface-disturbing activities in the White River corridor and floodplain, as well as any other riparian areas and floodplains in the CWSA.

Issue/Comment: The EIS should analyze the potential for downstream effects from the project on the White River.

Issue/Comment: The EIS should analyze the potential for weed invasion/infestation due to the proposed development, and should analyze potential impacts to natural resources as a result of weed invasion and weed control.

Issue/Comment: Halogeton is prevalent in the CWSA, particularly in disturbed areas, and has a negative effect on sheep grazing.

Issue/Comment: The EIS should analyze the effects of the proposed development on raptors and provide appropriate raptor breeding activity, nesting activity, and habitat protection measures.

Issue/Comment: The EIS should analyze the effects of the proposed development on migratory birds and migratory bird habitat in the CWSA.

Issue/Comment: The EIS should analyze the effects of the proposed development on threatened, endangered, candidate, sensitive, and otherwise special status plants and animals, including the Colorado River cutthroat trout, sage grouse and white-tailed prairie dog.

Issue/Comment: The EIS should address potential depletion from the Upper Colorado River drainage basin and effects on the Colorado River Endangered fish species.

Issue/Comment: The EIS should include an alternative to provide the utmost level of protection to the natural viewshed of the White River corridor and also protect it from noise impacts.

Issue/Comment: The EIS should fully analyze the effects of the proposed development on air quality within the CWSA and on a cumulative basis (within the Uintah Basin).

Issue/Comment: Paleontological surveys should be conducted on all areas where surface disturbance is proposed.

Issue/Comment: Class I and Class III cultural resource surveys should be conducted on all areas proposed for surface disturbance, including any areas where cross-country vehicle or OHV travel is proposed.

1.6.2 Critical Elements of the Human Environment

The BLM requires that the type and magnitude of potential impacts to the 17 Critical Elements of the Human Environment be addressed during the NEPA process (BLM 1988b and 2003).

Water Quality	Flood Plains
Wetlands/Riparian Zones	Air Quality
Farmlands, Prime and Unique	Rangeland Standards
Threatened and Endangered Species	Cultural Resources
Paleontological Resources	Areas of Critical Environmental Concern
Wild and Scenic Rivers	Wilderness Areas/Wilderness Study Areas
Native American Religious Concerns	Native American Trust Resources
Hazardous Materials/Waste	Environmental Justice
Migratory Birds	

Areas of Critical Environmental Concern (ACEC), prime or unique farmlands, designated wilderness and Wilderness Study Areas, and wild and scenic rivers do not occur within the CWSA, and, therefore, are not addressed further in this EIS. The remaining 13 Critical Elements of the Human Environment will be carried forward for discussion in Affected Environment and Environmental Consequences chapters of this EIS.

1.6.3 Public Commenting Opportunities on the DEIS

The Notice of Availability (NOA) of the formal CWSA DEIS was published by the BLM in the Federal Register on January 12, 2006. The EPA's Federal Register NOA publication occurred on January 20, 2006, which officially began the public comment period. Written comments on the CWSA DEIS were accepted from January 20 to March 13, 2006 on the DEIS. A public meeting for the receipt of comments on the DEIS was held in Vernal, Utah, on February 8, 2006. Hard copies of the DEIS and project maps were made available

during this public meeting. BLM representatives were available for questions and comments. Except for representatives from one consulting firm and three oil and gas companies, no other publics or other government agencies attended the public meeting. Eight written comment letters were received by the BLM. Copies of the letters received are on file at the Vernal BLM Field Office in Vernal, Utah. A summary of the comments received during the DEIS commenting period are included in Chapter 6.0 of this FEIS.

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2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 ALTERNATIVE A - PROPOSED ACTION

In this FEIS, the Proposed Action is BLM's approval of EOG's proposed development, under which EOG proposes to drill a total of up to 627 new gas wells to the Green River Formation, Wasatch Formation, Mesaverde Group (including Blackhawk Formation), Mancos Shale and, possibly, other formations. Of the planned wells, 473 would be new well pad locations and 154 are expected to be twin wells drilled from existing locations. The twin wells would represent approximately 25 percent of the total new wells that would be drilled.

The majority of the proposed wells would be drilled on 40-acre surface spacing. However, some pilot 20-acre locations (see Figure 2-1, Appendix A) may be drilled to the Mesaverde Group within the CWSA to aid in the determination of whether development on 40-acre spacing can reasonably provide for the optimum recovery of reserves from the CWSA. The CWSA contains the Chapita Wells Unit and the Stagecoach Unit in addition to non-unitized lands. The ability to drill 20-acre surface spacing outside of the unitized areas of the CWSA would be subject to formal well spacing orders and well location patterns as prescribed by the BLM and Utah Division of Oil, Gas, and Mining (UDOGM). Approximately 66 of the proposed new well pad locations could be drilled on 20-acre spacing, however, an exact number, if any, has not yet been determined. If the results of the 20-acre pilot program are pursued and provide sufficient evidence that denser spacing is desirable from an economic and reservoir drainage perspective, additional 20-acre locations within the CWSA could be proposed by EOG in the future. Any such future Federal action would be subject to a separate project-specific/site-specific analysis and approval. Twenty-acre spacing is not part of the Proposed Action because EOG considers the success of the pilot program to be sufficiently speculative that its consideration is currently not warranted to meet the Purpose and Need for the action.

EOG's long-term plan of development is to drill wells at the rate of approximately 90 wells per year over a period of seven years, or until the resource base is fully developed. The total number of wells drilled would depend largely on factors outside of EOG's control such as production success, engineering technology, economic factors, availability of commodity markets, drilling rig availability, and lease stipulations.

The productive life of each proposed well is estimated to be 40 years. Associated facilities and infrastructure required by the Proposed Action would include roads, gas pipelines, and separation, dehydration, metering, and produced fluid storage facilities.

Proposed wells, pipelines, and access roads are conceptually illustrated in Figure 2-1 (Appendix A). Although Figure 2-1 illustrates the 20-acre wells as being located in Sections 22 and 23, T9S/R22E, and Sections 33 and 34, T9S/R23E, they may be drilled in other parts of the CWSA. Figure 2-1 (Appendix A) also illustrates existing wells and wells previously approved under the Chapita Wells 1999 EA that have not yet been drilled.

Implementation of the Proposed Action would occur in three primary phases: drilling and construction of facilities; production and maintenance; and decommissioning and reclamation. Specific details of the Proposed Action are described in the following sections.

2.1.1 Construction

Construction operations would generally occur during daylight hours only. However, there could be infrequent circumstances that would require construction to occur on either side of daylight hours.

2.1.1.1 Well Pads

Prior to well pad construction or surface disturbance activities, EOG would obtain approval of an APD by the BLM and/or the UDOGM. Each APD would contain site-specific COAs that apply to construction and well operations.

Well pads would be constructed from the native sand/soil/rock materials present. Mineral materials would not be required. Well pad locations would be leveled by balancing cut and fill areas. Construction practices could include blasting or ripping to achieve a level pad. Blasting is normally required when bedrock is near the surface; however, blasting would not be used within 800 feet of Fantasy Canyon. Two or three pieces of heavy equipment, such as bulldozers and/or motor graders, would be used to perform earth-moving operations. Topsoil and vegetation would be removed from the well pad area. Topsoil would be stockpiled for use in future reclamation practices. A six to eight-foot wide cellar would be constructed on the pad to allow access to casing heads and rat holes adjacent to the wellbore to accommodate drilling operations. A temporary reserve pit, approximately twelve feet deep, would also be excavated within the pad.

Single well pad sizes would vary from two to three acres, depending on the size of the drilling rig used. For disturbance calculation purposes, the average well pad size is estimated to be 2.5 acres (i.e., 310 by 350 feet). A well pad supporting two wells may require an additional 0.5 acres of disturbance or approximately 3.0 acres in total for the two wells. Construction of well pads for 627 wells, 154 of which could support two wells on a single pad, would result in the initial disturbance of approximately 1,260 acres. Dry holes would be reclaimed after the well is evaluated as unproductive (see Appendix E). Approximately three percent of the proposed wells (i.e., 19 wells) are estimated to be dry holes.

An average reserve pit size is estimated to be approximately 0.258 acres, based upon average dimensions of 150 by 75 feet. Reserve pits would be reclaimed in compliance with Onshore Order #1. Plastic liners would be torn and perforated before backfilling the pit.

As discussed in Section 2.3.1, EOG would not drill from new or existing well pads within the 100-year floodplain of the White River Corridor. The most recent data available regarding 100-year floodplains in the CWSA is a 1977 HUD and FEMA survey, which inventoried public and State lands in Uintah County. The White River 100-year floodplain is illustrated in Figure 3.2-1 (Appendix A).

