

**ENVIRONMENTAL ASSESSMENT
#CO-800-2007-043**

**KINDER MORGAN PROPOSED
GOODMAN POINT DEVELOPMENT PROJECT**



**Project Applicant:
Kinder Morgan CO₂ Company LP
17801 Highway 491
Cortez, CO 81321**

**Prepared for:
U. S. Department of Interior
Bureau of Land Management
Canyons of the Ancients National Monument
Anasazi Heritage Center
27501 Highway 184
Dolores, CO 81323**

March 2008

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ENVIRONMENTAL ASSESSMENT

KINDER MORGAN PROPOSED GOODMAN POINT DEVELOPMENT PROJECT

| PROJECT SPECIFICATIONS | |
|---------------------------------|--|
| EA NUMBER | CO-800-2007-2007-043 |
| CASE FILE/PROJECT NUMBER | CANM 07-006 |
| PROJECT NAME | Goodman Point Development Project |
| ECOREGION/PLANNING UNIT | Canyons of the Ancients National Monument/San Juan/San Miguel Resource Area |
| LEGAL DESCRIPTION | T. 36 N., R. 18 W., sec 2 and 3; T. 37 N., R. 18 W., sec 33 and 34, Montezuma, County |
| APPLICANT/OPERATOR | Kinder Morgan CO₂ Company LP |

KINDER MORGAN PROPOSED GOODMAN POINT DEVELOPMENT PROJECT

1.0 INTRODUCTION

Kinder Morgan CO₂ Company, LP (Kinder Morgan) is planning to further develop the McElmo Dome Unit by drilling new carbon dioxide (CO₂) source wells and installing additional CO₂ collection and transportation facilities for development of the mineral resources. Kinder Morgan has submitted Applications for Permits to Drill (APDs) for seven (7) CO₂ gas wells and associated well tie and production pipelines on lands administered by the Bureau of Land Management (BLM), in Montezuma County, Colorado. The wells would be drilled on a mesa top area near the eastern boundary of Canyons of the Ancients National Monument (the Monument) known as Burro Point. The proposed collection and transportation facilities would include approximately 24,018 feet/4.54 miles of production pipeline within the boundaries of the Monument.

The proposed wells would develop mineral resources associated with existing federal leases (see Table 1) in the McElmo Dome Unit within CANM approximately 15 miles west - northwest of Cortez, Colorado. The legal descriptions for the proposed wells are provided in Table 1. The surface locations of the proposed wells are all within the exterior boundary of the Monument, with the surface use and subsurface mineral estate managed by the BLM

The seven (7) wells are identified as the Kinder Morgan Goodman Point (GP) #1 through 7. The locations of the proposed wells, pipelines and access roads are provided in Figures 1 and 2. The wells would be vertically drilled with horizontal completions. As proposed, the project includes the construction of seven well pads and associated access roads and flow lines (34 acres) and production lines (24,018 feet/28 acres of disturbance). Each well pad location was chosen to allow for maximizing of production by installing a horizontal component to the well completion. By adding the horizontal completion component, each well had a potential increase of ~20% in CO₂ production. By maximizing production with this methodology, the number of wells, and associated surface disturbance, was reduced. The proposed locations were chosen to avoid overlap of the horizontal completion areas, thus maximizing the production for each of the wells.

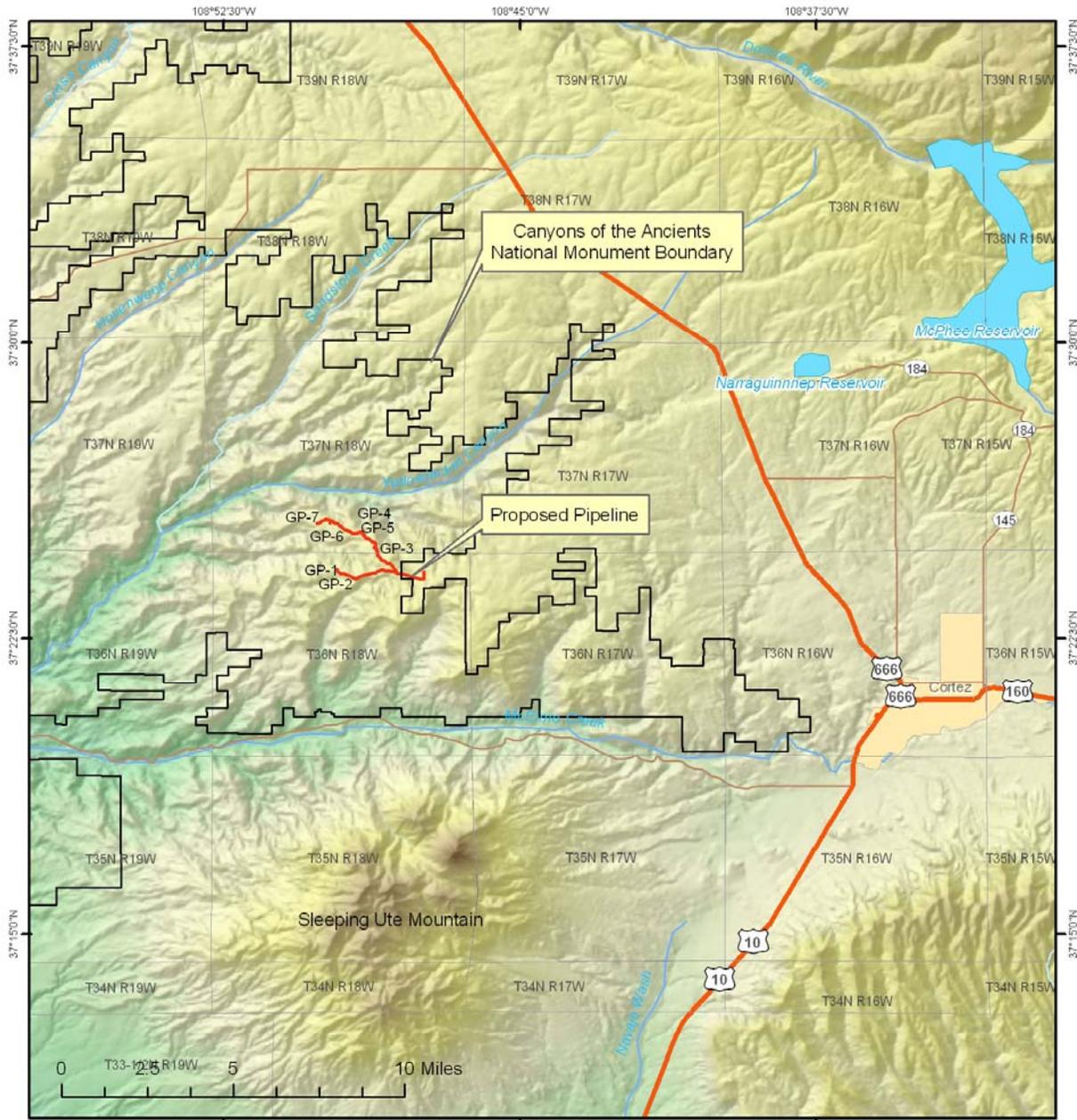
The total surface disturbance for the proposed project would be 62 acres. The proposed project would include a short term area of disturbance of 41 acres that would be reclaimed after project construction activities are completed. Areas of long term disturbance (roads and well pads totaling 21 acres) would be reclaimed when the project is completed. The gas flow lines would be constructed entirely parallel to existing access roads. Because the project is on an existing lease, no new Rights-of-Way (ROWs) would be required for the proposed project. If the wells were unproductive, all surface disturbances would be reclaimed and abandoned according to BLM specifications.

Additional development components for the proposed project would be located outside of the Monument boundary on private lands. A summary of these offsite components is provided in Section 9.0 of this Environmental Assessment (EA).

Table 1. Lease summaries and legal descriptions for proposed well pad locations.

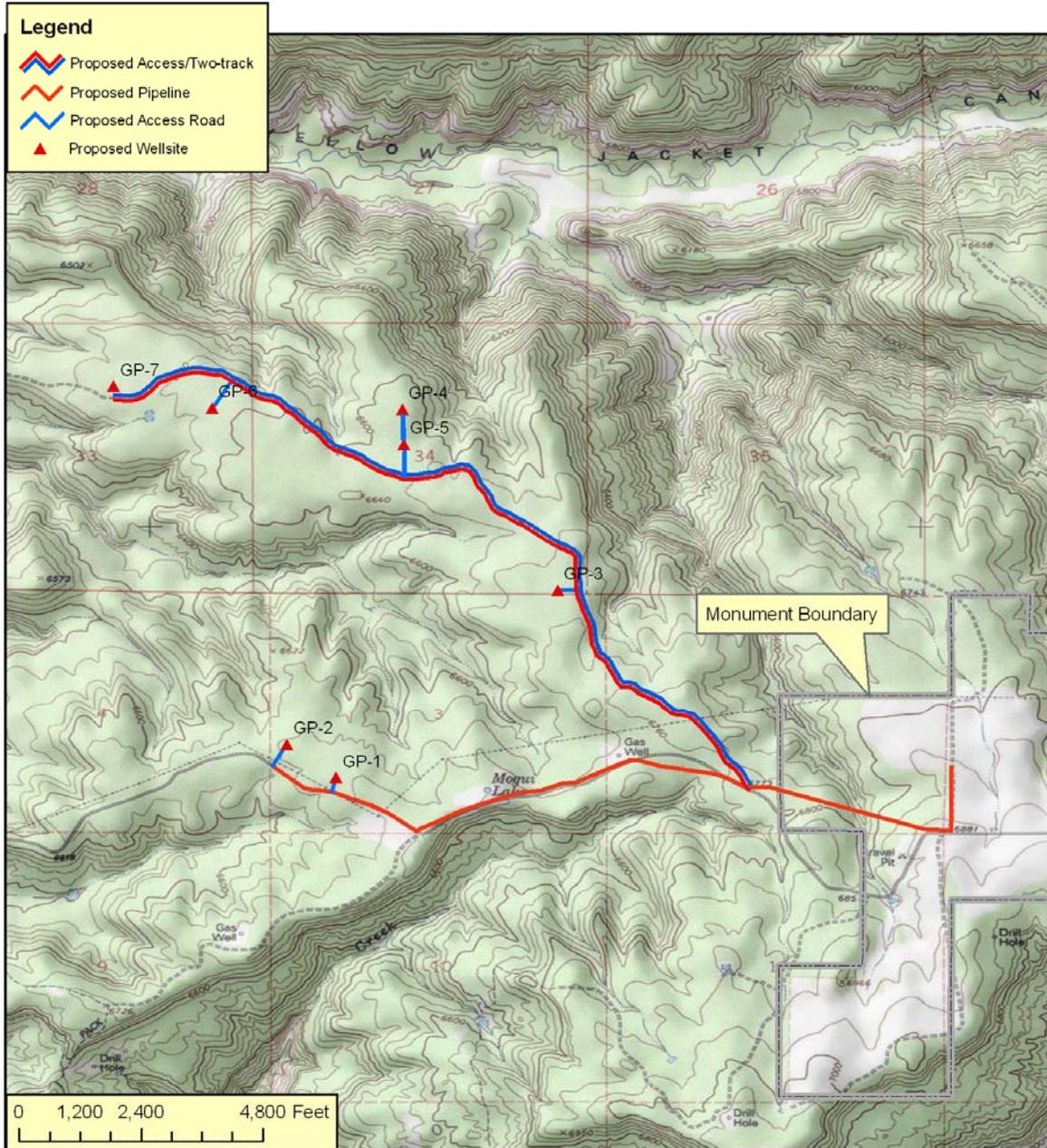
| Well Name | Mineral Lease - Surface/Bottom Hole (Issue Date) | Lease Stipulations | Surface Location (Ownership) | Bottom Hole Location (Mineral Ownership) | Vertical Depth (feet)* |
|------------------|---|---|---|---|-------------------------------|
| GP #1 | COC-12462 (4/1/71)/COC-27348 (1976-1978) | Standard Lease Terms and conditions and NSO for Lightning Tree Tower Group area | T36N; R18W; S3; 1029' FSL; 934' FWL (BLM) | T36N; R18W; S10; 1380' FNL; 1611' FWL; (BLM) | 7,888 |
| GP #2 | COC-027348/COC-027349 (1976-1978) | Standard Lease Terms and Conditions | T36N; R18W; S3; 1677' FSL; 125' FWL (BLM) | T36N; R18W; S4; 644' FNL; 513' FEL (BLM) | 7,888 |
| GP #3 | COC-012462 (4/1/71)/COC-009850 (1976-1978) | Standard Lease Terms and conditions and NSO for Lightning Tree Tower Group area | T37N; R18W; S34; 63' FSL; 528' FEL (BLM) | T37N; R18W; S35; 1849' FSL; 1241' FWL (BLM) | 8,037 |
| GP #4 | COC-012462 (4/1/71)/COC-012462 (4/1/71) | Standard Lease Terms and conditions and NSO for Lightning Tree Tower Group area | T37N; R18W; S34; 1733' FNL; 2318' FWL (BLM) | T37N; R18W; S27; 34' FSL; 1192' FEL (BLM) | 8,037 |
| GP #5 | COC-012462 (4/1/71)/COC-012462 (4/1/71) | Standard Lease Terms and conditions and NSO for Lightning Tree Tower Group area | T37N; R18W; S34; 2426' FNL 2335' FWL (BLM) | T37N; R18W; S34; 501' FSL; 1686' FWL (BLM) | 8,037 |
| GP #6 | COC-019463 (1976-1978)/COC-019463 (1976-1978) | Standard Lease Terms and Conditions | T37N; R18W; S33; 1712' FNL; 673' FEL (BLM) | T37N; R18W; S33; 1824' FSL; 2442' FEL (BLM) | 8,037 |
| GP #7 | COC-019463 (1976-1978)/COC-019463 (1976-1978) | Standard Lease Terms and Conditions | T37N; R18W; S33; 1277' FNL; 2219' FEL (BLM) | T37N; R18W; S28; 1138' FSL; 2415' FWL (BLM) | 8,037 |