Furthermore, EOG would not drill new wells in the White River corridor that would result in new well pads and roads. The White River corridor is defined as the line of sight from the centerline, up to ½ mile, along both sides of the White River. The oil and gas resources beneath the White River corridor in the CWSA have been leased by the United States, and under the terms of such leases, the BLM cannot deny EOG's valid, existing rights to drill and develop this leasehold. Thus, EOG may drill new twin wells on existing well pads within the White River corridor (but outside the 100-year floodplain). These twins to existing wells would require no new roads.

Table 2.1-1 reflects surface disturbance estimates associated with the well pads by surface owner.

Table 2.1-1. Proposed Action Well Pad Disturbance[1] by Surface Owner

Surface Ownership	Acreage in CWSA	Number of Wells		Surface Disturbance Associated with Well Pads (acres)
		Single Well Locations	Twin Well Locations	
BLM	22,693	382	97	1,004
State of Utah	1,914	24	0	60
Ute Tribe/Allottees	6,577	64	50	185
Private	688	3	7	11
Total	31,872	473	154	1,260[1]

[1] Minor discrepancy due to rounding.

2.1.1.2 Access Roads

Existing roadways would be used where possible, and new roads would be constructed where needed. Construction of proposed roads would conform to standards as outlined in the BLM *Gold Book (*Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, 4th Edition, 2007). EOG, in consultation with Uintah Engineering and Land Surveying, depicted conceptual access routes to the proposed well pads on Figure 2-1 (Appendix A), but the exact location of access roads would be determined and approved by the appropriate SMA at the time of the onsite inspection. Under the Proposed Action, the proposed roads are expected to cross Federal, State, Tribal, and private surfaces.

All construction materials for the proposed access roads would consist of native borrow and soil accumulated during road construction. Mineral materials would not be required. Road construction would utilize standard grading techniques. Dry drainage crossings would typically be of the dry creek drainage crossing type. Crossings would be designed to prevent the accumulation of silt or debris and would not be blocked by the roadbed. Water would be diverted from the roadway at frequent intervals. All travel during construction would be restricted to the 30-foot disturbed road width.

Access to the 627 new wells (154 of which would support two wells on a single pad) would result in the construction of approximately 99.5 miles[1] of new roads for the 473 new well pad locations. All new roads shall be designed and constructed to a safe and appropriate standard, “no higher than necessary” to accommodate their intended use. Standards and procedures described in the *Gold Book* will be followed when designing and constructing new access roads. The typical running surface of proposed roads would be 18 feet wide. However, for analysis purposes access road surface disturbance has been calculated using

[1] It is important to note that road mileages, and subsequent disturbance calculations within this EIS are approximate, and are based on the conceptual road locations and lengths illustrated on Figure 2-1 in Appendix A.

a width of 30 feet, which is based on the width of a typical road ROW. As such, the construction of a single-well access road would result in an average long-term disturbance of less than 0.8 acres. Construction of all 473 well pads would result in approximately 362 acres of long-term disturbance from proposed roads, approximately 297 acres of which would occur on BLM-administered lands.

As discussed in Section 2.3.1, EOG would not build new well pads or new roads in the White River corridor. EOG may drill new twin wells on existing well pads within the White River corridor (but outside the 100-year floodplain of the river). However, these twins to existing wells would require no new roads.

Table 2.1-2 reflects surface disturbance calculations from proposed roads.

Table 2.1-2. Access Road Surface Disturbance[1] by Surface Owner under the Proposed Action

Surface Ownership	Proposed Pad Locations	Length of Roads (feet)	Length of Roads (miles)	Acres	Road Disturbance as a Percentage of the 31,872-acre CWSA
BLM	382	431,874.4	81.8	297.4	0.9
State of Utah	24	32,780.5	6.2	22.6	0.1
Ute Tribe/Allottees	64	59,260.1	11.2	40.8	0.1
Private	3	1,424.8	0.3	1.0	0.0
Total	473	525,339.9	99.5	361.8	1.1

[1] Minor discrepancy due to rounding.

Existing roads that require upgrading would meet standards appropriate to the anticipated traffic flow and all-weather road requirements. Upgrading may include ditching, drainage, graveling, crowning, and capping the roadbed as necessary to provide a well-constructed, safe roadway. Upgrading would not occur during muddy conditions.

2.1.1.3 Pipelines

Steel pipe gathering lines with a three to four-inch outside diameter (OD) would be installed on the surface to transport the produced gas from the wells to larger lateral lines. Steel pipe lateral lines with a four to eight-inch OD would be installed on the surface as needed throughout the CWSA, depending on well performance and gathering system requirements. EOG, in consultation with Uintah Engineering and Land Surveying, has depicted conceptual potential pipeline routes on Figure 2-1 (Appendix A) but the exact location of pipelines would be determined at the time of the onsite inspection with the appropriate SMA. Under the Proposed Action, the proposed pipelines are expected to cross Federal, State, Tribal, and private surface.

Approximately 104.5 miles of pipelines[2] would be constructed under the Proposed Action. All proposed pipelines would be laid on the surface. Pipelines would be buried at road crossings in order to provide and maintain access routes, but no additional surface disturbance would result. Approximately 50 percent of the proposed pipelines are

[2] It is important to note that pipeline mileages, and subsequent disturbance calculations within this EIS are approximate, and are based on the conceptual pipeline locations and lengths illustrated on Figure 2-1 in Appendix A.

anticipated to be installed parallel to the proposed and existing access roads. The remaining pipelines would be installed as cross-country pipelines (see Figure 2-1, Appendix A for a conceptual illustration).

The amount of surface disturbance associated with pipeline installation is based upon a disturbance width of eight feet, corresponding to the width of land required for temporary use by pipeline installation equipment. Total surface disturbance associated with proposed pipelines would be approximately 101 acres, approximately 94 acres of which would occur on BLM-administered lands. **Table 2.1-3** summarizes disturbance associated with pipeline construction.

Executive Order 11988 requires Federal agencies to make decisions in a manner that promotes avoidance of adverse impacts and reduces the risk of property loss and human safety due to floodplain development/modification, and preserves the natural and beneficial values of floodplains. Floodplain development/modification is allowed only if there are no other feasible alternatives. In accordance with EO 11988, where pipelines would cross washes, floodplains, or other areas prone to flooding, construction methods would follow recommendations in the Utah BLM guidance document "Hydraulic Considerations for Pipeline Crossings of Stream Channels" (BLM 2005). These recommendations would help prevent erosion and increased sediment yield at these locations.

Table 2.1-3. Pipeline Surface Disturbance[1] by Surface Owner under the Proposed Action

Surface Ownership	Proposed Pad Locations	Length of Pipelines (feet)	Length of Pipelines (miles)	Acres	Pipeline Disturbance as a Percentage of the 31,872-acre CWSA
BLM	382	512,129.3	97.0	94.1	0.3
State of Utah	24	29,401.7	5.6	5.4	0.0
Ute Tribe/Allottees	64	7,242.1	1.4	1.3	0.0
Private	3	2,765.9	0.5	0.5	0.0
Total	473	551,539.0	104.5	101.3	0.3

[1] Minor discrepancy due to rounding.

2.1.2 Drilling Operations

Drilling operations would be conducted in compliance with all Federal Oil and Gas Onshore Orders, all UDOGM rules and regulations, and all applicable local rules and regulations. EOG anticipates that an average of four drilling rigs would be operating at any particular time in the CWSA to achieve its production objectives.

Following construction of the access road and well pad, a mobile drilling rig would be transported to the well site (along with other necessary equipment) and would be erected on the well pad. Drilling would commence with the spudding of a well. Drilling operations would generally include: adding new joints of pipe at the surface as the hole deepens; circulating drilling mud to cool the drill bit and remove the cuttings; removing the drill string from the hole to replace worn drill bits; and setting production casing and cementing it in place.

Water use during drilling operations would vary in accordance with the formations to be drilled:.

- Drilling the estimated 15 Green River Formation wells would require three to five days per well to reach 1,000 to 6,000 feet, and would use approximately 5000 barrels of water per well (0.64 acre-feet per well).

- Drilling the estimated 126 Wasatch Formation wells would require five to 10 days per well to drill to 6,000 to 8,000 feet, and would use approximately 8,000 barrels of water per well (1.03 acre-feet per well).

- Drilling the estimated 470 Mesaverde Group wells would require 10 to 25 days per well to drill to depths of 8,000 to 11,000 feet, and would use approximately 14,000 barrels of water per well (1.80 acre-feet per well).

- Drilling the estimated 16 Mancos Shale wells would require 25 to 35 days per well to reach 11,000 to 12,000 feet, and would use approximately 20,000 barrels of water per well (2.57 acre-feet per well).

It is important to note that an estimated 31 wells may be drilled to formations other than the Wasatch and/or Mesaverde; however, EOG has not yet determined an exact number of wells that would be drilled to other formations, nor the exact formations to which they would be drilled. Total water needed for drilling operations over the seven-year drilling season would be approximately 7,983,000 barrels (1,029 acre-feet), for a total of approximately 147 acre-feet per year.

Drilling fluids would consist of a water/gel mixture, with water being the main constituent. In order to achieve borehole stability and minimize possible damage to the gas producing formations, a potassium chloride substitute and commercial clay stabilizer may be added to the drilling fluid. Drilling fluid would be circulated by means of pump pressure from the reserve pit down the drill pipe, out jets in the bit, up the annulus (i.e., the space between the well bore and the drill pipe), and returned to the reserve pit along with drill cuttings from the wellbore. No hazardous substances would be placed in this pit. The reserve pit would be constructed so as not to leak, break, or allow discharge. The reserve pit would be fenced on three sides during drilling operations and on the fourth side when the rig moves off the location. Fences would be constructed according to standards established in the *Gold Book,* or as otherwise required by the SMA.

During drilling operations, a blow out preventer (a manifold mounted below the rig floor consisting of manual and hydraulic rams) would be installed to be able to seal the wellbore in the event that down-hole pressure exceeds the drilling mud's hydrostatic pressure, allowing reservoir fluids to enter the wellbore.

Prior to setting casing, open-hole well logs may be run to evaluate the well's production potential. If the evaluation concludes that sufficient gas is present and recoverable, then steel production casing would be run and cemented in place in accordance with the well design, as specified in the APD and COAs. Evaluation logs may be run subsequent to setting and cementing production casing.

The types of casing used, and the depths to which they are set, would depend upon the physical characteristics of the formations that are drilled. All casing would be new or inspected. Surface casing would be installed to protect near-surface aquifers. Intermediate and/or production casing would subsequently be run to attain total depth.

2.1.3 Completion Operations

Completion operations would consist of cementing and perforating the casing and stimulating the formation, and would follow the procedures specified in the 1999 Chapita Wells EA.

The casing and cementing program would be designed to isolate and protect the shallower formations encountered in the wellbore and to prohibit pressure communication or fluid migration between different formations. In addition, the cement would protect the well by preventing formation pressure from damaging the casing and retarding corrosion by minimizing contact between the casing and formation fluids. Once production casing has been cemented in place, the drilling rig would be released and a completion rig would be moved in. The casing would be perforated across the gas-producing zones, followed by a stimulation treatment of the formation to enhance its transmissibility of gas.

The typical stimulation in the CWSA is a hydraulic fracture treatment of the reservoir. Fresh water/sand slurry would be used with gels and other chemical additives to ensure the quality of the fracture fluid. Fluid would be pumped down the well through perforations in the casing and into the formation. Pumping pressures are increased to the point where the formation fractures or breaks. The sand serves as a proppant to keep the created fracture open, thereby allowing reservoir fluids to move more readily into the well.

Approximately 2,000 to 12,500 barrels (average of 10,000 barrels) of water would be needed to complete each well. Total water needed for completion over the seven-year drilling season would be approximately 6,315,000 barrels (814 acre-feet), for a total of approximately 116 acre-feet per year.

2.1.4 Production and Maintenance

Well production equipment would be installed on the location if a well were successfully completed. Equipment needed to produce the well would include a wellhead, valves, piping, and a combination separator/dehydrator/gas meter that would be housed in a small building on each location. All gas would be measured electronically, and telemetry equipment is planned. The use of well telemetry would reduce the need for pumpers to inspect the well sites. Production pits would not be used and well site compression is not anticipated.

Each Green River and Wasatch location would use one 300-barrel tank for storing condensate and water. The tank would be approximately 12 feet in diameter and 18 feet high, with stairs and walkway. Each Mesaverde and Mancos “B” location would use two 400-barrel tanks for storing water and condensate. Each tank would be approximately 12 feet in diameter and 20 feet high, with stairs and walkway. Plunger lift equipment would generally be installed at some point during the life of a well. Mesaverde and Mancos “B” well locations would contain drums of scale inhibitor and would have associated injection pumps. Methanol tanks and pumps would infrequently be required on these locations.

All permanent structures (i.e., on site six months or longer) constructed or installed would be painted a flat, non-reflective, earth-tone color as specified by the appropriate SMA. All facilities requiring painting would be painted within six months of installation. Interim reclamation of well locations and ROWs not needed for production activities would be conducted soon after the associated well(s) is put into production. Appendix E includes a reclamation plan for both interim and final reclamation activities.

Proposed wells would typically be visited daily but possibly less frequently depending upon well performance and availability of well site telemetry.

Workovers would be required periodically to repair worn downhole equipment, to sustain existing production rates, or to recomplete the well to enhance its productivity. A workover uses a unit similar to a completion rig. These repairs generally would occur only during daylight hours and are typically of short duration. The length of workover operations can range from one to 10 days, with a small number requiring more than 10 days. The frequency for this type of work cannot be accurately projected since workovers vary well by well and depend on site-specific circumstances. No additional surface disturbance would result from workover operations.

Road travel would be restricted to the 18-foot running width. Maintenance on project roads during drilling and construction would be the responsibility of EOG and would be consistent with specifications of the appropriate SMA. Throughout the duration of the project, EOG would monitor the project roads and perform appropriate repairs. Repairs may be necessary to correct excessive soil movement, rutting, braiding around problem areas, and/or damage to cattleguards or gates.

2.1.4.1 Gas Treatment and Compression

Gas would be transported from the wellhead via gathering pipelines owned by Questar Gas Management (QGM) to centralized compression and dehydration facilities at the QGM Chapita Wells Unit (CWU) compressor station or to the Wonsits Valley compressor station. The CWU compressor station is a previously approved facility located within the CWSA. It consists of two compressors with a total of approximately 4,000 horsepower (hp). Gas compressed through the CWU compressor station would then be transported to the CIG 101 compression and processing plant in Natural Buttes and/or the Red Wash gas processing facilities, and from there into mainline pipelines. Gas compressed through the Questar Wonsits Valley compressor station would be processed at the Red Wash gas processing facilities and would then be transported to mainline pipelines.

An additional 5,000 hp (approximate) of compression capacity may be required at the QGM CWU compressor station in order to accommodate anticipated volume growth from proposed wells in the CWSA and to allow for the movement of gas at higher pressure to the Red Wash processing facilities outside the CWSA. As previously stated, well site compression is not anticipated.

2.1.4.2 Produced Water

Produced water may be confined to a lined pit or storage tank for a period not to exceed 90 days after initial production. After the 90-day period, the produced water contained at the well site would be transported by water hauling trucks to disposal facilities. Produced water not utilized for drilling operations would be disposed of via subsurface injection or by evaporation at commercial disposal pits located within and outside the CSWA. Up to four wells may need to be drilled or converted for use as produced water disposal wells. The number of produced water disposal wells would depend upon EOG's ability to obtain the necessary permits. The produced water disposal wells would be permitted through the appropriate authority prior to the conversion of existing wells or the construction of new disposal wells.

It is anticipated that the water disposal wells would require the use of injection pumps. Either natural gas driven generators or gas-fueled engines would be used initially to supply power to the pumps. Overhead electric lines may be subsequently installed to provide power to the pumps, replacing the generators or gas engines. The power lines would be

secondary lines originating from the Fidlar Station. If overhead electric lines were installed, less than 0.01 acres of surface disturbance is estimated to result from pole installation.

The construction of four injection wells would result in an amount of surface disturbance equivalent to the drilling of four gas wells (**Table 2.1-4**).

2.1.5 Surface Disturbance Summary under the Proposed Action

The Proposed Action would result in disturbance to Federal, State, Tribal, and private lands due to the construction, improvement and use of proposed roads, the construction or expansion of well pads, and the installation of aboveground pipelines.

Recent BLM monitoring has documented that interim reclamation efforts in oil and gas development areas have largely been unsuccessful due to below average precipitation and poor soil conditions. As such, BLM field inspections are indicating that short-term impacts may be more accurately portrayed as long-term impacts. Thus, all proposed surface disturbance will be considered long-term in the Chapter 4 environmental consequences discussions.

Total surface disturbance to construct all facilities, roads, and pipelines would be approximately 1,735 acres.

Approximately five percent of the total 31,872 surface acres within the CWSA would be disturbed for the long-term as a result of Proposed Action development. Of the estimated 1,735-acre disturbance, approximately 1,405 acres would be on BLM land, 88 acres would be on State land, 230 acres would be on Ute Tribal/allotted land, and 13 acres would be on private land. Approximately six percent of the BLM lands in the CWSA would be affected by Project well development. Lands owned by the State, the Tribe, and Tribal allottees would be affected to a lesser extent, reflecting the fewer number of wells that would be drilled on these surfaces.

A summary of Proposed Action-related disturbance is provided in **Table 2.1-4**.