* Each of the proposed wells would have a 2,600 foot horizontal completion installed from the bottom hole location, at the vertical depth of the given well.



| | | |
|--|--|----------------------|
|  <p>ECOSPHERE ENVIRONMENTAL SERVICES</p> | KINDER MORGAN GOODMAN POINT DEVELOPMENT PROJECT | |
| | PROJECT VICINITY MAP | FIGURE 1 |
| | TOWNSHIP 37N RANGE 18W, SECTIONS 34 & 35 | MONTEZUMA COUNTY, CO |
| TOWNSHIP 36N RANGE 18W, SECTIONS 2 & 3 | 3/2008 | |

Figure 1. Project Vicinity Map



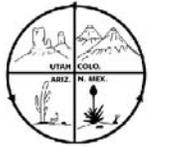
| | | |
|--|--|----------------------|
|  <p>ECOSPHERE ENVIRONMENTAL SERVICES</p> | KINDER MORGAN GOODMAN POINT DEVELOPMENT PROJECT | |
| | PROJECT AREA MAP | FIGURE 2 |
| | TOWNSHIP 37N RANGE 18W, SECTIONS 34 & 35 | MONTEZUMA COUNTY, CO |
| TOWNSHIP 36N RANGE 18W, SECTIONS 2 & 3 | 1/17/2008 | |

Figure 2. Project Area Map

This EA for the proposed Kinder Morgan Goodman Development Project (Proposed Action) was prepared by Ecosphere Environmental Services as a third-party NEPA document preparer under contract to Kinder Morgan. BLM natural resource protection staff and the Monument managers were consulted regarding the scope of analysis, the extent of potential impacts, and appropriate mitigation measures for resource protection. Kinder Morgan developed project-specific design criteria that would achieve the project purpose and need while providing project-specific environmental protection measures.

2.0 PROPOSED ACTION

2.1 Project Description

Kinder Morgan has filed Notices of Staking and APDs with the BLM - San Juan Public Lands Center and the Colorado Oil and Gas Conservation Commission (COGCC) to drill and develop seven CO₂ gas wells in the Burro Point area, within the Monument boundary in Montezuma County, Colorado. The wells would be drilled to the Leadville Formation of the McElmo Dome Unit under the terms of existing mineral leases with the BLM. The Notices of Staking were submitted in September 2006, and the APDs for the wells were submitted to the COGCC and the BLM on 26 March 2007. As part of the mineral development activities, Kinder Morgan proposes to produce and transport the CO₂ gas in a new well tie pipeline and flow lines. The proposed pipeline system would provide transport of the produced minerals from the proposed wells to a collection, compression, and treatment facility located on private land outside of the Monument boundary. A summary of the proposed construction activities is provided below, with additional details provided in Section 2.1.2. A summary of the area of disturbance (62 acres) for the proposed project activities is provided in Tables 2 and 3.

The proposed project includes construction of seven new well pads from which to drill the wells, and construction of access roads to six of the seven well pads for drilling, operation and maintenance of the wells. The proposed GP #7 well pad would be constructed adjacent to an existing oil field access road; therefore, no new access road would be required. A total of 2,496 feet of new road construction within a 50-foot-wide construction corridor area would be required for access to the new well pads. The proposed access roads would connect each well site to existing oil and gas infrastructure roads.

Once drilling and testing of the wells are completed, and the wells are deemed productive, they would be connected via construction of a flow line to a proposed CO₂ gathering system production line. The flow lines for each well would be constructed within the access road construction corridor area. The total length of flow lines would be the same as the total length of access roads (2,496 feet). The access road and pipeline width for the all project components would be 50 feet. If the wells were unproductive, the well bore would be plugged and abandoned, and the well pad and access road would be reclaimed per the BLM conditions of approval.

The production line infrastructure for the proposed Goodman Point Development project would include installation of 24,018 feet of production lines for connection of the wells to a central gathering location (compressor station), for treatment and delivery to out of state markets. The compressor station is under construction and is located outside of the boundary of the Monument

on private land owned by Kinder Morgan. The produced gas would be treated for removal of produced water at the compressor station.

There would be two production lines installed within each pipeline route: a main transport production line and a second production line for testing production individually from each of the proposed wells. The two pipelines would be installed a minimum of 10 feet from each other for pipeline operation safety. The test production line would be constructed of 10-inch steel and would have valves for each of the wells to isolate the production stream from each well. The main transport production lines would be constructed of steel pipe ranging in diameter from 10 inches at the beginning of the production line, telescoping up to 20 inches at the end of the production lines. The diameter of the production pipelines would increase as the flow from additional wells is added into the production line.

On site field investigations of the well sites and flow line routes were conducted in October 2006, December 2006, and March 2007 by BLM Natural Resource Specialists and Ecosphere Environmental Services Biologists and Natural Resource Specialists. On site inspections of the proposed well pad areas and the proposed production line routes were performed on 24 October and 5 December 2006; 7 March 2007 and 26 June 2007. Natural resource specialists from the BLM listed in Section 11.0 (page 79) attended the on site meetings. The on site inspections were utilized to describe the project construction and operation plan to the BLM staff, and to identify potential areas of concern for natural resource protection staff. The on site meetings identified cultural resources, visual resources and wildlife resources as being potential areas of concern for the proposed project. The project components were not changed during the on site meetings. An additional tour of the site was completed by Kinder Morgan staff and San Juan Citizen's Alliance (a local public lands advocacy group) staff in August 2006. The project site tour was initiated by Kinder Morgan, and was meant to provide the San Juan Citizen's Alliance staff with an introduction to the project and proposed project area prior to the formal environmental and public review process.

Interim and final reclamation of the well pads, production line routes and flow line/access road routes would be required by the BLM. If a well would be deemed unproductive, the well and well pad location would be abandoned and reclaimed in accordance with applicable BLM requirements stipulated in the Surface Use Conditions of Approval (COA) for the APDs. Reclamation efforts would continue until all related COA stipulations are met. The COAs for each well pad and flow line route, the proposed *Drilling Plan* and *Surface Use Plan* are all part of the Proposed Action. If a well were produced, final reclamation would occur after the well is no longer economically productive (in an estimated 20-30 years).

2.1.1 Project Location

The proposed Goodman Point Development project CO₂ gas wells are located approximately 15 miles west-northwest of Cortez, Colorado, and within the eastern portion of the Monument (Figure 1). The proposed wells are entirely within Montezuma County, Colorado, and can be found on the Woods Canyon and Battle Rock; 7.5 minute U. S. Geological Survey (USGS) topographic quadrangle maps (Figure 2). The legal description of the surface and bottom hole location for the proposed wells is provided in Table 1.

2.1.2 Project Construction

The following descriptions of project design features (Tables 2 and 3) and construction practices are based on the surface use plans of each well site and the project plats.

Existing Infrastructure – There are two existing roads that provide access to the Burro Point area (see Figure 2). The access road to the southern flow line route and wells GP #1 and #2 is a two-lane gravel road that provides general access to areas of the Monument and is owned by the BLM and maintained by Kinder Morgan. The access road to the northern flow line route and wells GP #3 through GP #7 is an un-maintained dirt two-track road.

Additional infrastructure in the Burro Point area includes an overhead 115 kilovolt (kV) electric transmission line owned and operated by Empire Electric Association, and an underground CO₂ production line that is owned and operated by Kinder Morgan. These two utility lines are located within ROW areas that generally parallel the BLM gravel road that would be used to access well pads GP # 1 and GP #2.

Access Road Construction – New access roads would be constructed for six of the seven proposed well pads (GP #1 through #6). The last well pad (GP #7) would be constructed adjacent to the un-maintained dirt two-track road that will be improved to provide access. A summary of the access road lengths is provided in Table 2. The following project components would be constructed within the 50-foot-wide access road construction corridor: an 18-foot-wide driving surface; bar ditches along both sides of the driving surface; and a gas flow line and a gas test line (if the well is productive). The proposed access roads would be constructed according to specifications outlined in each well pad *Surface Use Plan*, in conformance with the BLM/USFS “Surface operating Standards for Oil and Gas Exploration and Development, The Gold Book” (BLM 2006), per the engineering plans prepared and approved by the BLM.

A summary of the proposed access road flow line lengths, well pad areas and maximum potential affected surface area for each of the proposed well pads is provided in Table 2.

Well Pad Construction –The pad locations would be stripped of vegetation, leveled and graded. Stripped vegetation and topsoil would be segregated outside of the well pad work area, but within the construction boundary limit. The vegetation and topsoil would be utilized for interim reclamation activities as described in the Plans for Surface Reclamation section below.

A surface cover of gravel would be applied in the primary work and parking areas in order to provide a safe working surface and to reduce the potential for wind and water erosion of site soils. Trailers for work and living space for the rig supervisor, tool pushers, mudloggers/geologists, mud engineers, and safety personnel would be temporarily placed on the pad locations, within the area identified at each well pad for temporary use.

Well Drilling – The following is a brief summary of the proposed drilling activities for the Goodman Point Development project. Additional details are provided in the project *Drilling Plans* that are included with the APD package. The current schedule would be for one drill rig to begin work on GP #4 and then utilize two rigs to drill the remaining wells. Drilling operations for each well would last approximately four to five weeks. Wells GP #1, #3, #5, #6 and #7,

would be drilled in succession utilizing the two well system discussed throughout this section. The proposed well GP #2 is not currently included in the drilling schedule, but is being permitted to provide an additional source of CO₂ as production in other wells declines.

Table 2. Project design features – well pads and access roads/flow lines.

| Well Name | Access Road/Flow line Length/Acres Disturbed (50-foot-wide construction corridor) | Well Pad Area (Acres) | Temporary Use Area (Acres)* | Total Affected Surface Area (Acres)** |
|---|--|------------------------------|------------------------------------|--|
| GP #1 | 122-ft/0.14-ac | 2.90 | 1.85 | 4.89 |
| GP #2 | 362-ft/0.42-ac | 2.90 | 1.85 | 5.17 |
| GP #3 | 734-ft/0.84-ac | 2.77 | 1.70 | 5.31 |
| GP #4 | 344-ft/0.39-ac | 2.24 | 1.91 | 4.54 |
| GP #5 | 427-ft/0.49-ac | 2.3 | 1.80 | 4.64 |
| GP #6 | 501-ft/0.58-ac | 2.83 | 1.52 | 4.93 |
| GP #7 | Adjacent to road | 2.74 | 1.39 | 4.13 |
| Subtotals | 2,490-ft/2.86 acres | 18.68 acres | 12.02 acres | 33.61 |
| Total disturbance from well pads/access roads/temporary use areas: 33.61 acres | | | | |

* The area surrounding the well pad ‘footprint’ would be for temporary use during well pad construction only. All work would be performed within the area surveyed for archeological and other resources.

** The temporary use areas for wells GP #1 through GP #7 are from the project cultural resources survey report (Woods Canyon 2006).

Table 3. Project design features – production lines.

| Production Line | Length/Acres Disturbed (50-foot-wide construction corridor) | Location |
|--|--|--|
| North Production Line (New access road and production line route) | 14,724-ft/16.9-ac | T 37 N, R 18 W, Sects 33 & 34 and T 36 N, R 18 W Sects 2 and 3 |
| South Production Line (Production line only) | 9,294-ft/10.7-ac | T 36 N, R 18 W, Sects 2 and 3 |
| Private Land Section | 4,888-ft/5.6-ac | T 36 N; R 18 W; Sects 1 and 2 |
| Total disturbance from production lines on the Monument: 27.55 acres | | |

Two rig crews work on 12-hour shifts each and typically number five people per crew. The rig crews are typically on site for seven days on then seven days off, working 12-hour shifts and resting in on-site travel trailers while not working. Details regarding the specific drilling plans for each well are provided in the APD package submitted to the BLM on 26 March 2007. The drill rig derrick is approximately 132 feet high during drilling operations.

The salt/shale section located at ~5500 feet to ~7000 feet has a high risk associated with drilling a vertical hole through the shale due to swelling and sloughing. This presents a very “sticky hole” condition that has been the cause of several fishing/sidetracking operations throughout the development of McElmo Dome. There are also high concentrations of hydrogen-sulfide gas (H₂S) encountered throughout this interval. The interval was named the “Killer Shale” by Shell Oil Company when they were developing this field.

The “Killer Shale” section in this interval is extremely difficult to drill. Potential problems with stuck pipe can occur. Good drilling practices and procedures help reduce the risks of problems in this interval. A full string of 7-inch Chrome casing (tubingless completion) would be set and cemented to surface. A 6-inch pilot hole is drilled to run open hole logs to evaluate the formation and select the depth at which the lateral would be drilled horizontally. Following the wireline logging of this section, a cement plug would be spotted and drilled to a “kick off” depth dictated by the logging results.