Table 2.1-4. Surface Disturbance[1] by Type of Disturbance and Surface Owner under the Proposed Action

Surface Disturbance	BLM	State of Utah	Ute Tribe/Allottees	Private	Total	Percent of CWSA
Well Pads	1,004	60	185	11	1,260	3.9
Roads	297.4	22.6	40.8	1.0	361	1.1
Pipelines	94.1	5.4	1.3	0.5	101	0.3
Injection Wells	9.8	0	3.3	0	13	0
Total Surface Disturbance	1405.3	88	230.4	12.5	1,735	5.3
% of Affected Surface Owner Lands with the CWSA	6.1% of BLM Lands	4.5% of State Lands	3.5% of Tribal/allotted lands	2.1% of Private Lands		

[1] Minor discrepancies may occur due to rounding.

Most of the Proposed Action-related surface disturbance would result from the construction of well pads. By locating 154 new wells on existing well pads, the need to construct new drilling pads is reduced and therefore, approximately 385 acres of potential disturbance from new well pads within the CWSA would be prevented. Approximately 242 of the 385 undisturbed acres would be conserved on BLM lands.

EOG would continue to minimize surface disturbance as much as possible through the implementation of prudent road placement and construction practices determined at the time of the onsite inspection and by commingling production to the extent made possible after consideration of minerals ownership and spacing issues. EOG has developed a map that conceptually displays road placement within the CWSA (See Figure 2-1, Appendix A). The map was developed to serve as a guide in minimizing disturbance from new road construction and to facilitate efficient transport of the workforce and materials throughout the CWSA.

2.1.6 Water Requirements and Water Sources

Water needs for drilling operations by formation are addressed in Section 2.1.2. Total water needed for drilling over the seven-year drilling season would be approximately 7,983,000 barrels (1,029 acre-feet), for a total of approximately 147 acre-feet per year. Water needs for completion operations are addressed in Section 2.1.3. On average, approximately 10,000 barrels of water would be needed to complete a single well. Total water needed for completion over the seven-year drilling season would be approximately 6,315,000 barrels (814 acre-feet), for a total of approximately 116 acre-feet per year. Based on this information, approximately 263 acre-feet per year would be needed to drill and complete all 627 proposed wells.

Water used for drilling purposes would be obtained from the White or Green Rivers as a result of existing water rights with the State of Utah; commercial water source wells; or recycled water from drilling and completion operations. Typical commercial water supply sources include the Ouray Brine Plant at Ouray, Utah, and the Target Trucking water source in the SWSW Section 35, T9S/R22E, Uintah County, Utah (State Water Right #49-1501).

Water used for completion purposes generally comes from commercial water sources or from the City of Vernal, Utah. Water supply wells are not currently anticipated within the CWSA.

2.1.7 Hazardous Materials

A variety of chemicals, including lubricants, paints, and additives are used to drill and produce a well. Some of these chemicals can contain constituents that are hazardous. Hazardous materials include some greases or lubricants, solvents, acids, paint, and herbicides, among others. The transport, use, storage, and handling of hazardous materials would follow the procedures specified in the 1999 Chapita Wells EA. Transportation of hazardous materials to the well location is regulated by the Department of Transportation (DOT) under 49 CFR, Parts 171–180. DOT regulations pertain to the packing, container handling, labeling, vehicle placarding, and other safety aspects. Potentially hazardous substances used in the development or operation of wells would be kept in limited quantities on well sites and at the production facilities for short periods of time.

Most wastes generated under the Proposed Action would be exempt from hazardous waste regulations under the exploration and production exemption of the Resource Conservation

and Recovery Act (RCRA). Exempt wastes would include those produced at the wellhead, through the production stream, and through the inlet of the gas plant. Examples of exempt wastes include produced water, production fluids such as drilling mud or well stimulation flowback, and hydrocarbon impacted soils.

None of the chemicals that would be used to drill or produce the wells meet the criteria for an acutely hazardous material/substance, or meet the quantities criteria per BLM Instruction Memorandum No. 93-344. With the exception of produced hydrocarbons, chemicals subject to reporting under Title III of the Superfund Amendments and Reauthorization Act (SARA) in quantities of 10,000 pounds or more would not be used, produced, stored, transported, or disposed of during the drilling, completion, or operation of any well in the CWSA. In addition, no extremely hazardous substance, as defined in 40 CFR 355, in amounts above the threshold planning quantities, would be used, produced, stored, transported, or disposed of while producing any well.

Spills and releases can result in soils that are contaminated by produced water, petroleum products, or chemicals. EOG would develop and maintain a Spill Prevention, Control and Countermeasure (SPCC) plan for each well in the CWSA. To satisfy the EPA's SPCC requirements, if oil storage facilities or tanks were constructed, they would utilize secondary containment structures of sufficient capacity to contain, at a minimum, the entire contents of the largest tank, with sufficient freeboard to contain precipitation.

2.1.8 Reclamation

Reserve pits would be reclaimed in compliance with Onshore Order #1.

Final reclamation of a well site would be performed in compliance with applicable Federal, State, and Tribal regulations as well as the COAs on the APDs. All surface equipment, including pipelines, would be removed from the site. EOG would cut off the well casing at the base of the cellar, or three feet below the final graded ground level (whichever is deeper), and cap the casing with a metal plate a minimum of 0.25-inch thick. The cap would be welded in place with the well name and location engraved on the top. The cap would be constructed with a weep hole. Global Positioning System (GPS) coordinates of the caps would be recorded. The surface would be recontoured to its original appearance, to the extent possible. Topsoil would be distributed to blend the site in with its natural surroundings. All disturbed areas would then be planted with a seed mixture of desired vegetation species as specified by the appropriate SMA. Additional information on reclamation is provided in Appendix E.

2.1.9 Workforce and Time Requirements

The majority of the workforce requirement for the Proposed Action would be for construction, drilling, and completion activities. On average, on-location workforce needs for construction activities would be two, five-person crews per month. Up to four drill rigs could be operating during any given month over the seven-year construction season. On average, on-location workforce needs for drilling and completing an individual well would be 10 people, but could range from five to 30 people per well. During production, a minimal workforce would be required to operate and maintain the facilities. Specific labor needs for construction and drilling activities are discussed in the following sections.

2.1.9.1 Construction

Construction of an individual well pad and associated access road typically takes five to seven days. Approximately two construction crews would generally be working each month over the seven-year construction period. Each construction crew would be comprised of four to six people (average of five people per crew), who would access the location using an average of three light trucks.

2.1.9.2 Drilling

Drilling operations would occur on a 24-hour per day basis and would require an average workforce of ten people per well using between four and ten vehicles. Up to four wells could be drilled per month per rig over the seven-year construction season. Drilling times would vary from a minimum of three days to reach shallower formations, to a maximum of 35 days to reach deeper formations. Related traffic would include light trucks, water trucks, and heavy equipment.

2.1.9.3 Completion

Completion operations would require an average of ten people per well over a period of three to ten days, using two to 20 vehicles. Up to four wells could be completed per month per rig over the seven-year construction season.

2.2 ALTERNATIVE B - NO ACTION

Under the No Action Alternative, the BLM would reject EOG's proposed development on Federal lands as described in the Proposed Action. However, natural gas development would continue to occur on Federal lands under the authority of prior approvals and on non-Federal lands subject to the approval of the appropriate SMA.

The effects of previously approved development on Federal lands within the CWSA have been addressed in other NEPA documents which are available to the public. For this reason, the No Action Alternative for this EIS focuses on new development on non-Federal lands. The No Action Alternative assumes a maximum level of development of approximately 148 wells, including 24 wells on State of Utah lands, 114 wells on the Ute Tribal/allotted lands and 10 wells on private lands. Specific details of the No Action Alternative are discussed in the following sections.

2.2.1 Construction

2.2.1.1 Well Pads

Prior to well pad construction or surface disturbance activities under the No Action Alternative, EOG would obtain approval of an APD from the BLM and/or UDOGM, as required. Each APD would contain site-specific COAs that apply to construction and well operations. The description of well pad construction would be similar to that discussed under the Proposed Action. Well pad disturbance under the No Action Alternative is summarized in **Table 2.2-1**.

Table 2.2-1. Well Pad Disturbance by Surface Owner Under the No Action Alternative

Surface Ownership	Acreage in CWSA	Number of Wells		Surface Disturbance Associated with Well Pads (Acres)
		Single Well Locations	Twin Well Locations	
BLM	22,693	0	0	0
State of Utah	1,914	24	0	60
Ute Tribe/Allottees	6,577	64	50	185
Private	688	3	7	11
Total	31,872	91	57	256[1]

[1] Minor discrepancy due to rounding.

2.2.1.2 Access Roads

Under the No Action Alternative, access to the 148 new wells (57 of which would be drilled from existing locations) would result in the construction of approximately 17.7 miles of new roads for the 91 new surface locations. Although the running surface of new roads would be 18 feet wide, long-term road disturbance is calculated using a width of 30 feet based on the width of a typical road ROW. Construction of all 91 new well pads would result in approximately 64.4 acres of disturbance from proposed roads. **Table 2.2-2** reflects surface disturbance calculations from proposed roads under the No Action Alternative. The descriptions of access road construction and maintenance under the No Action Alternative would be similar to those described for the Proposed Action.