Fresh water for drilling operations would be obtained and trucked from a private, off lease source during construction and drilling. Trucked water would be discharged onsite to the fresh water reserve pit. Approximately 8,000 barrels (bbls) of water would be needed for the first drill location. Any leftover fresh water (following drilling) would be pumped from the pit and hauled to the next drill location (for the wells drilled in succession). It is estimated that another 2,000 bbls would be needed to supplement recycled water for each successive well. In total approximately 20,000 bbls or 2.57 acre-feet of fresh water would be estimated for use in the drilling process. The fresh water usage could vary depending on the severity of lost circulation during drilling.

Water generated during production testing would be discharged to a flow back tank where it would be collected by vacuum truck and hauled off-site to a permitted underground injection control (UIC) well. In addition to fresh water, salt water (brine) would be needed for drilling through the salt Paradox Formation at approximately 5,800 feet. The brine water would be purchased and hauled to the first well site from a private well in Bedrock, Colorado (20 miles west of Naturita). Approximately 4,000 bbls of brine water would be discharged onsite into the salt-water reserve pit for the first well pit. Any unused brine water would be recycled and hauled to the subsequent drill sites. It is estimated that an additional 1,500 bbls would be needed for each subsequent drill site to supplement the recycled brine water. In total, approximately 13,000 bbls or 1.67 acre feet of brine water is estimated for use during the drilling of all the wells.

The water remaining at the end of the drilling program would be disposed of in the nearest Kinder Morgan disposal well, Moqui Salt Water Diposal (SWD) well #1. It is estimated that approximately 1,000 bbls of fresh water and 2,000 bbls of brine would necessitate disposal upon completion of the drilling operations.

Drilling fluids and mud additives would be re-circulated into the wells during drilling. Drill cuttings are extracted from the drilling muds and placed in the reserve pit. The drilling fluids would be recycled whenever practical. Produced water or spent fluids would be allowed to evaporate in the reserve pit, or would be hauled to a Class I non-hazardous disposal well.

Well Completion, Testing, and Operation – Production casing would be run and the well would be completed for production following drilling. Near surface aquifers would be cased off with a 9 $\frac{5}{8}$ -inch diameter surface casing string set at 2,800 to 3,200 feet below ground surface and cemented to surface. All areas of the well pad not needed for production would be reclaimed once production commences (interim reclamation). Wireline logging at the end of drilling operations would be conducted in one day by one double-axle logging truck. The completion rig would be on location for approximately four weeks. The completion activities would include the vertical sections, and the horizontal sections included at the bottom of each vertical boring.

On-site Personnel - During the construction, drilling, completion and operation of each well, the following personnel would be on-site for varying durations: Rig supervisor, tool pusher, mud logger (2), mud engineer (1), H₂S safety technicians (2), in addition to the regular rig crew (5 people) that works 12-hour shifts. Other personnel such as welders and mechanics may be at the site as needed. Other miscellaneous drilling and production staff, specialists and consultants may also be needed. Due to safety concerns all unnecessary personnel and vendors would be kept off these closed and gated locations. On-site personnel each have a vehicle on location.

Transportation – Typically 25 tractor-trailer loads are required to move the bulk of the drilling equipment onto the surface location and the same numbers of loads are required to relocate the drilling equipment from the location. Approximately 125 trips (total) per well site are needed to supply water for drilling, plus two trips for fuel and four trips for cement. An additional 10 vehicle trips per day would be needed for transportation of crews to the site. Approximately 70 trips per well site would be needed to relocate (first well) and dispose (final well) of fresh water and brine water after completion of drilling. Each well in the series would require approximately 10 trips to transfer fresh water and brine, and to provide make up water and brine. Solid waste

and liquid waste would be disposed of once per week for a total of 24 trips per well. This would be a total of 565 vehicle trips per well.

Safety and Hazards – Safety and security are of primary concern to Kinder Morgan due to possible releases of H₂S during drilling and completion operations within the McElmo Dome Field.

In order to assure that only personnel certified in H₂S safety protocols and the use of specialized H₂S safety and emergency equipment are permitted onsite, all well pad locations would be fenced and gated during drilling and completion operations. All personnel would be required to check in and out with the H₂S safety supervisor upon arrival or departure from the site. All personnel would be required to wear H₂S monitors on the outside of clothing when working in the project area. Finally, the drill rig would be equipped with several H₂S monitors with audible and visual alarm systems to alert all project site personnel when H₂S is present.

Kinder Morgan's H₂S Safety Plan is provided in the APD. Other standard industry safety policies would also be in effect during all operations at the well sites in an effort to prevent any accidents.

Flow Line and Production Line Construction - Should the wells prove productive, the flow lines would be constructed to transport the produced CO₂ from the well head to the area production lines. A summary of the length and area of disturbance for the proposed access road/flow lines is provided in Table 2. A summary for each of the proposed production lines is provided in Table 3 (page 10). As described previously, the flow lines and access roads would occupy the same construction corridor alignments. Typical construction consists of clearing the corridor, trenching the ditch to 5-6 feet, stringing and welding the pipe, and reclamation of the disturbed areas of the corridor. Additional details regarding construction activities and interim and final reclamation are provided in the *Surface Use Plans* prepared for the project submitted to the BLM with the APD package. A summary of the reclamation activities is provided in the Plans for Surface Reclamation section below.

The production lines would be constructed of steel lines ranging in diameter from 10 inches at the beginning of the production line, up to 20 inches at the end of the production lines. To allow for construction activities within the existing well pad access road that provides access to well pads GP #3 through GP #7, a temporary road closure permit may be required. Pipeline valve boxes would be installed on the well pads. The valve boxes would have pipe guards installed around the boxes to protect the valves from traffic damage.

Operation and Maintenance - Should the wells be productive, Kinder Morgan would own or have control of the following facilities on each location: the wellhead and associated equipment, and a short piece of above ground piping to connect the well to a new underground flow line. The new flow lines would be combined in the new production lines, which would transport the produced CO₂ to a treatment and compression facility currently under construction outside of the Monument boundary on private land. At the facility, separators would be used to remove production liquids from the gas stream, and compressors would be utilized to transport the treated 'dry' gas to the Cortez Pipeline for transport to out of state markets.

Produced water from the proposed mineral development activities would be removed from the gas production stream at an off site facility and disposed of in a permitted disposal well.

Normal producing CO₂ well operation requires approximately weekly visits to monitor well production and pressure operations. Pipeline operations require monthly surface inspections and annual pressure testing of all the lines. All the well pads and pipeline routes could be inspected in a single day with a Kinder Morgan maintenance crew. Therefore, normal operations of the proposed production wells and pipelines would require 52 vehicle trips per year, on average.

Plans for Surface Reclamation – Interim reclamation of the unused portions of the well pad areas, the reserve pits and pipeline routes would be completed after surface disturbance activities were completed and the proposed wells, production and flow lines were operating. Interim reclamation activities would be completed as described in the project Surface Use Programs submitted to the BLM with the APD package. Interim reclamation activities would be completed on the temporary use areas around each well pad (12 acres) the flow line route portions of the construction corridors (28 acres) and approximately ½ of the 50 feet width of the access road areas (1 acre). **The total area of short term disturbance that would be reclaimed within approximately six months of project construction completion under the interim reclamation activities would be 41 acres.** Long term disturbance associated with access roads and well pad areas would be 21 acres. Specific reclamation activities include: removal of all solid waste from the project site; spreading stockpiled topsoil over areas to be reclaimed, drilling or broadcasting native seed, mulching with cleared vegetation, replanting salvaged vegetation including cactus and yucca, and monitoring for revegetation success and noxious weed infestations.

After completion of the proposed project, each well pad location and flow line route would be reclaimed according to BLM specifications provided in each approved APD's Surface Use COAs, and as proposed by Kinder Morgan in their *Surface Use Program* (see Appendix A). Reclamation activities would include removal of facilities and waste, reserve pit closure, re-contouring abandoned sites, reseeding and monitoring of re-vegetation efforts and noxious weed management. All well pad locations would be reclaimed to approximately one acre, which would remain for the life of the well. Kinder Morgan would contact the BLM within 48 hours of initiating reclamation activities and upon completion of the reclamation activities.

3.0 NO ACTION ALTERNATIVE

The National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347, as amended) (NEPA) requires that a “no action” alternative be considered in all environmental documents. The Proposed Action involves Federal subsurface minerals that are encumbered with Federal oil and gas leases, which grant the lessee a right to explore and develop the lease. Although the BLM cannot deny the right to drill and develop the leasehold, individual APDs can be denied to prevent unnecessary and undue degradation. The no action alternative constitutes denial of the APDs associated with the Proposed Action.

There are associated mineral development activities that would occur even if the APDs for well locations on the Monument are denied. On going mineral development activities within the

McElmo Dome Unit by Kinder Morgan include drilling of wells outside of the Monument boundary on fee land. These wells would access Federal minerals, and these wells will be constructed and developed even if the proposed Monument well APDs are denied. The construction and development activities described for the Proposed Action are similar to the activities that would occur for the wells outside of the Monument boundary. The same development, interim reclamation, long term operation and final reclamation activities described in the Proposed Action would be completed for the wells constructed on fee land.

4.0 ALTERNATIVES

4.1 Alternatives Considered but not Carried Forward

The Proposed Action has been put forward by Kinder Morgan to allow for development of the mineral resources present in the Burro Point area while minimizing environmental impacts to land surface resources. As part of the site evaluation process, archeological, surface water flow patterns and visual resources were considered prior to choosing the locations for each well pad, access road/flow line route and production line route. Based on an initial screening of the proposed project area and vicinity, the proposed project locations were chosen as representative of the locations that would best protect area resources while allowing development of the mineral resources.

In developing the proposed alternative, two additional proposals (alternatives) were considered. A description of each of the proposals is provided below.

1. Kinder Morgan considered drilling the proposed wells from a single well pad or from a cleared area in the vicinity of proposed well locations GP #2 (potential compressor station location). Multiple wells from a single location need to be directionally drilled so that the bottom hole locations are within the target zones of different lease areas. Due to the presence of the difficult drill zone described as the “killer shale”, directional drilling is not technically feasible. Therefore this alternative was considered but eliminated from further consideration.
2. Kinder Morgan considered drilling two additional wells and not utilizing a horizontal component for any of the wells. This alternative would have involved the construction of nine well pads within the Monument, construction of additional access roads and additional flow line routes. This alternative would have allowed for the same amount of production as the Proposed Action, but would have required additional surface disturbance. This alternative was eliminated from further consideration due to the additional impacts to surface resources, and the ability of Kinder Morgan to complete horizontal components to the vertical wells, thus allowing for the same amount of production with the reduced number of wells (seven) associated with the Proposed Action.
3. Two existing well pads Sand Canyon (Deep) Unit 2-36-18 #6 and Sand Canyon (Deep) Unit 9-36-18 #1 were considered as locations to drill the proposed Goodman Point #1 or #2 wells. These locations are not feasible because it would force Kinder Morgan to drill across a known fault. Drilling across faults significantly increases potential drilling

problems and increases associated drilling time. The additional drilling time increases visual and ambient noise level impacts, and also increases potential impacts to drill worker and public health and safety. Therefore these locations were not included in the Proposed Action.

Following onsite surveys, the BLM determined that the location of the preferred alternative well sites (Proposed Action) represents the least environmental impact relative to the placement of the well sites at alternative locations. No other action alternatives were identified for analysis.

4.2 Rationale for Development of the Proposed Action

The Proposed Action has been chosen by Kinder Morgan to allow for development of the mineral resources present in the proposed Burro Point area while minimizing environmental impacts to land surface resources. As part of the site evaluation process, archaeological, surface water flow patterns and visual resources were considered prior to choosing the locations for each well pad, access road/flow line route and production line route. Based upon an initial screening of the proposed project area and vicinity, the proposed project locations were chosen as representative of the locations that would least impact area resources while allowing development of the mineral resources.

In choosing each well pad and production line location a number of factors were considered. The following steps were performed by Kinder Morgan in choosing the locations for the proposed wells. The overall sequence demonstrates the process Kinder Morgan used to minimize the environmental impacts of the Proposed Action.

1. The initial development proposal for Kinder Morgan mineral resources within the Monument included two sets of four wells each, with associated access roads, flow lines, production lines and a compressor station for each set of four wells. One of the sets of wells and associated facilities would have been located on Burro Point and the second set of wells and facilities would have been located in the Cow Canyon area. The four wells in the Cow Canyon area were moved to the Burro Point mesas area to allow for consolidation of infrastructure to reduce the area of surface disturbance associated with the proposed project.
2. Existing information and new archaeological inventory information was used to identify potential well locations that had the largest distance between site boundaries and construction limits. From this block survey, seven well pad locations were recommended to Kinder Morgan that would minimize impacts to archaeological resources. Each well pad location had a 10- to 40-acre window around the proposed location surveyed for archeological resources. Based on the results of the archeological survey of the entire 10- to 40-acre area, a preferred location that minimized impacts to archeological resources was chosen. The production line routes also were surveyed for preferred routes that would minimize impacts to archeological resources. Consideration was also given to location topography, the presence of arroyos or drainage channels and the distance to existing access roads. Based on this screening method, a range of alternatives was considered for each location, and the preferred alternative was chosen as representing the least impact to the Monument resources.

5.0 PURPOSE AND NEED FOR THE ACTION

5.1 Purpose and Need for the Proposed Development

The purpose of the Proposed Action is to develop CO₂ gas reserves in the McElmo Dome Unit on five oil and gas leases that have been issued by the BLM. Gas produced from the Proposed Action would be moved via existing pipelines to the Permian Basin to supply CO₂ markets. The CO₂ gas that would be produced by the Proposed Action is needed to enhance oil production in the Permian Basin located in west Texas and southeast New Mexico. Domestic oil and gas production is needed to meet current domestic demand and to reduce dependence on foreign oil. Enhanced oil recovery with CO₂ gas injection is a proven technology for extending production rates in mature oil fields.

The Federal mineral estate, administered by the BLM as part of its mineral leasing program, provides minerals, including fossil fuels, for the benefit and use of the American public, and encourages development of domestic oil and gas reserves to reduce dependence on foreign energy supplies. Mineral development is supported by the Mineral Leasing Act (1920 30 USC 181 et. seq.), the Federal Land Policy and Management Act (FLPMA), Department of Interior (DOI) policy, the San Juan-San Miguel Resource Management Plan, and the issuance of leasing rights by the BLM. General guidance for management of the mineral estate within the Monument is provided for in the Monument Proclamation and the BLM Interim Management Guidelines for Canyons of the Ancients National Monument (BLM 2001a).

The Proposed Action includes all activities associated with gas development including activities to construct, operate, reclaim, and abandon one well per APD. The APDs include associated new access roads and pipelines to transport the produced gas to a treatment and compression facility located outside of the Monument boundary.

5.2 Purpose of the Environmental Analysis Process

NEPA requires analysis of the potential environmental affects associated with federal actions. The environmental analysis process is designed to provide the BLM's authorized Decision-maker with information needed to render a decision that is fully informed and based on factors relevant to the proposed Project, in compliance with BLM responsibilities under NEPA. It also documents the analyses conducted on the Proposed Action and alternatives to the Proposed Action in order to identify environmental impacts and mitigation measures necessary to address resource issues.

This EA is site-specific in nature; i.e., it describes environmental impacts resulting from development of the specific wells and associated facilities on federal surface and mineral estate outside and within the McElmo Dome Unit. Due to the size and connected nature of the proposed development, a larger landscape scale analysis of environmental impacts was completed to allow for proper evaluation of this proposal's contribution towards cumulative impacts, especially to cultural resources in the Monument. The EA also provides a vehicle for disclosure of the Proposed Action, and the environmental effects for public review and comment. If a decision is reached from this analysis that approves the APD, no additional NEPA would be required. If the responsible official determines that a Finding of No Significant Impact cannot be

reached, an Environmental Impact Statement (EIS) would be required to further evaluate this proposal.

5.3 Decisions to be Made

Ultimately, the decision to be made is whether or not to approve the Proposed Action in its entirety or in parts. The factors that will be considered as a result of the environmental analysis process include:

- Whether all or some of the proposed locations can be drilled.
- A determination of whether the Proposed Action and alternatives are in conformance with the policies, regulations, and approved Resource Management Plan (RMP), the Monument interim management guidelines of the BLM and the Monument Proclamation.
- The selection of environmentally suitable well locations, access roads, and production line routes that is compatible with other resource activities that minimize resource impacts, yet honor the lease rights within the project area.
- The determination of the nature and level of impacts resulting from the Proposed Action and alternatives on the human environment, if conducted in accordance with applicable regulations and lease stipulations, and the development of mitigation measures necessary to avoid or minimize these impacts.

6.0 PLAN CONFORMANCE REVIEW

The Proposed Action is subject to and has been reviewed for conformance with the following plan and amendment (43 CFR 1610.5, BLM 1617.3):

Plan: *San Juan/San Miguel Planning Area Resource Management Plan (RMP)*

Date Approved: September 1985

Page Number: Page 17 states “BLM actively encourages and facilitates the development by private industry of public land mineral resources so that national and local needs are satisfied and economically and environmentally sound exploration, extraction, and reclamation practices are provided.”

Amendment: *San Juan/San Miguel Resource Management Plan Amendment Record of Decision (1991)*. The Final Environmental Impact Statement (FEIS) is also known as the Amendment to the RMP.

Date Approved: October 28, 1991

Page Number: Page 11 states that the objective is to “Facilitate orderly, economic, and environmentally-sound exploration and development of oil and gas resources using balanced multiple-use management.” Also, page 2-2 of the FEIS states that: “In addition to this EIS, an Environmental Assessment (EA) will be completed on each Application for Permit to Drill or group of APDs.”

The Proposed Action is also subject to conformance with the Presidential Proclamation that established the Monument, the BLM Interim Management Guidelines for Canyons of the Ancients National Monument (BLM 2001a) and the BLM Interim Management Guidance for Oil and Gas Leasing and Development (BLM 2001b).

Proclamation: Monument Proclamation

Date: June 9, 2000

Language: “Now, therefore, I, the president of the United States of America, by the authority vested in me ... do proclaim that there are hereby set apart and reserved as Canyons of the Ancients National Monument ...”

“Because most of the Federal lands have already been leased for oil and gas, which includes carbon dioxide, and development is already occurring, the monument shall remain open to oil and gas leasing and development; provided, the Secretary of the Interior shall manage the development, subject to valid existing rights, so as not to create any new impacts that interfere with the proper care and management of the objects protected by this Proclamation; and provided further, the Secretary may issue new leases only for the purpose of promoting conservation of oil and gas resources in any common reservoir now being produced under existing leases, or to protect against drainage.”

Guidance: BLM Interim Management Guidelines for Canyons of the Ancients National Monument

Language: Monument lands remain open to continued oil and gas (including carbon dioxide) development under existing leases, under current lease restrictions and BLM regulations. The Proclamation also directs the Secretary to manage development, subject to valid existing rights, so as not to create any new impacts that interfere with the proper care and management of the objects protected by the Proclamation. With respect to oil and gas leases, "valid existing rights" vary from case to case, but generally involve rights to explore, develop, and produce within the constraints of the lease terms, laws and regulations.

The Proposed Action would fulfill the objective and intent of the 1985 San Juan-San Miguel RMP that public land mineral resources be developed in an environmentally sound way and thus, is in conformance with the RMP. This EA is being utilized to determine conformance with the Monument Proclamation and Interim Guidance. A written decision by the Authorized Officer would include a decision on conformance.

7.0 CONFORMANCE WITH STATUTES/OTHER REGULATIONS

Exploration and development of federal oil and gas leases by private industry is an integral part of the BLM’s oil and gas leasing program under authority of the Mineral Leasing Act of 1920, as amended, the Mining and Minerals Policy Act of 1970 (30 U.S.C. 21), the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1761-1777), the Federal Onshore Oil and Gas Leasing

Reform Act of 1987 (30 U.S.C. 195 et seq.), and applicable BLM Onshore Oil and Gas Orders (43 CFR 3160).

BLM regulates oil and gas development so as to minimize environmental impacts to public lands as required by numerous federal laws, including:

- The Endangered Species Act of 1973 (P.L. 94-325)
- The Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703-712)
- The Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. 668-668d)
- The Federal Water Pollution Control Act of 1948, as amended (33 U.S.C. Chap. 26)
- The Clean Air Act of 1963, as amended (P.L. 88-206)
- Clean Water Act of 1972, amended 1977
- The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 U.S.C. Chap. 103)
- The Antiquities Act of 1906, as amended (P.L. 52-209)
- The National Historic Preservation Act of 1966, as amended (P.L. 89-665)
- The Archaeological and Historic Preservation Act of 1974 (P.L. 86-253)
- The Archaeological Resources Protection Act of 1979, as amended (P.L. 96-95)
- The American Indian Religious Freedom Act of 1978, as amended (42 U.S.C. 1996)
- The Native American Graves Protection and Repatriation Act of 1990 (P.L. 101-601)
- Executive Order 12898 of 1994 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations"

This EA considers the requirements of these laws and implementing regulations, as applicable, as part of the Proposed Action. The Proposed Action, including associated applicant-committed mitigation measures, complies with the laws and implementing regulations indicated above.

Conformance with Colorado Standards for Public Lands Health

In September 1997, BLM established standards for health of public lands in Colorado (BLM, 1997). The standards relate to all uses of public lands and a finding for each standard must be included in each EA. The five standards for protecting Public Lands Health are:

- 1) Ensure healthy upland soils;
- 2) Protect and improve riparian systems;
- 3) Maintain healthy, productive, native plant and animal communities;
- 4) Maintain or enhance threatened or endangered species and their habitats; and
- 5) Ensure water quality meets minimum Water Quality Standards established by the State of Colorado

The standards describe conditions needed to sustain public land health, and relate to all uses of the public lands. The standards are applied on a landscape scale and relate to the potential overall health and sustainability of the landscape. Additional information on the standards and guidelines can be found at the Colorado BLM website: <http://www.co.blm.gov/standguide.htm>. Findings for each of the specific project study area standards (if applicable) are described in the relevant resource description in Section 8.0 below.

8.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

In this chapter, to comply with the CEQ requirements of analytic and concise environmental documents (40 CFR 1502.2) those resources identified as potentially affected by the Proposed Action or as a special concern are described. Table 4 provides a summary of critical elements and non critical elements and their potential to be impacted by the Proposed Action. **Critical and non critical elements identified as not potentially impacted by the Proposed Action are not discussed in this EA.**

Environmental resources may be affected in many ways during implementation of the Proposed Action. The effect, or impact, is defined as any change or alteration in the pre-existing condition of the environment produced by the Proposed Action, either directly or indirectly. Impacts can be beneficial to the resource (positive) or adverse (negative), and can be either long-term (permanent) or short-term (incidental, temporary). Short-term impacts affect the environment for only a limited time (generally less than five years), and the environment generally reverts to the pre-project condition. Long-term impacts are defined as lasting longer than five years. Additionally, with long-term impacts, the environment would potentially not revert to pre-existing condition during the lifetime of the proposed project and beyond. For the purpose of this EA, potential impacts have been divided into three categories:

High – as defined in CEQ guidelines (40 CFR 1500-1508) are impacts that are substantial in severity and therefore should receive the greatest attention in decision-making;

Moderate – impacts which cause a degree of change that is easy to detect, and do not meet the criteria for substantial impacts; and

Low – impacts which cannot be easily detected, and cause little change in the existing environment

Implementation of the Proposed Action could potentially affect certain critical elements of the human environment, as defined in the BLM Handbook H-1790-1 National Environmental Policy Act Handbook (NEPA Handbook), Appendix 5, as amended. These elements must, at a minimum, be considered in all EAs developed by the BLM and either analyzed or a no-effect declaration made. The status of the critical and non critical elements for the Proposed Action is indicated in Table 4.

The project area is located within a National Monument. Primary uses of the project area are recreation, heritage tourism, grazing, firewood gathering and natural resource development activities consisting primarily of natural gas (including CO₂) production, gathering, and transport. There are no prime or unique farmlands, known paleontological resources, wilderness or wilderness study areas, floodplains, or wild and scenic rivers within the study area. There are no people living in the study area, and no minority or low income populations that depend on the proposal, therefore there are no potential issues associated with environmental justice.

The Proposed Action includes drilling and operation of seven proposed CO₂ production wells, associated access roads and flow lines, and approximately 4.54 miles of production lines connecting the proposed wells into a central treatment facility. The project components located

within the boundary of the Monument are the Proposed Action, and impacts to the environment are being considered based on the construction and operation of the entire project. The analysis area for land based natural resources includes the mesa top area known as Burro Point, located generally south of Yellow Jacket Canyon and north of Rock Canyon (see Figure 2).

Table 4. Critical and non-critical elements affected by the Proposed Action.

| Critical Elements* | Potentially Affected | | Non-Critical Elements | Potentially Affected | |
|--|----------------------|----|-----------------------------------|----------------------|----|
| | Yes | No | | Yes | No |
| Air Quality | X | | Access | X | |
| Areas of Critical Environmental Concern (ACEC) | X | | Cadastral Survey | | X |
| Cultural Resources | X | | Forest Management | | X |
| Environmental Justice | | X | Fire | X | |
| Farm Lands (Prime or Unique) | | X | Geology and Minerals | X | |
| Floodplains | | X | Health and Safety | X | |
| Invasive, Non-Native Species | X | | Hydrology/Water Rights | | X |
| Migratory Birds | X | | Lands/ROW/Realty Authorizations | | X |
| Native American Religious Concerns | X | | Law Enforcement | X | |
| Threatened or Endangered Species | X | | Noise | X | |
| Wastes, Hazardous or Solid | X | | Paleontology | | X |
| Water Quality Drinking/Groundwater | X | | Rangeland Management | X | |
| Wetlands/Riparian Zones | | X | Recreation | X | |
| Wild and Scenic Rivers | | X | Socioeconomic Values | X | |
| Wilderness | | X | Soils | X | |
| * DPLO resource specialists and the Responsible Official have reviewed the information in this document and concur with the findings summarized in this table and described in the following sections. | | | Sensitive Species | X | |
| | | | Vegetation | X | |
| | | | Visual Resources | X | |
| | | | Wildlife, Aquatic and Terrestrial | X | |

Critical Elements Listing Source: (BLM 2003). Potential affects determination made by resource specialist staff and the Responsible Official for the Monument, Bureau of Land Management.

8.1 Mitigation Measures vs. Design Criteria

Mitigation measures and design criteria are requirements that address site-specific conditions and are intended to reduce specific environmental effects. They are used to provide additional guidance for those implementing the Proposed Action. Mitigation measures were evaluated by BLM resource specialists and developed using the following criteria that should be met in identifying and designing mitigation measures:

- Reduce the environmental impacts from an action to a minor level;
- Have a demonstrated effectiveness in past use or a reasonable rationale for effectiveness if being used for the first time;
- Not be controversial in terms of effectiveness;
- Be specific, measurable, and enforceable.