Table 2.2-2. Access Road Surface Disturbance[1] by Surface Owner under the No Action Alternative

Surface Ownership	Proposed Pad Locations	Length of Roads (feet)	Length of Roads (miles)	Acres	Road Disturbance as a Percentage of the 31,872-acre CWSA
BLM	0	0	0	0	0
State of Utah	24	32,780.5	6.2	22.6	0.1
Ute Tribe/Allottees	64	59,260.1	11.2	40.8	0.1
Private	3	1,424.8	0.3	1.0	0.0
Total	91	93,465.4	17.7	64.4	0.2

[1] Minor discrepancy due to rounding.

2.2.1.3 Pipelines

Under the No Action Alternative, approximately 50 percent of the proposed pipelines would be installed parallel to the proposed and existing access roads. Surface disturbance associated with pipeline installation is based upon a disturbance width of eight feet, corresponding to the width of land required for temporary use by pipeline installation equipment. The total amount of disturbance associated with proposed pipelines under the No Action Alternative would be approximately 6.8 acres corresponding to approximately

7.5 miles of proposed pipelines. **Table 2.2-3** summarizes disturbance associated with pipeline construction. The descriptions of pipeline construction methods under the No Action Alternative would be similar to those described for the Proposed Action.

Table 2.2-3. Pipeline Surface Disturbance Associated by Surface Owner under the No Action Alternative

Surface Ownership	Proposed Pad Locations	Length of Pipelines (feet)	Length of Pipelines (miles)	Acres	Pipeline Disturbance as a Percentage of the 31,872-acre CWSA
BLM	0	0.0	0.0	0.0	0.0
State of Utah	24	29,401.7	5.6	5.4	0.0
Ute Tribe/Allottees	64	7,242.1	1.4	1.3	0.0
Private	3	2,765.9	0.5	0.5	0.0
Total	91	39,409.7	7.5	7.2	0.0

2.2.2 Drilling, Completion and Production Operations

The descriptions of drilling, completion and production operations under the No Action Alternative would be similar to those described for the Proposed Action.

2.2.3 Surface Disturbance Summary under the No Action Alternative

The No Action Alternative would result in disturbance to State, Tribal, and private lands due to the construction, improvement, and use of proposed roads; the construction or expansion of well pads; and the installation of aboveground pipelines.

Total surface disturbance required to construct all facilities, roads, and pipelines would be approximately 329 acres. Of the estimated 329-acre disturbance, approximately 88 acres would be on State land, 230 acres would be on Ute Tribal/allotted land, and 12 acres would be on private surface. Within the entire CWSA, approximately one percent of the surface would be disturbed as a result of natural gas development under the No Action Alternative.

A summary of surface disturbances under the No Action Alternative is provided in **Table 2.2-4**.

Table 2.2-4. Surface Disturbance[1] by Type of Disturbance and Surface Ownership under the No Action Alternative

Surface Disturbance	BLM	State of Utah	Ute Tribe/Allottees	Private	Total	Percent of 31,872-acre CWSA
Well Pads	0	60	185	11	256	0.8
Roads	0	22.6	40.8	1.0	64	0.2
Pipelines	0	5.4	1.3	0.5	7	0.0
Injection Wells	0	0	2.5	0	2.5	0.0
Total Surface Disturbance	0	88	229.6	12.1	329.5	1.0
Percent of Long-term Disturbance with Respect to CWSA Acreage by Surface Owner[2]	0% of BLM Lands	4.2% of State Lands	2.9% of Tribal/allotted lands	1.3% of Private Lands	-	-

[1] Minor discrepancy due to rounding.
[2] Long-term disturbance = short-term disturbance less reserve pit and dry hole acreages.

2.2.4 Water Requirements and Water Sources

Water use during drilling and completion operations would vary in accordance with the formations to be drilled.

Under the No Action Alternative, drilling the estimated four Green River Formation wells would require approximately 5,000 barrels of water per well (0.64 acre-feet per well). Drilling the estimated 29 Wasatch Formation wells would require approximately 8,000 barrels of water per well (1.03 acre-feet per well). Drilling the estimated 111 Mesaverde Group wells would require approximately 14,000 barrels of water per well (1.80 acre-feet per well). Drilling the estimated four Mancos Shale wells would require approximately 20,000 barrels of water per well (2.57 acre-feet per well). Total water needed for drilling over the two-year drilling season would be approximately 1,886,000 barrels (243 acre-feet), for a total of approximately 122 acre-feet per year.

Approximately 2,000 to 12,500 barrels (average of 10,000 barrels) of water would be needed to complete a single well from each of the target formations. Total water needed for completion over the two-year drilling season would be approximately 1,490,500 barrels (192 acre-feet), for a total of approximately 96 acre-feet per year.

Water used for drilling purposes would be obtained from the White or Green Rivers as a result of existing water rights with the State of Utah; commercial water source wells; or recycled water from drilling and completion operations. Typical commercial water supply sources include the Ouray Brine Plant at Ouray, Utah, and the Target Trucking water source in the SWSW Section 35, T9S/R22E, Uintah County, Utah (State Water Right #49-1501).

Water used for completion purposes generally comes from commercial water sources or from the city of Vernal, Utah. Water supply wells are not currently anticipated within the CWSA.

2.2.5 Hazardous Materials

Hazardous material use under the No Action Alternative would be similar to that described under the Proposed Action.

2.2.6 Reclamation

Reclamation activities under the No Action Alternative would be similar to those described for the Proposed Action.

2.2.7 Workforce and Time Requirements

Workforce and time requirements for construction, drilling, and completion under the No Action Alternative would be similar to those described for the Proposed Action.

2.3 APPLICANT-COMMITTED MEASURES COMMON TO ALL ALTERNATIVES

EOG commits to applying the following design features to the development of its proposed wells in the CWSA. The features are in addition to others described in the Proposed Action, such as drilling a twin well adjacent to an existing well on a common well pad to reduce surface disturbance. These design features do not replace local, state, Federal or Tribal requirements. EOG decided to voluntarily implement these design features to further minimize impacts to environmental resources in the CWSA.

2.3.1 Protection of the White River and 100-Year Floodplains

EOG would not drill from new or existing well pads within the 100-year floodplain of the White River Corridor. The most recent data available regarding 100-year floodplains in the CWSA include a 1977 U.S. HUD and FEMA survey, which inventoried public and State lands in Uintah County. The White River 100-year floodplain is illustrated in Figure 3.2-1 (Appendix A).

EOG would not drill new wells in the White River corridor that would result in new well pads and roads. The White River corridor is defined as the line of sight from the centerline, up to ½ mile, along both sides of the White River. The oil and gas resources beneath the White River corridor in the CWSA have been leased by the United States, and under the terms of such leases, the BLM cannot deny EOG's valid, existing rights to drill and develop this leasehold. EOG may drill new twin wells on existing well pads within the White River corridor (but outside the 100-year floodplain). These twins to existing wells would require no new roads.

For surface-disturbing activities proposed within the 100-year floodplains of Coyote Wash and Red Wash, additional applicant-committed design features would be considered on a site-specific basis during the onsite inspection in order to maintain and protect wildlife habitat, water quality, quality of the recreation experience, and other land uses. Such site-specific design features could include the use of closed-loop drilling within the 100-year floodplain, directional drilling, placement of surface facilities (other than the associated wellhead and pipeline) outside of the floodplain, and/or other measures designed to eliminate potential impacts to the floodplains. The decision to implement additional,

site-specific design features within the 100-year floodplains of Coyote Wash and Red Wash would be determined on a well-by-well basis during the APD approval process.

2.3.2 Recreation and Visual Resources

Twin wells in the White River corridor (but outside the 100-year floodplain) will be located, designed, or screened to be out of view of recreational boaters on the White River from the upstream boundary of the Chapita Wells Unit to the Mountain Fuel Bridge. The White River Seen Area Analysis (Chapter 4.0, Map 4-1, EOG Resources, Inc., Environmental Assessment Chapita Wells Unit Infill Development, Uintah County Utah, EA No. UT-080 1999-32) is the conceptual guideline used to define areas that are out of view of White River recreational boaters. In conjunction with the APD, EOG and the AO will jointly determine the use of topographic features and placement of facilities, such as low-profile tanks, to prevent facilities from view. EOG will use telemetry/automation to reduce vehicle trips to these locations.

If drilled, twin wells within the White River corridor (but outside the 100-year floodplain) will be drilled during the months of August though April, outside of the typical boating season, to the extent possible in consideration other applicable constraints, such as seasonal restrictions associated with wildlife protection. If EOG is unable to schedule drilling operations outside of the boating season, a drilling rig, workover rig, and associated equipment may be visible to recreational boaters on the White River temporarily while a well is being drilled or re-worked.

EOG shall improve sight distances along routes accessing Fantasy Canyon and the White River by implementing construction measures developed in conjunction with the AO. Such measures would include taking out high points on rises and by laying back cut slopes near blind turns.