Design criteria are measures taken in the design phase of a Proposed Action to avoid or minimize a foreseeable effect to a resource. When implemented, design criteria keep the potential impact to the resource within an acceptable limit. A mitigation measure is implemented in order to

reduce an impact to a resource when a design criterion has not reduced the impact to an acceptable level.

Full design criteria are detailed in the Surface Use Plans and Drilling Plans submitted by the operator with each APD packet (available from the BLM). These design criteria are standard for CO₂ projects and are considered binding parts of the Proposed Action that would be implemented should the APDs be approved. Where design criteria are deficient, mitigation measures are included in the COA (Appendix A). Further, mitigation measures in the COA (Appendix A) take precedence over any design criteria in the Surface Use Plans.

8.2 Critical Elements

8.2.1 Air Quality

The project study area lies within the Western Slope Colorado Air Quality Control Region as defined by the Colorado Air Quality Control Commission Report to the Public, 2005-2006, (CDPHE 2006). On going state air quality monitoring and sources of air quality impairment in the area are summarized in the annual air quality report. Historically, the primary sources of air pollutants in this region included particulate matter from unpaved roads and seasonal sanding of paved roads for winter travel, motor vehicle emissions, and wood burning stove emissions. Currently, air quality concerns in the Western Slope Region are from impacts of energy development and coal-fired power generation facilities, including direct emissions, support service impacts and associated growth. In addition, controlled and uncontrolled burns are a substantial source of air pollution in this region (CDPHE 2006).

The Colorado Department of Public Health and Environment (CDPHE), Air Quality Division regulates air quality impacts from oil and gas activities and develops mitigation measures on a case-by-case basis. Impacts are evaluated to see if they are allowable or unacceptable. Air quality permits are required for emission sources on well pads if established emission thresholds for designated pollutants are exceeded.

The *Drilling Plans* for each of the proposed wells include drilling methodologies and a tested H₂S Contingency Plan that is designed to alert and protect the public from accidental releases of H₂S gas.

Environmental Consequences

Air emissions associated with CO₂ production primarily occur during well pad construction and drilling phases. Air emissions include: hydrocarbons, carbon monoxide (CO) and nitrogen oxides (NO_x) associated with production equipment; gas fired drilling equipment, and vehicle exhaust. Air quality impacts associated with the construction, drilling and operation of the proposed wells and associated access roads and flow line routes would occur from several sources:

- Suspended particulates (dust) during site clearing and from vehicular traffic on unpaved roads;

- Suspended particulates (dust) from wind erosion on cleared construction areas;
- Hydrocarbon emissions from the drill rig, service/support vehicles and operation of gasoline and diesel engines (i.e., generators).

Air quality impacts from construction and drilling operations, primarily from vehicle/equipment exhaust and increased fugitive dust, would be low to moderate and short-term. Wind dispersion and dilution would reduce the magnitude of emissions and these impacts would be low at locations beyond the well site boundaries.

Under normal conditions, air quality would not be affected during well production as a result of the operation of the wells. Indirect impacts would be from vehicle travel on area roads during on-going facility and well operation inspections. The operation of the wells and pipelines are not a source of emissions of monitored parameters. No air quality permits are anticipated to be required for the Proposed Action.

Under the Proposed Action, the impacts on air quality would be low to moderate and short-term during construction and drilling. The potential for releases of H₂S gas is low during the drilling phase of well development activities, and is discussed Section 8.3.3 – Health and Safety. Impacts during production operations would be low and long term.

Under the No Action Alternative, there would be no short term increase in impacts to project area air quality from construction activities associated with the proposed mineral development activities within the Burro Point Area. On going impacts to air quality such as traffic on area roads, impacts from coal fired power plants and impacts from existing compressor stations would continue.

Mitigation Measures

The potential impacts to air quality due to generation of fugitive dust would be mitigated by adherence to Surface Use COAs (Appendix A), should the Proposed Action be approved. Suspended dust from construction would be reduced through sprinkling of disturbed areas with fresh water from a clean water source during construction (COA #5). If the wells prove productive, the unused portions of the well pad area would be re-seeded with a BLM approved seed mix to stabilize soils and reduce the impacts of fugitive dust created from wind erosion (Reclamation COA #2). These actions would not only reduce the amount of dust in the air, but would maintain good construction site visibility thereby minimizing potential health and safety hazards.

8.2.2 Areas of Critical Environmental Concern

Areas of Critical Environmental Concern (ACEC) are those specific areas of BLM administered lands, which are managed to protect or enhance particular, special, or unique values (BLM 1985). The proposed project area is within the boundaries of the Monument, which was formerly designated as the Anasazi Culture Multiple Use Area (ACMUA) ACEC. The management objectives of the Anasazi Culture Multiple Use Area are strengthened by the

Monument designation. A description of the resources and management objectives of the Monument is presented in Section 6.0 (page 17) of this EA.

One of the proposed access road/flow line routes (for well pad GP #5) and a section of the production line route would be constructed within the boundary of the Lightning Tree Tower Group. This cultural resources site/area was included in the Anasazi Culture Multiple Use Area ACEC, and was protected with No Surface Occupancy (NSO) lease stipulations in the San Juan/San Miguel Resource Management Plan Oil & Gas Leasing and Development Amendment (BLM 1991). The oil and gas lease for development of resources within the Lightning Tree Tower Group (COC 012462) was issued prior to the NSO stipulations. Therefore the NSO stipulations do not apply to the development activities proposed for the COC 012462 lease.

Environmental Consequences

The Proposed Action is consistent with the terms of the lease and with the management direction outlined in the 1985 RMP, the San Juan/San Miguel Resource Management Plan Oil and Gas Leasing Amendment (BLM 1991), the BLM Interim Management Guidelines for Canyons of the Ancients National Monument and the Monument Proclamation.

Under the No Action Alternative, current land use within the Anasazi ACEC and the Monument would remain unchanged.

Design Criteria

The proposed production line routes were selected to minimize activities within the 160-acre Lightning Tree Tower Group area as designated in the Anasazi Culture Multiple Use Area ACEC Plan (BLM 1986).

8.2.3 Cultural Resources and Native American Religious Concerns

Existing cultural resources inventory data indicate that the vicinity of the project area has been utilized and inhabited by human groups from as early as 5,500 B.C. to present.¹ It was intensely occupied by Ancestral Puebloan people between A.D. 675 to 1290. The Ancestral Puebloans were sedentary agricultural people who built settlements on the mesas and canyons of the area. Archaeologists divide the chronology of Ancestral Puebloan occupation into a series of developmental periods Basketmaker II (AD 1- 500), Basketmaker III (AD 500 – 750), Pueblo I (AD 750 – 900), Pueblo II (AD 900 – 1100), and Pueblo III (AD 1100 – 1300) that reflect changes in culture during the six hundred years of occupation. Surveys in the project area suggest intensive occupation of the project area in the Basketmaker III, Pueblo II and Pueblo III periods. During the Basketmaker III period, the Ancestral Puebloans built single and multiple pithouse settlements on the deep soils in the center of the mesa. During the Pueblo II period, the Ancestral Puebloans built single or multiple habitation units composed of masonry and adobe surface rooms and kivas also situated on the deep soils of the mesa centers. During the last century of the occupation in the Pueblo III period, the Ancestral Puebloan built large villages

¹ All references for cultural resources were from cultural resource inventory reports (Fetterman 2006; Honeycutt and Fetterman 2007).

made of masonry situated away from the mesa centers near spring sources at the heads of canyons.

Prior to designation as a National Monument, the entire area now known as the Monument was an ACEC known as the ACMUA. The ACMUA was designated on 2 October 1985 in the San Juan/San Miguel Resource Management Plan on the basis of the collective significance and density of cultural resources. An ACEC management plan was developed to guide overall management of the ACEC with the objective of reducing impacts to significant cultural resources and their setting, as directed in the RMP. Subsequent site or area-specific management plans have also been developed and implemented within the ACEC prior to establishment of the monument. The San Juan/San Miguel RMP also established “No Surface Occupancy” stipulations for oil and gas leasing on a number of individual sites and areas of prehistoric settlement including the Lightning Tree Tower Group which is located immediately adjacent to Well 4 and 5 of the Proposed Action. The Presidential Proclamation that established the Monument states that “the Secretary of the Interior shall manage the development, subject to valid existing rights, so as not to create any new impacts that interfere with the proper care and management of the objects protected by this proclamation...”

Archaeologists from Woods Canyon Archeological Consultants (Woods Canyon) (BLM permit BLM-C-39470) conducted Class III archaeological surveys of the proposed well sites and associated access roads and flowline alignments. The proposed project area was surveyed and reported as two separate projects, each of which is summarized below. For each wellpad, a 660-foot by 660-foot (10-acre) area was inventoried by walking a series of parallel transects spaced no greater than 15 meters apart. Prior to field surveys, a records search was undertaken at the the Monument and State of Colorado Office of Archaeology and Historic Preservation office in order to identify previously recorded sites within and in proximity to the project areas. The two cultural resources reports have been submitted to the Monument and the State of Colorado Office of Archaeology and Historic Preservation: A Cultural Resources Inventory of Kinder Morgan’s Goodman Point Wells 1 and 2 on Burro Point (Project No. CANM 06-023); and A Cultural Resources Inventory of Kinder Morgan’s Goodman Point Wells 3-7 and Associated Pipelines and Access Roads (Project No. CANM 07-006).

The GP #1 and GP#2 well pads and access road areas (formerly named Cannonball Mesa #1 and 2) were surveyed on 30 May and 1 June 2005. Six previously recorded archeological sites were identified within the 10 acre survey areas. Five of the six sites are eligible for nomination to the National Register of Historic Places (NRHP). The sixth site needs more data to evaluate eligibility to the NRHP. The final locations of the proposed well pads and access road routes were chosen so as to avoid the known sites.

The GP #3 through #7 well pads, access road areas and the proposed flow line routes were surveyed by Woods Canyon staff between June and November 2006. Thirty-seven previously recorded archeological sites were identified within the survey area. Twenty-seven of the sites are considered eligible for nomination to the NRHP. Five of the sites need more data to evaluate eligibility to the NRHP. Five of the sites are not considered eligible for nomination to the NRHP.

The Colorado BLM Site Buffer Standard is 100 meters; State guidance allows buffers to be adjusted by local managers based upon other factors and circumstances. The Monument Manager established a minimum buffer of 30 meters (98.4 feet) at a 27 June 2007 meeting with Kinder Morgan personnel and the NEPA and archaeological contractors.

In all, 43 sites have been identified in the survey area for the wellpads, access road, and flowlines. Five of these sites are recommended as not eligible for the NRHP, and they are not included in the following breakdown (they represent 12% of the total number of sites). The remaining 38 sites have avoidance buffers less than 30 meters (88% of the 43 total sites), of which:

- 29 sites have avoidance buffers between 0-10 meters (67% of the total of 43 sites)
- 6 sites have avoidance buffers between 11-20 meters (14% of the total of 43 sites)
- 2 sites have avoidance buffers between 21-30 meters (5% of the total of 43 sites)
- 1 site has an avoidance buffer greater than 30 meters (2% of the total of 43 sites)

The BLM determination of effect for the undertaking under Section 106 of the National Historic Preservation Act is an “adverse effect.” This determination is based upon the potential of the undertaking to adversely affect significant qualities of the historic properties. The determination is based upon the following elements:

- The number of archaeological sites (38 in close proximity to the wells, pipelines, and access roads contained in the proposal;
- The significance of the archaeological sites in terms of eligibility to the National Register of Historic Places;
- The cultural significance of these ancestral sites to the Hopi people as identified during the consultations;
- The potential for the risk of subsurface discoveries, including human remains, during construction as a result of the small avoidance buffers between the site boundaries and construction areas;
- The disruption of the cultural landscape that may occur visually and physically by the establishment of a long-term industrial complex in an area of the Monument that is relatively undeveloped;
- The potential that the Proposed Action may create new impacts that interfere with the proper care and management of the objects protected by the Proclamation.

The BLM initiated consultation with the Colorado State Historic Preservation Office (SHPO) on the project determination of effect/adverse effect and NRHP site eligibility on 28 November 2007. Consultations on the project are continuing.

Tribal Consultation

A summary of the tribal consultation conducted by the BLM for this Proposed Action is attached in Appendix B. The Monument consults with 25 tribes (listed below) who have traditional ties

to the land area encompassed within the monument, or have been determined culturally affiliated to the Ancestral Puebloan prehistoric culture group.

- 1-Acoma, Pueblo of
- 2-Cochiti, Pueblo of
- 3-Hopi Tribe
- 4-Isleta, Pueblo of
- 5-Jemez, Pueblo of
- 6-Jicarilla Apache Nation
- 7-Laguna, Pueblo of
- 8-Nambe, Pueblo of
- 9-Navajo Nation
- 10-Northern Ute Tribe
- 11-Picuris, Pueblo of
- 12-Pojoaque, Pueblo of
- 13-San Felipe, Pueblo of
- 14-San Ildefonso, Pueblo of
- 15-San Juan, Pueblo of
- 16-Sandia, Pueblo of
- 17-Santa Ana, Pueblo of
- 18-Santa Clara, Pueblo of
- 19-Santo Domingo, Pueblo of
- 20-Southern Ute Indian Tribe
- 21-Taos, Pueblo of
- 22-Tesuque, Pueblo of
- 23-Ute Mountain Ute Tribe
- 24-Zia, Pueblo of
- 25-Zuni Pueblo

Consultation for the Proposed Action was initiated by a letter dated 2 July 2007 from the BLM to the Tribes. The letter notified the Tribes about the proposal, provided the cultural inventory information, related the BLM's "adverse effect" determination of effect for the undertaking; and requested identification of traditional cultural properties, and input regarding the proposal.

The Tribes are also mailed the quarterly Schedule of Proposed Actions (SOPA) mailings for the San Juan Public Lands, and have access to the SOPA on the Internet (<http://www.co.blm.gov/nepa/sjplcnepa.htm>). Interested Tribes are asked to contact the BLM if they would like to receive additional information concerning a project. This project was entered into the SOPA database on 12 December 2006.

Responses were received from the Pueblo of Laguna and the Hopi Tribe. The Pueblo of Laguna stated that "The Pueblo of Laguna has determined that the proposed undertaking will not have a significant impact at this time." The Hopi Tribe response stated that the Hopi claim cultural affiliation to the prehistoric cultural groups in the monument; they did not concur with the recommended determination of "no effect" to historic properties contained in the inventory

report, stating they determine an “adverse effect,” and requested a meeting with the BLM to discuss their opposition to the project.

An administrative meeting was held with the Hopi Tribal representatives to discuss the project design features, the archaeological resources report, and the tribal concerns with the project. In a follow up letter from the Hopi Tribal representatives, the following issues were identified:

- Asserts the Hopi claim of cultural affiliation to prehistoric groups in the the Monument, and supports the identification and avoidance of prehistoric archaeological sites and traditional cultural places.
- Cites the contradiction of potential energy development within the Monument and within BLM special area designations (Mockingbird Mesa Cultural Resource Emphasis Area and the Anasazi Cultural Multiple Use Area of Critical Environmental Concern).
- States that the Hopi do not concur with the survey report recommendation that “The building of the project will have no effect on eligible cultural resources...”
- States the concern with the small avoidance buffers between site boundaries and construction areas.
- Asserts that the Hopi conclude that the proposal “will result in significant adverse effects to numerous cultural resources significant to the Hopi Tribe.”

Follow-up efforts to contact cultural resources contacts for the Pueblos of Acoma and Zia were not successful. The Pueblo of Zia Tribal Administrator, Peter Pino, spoke to Monument Manager LouAnn Jacobson and stated that the Zia had no concerns about the project. A response of 15 October 2007 from the Navajo Nation stated that the project would not impact any Navajo traditional cultural properties or historical properties.

Environmental Consequences

The direct and indirect impacts to cultural resources associated with implementation of the Proposed Action are listed below.

The No Action Alternative would result in no additional impacts to cultural resources within the proposed project area. Ongoing direct and indirect impacts to cultural resources due to vandalism and recreation activities within the proposed project area would continue.

Direct Impacts

- 1) There is potential for having direct impacts on resources due to the close proximity of the majority of the cultural resources (38 with avoidance buffers less than 30 meters) to construction areas and the potential for encountering subsurface deposits and/or human remains during construction.
- 2) If the above potential for direct impacts is mitigated through a treatment plan that includes data recovery, the physical destruction of non-renewable archaeological sites would occur.

- 3) This physical destruction would result in the loss of the associated cultural values of the Native American ancestral sites to the living descendants of the Ancestral Puebloan people.
- 4) The project would result in the relatively long-term (+ or – 50 years) alteration of the physical setting of the cultural resources and prehistoric landscape by construction/operation/and rehabilitation of the Proposed Action. This includes vegetation removal and also physical alteration of the terrain.
- 5) The project would have auditory (noise) impacts to the setting of the cultural resources during construction.
- 6) The project would physically fragment the Monument landscape in the Goodman Point area by establishment and operation of the facilities contained in the Proposed Action.

Indirect Effects:

- 1) Increased potential for vandalism to the cultural resources as a result of increased access into the area.
- 2) Increased potential for erosion resulting from the development of the Proposed Action.

Mitigation Measures

Direct Impacts

1) An archaeological treatment plan would be developed to mitigate the adverse effects of the Proposed Action on the sites. It is anticipated that mitigation would include additional survey, testing, and data recovery. It would be tied to regional research and the State context recommendations and would be designed in such a way as to minimize impacts to the affected sites and maximize data recovery. The mitigation may include:

- Additional survey of the mesa top in the Lightning Tree area to gain comprehensive knowledge of the components in this community;
- Detailed mapping, augering, and in-field ceramic analysis to refine chronology, site function, and components at selected sites;
- Archaeological testing at selected sites to obtain dendrochronological samples to further refine chronology (testing would occur in the post-occupational deposits of pithouses and would not disturb floor contexts);
- Full data recovery at those sites chosen on basis of being most vulnerable to potential impacts and those best able to address research questions (PII fieldhouses, BMIII and Lightning Tree Tower communities/settlements).

It is estimated that approximately three sites would be chosen for data recovery, approximately 10 sites would be chosen for testing, and approximately 20 sites would be chosen for additional documentation (mapping/infield artifact analysis). The plan would include both an

Unanticipated Discovery plan, and a Native American Graves Protection and Repatriation Act (NAGPRA) plan. The Tribes and the Colorado State Historic Preservation Officer would be afforded the opportunity to participate in the development of the treatment plan.

2) While the implementation of the treatment plan would result in the physical destruction of non-renewable archaeological sites, the plan would be designed to minimize the physical destruction and to preserve the physical manifestations to the greatest extent by backfilling and utilizing minimally invasive testing procedures. Realization of the plan would have beneficial effects through the recovery, analysis, synthesis, and dissemination of the scientific information and the associated public benefits. Curation of the data recovery materials insures the availability of this archaeological data for future scientific inquiries that may utilize new techniques and analytical capabilities.

To further protect cultural resources during the development of the Proposed Action and to check for possible subsurface deposits, the project elements would be cleared and monitored by a permitted archaeologist prior to construction. This would permit the mitigation or avoidance of any unanticipated discoveries prior to actual construction. Secondly, a permitted archaeologist would be on site during soil removal operations, and trenching for the well pads, pipelines, and building of access roads to monitor for subsurface cultural resources. If previously unidentified cultural resources were discovered during construction, activity in the vicinity of the resource would cease, the resource would be protected, and the Monument Archaeologist would be notified immediately. This includes the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Activities in the vicinity of the discovery would be halted and the site would be protected until notification to proceed was received from the authorized officer.

All Kinder Morgan employees, contractors, and subcontractors would be informed before commencement of operations that any disturbance to, defacement of, or collection or removal of archaeological, historical, or sacred material is not permitted. They would also be informed that disclosure or release of information regarding the nature and location of archaeological, historic, or sacred sites, without written approval by the BLM, is prohibited by law.

Prior to the start of construction activities, temporary barrier fences would be erected along construction limits of the well pads, and flagging would be placed along construction corridor edges. Cultural resource monitors would assure that activities are confined within those areas. No equipment or construction would be allowed beyond the fence anytime during construction or subsequent well operations.

A detailed description of these specific mitigation measures is included in the Surface Use COAs (Appendix A).

3) To address impacts concerning the loss of the associated cultural values of the Native American ancestral sites to the living descendants of the Ancestral Puebloan people, an ethnographic study would be undertaken. This study would be integrated into the treatment plan and would incorporate Hopi and other tribes in the research objectives and conduct of work. The

ethnographic study may also include a study of clan/societal origins/migrations, uses, and associations to the sites and region.

4) Vegetation removal would be designed to maximize screening when viewed both from the cultural resources to the development and from the development to the cultural resources; using irregular patterns to retain a natural look. It would utilize timely post-construction vegetative reclamation that includes recontouring the terrain back to the original topography as far as practical and re-establishment of vegetation upon the termination of operations.

5) All available technology would be used by the operator to minimize noise during construction and operation of the developments, in order to address noise impacts to the setting of the cultural resources.

6) To address impacts associated with the physical fragmentation of the Monument landscape in the Goodman Point area by the Proposed Action, it is proposed that a comprehensive compilation of all past oil, gas, and CO₂ development in the Monument be conducted. This would result in a complete and accurate database upon which to base cumulative effects analyses for future proposed actions in the monument and to help in determining thresholds for development within the Monument.

Indirect effects

1) To address the potential increase in vandalism associated with increased access, monitoring of sites in the development area would be increased by BLM Rangers, Cultural Site Stewards, and Kinder Morgan employees.

2) To address impacts to cultural resources from post-construction erosion, immediate post-construction vegetative reclamation would be conducted. In addition, excelsior wattles and matting to reduce the erosion potential would be installed if needed.

Although mitigation has been designed to address direct and indirect impacts to cultural resources, implementation of the Proposed Action would result in an irreversible loss of cultural resources from the physical loss of the sites at which full data recovery is completed.

Implementation of the Proposed Action with the associated vegetation removal, and physical alteration of the terrain would also result in the irretrievable loss of the physical setting of the cultural resources and fragmentation of the Monument landscape.

8.2.4 Invasive, Non-native Species

The interim management guidelines for the Monument state “existing noxious weed control activities should continue. Exotic species should not be introduced” (BLM 2000). The Colorado Noxious Weed Act prioritizes noxious weed management into three groups (lists): List A—species designated for eradication; List B—species for which noxious weed management plans are designed to stop their continued spread; and List C—species for which management plans are not designed to eradicate or to stop their continued spread, but to provide additional education and research.

During the project area field surveys on 24 October 2006, 5 December 2006, and 7 March 2007, no List A or List B noxious weeds were identified. However, two List C noxious weed species were identified during the field surveys: cheatgrass (*Bromus tectorum*) an invasive, non-native annual grass was observed throughout the project area; and filaree (*Erodium cicutarium*) is a common invasive annual forb on disturbed soils, and it was identified near existing roadways. Because the field survey occurred at the end of the normal growing season (and outside the flowering period) for most flora, it is possible that additional noxious weeds occur in the project area.

Environmental Consequences

Ground disturbing activities (well pad, access road and pipeline route clearing) increase the chances of noxious weed infestation. Because cheatgrass, and filaree are already present in some portions of the project area, it is likely that some disturbed sites may be invaded by these species following disturbance or during reclamation efforts. Increased vehicle access could increase the potential for noxious weed infestation in the project area from seed transport on vehicles. These impacts would be low to moderate and short-term, and could result in a noticeable change in the composition of the project area vegetation. As unused areas of the well pads are re-claimed, impacts would shift to low and long-term.

Under the Proposed Action there would be low to moderate, short-term impacts during construction and drilling operations associated with increasing the potential for invasive species to establish in the project area.

Under the No Action Alternative low levels of change to project area vegetation would continue. On going mineral development and recreation activities would continue to provide a source of seed and disturbance that allow for the introduction and spread of noxious weeds. Areas of the Monument that have established noxious weed populations would provide sources of seeds for noxious weed establishment. Ongoing noxious weed management activities would also continue.

Design Criteria

The following design criteria would minimize and/or avoid introduction or spreading of noxious weeds. Stripped topsoil and vegetation would be stockpiled for subsequent reclamation of unused areas of the well pads, providing a source of native plant seeds. As part of Stormwater Management Plan inspection activities and routine operation inspections, reclaimed areas of the well pads and pipeline routes would be inspected for invasive and noxious weeds. If areas of weed infestation are observed, appropriate control of the outbreaks would be implemented.

Mitigation Measures

The following mitigation measures are included in the project COAs (Appendix A). The BLM would be notified prior to initiating seeding activities on well pads and pipeline routes. Cleaning of all vehicles and heavy machinery to remove seed and soil would be completed prior to

construction activities to reduce the potential for the introduction of invasive species into the project area. During the operations phase of the project, reclaimed areas would be monitored by Kinder Morgan field staff for noxious weeds. All noxious and invasive species that occur on site would be controlled using materials and methods approved in advance by the BLM. As part of interim and final reclamation activities, re-vegetation with a BLM-approved native seed mix (see Table 6) would be initiated by Kinder Morgan following completion of construction and drilling activities, and on disturbed areas not required for production operations.

8.2.5 Migratory Birds

The proposed project area occurs in piñon-juniper woodland, a vegetative community supporting the most diverse avian populations of upland communities in the western U.S. (Colorado Partners in Flight [CPIF] 2000). Consequently, the project area supports a large suite of migratory and resident bird species that are protected under the Migratory Bird Treaty Act (MBTA). Common bird species that breed in piñon-juniper habitats include gray flycatcher (*Empidonax wrightii*), juniper titmouse (*Baeolophus ridgwayi*), black-throated gray warbler (*Dendroica nigrescens*), bushtit (*Psaltriparus minimus*), white-breasted nuthatch (*Sitta carolinensis*), pinyon jay (*Gymnorhinus cyanocephalus*), plumbeous vireo (*Vireo plumbeus*), and blue-gray gnatcatcher (*Polioptila caerulea*).

The U.S. Fish and Wildlife Service (USFWS) maintain a Birds of Conservation Concern (BCC) list. These are non-game migratory avian species that the USFWS has targeted as conservation priorities, but are not currently federally listed as threatened or endangered. BCC species with potential to occur in the project area are golden eagle (*Aquila chrysaetos*), peregrine falcon (*Falco peregrinus anatum*), gray vireo, and pinyon jay.

Three other BCC species are associated with piñon-juniper woodlands but are unlikely to be impacted by project activities. Black-throated gray warblers require mature piñon-juniper woodlands (Versaw 1998). The project area contains early to mid-seral woodlands without the forest structure preferred by black-throated gray warblers. Virginia's warblers (*Vermivora virginiae*) are found in woodland habitat with a dense, taller shrub component such as Gambel's oak (*Quercus gambelii*) or three-leaf sumac (*Rhus trilobata*) (Olson and Martin 1999). This shrub component is absent from the project area. Lewis' woodpeckers (*Melanerpes lewis*) utilize piñon-juniper habitats only when they border riparian areas or when they are interspersed with taller ponderosa pines (*Pinus ponderosa*) that are more suitable as nest trees. Table 5 lists all bird species observed during the field surveys.