EOG would post signs along routes accessing Fantasy Canyon and the White River warning motorists of heavy truck traffic.

Operating equipment on all lands contained within the boundaries of the CWSA would be painted in a flat non-reflective color that is compatible with the surrounding landscape as specified by the appropriate SMA. Unpainted steel pipe would be used for surface gathering pipelines, which after rusting would blend with the existing landscape.

2.3.3 Cultural Resources

Prior to any project-related surface disturbance, all locations proposed for surface disturbance would be examined by an archaeologist approved by the applicable surface management agency to determine the presence of cultural resources. If any cultural resources are found, recommendations would be made to avoid or recover such resources. The possible need for onsite monitoring would be addressed at the onsite review. If any historic or archaeological resources are found during operations, all surface disturbing activities that could further disturb such materials would be suspended until the appropriate authorities are contacted, and a review of the situation is completed.

2.3.4 Paleontological Resources

In sensitive fossil areas (Condition 1) where bedrock is exposed at or near surface (generally less than three feet below the soil surface), a qualified and approved

paleontologist would examine locations proposed for surface disturbance for paleontological resources and make recommendations regarding the disposition of such resources. The possible need for onsite monitoring would be addressed at the onsite review. If any paleontological resources are found during operations, all operations that could further disturb such materials would be suspended until the AO of the appropriate SMA is contacted, and a review of the situation is completed.

2.3.5 Threatened, Endangered, and Other Sensitive Species

Prior to any project-related surface disturbance, all locations proposed for surface disturbance would be examined by a wildlife biologist and botanist approved by the applicable SMA to determine if any Federally Threatened or Endangered (T&E) plant or wildlife species are present. If present, EOG would consult with the appropriate SMA prior to initiating any surface disturbance activities, and shall implement appropriate avoidance or mitigation measures. Site-specific T&E species clearances would be performed at the time of the onsite review.

2.3.6 Raptors

In conjunction with the APD, EOG would coordinate with the applicable SMA to have a survey conducted (by an approved biologist) prior to surface-disturbing activities to determine whether raptor nests are present within 0.5 mile of locations proposed for surface disturbance. If nests are determined to be present, the AO from the appropriate SMA shall determine appropriate measures to avoid disturbing active nest sites and to protect the viability of all nest sites or potential future nest sites. Such measures may include: timing limitations on new construction and surface-disturbing activities within 0.5 mile of known nests (1.0 mile for nesting peregrine falcons); the use of terrain features to shield the nest site from human activities; and the construction of Artificial Nest Sites (ANS) in appropriate locations.

2.3.7 Surface Disturbance and Erosion Control

Erosion control at locations proposed for surface disturbance would consist of building sediment retention dams down slope from these facilities. Grading of individual locations shall direct drainage away from established watercourses. Each of the sediment retention dams shall be constructed so that they would function as a spillway if the dams become filled with sediment.

EOG would assume maintenance responsibilities for sediment retention features for three years from the time of construction. Sediment dams and basins would be evaluated over time and cleaned out as necessary. In addition, based on a site-specific review by the AO, sediment retention features associated with plugged and abandoned wells would be cleaned out or eliminated. Elimination would include removing the dam, grading to restore the original contour, and reseeding as directed by the AO.

As feasible, EOG would utilize centralized tank locations for water and condensate tanks. The feasibility of centralizing tank facilities would be determined on a site-specific basis.

2.3.8 Noise

EOG would utilize plunger equipment when practical in order to minimize the need for venting low-volume wells.

2.3.9 Abandonment Marker

At final abandonment, EOG shall cut off all casing at the base of the cellar or 3 feet below final restored ground level, whichever is deeper, and cap the casing with a metal plate a minimum of 0.25 inch thick. The cap would be welded in place and the well location and identity would be permanently inscribed on the cap. The cap also would be constructed with a weep hole. GPS coordinates of the caps would be recorded.

2.3.10 Gold Book Compliance

EOG will follow the procedures specified in *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development* (the Gold Book), 4th Edition, 2007.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

2.4.1 One Well Per Well Pad

EOG briefly considered developing natural gas within the CWSA by using one new well pad for every proposed well. This alternative would have resulted in the construction of an additional 154 new well pads, and approximately 385 acres of surface disturbance from well pad construction, 117.7 acres of additional surface disturbance for road construction (based on approximately 1,110.6 feet of access road per well pad), and 32.9 acres of surface disturbance for pipeline construction (based on approximately 1,166.0 feet of pipeline per well pad). In total, this alternative would have resulted in approximately 535.6 acres of surface disturbance above and beyond that described under the Proposed Action. Consequently, this additional surface disturbance would have incrementally contributed to impacts on natural resources within the CWSA, such as those described in Chapter 4.0 (e.g., wildlife habitat loss and fragmentation, erosion and sediment yield, etc.). Rather than continue with a One Well Per Well Pad proposal, EOG determined that they could co-locate 154 of their proposed wells on existing pad locations, successfully fulfill their purpose and need, and reduce overall surface disturbance and related effects on natural resources. Based on this information, the One Well Per Well Pad alternative was eliminated from further analysis in this EIS.

2.4.2 No New Development

A No New Development alternative, which would deny all APDs and ROWs on BLM surface in the CWSA, was briefly considered but eliminated from further analysis because it does not meet the purpose and need for this project, for the following reasons:

- One hundred sixty one (161) wells, 26 miles of access road, and 26 miles of pipeline, were approved in the Decision Record and FONSI for the 1999 Chapita Wells EA (BLM 1999). As of March 1, 2004, 100 wells approved by the 1999 Chapita Wells EA Decision Record and FONSI remained to be drilled and/or constructed in the CWSA. Since the 100 wells in the 1999 Chapita Wells EA were previously analyzed and approved, they would not support a “no new development” alternative, and therefore, a “no new development” alternative is not reasonable for this EIS.

- With approval from the appropriate landowner, development would occur on Tribal,

State of Utah, and private lands within the CWSA regardless of a BLM decision to deny development of Federal lands. Therefore, a "no new development" alternative is not reasonable for this EIS.

- The BLM cannot deny access through Federal lands to private holdings on non-Federal lands. The BLM's policy concerning access to oil and gas resources on non-Federal lands is detailed in BLM Manual 2800 on Rights-of-Way (BLM 2004h.). This policy directs BLM to allow access to secure for the owner/lessee reasonable use and enjoyment. Necessary access through Federal lands cannot be denied as long as the landowner/lessee complies with BLM rules and regulations on Federal surface. Therefore, a "no new development" alternative is not reasonable for this EIS.

- Denial of development on Federal lands could lead to the drainage of Federal reserves by wells on adjacent State and private lands. Drainage by offset non-Federal wells would result in a loss of Federal royalties. A drainage stipulation designed to protect the Federal mineral estate is included in the terms of the lease contracts for all Federally leased lands in the CWSA. Therefore, a "no new development" alternative is not reasonable for this EIS.

- A denial to develop valid leases would violate the lessees' contractual rights as agreed to by the government of the United States. An oil and gas lease grants the lessee the right and privilege to drill from, extract, mine, remove, and dispose of all oil and gas deposits in the leased lands, subject to the terms and conditions of the lease. A denial of all activity would constitute a breach of contract of the lessees' rights to conduct oil and gas operations on the leased lands. Only the U.S. Congress has the authority to grant a complete denial of the granted lease rights. Disallowing the development of valid leases would also result in a loss of Federal royalties. Therefore, a "no new development" alternative is not reasonable for this EIS.

Based on the above rationale, an alternative analyzing "no new development" in the CWSA would not be reasonable for this EIS, and would not meet the purpose and need for this project.

2.4.3 Directional Drilling

Under the Proposed Action, EOG would drill 473 vertical wells from new drill pads and an additional 154 vertical wells as twins from existing well pads. Consideration was given as to whether the number of new drill pads could be reduced by requiring that a single pad be used for drilling one vertical well and one or more directional wells throughout the CWSA. Conceptually, directional wells might be used to avoid surface disturbance within riparian areas in the CWSA or simply to reduce the total acreage disturbed by new pads.

Whether directional drilling can be conducted successfully depends on site-specific geological conditions. The technical and economic feasibility of directional drilling (EOG 2004) specifically within the CWSA was analyzed. The BLM reviewed the analysis, concurred with the findings, and concluded that an alternative requiring directional drilling throughout the CWSA is not a feasible means of achieving the purpose and need of the Proposed Action. A summary of the assessment, and the primary technical and economic rationale for the BLM's decision to dismiss a directional drilling alternative from detailed analysis in the EIS, is provided in the following discussion. While further consideration of an alternative based on directional drilling throughout the CWSA was determined to be

infeasible, it should be understood that consideration of directional drilling as an option for a site-specific situation may be appropriate.