Table 5. Avian species observed within the proposed project area.

| Common Name | Scientific Name |
|---------------------|----------------------------------|
| American crow | <i>Corvus brachyrhynchos</i> |
| Common raven | <i>Corvus corax</i> |
| Juniper titmouse | <i>Baeolophus ridgwayi</i> |
| Mountain chickadee | <i>Poecile gambeli</i> |
| Dark-eyen junco | <i>Junco hyemalis</i> |
| Northern flicker | <i>Colaptes auratus</i> |
| Pinyon jay | <i>Gymnorhinus cyanocephalus</i> |
| Western scrub jay | <i>Aphelocoma californica</i> |
| Black-billed magpie | <i>Pica hudsonica</i> |
| American robin | <i>Turdus migratorius</i> |
| Rock wren | <i>Salpinctes obsoletus</i> |
| Red-tailed hawk | <i>Buteo jamaicensis</i> |
| American kestrel | <i>Falco sparverius</i> |
| Bushtit | <i>Psaltiparus minimus</i> |

Environmental Consequences

The Proposed Action would result in a maximum disturbance of 62 acres of vegetation in the project area. Vegetation removal would result in a direct loss of breeding and foraging habitat for avian species associated with piñon-juniper woodlands. Construction activities could directly impact area birds, including species occupying cliff habitat adjacent to the project area, due to increased noise and human activity. The reserve pits, if uncovered, pose a hazard to birds flying into or drinking from them. All of these impacts are expected to be low to moderate and short-term. The duration of construction activities for each well pad would be for a period of several weeks, thereby limiting the severity of potential impact to a short time period for any specific area.

There would be long-term indirect impacts to area birds during operation of the wells from periodic human activity, vehicular traffic in the area, and from the conversion of habitat to industrial use. Well operation would not require on-site pump jacks or compressors; therefore, post-construction noise impacts are expected to be low. Because much of the project occurs in undisturbed terrain, the resulting increase in habitat edge might cause an increase in nest predation and cowbird parasitism in adjacent areas (Paton 1994). These impacts are expected to be low and long-term.

Birds of Conservation Concern species with potential to occur in the project area are expected to disperse into available piñon-juniper habitat surrounding the project area. **No population level impacts to these species are expected.**

Under the Proposed Action, potential impacts to area birds would be low to moderate and short-term during construction and drilling and low and long-term during production. These potential impacts would be minimized by the implementation of mitigation measures described below. While there may be some impacts to individual birds, impacts to regional populations of these avian species are expected to be low.

Under the No Action Alternative there would be no increase in impacts to project area wildlife, including avian species. On going impacts to migratory birds from current activities on the Monument would continue.

Mitigation Measures

The impact to migratory birds caused by the removal of vegetation would be mitigated through the implementation of reclamation measures and best management practices outlined in the Surface Use COAs (Appendix A). The COAs include the following measures that would help in mitigating impacts to birds. After drilling of the wells is complete and the reserve pits have been fenced, bird netting would be placed over the pits. Construction activities would be confined to the proposed well pads, access roads, and pipeline corridor areas to minimize disruption to area birds. Vegetation removal would take place during the non-breeding season for area birds nesting in piñon-juniper woodlands (approximately September-March). If vegetation removal must take place during the breeding season (April-August), an inventory of the area to be cleared would be performed to identify any active nests. If active nests are found, vegetation removal would be postponed until after the nest either successfully fledges young or fails.

8.2.6 Threatened and Endangered Species

In following the guidelines of the Endangered Species Act (ESA) of 1973, as amended, a search was made for threatened or endangered flora and fauna species with potential to occur in Montezuma County and/or in the project area. The project area was surveyed for potential habitat of the listed species on 5 December 2006 and 24 October 2007, by biologists from Ecosphere Environmental Services (Ecosphere), and again on 7 March 2007 by biologists from Ecosphere and the BLM.

None of the current federally listed threatened, endangered, or candidate species have potential to occur in the project area.

The Standard for Public Lands Health for threatened and endangered species is not applicable to the proposed project as no species or their associated habitat are present in the proposed project area or vicinity.

Environmental Consequences

There would be no impacts to federally listed threatened, endangered, or candidate species because there are no species with potential to occur within the project area or project area vicinity.

Under the No Action Alternative there would be no impacts to listed species.

Mitigation Measures

Construction activities would be confined to the proposed well pads, access roads and flow line routes to avoid potential impacts to listed species possibly occurring outside the area surveyed

during the biological survey. Should any listed species be identified during construction or operation of the proposed projects, BLM resource specialists would be contacted immediately.

8.2.7 Hazardous or Solid Wastes

The proposed project area and general vicinity does not contain any known hazardous waste or solid waste disposal areas. Hazardous materials subject to regulation that may be found at each well drilling site during drilling and completion activities may include: drilling mud and cementing products that are primarily inhalation hazards, fuels (flammable and/or combustible), and materials that may be necessary for well completion/stimulation activities such as flammable or combustible substances, fly ash, and acids/gels (corrosives). Human solid and liquid wastes would be generated primarily during the construction and drilling phases of the project and would be contained within portable facilities at the site. Solid waste generated during drilling and operation activities would be disposed of off site in a regularly maintained solid waste disposal container.

Kinder Morgan maintains a file, per 29 CFR 1910.1200(g), containing current Material Safety Data Sheets (MSDS) for all chemicals, compounds, and/or substances which are utilized during the course of construction, drilling, completion and production operations for each of the proposed wells.

Environmental Consequences

Human solid and liquid wastes would be generated primarily during the construction and drilling phases of the project activities and would be contained within portable facilities at the site. There would be potential for spills of fluid hydrocarbons or other chemicals used during the drilling and completion activities. The potential for environmental impacts from spills or releases of regulated substances in excess of federal and state reportable quantities would be low due to the volume of material handled, the design criteria that would be used to reduce potential impacts, and the clean-up procedures that would be used. The Surface Use Plans for the proposed construction and drilling activities include measures for responding to spills at the well sites.

Under the Proposed Action, the potential to release hazardous or solid wastes is low to moderate and short-term during construction and drilling and low and long-term during production operations.

Under the No Action Alternative there would be no increase in potential exposure to hazardous or solid wastes.

Mitigation Measures

The following COAs address potential impacts to human health and the environment due to use of hazardous materials during implementation of the proposed project. After completion of drilling activities, all solid waste present within a given work area would be collected and disposed of in a permitted facility. Any spills or releases would be cleaned up and disposed in accordance with State and Federal regulations.

8.2.8 Surface Water and Groundwater

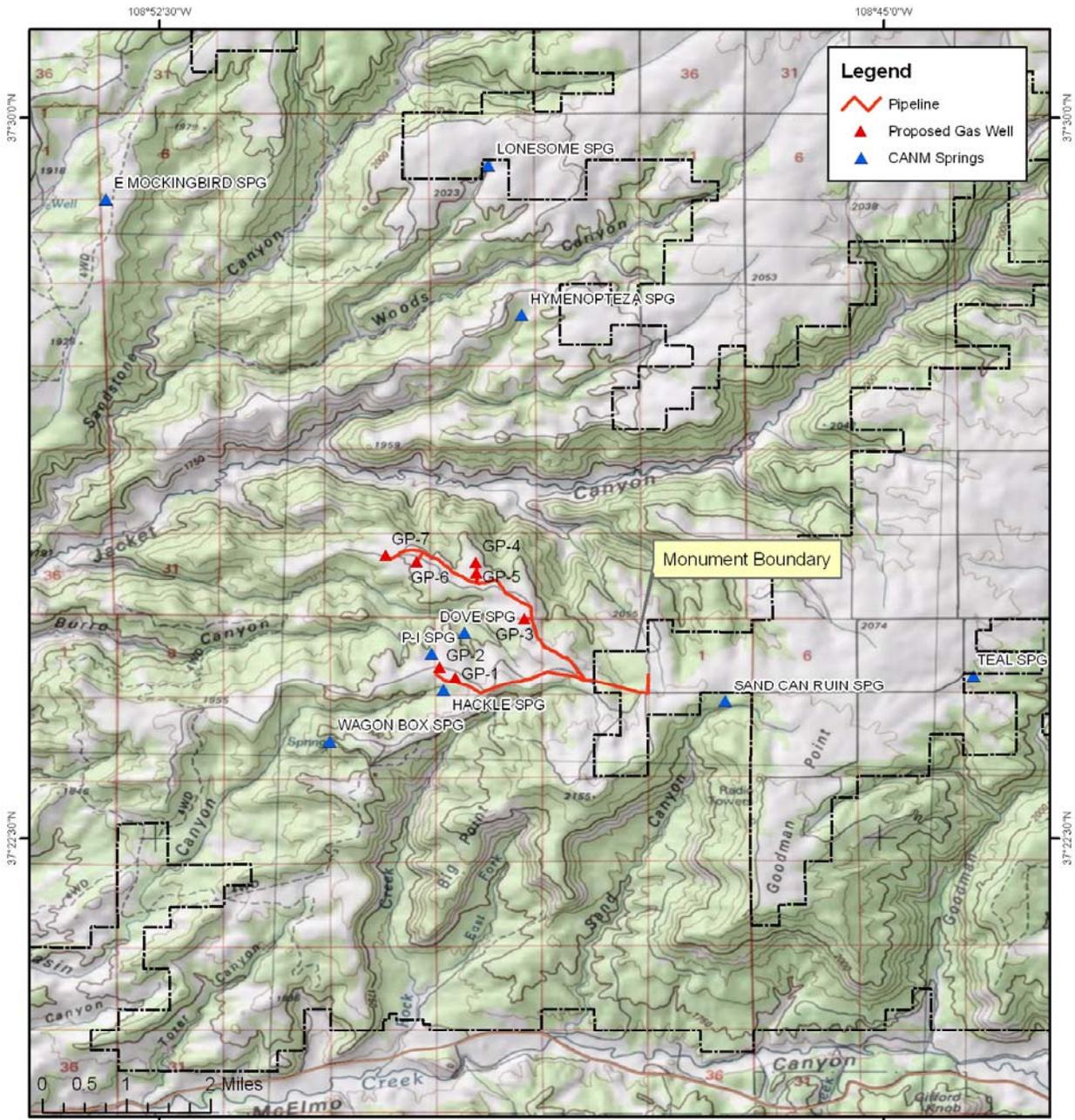
The proposed project area is situated on a mesa top area that drains to the north into Yellow Jacket Canyon and to the south into Sand Canyon and Rock Creek. Yellow Jacket Canyon is located approximately one mile to the north of the proposed northern flow line and well pads GP # 4, 5 and 7. The edge of the canyon walls of Rock Creek is located adjacent to the existing oil field access road that provides access to the proposed GP #1 and 2 well pads. Sand Canyon is located to the southeast of the main flow line at the eastern Monument boundary. No perennial water sources are located within a ½-mile radius of the proposed project area.

Sand Canyon and Rock Creek are ephemeral tributaries to McElmo Creek and eventually the San Juan River, which runs generally east to west approximately 24 miles south of the project area. McElmo Creek, a perennial waterway, is located approximately five miles south of the proposed project area. Yellow Jacket Creek has perennial flows, and is located approximately one mile to the north of the proposed project area. Typically, the San Juan River experiences peak flows, primarily from snowmelt, between April and June (BLM 1985). Principal water uses within the San Juan River Basin include irrigation, municipal, industrial, domestic, recreational, and transmountain and transbasin diversion uses.

No riparian habitats or riparian vegetation species were observed immediately adjacent to or within a ¼-mile radius of the proposed well pads or flow line route locations. Various unnamed ephemeral drainages are located throughout the project area. The hydrologic regime in the vicinity of the project area is such that surface water flows only on an intermittent basis in conjunction with sizable precipitation events. Thunderstorms are the primary source of intermittent flow in these ephemeral drainages, which are also fed by snowmelt. Key factors that influence the surface water quality in the project area include sparse vegetative cover, highly erosive soils, rapid runoff, and livestock grazing. Surface runoff from each of the well pad locations discharges to local ephemeral tributaries that eventually discharge to McElmo Canyon.

There are three identified springs located in the general vicinity (within ½ mile) of the proposed project development components. The springs are located within Moccasin Canyon (Hackle Spring) and Burro Canyon (Dove Spring and P-I Spring). The location of the springs relative to the project components are shown on Figure 3.

Total suspended solids, total dissolved solids (salinity), heavy metal and biogenic pathogens are the water quality parameters of concern (BLM 1985) within the project area. McElmo Creek is not listed in the CDPHE 2006 Clean Water Act Section 303(d) list of impaired waters within the State of Colorado.



| | | |
|---|--|----------------------|
|  | KINDER MORGAN GOODMAN POINT DEVELOPMENT PROJECT | |
| | AREA SPRINGS | FIGURE 3 |
| | TOWNSHIP 37N RANGE 18W, SECTIONS 34 & 35 | MONTEZUMA COUNTY, CO |
| | TOWNSHIP 36N RANGE 18W, SECTIONS 2 & 3 | 3/2008 |

Figure 3. Surface Water Resources

Groundwater

The groundwater aquifer in the project area consists of the Colorado Plateau Aquifers that underlie an area of approximately 110,000 square miles in western Colorado, northwestern New Mexico, northeast Arizona, and eastern Utah. Aquifers within the Colorado Plateau are generally composed of permeable sedimentary rocks that vary in thickness, lithology, and hydraulic characteristics. Within the project area, the Mesa Verde and Dakota-Glen Canyon aquifers are the uppermost water-yielding units in the Colorado Plateau aquifers. Water from the Mesa Verde aquifer is derived from the Menafee and Cliffhouse sandstone formations; water in the Dakota-Glen Canyon aquifer is derived from the Dakota and Morrison formations (Robson and Banta 1995).