Drilling directionally within the CWSA presents several technical difficulties resulting from area-specific subsurface geologic conditions. Drilling directionally from a kickoff point above a severely fractured, under-pressured, geologic bed contained in the Upper Green River Formation below the CWSA, known as the "Bird's Nest Aquifer," to reach targeted zones in the Green River Formation, Wasatch Formation, Mesaverde Group, and Mancos Shale is impractical because of the severe loss of circulation normally encountered while drilling through the Bird's Nest Aquifer. The depth of the Bird's Nest Aquifer ranges from 1,500 feet to 2,200 feet below the ground surface of the CWSA. Technical challenges associated with directional drilling from a point above the aquifer include:

- Hole cleaning issues;
- Stuck drill string; and
- Difficulty obtaining accurate directional drilling measurements due to the lack of a full-fluid column.

Drilling a directional well bore at any point above the lowest evidence of the Bird's Nest Aquifer is impractical based on the above-described reasons, and to do so would compromise EOG's ability to successfully drill and complete a productive well.

A directional well bore that kicks off below the aquifer to produce gas from the deeper target formations results in potential difficulties associated with the amounts of offset required to reach the intended bottom hole location (BHL). The amount of offset distance between the surface location and the BHL determines the drilling angle of the well bore. A greater offset distance requires greater angles of deviation from vertical. The ability to successfully drill a well with a significant offset is uncertain because of difficulties associated with the length of the well bore held at a high angle and the high dog legs in the build and drop sections. In addition, deviated well bores are poorly suited for possible future oil production from the Green River Formation. Technical challenges associated with directional drilling from a point below the Bird's Nest Aquifer include:

- Increased risk of differential sticking in the hold section;
- High risk of keyseating;
- Failure to land intermediate casing through the drop;
- The greater the offset distance to the intended BHL of a directionally drilled well, the greater the depth to the target formation must be in order to maintain a build angle that discourages keyseating. A build angle of 4 degrees per 100 feet, although not excessive, does not ensure that keyseating would not be a problem;
- Depleted fractures and/or high permeability sandstones in the Wasatch Formation also increase the risk of lost returns and loss of equipment if the drill string were to become stuck in the well bore due to differential pressures. Using mud in an under-pressured formation through the build section of the well bore can cause formation damage, further increasing well costs and possibly hindering production; and
- Wells directionally drilled to the Mesaverde Group or Mancos Shale that kick off below the Birds Nest would have production casing set at high angle across thick and potentially productive intervals of the Green River and Wasatch formations. Completions in high angle well bores can result in ineffective fracture stimulation due to the creation of multiple fractures during treatment.

Loss of quantities of mud to a formation, or "lost returns," is indicated by the complete or partial loss of drilling mud that returns to the surface. Until the zone in which the drilling fluid has been lost is sealed off, drilling cannot be resumed in most cases. Drilling problems associated with lost circulation often occur where the borehole has intersected critically-stressed natural fractures that are inherently prone to high fracture permeability, such as in the Wasatch Formation. An optimal trajectory through the reservoir must be selected to minimize the formation damaging effects of mud infiltration, control compressive failure leading to the development of well bore breakouts, and, at the same time, prevent catastrophic tensile failure leading to formation breakdown or fluid losses through natural fractures. The optimal trajectory through formations beneath the CWSA is vertical.

For these reasons, the BLM concurred with EOG's assessment that drilling directionally is not feasible for the entirety of the CWSA and determined that directional drilling throughout the CWSA would compromise EOG's ability to successfully drill and complete a productive well. An alternative requiring directional drilling throughout the CWSA was eliminated from further analysis because technical and economic factors would not allow this alternative to meet the purpose and need of the project. As previously discussed, in areas where vertical drilling is not feasible or would lead to undue environmental impact, directional drilling would be considered on a site-specific basis.

2.4.4 Decreased Density Development

Various well densities/spacing patterns were considered during initial project design. The depositional environment that defined the characteristics of the hydrocarbon-bearing reservoirs, including limited permeability, beneath the CWSA, as well as current reservoir engineering analysis, indicate that even 80-acre spacing provides insufficient well density to efficiently and completely drain the hydrocarbon reserves from the targeted reservoirs. EOG and other operators have been or are currently successfully developing the Mesaverde Group and Wasatch Formation gas reservoirs in the vicinity of the CWSA on 40-acre spacing. Anticipated production from a single well located on 80-acre spacing would not be able to match the corresponding production from two wells spaced on 40 acres. Drilling wells on 80-acre spacing would result in a decrease of approximately 36 percent of the wells proposed in this action. Just 403 wells would be drilled as opposed to 627 wells, as proposed. At a minimum, anticipated production from the reduced number of wells would decrease proportionally. Therefore, decreased well density would not meet the purpose and need of the project, and this well spacing alternative was eliminated from further analysis.

2.4.5 Best Management Practices

Best Management Practices (BMPs) are practices currently identified by BLM in Washington Office Instruction Memorandum 2007-021 defined as "innovative, dynamic, and economically feasible mitigation measures applied on a site-specific basis to reduce, prevent, or avoid adverse environmental or social impacts."

As discussed in Section 2.3, the project proponent has voluntarily committed to implement some of the BMPs as well as many standard operating practices commonly used in the Uinta Basin to reduce the potential environmental impacts of the proposed natural gas development. For the CWSA, selected BMPs and improved standard operating practices specific to the CWSA were developed and evaluated that would mitigate potential impacts resulting from EOG's operations. These measures have been incorporated into the Proposed Action.

The BLM considered an alternative that would require EOG, as a condition of approving the Proposed Action, to implement all of the additional BMPs listed in the national policy guidance and those referenced on the BLM national website (http://www.blm.gov/bmp) to mitigate potential impacts to surface and subsurface resources. BLM considered whether to apply all listed BMPs to all APDs and rights-of way sought under the Proposed Action.

BLM Instruction Memorandum No. 2007-021 (11/28/06) states that Field Offices incorporate BMPs into APDs and associated on and off-lease ROWs after appropriate NEPA evaluation. This is done in two ways. First are those BMPs to be considered in nearly all circumstances. Second are those BMPs to be considered on a case-by-case basis.

The BMPs to be applied in all cases are as follows:

- Interim reclamation (see Appendix E) of well locations and access roads soon after the well is put into production;

- Painting of all new facilities a color which best allows the facility to blend with the background, typically a vegetated background;

- Design and construction of all new roads as to safe and appropriate standard, "no higher than necessary" to accommodate their intended use; and

- Final reclamation recontouring of all disturbed areas (see Appendix E), including access roads, to the original contour or a contour that blends with the surrounding topography.

As discussed in Sections 2.1 and 2.3, the project proponent has voluntarily committed to implement all of the BMPs listed above.

The BLM Vernal Field Office does not believe the remaining impacts from the Proposed Action justify application of nationally identified BMPs as a separate alternative.

Examples of typical case-by-case BMPs include, but are not limited to, those BMPs in the following list, as described in the Instruction Memorandum. These BMPs were evaluated for generic applicability to the proposed project:

- Installation of raptor perch avoidance – Electric power lines would not be installed to implement the proposed project, rendering perch avoidance measures unnecessary.

- Burying of distribution power lines and/or flow lines in or adjacent to access roads – Burying pipelines may successfully mitigate visual impacts in other parts of the western United States; however, the CWSA is dominated by the presence of surface and near-surface bedrock. Burying pipelines in this environment would frequently result in new surface disturbance caused by ripping, cutting, or blasting rock along the pipeline corridor. Surface disturbance resulting from these construction methods would result in long-term visual impacts, destruction of sparse vegetation, soil erosion, possible noxious weed infestation, and reduction of livestock and wildlife forage and habitat. The semi-arid and arid climate regime characteristic of the Uinta Basin makes successful interim and final reclamation difficult to achieve in the short-term, as is evident from historical experience. Based on these and other considerations, buried pipelines were considered to be an unrealistic BMP in the CWSA.

- Centralizing production facilities – Compression for CWSA wells is achieved by utilizing central compressor facilities. The proposed use of telemetry would reduce well visits and therefore decrease vehicle traffic within the CWSA, one objective of combining production facilities. Facilities commonly found on each CWSA well site include condensate and water tanks, separation/dehydration equipment, and gas measurement equipment. Combining separation facilities at a central location is physically impractical in the CWSA because of the difficulties presented by transporting a combined water and gas stream through a single aboveground pipeline. Burying pipelines may alleviate the problems that would result from transporting water in aboveground pipelines; however, buried pipelines were not considered practical because of the resulting adverse environmental impacts described previously. Heaters, insulated pipe, and blow down valving would be some examples of additional equipment, not currently needed, that could need to be installed should central facilities be required. In addition, due to varied mineral ownership within the CWSA, accurate allocation of sales streams would not be feasible if centralized facilities were utilized.

- Submersible pumps – Use of submersible pumps as an artificial lift option is not economically practical given the production characteristics of the wells and lack of an electrical power source within the CWSA. Other more economically efficient methods of artificial lift, such as plunger lift equipment, are commonly used in the CWSA.

- Belowground well heads – Belowground well heads are not practical for wells in the CWSA. The CWSA is dominated by the presence of surface and near-surface bedrock. Installing well heads below the ground in this environment would frequently result in new surface disturbance caused by blasting rock. In addition, CWSA wells primarily produce gas, and the need for convenient access to well heads during production operations and the potential for safety hazards preclude the consideration of this option.

- Drilling multiple wells from a single pad – EOG has proposed to drill 154 vertical wells as twins to existing wells on existing pads. EOG has not proposed drilling directional wells on shared well pads because of the technical obstacles that preclude successful directional drilling under the CWSA (see Section 2.4.3).

- Wildlife monitoring – EOG has committed to performing surveys for any Federally T&E Species and to determining whether raptor nests are present within 0.5 mile of locations proposed for surface disturbance. If T&E species are present, EOG would consult with the appropriate SMA to implement avoidance or mitigation measures. If raptor nests are determined to be present within the surveyed area, EOG would consult with the appropriate SMA to determine measures to avoid disturbing active nest sites and protect the viability of all nest sites or potential future nest sites (see Sections 2.3.4 and 2.3.5).

- Noise reduction technologies and design – EOG has committed to utilizing plunger equipment when practical to minimize the need for venting low-volume wells and the associated noise.

- Seasonal restriction of public vehicle access – As noted in Section 3.11, most of the 121 miles of unpaved roads within the CWSA are claimed as Class “B” and “D” roads by Uintah County and are therefore public roads. The remaining roads in the

CWSA are short (average access road length is approximately 0.2 mile), dead end roads used to access well pads. These roads would not be considered "through" roads by the public, rendering their use unlikely. Seasonally restricting public access to some roads would prevent their use for livestock transportation for grazing and by recreational users.

- Avoiding placement of production facilities on hilltops and ridgelines – EOG has committed to improving site distances along routes accessing Fantasy Canyon and the White River. Also, EOG committed to locating, designing, or screening new facilities from the view of recreational boaters on the White River (see Section 2.3.2).

- Screening facilities from view – EOG has committed to locating, designing, or screening facilities from view of recreational boaters on the White River (see Section 2.3.2).

- Bioremediation of oil field wastes and spills – The primary hydrocarbon product produced from the CWSA is natural gas. There has been no need to bioremediate oil field wastes and spills because of the small quantities of liquid hydrocarbons produced. The use of bioremediation in the CWSA has not been precluded by EOG; however, the need to consider utilizing this technology at each well pad is not warranted.

- Use of common utility or right-of-way corridors – With the exception of solar panel-generated electricity, EOG does not use electric power to service producing wells. Electrical power is proposed only for water disposal facilities, and the power there would be generated through the use of natural gas powered engines. EOG's gas gathering lines typically follow well access roads to join Questar's larger main lines for transport out of the CWSA and thus, do not typically utilize corridors employed by gas transportation companies.

In addition to these national BMPs, the Vernal Field Office of the BLM, operators in the Uinta Basin, and Uintah County officials are cooperatively developing a comprehensive list of improved standard operating practices and additional BMPs specific to oil and gas operations in the Uinta Basin. The objective of this cooperative effort is to apply those BMPs on individual wells in a case-by-case basis to demonstrate effectiveness in the field and to facilitate their application to future operations in the Uinta Basin. For the CWSA, selected BMPs and improved standard operating practices specific to the CWSA were developed and evaluated to mitigate potential impacts resulting from EOG's operations.

Based on preliminary data from over 50 years of oil and gas operations in the Uinta Basin, the final list is expected to include more than one hundred measures that could be considered and evaluated on a case-by-case basis.

Evaluation of these site-specific BMPs and improved standard operating practices requires evaluation during the BLM-mandated onsite reviews prior to approval on individual APDs. That review is currently part of normal BLM permitting procedures; thus, this document does not include evaluation of site-specific BMPs.

2.4.6 Phased Development

Based on comments received from the EPA on the DEIS, a phased development alternative that requires drilling and production occur sequentially across the CWSA was considered for

analysis in this EIS. Under this alternative, natural gas development on Federal leases would be implemented in a manner that may be spatially or temporally constrained.

Phased development for this project is not feasible for the following reasons:

- It would not meet the stated purpose and need for the project to increase the available supply of natural gas by a daily delivery of up to 175 million cubic feet, with an ultimate production volume of between 650 billion cubic feet and 850 billion cubic feet during defined life of the project.

- Temporal, spatial, seasonal restrictions associated with wildlife and/or other resource values may preclude drilling in some areas or otherwise further restrict development in a manner that would conflict with the stated purpose and need for the project.

The Proposed Action as presented by EOG contains an inherently phased approach to development with a structured timeline. The expected construction, drilling, and completion phase of the project would extend over seven years, with an average annual number of wells anticipated to be drilled each year. The Proposed Action is structured so that orderly development would occur during the 7-year construction, drilling, and completion phase.

The EPA-recommended phased development would restrict exploration and development in some areas until all development within a specified area would be complete. The Proposed Action contains elements of exploration as well as infill development. EOG has included outlying areas within the CWSA that have yet to demonstrate production that warrants the type of development and infill wells proposed for the known productive areas of the CWSA. Exploration in outlying areas of the CWSA is necessary to confirm or contraindicate future development drilling. Spatial limitations to project development may disproportionately emphasize or de-emphasize these outlying areas to an extent that the purpose and need for the project is not met.

In consideration of these reasons, phased development as a distinct alternative was considered but not analyzed in detail.

2.4.7 Minimum Setback Distances from Riparian Zones, Floodplains, Springs, or Sensitive Wildlife, Geologic, and Cultural Resources Areas

Based on comments received from the EPA and USFWS on the DEIS, an alternative requiring minimum setback distances from riparian zones, floodplains, springs, or sensitive wildlife, geologic, and cultural resources areas was considered for detailed analysis by this EIS. In response, EOG acknowledged the issues and concerns detailed by the comments and voluntarily decided to revise its Proposed Action with additional commitments.

After publication of the DEIS, EOG voluntarily committed that they would not drill from new or existing well pads within the 100-year floodplain of the White River Corridor. Furthermore, EOG committed that they would not drill new wells in the White River corridor that would result in new well pads and roads.

EOG's modification to the Proposed Action and removal of all proposed well development from the 100-year floodplain of the White River effectively addresses the specific concerns of the USFWS. Potential impacts that could have occurred from drilling on existing well

pads or constructing new well pads were eliminated by the EOG commitments. The primary need for a minimum setback distance, as described in USFWS' comment letter, has been resolved by the Proposed Action and subsequent commitments by the operator. Therefore, analysis of a required minimum setback to the White River was not needed and eliminated from further analysis.

Possible impacts to riparian zones, floodplains other than that of the White River, springs, or sensitive wildlife, geologic, and cultural resources areas would be avoided by the application of standard lease terms and conditions contained in 43 CFR 3101.1-2. The regulation states that facilities can be moved 200 meters to avoid any conflicts. The implementation of the offset distance allowed by standard terms and conditions, the application of conditions of approval to specific APDs resulting from onsite inspections, and compliance with applicable laws and regulations, such as the National Historic Preservation Act (NHPA) and Endangered Species Act, would prevent impacts to the identified resources. Therefore, a minimum setback analysis throughout the project area was considered but not fully analyzed because the regulatory mechanisms are in place that would allow adverse impacts to be avoided.

Furthermore, well sites shown in Figure 2-1 (Appendix A) are not intended to accurately depict actual well locations. The well pad, access road, and pipeline ROW locations illustrated for the Proposed Action are conceptual in nature. Actual proposed well locations would be determined during project implementation by EOG and the appropriate SMA. Well locations would be finalized during the onsite inspection/evaluation process based on site-specific resource conditions. EOG's commitment to not drill from new or existing pads within the 100-year floodplain of the White River overrides the conceptual depiction of possible future well locations in Figure 2-1. Well sites that appear to be located in proximity to riparian zones, floodplains, springs, or sensitive wildlife, geologic, and cultural resources areas do not represent actual physical well locations on the ground.

2.5 SUMMARY COMPARISON OF ALTERNATIVES

Table 2.5-1 displays a comparison of key proposal features of each alternative.

Table 2.5-1. Key Proposal Features under each Alternative

Project Component	Proposed Action	No Action Alternative
Wells	627 gas wells 1,260 acres short-term disturbance	148 gas wells 256 acres short-term disturbance
Roads	99.5 miles 362 acres short-term disturbance	17.7 miles 64 acres short-term disturbance
Pipelines	104.5 miles 101 acres short-term disturbance	7.5 miles 7 acres short-term disturbance

Project Component	Proposed Action	No Action Alternative
Injection Wells	4 UIC wells 13 acres short-term disturbance	1 UIC well 2.5 acres short-term disturbance
Total Approximate Surface Disturbance	**1,735**[1]	**329.5**

[1] Minor discrepancy in acreage totals due to rounding.