More localized and shallow groundwater resources are encountered within alluvial deposits associated with the surface water drainages within the project area. These aquifers consist of Quaternary period deposits of alluvial gravel, sand, silt, and clay or Quaternary deposits of eolian sand and silt (Robson and Banta 1995). These aquifers tend to be localized near surface water and of limited aerial extent. In general, groundwater movement is from areas of recharge to areas of discharge (i.e., springs, seeps). Higher elevation mountainous and sloped areas provide the most important recharge areas based on the presence of outcrops of permeable geologic formations.

No groundwater wells were identified within the project area based on a search of the USGS database of available groundwater data, and the Colorado Water Resources Division database of water well permit applications. Specific information on groundwater use is limited within the project area and no residential properties or windmill wells for stock watering were observed in proximity to the proposed project components.

Water quality data for groundwater in the project area is also lacking although aquifers associated with sedimentary rocks and marine deposits are known to contain high salinity (BLM 1985) and abundant mineralization. Water quality in the deeper sedimentary aquifers may be influenced by upward movement of saline water through improperly plugged exploration holes (Robson and Banta 1995).

The project area is considered to be meeting Public Lands Health Criteria for water quality (surface and ground water). Perennial surface water resources have been evaluated by CDPHE and they are not included in the state list of impaired waters. Ground water resources within the proposed project area are not currently developed, so the quality has not been assessed.

Environmental Consequences

There are a number of sources for potential impacts to surface water quality that may occur as a result of developing the Proposed Action. Disturbed project area soils would be subject to erosion by wind and/or water into nearby ephemeral washes, impacting localized surface water quality. Spills or releases of hazardous substances, production fluids, fuels, or other constituents utilized during well drilling activities could be washed into surface drainages during storm events. Absence of actively flowing (perennial) surface waters within a ½-mile radius of the

proposed well pads, access roads and flow line routes reduces the potential for surface water quality impacts to regional surface water resources.

Potential effects on surface water quality that could occur during construction of the Proposed Action would be low and short-term. During operation of the wells and gathering system, potential impacts to surface water quality would be low to none and long-term based on reclamation and stabilization of unused areas of the proposed well pads and construction corridor routes, and a decrease in use of potentially hazardous substances, chemicals, and fuels once each well is in operation.

Under the Proposed Action, potential impacts to surface water quality would be low and short-term during construction and drilling, and low to none and long-term during production.

Under the No Action Alternative there would be no impacts to project area surface water resources.

Potential groundwater impacts associated with CO₂ resource development include:

- Migration of gas into shallow aquifers; and
- Contamination of shallow drinking water aquifers due to surface spills and releases.

Groundwater contamination, dewatering, or gas migration could occur as the result of improperly sealed surface casings during drilling, well bore stimulation activities, production, and abandonment activities. Releases of naturally occurring gases to groundwater include methane, hydrogen sulfide, or carbon dioxide. Although migration of gas by diffusion or through natural fractures is possible, manmade conduits account for most of the upward migration of gas to the near surface environment (USGS 1994). Potential impacts are expected to be low and long-term during drilling and operation.

Shallow groundwater quality could be impacted by leakage of fluids from transfer and transportation of drilling fluids, additives, and fuels. Proposed project design criteria would reduce the potential for this to occur. Potential impacts to groundwater resources during drilling are expected to be low and short-term. During production, impacts are expected to be low and long-term.

Under the Proposed Action, potential impacts to groundwater quality and aquifer dewatering would be low and short-term during construction and low and long term during production operations.

Under the No Action Alternative there would be no impacts to project area groundwater.

Design Criteria

Project design criteria that provide for protection of surface water and ground water resources include the following: prompt reclamation of non-used areas of surface disturbance, utilization of best management practices to minimize soil erosion and sediment transport, proper lining and maintenance of reserve pits, proper well drilling and completion techniques that are reviewed

and approved by a BLM Petroleum Engineer and training of project staff on spill response and reporting requirements. In addition, Kinder Morgan would prepare project specific Storm Water Management Plans for inclusion in the Kinder Morgan McElmo Dome Programmatic SWMP prepared in accordance with CDPHE requirements.

8.3 Non-critical Elements

8.3.1 Access

The main access to the Monument is via US Highway 491 which runs generally southeast to northwest to the east of the Monument. From US 491, access to the Monument is via gravel and paved surface Montezuma and Dolores County roads. Within the Monument access includes a combination of county roads and BLM system, non-system and oil and gas access roads. The road network provides access for recreational and educational uses within the Monument, access to range allotments, and access to oil, natural gas and mineral development areas.

Access to the proposed project area is via US Highway 491 and then County Road P, which travels along the Burro Point mesa area. Access to wells GP #3 through GP #7 would be via an un-maintained dirt two track road previously constructed for the original drilling of a well that is now plugged and abandoned. As described in the Proposed Action (Section 2) the well pad construction, well drilling and pipeline construction activities would require approximately 565 vehicle trips to the project area per well. To provide access to well GP #3 through GP #7, the existing, un-maintained dirt two track road would be improved by applying road base material to the existing 16-foot-wide driving surface.

Environmental Consequences

Implementation of the Proposed Action would cause direct impacts to the existing transportation network through increased wear on area roads and indirect impacts to health and safety due to an increase in traffic that may cause an increase in vehicle accidents. These impacts would be short term (less than 6 months) as the impacts would be primarily during the well pad construction, well drilling and pipeline construction period. If the wells are productive, the wells and pipelines would require monthly inspection, which would be completed during the ongoing inspection program conducted by Kinder Morgan for producing CO₂ wells within the Monument.

The improvements to the access road for wells GP #3 through GP #7 may cause an increase in vehicle travel along this existing access road. The increased vehicle travel and possible recreational use of the area may cause additional impacts to archaeological, vegetation and surface water resources in the area due to the potential increase in use of the area. These impacts are discussed in the relevant sections of this EA. Installation of a gate at the beginning of the access road was considered, to reduce the impacts to air quality and visual resources from the on going and future recreational travel on the proposed improved road. If the Proposed Action is approved, the gate would not be installed as the impact to the current recreational use of the un-maintained dirt two track road was determined to outweigh the increase in air quality and visual impacts associated with on going road usage.

Under the No Action Alternative the current levels of traffic would continue, and the existing transportation network would remain in place with the current improvement levels.

Design Criteria

All vehicle travel to and from the proposed project area would be limited to the approved access routes for each location. The access roads would be constructed to BLM oil and gas exploration “Gold Book” standards. The roads would be maintained to the BLM, San Juan Resource Area road specifications and “Gold Book” standards. The proposed roads would be designed by a registered engineer and the plans will be reviewed and approved by the BLM prior to initiation of road construction activities.

8.3.2 Fire

Natural and human-caused fires are common throughout the Southwest, and are an integral component of the ecosystem. Historic fire patterns are irregular but are considered to have included more low intensity fires. The increase of roads, accumulated fuels from fire suppression and the spread of cheatgrass (*Bromus tectorum*) have all contributed to more widespread and high severity wildfires. Wildfire frequency in southwest Colorado has increased in the past five years due to an extended drought period, seasonal variations in distribution of precipitation and a history of fire exclusion throughout the 20th century. The increase in available fuels and lower moisture content in existing fuel material has created a set of conditions that contribute to high-severity fires that may be generated by human or natural causes.

There have been no prescribed burns or other fuels reduction projects conducted in the general vicinity of the proposed project. The areas adjacent to the existing access roads are open to public firewood collecting due to the presence of down woody material from chaining activities performed in the 1970s. These areas are open for public fuel wood collection to help reduce fuel loads and fire hazard in areas where chaining activities have generated dead and down fuel wood.

Environmental Consequences

Potential impacts would include increased fire hazard as a result of more frequent human presence in the project area, an increase in ignition sources during well drilling and completion, and pipeline construction activities. The project area does have natural and man made fire breaks in the general vicinity (sandstone cliff faces and exposed bedrock areas, cleared agricultural lands and roads and utility transmission lines). Impacts would be expected to be low and long-term.

Under the Proposed Action, potential impacts created by fire danger would be low to moderate and short-term during construction and low to moderate and long term during production operations.

Under the No Action Alternative there would be no change in project area fire potential.

Mitigation Measures

All Kinder Morgan employees would be briefed on fire hazards in the area and are committed to the prevention of human-caused fires.

8.3.3 Geology and Minerals

The proposed project area is located on the Burro Point mesa top located between Yellow Jacket Canyon to the north, and Rock and Sand Canyons to the south. The uppermost geologic strata exposed in the canyon walls are the sandstone cliffs of the Dakota and Burro Canyon formations – cretaceous age. Below the Dakota Sandstone layer are various sandstone and shale layers associated with the Morrison formation, of the Jurassic Age. Unconsolidated canyon bottom material consists of modern alluvium material generated in the Quaternary age.

The proposed well pads and flow lines are located adjacent to existing roads, generally along the top of the mesa area, known as Burro Point. The cliff edges on the mesa sides are moderately to steeply sloped with some areas of exposed sandstone bedrock cliffs. The Burro Point mesa is approximately ¼-mile wide, with Burro Canyon running west from Burro Point. Slopes on the mesa top area are generally 2-5% with varying aspects. The elevation of the general project area ranges from 6,600 to 6,800 feet.

Mineral resources within this section of the Monument are primarily CO₂ deposits associated with the McElmo Dome formation. The McElmo Dome is described as the largest currently producing CO₂ deposit in the world (Paulson and Baker 2006).

Environmental Consequences

Blading, excavations and trenching during construction activities would alter the existing topography of the well pad areas, access roads and flow line routes. These impacts would be low and long-term.

The proposed development activities would provide for production of CO₂ resources from subsurface geologic formations. The proposed development would reduce the amount of mineral resources present within the developed formation.

Under the Proposed Action, potential impacts to area geology and minerals would be low and long-term.

Under the No Action Alternative there would be no additional impacts to project area geologic and mineral resources.

Mitigation Measures

No mitigation measures for impacts to geology and mineral resources are necessary.

8.3.4 Health and Safety

The proposed project area (Burro Point) does not currently have any active oil and gas or CO₂

production wells in operation. There are three abandoned well locations within a one-mile radius of the proposed project area (see Figure 4, page 70). As such, the primary health and safety concerns within the proposed project area include: vehicle travel on existing access roads and operation of existing utilities. The following utilities are present on or near the proposed well sites:

- An Empire Electric Association 115 kilo volt (kV) transmission line runs generally west to east along the access road and flow line from well pads GP #1 and GP #2.
- A Kinder Morgan operated CO₂ flow line runs generally parallel to the existing oil and gas access road that runs along the rim of Rock Canyon.

Health and safety issues associated with the Proposed Action include the following: operation and maintenance of drilling rigs, work activities with chemicals and drilling fluids, construction activities in the vicinity of existing utilities, and travel on access roads. The proposed drilling activities are known to generate H₂S, an odorless, poisonous gas, during drilling operations. Production fluids may contain low concentrations of potentially hazardous substances but consist mainly of brackish water.

Environmental Consequences

The Proposed Action could result in occupational health and safety hazards to operators during the construction, drilling, and operation of the proposed project, in addition to individuals that may travel or access the well pad sites. Health and safety hazards associated with drilling of the proposed wells include: H₂S gas releases, noise exposure, high-pressure liquid hazards, and chemical hazards. Existing utility infrastructure present within the project area represent health hazards for construction activities. Damage to any of these facilities during project construction, operations and maintenance represent health and safety risks to workers and to the general public. Kinder Morgan has an H₂S Contingency Plan that minimizes the potential for releases of the gas during drilling activities, and also provides safety response measures in the case of releases of H₂S at a drill site.

Under the Proposed Action, potential impacts from the release of hazardous materials would be low to moderate and short-term during construction and drilling and low and long-term during production operations.

Under the No Action Alternative there would be no increased impacts to project area health and safety.

Mitigation Measures

The following project design criteria would be implemented to specifically address health and safety hazards associated with drilling of the proposed wells. Signs would be posted as necessary on the proposed project facilities that identify potential hazards associated with its operation including H₂S gas releases, work in the vicinity of high pressure equipment and chemical release hazards. Material Safety Data Sheets for any treatment chemicals would be maintained on site during the construction phase. In addition, a manned safety station would be setup in the road adjacent to all of the well drilling locations to control public access to the

drilling locations and a tested H₂S Contingency Plan would be used during drilling of the Proposed Action. Equipment operators would be required to wear appropriate personal protective equipment to minimize exposure to these hazards. Only authorized personnel would be permitted onsite. Signs and warnings would be posted in the general vicinity of construction and drilling activities to alert the general public to the construction activities.

8.3.5 Law Enforcement

Law enforcement activities within the Monument include enforcement of Colorado and Federal rules and regulations regarding criminal actions, protection of terrestrial and aquatic wildlife and protection of archaeological and cultural resources. Law enforcement activities are carried out by several agencies that work and support each other through cooperative agreements and memorandums of understanding. The nearest BLM law enforcement officers are stationed at the Anasazi Heritage Center.

Environmental Consequences

Implementation of the Proposed Action has the potential to impact law enforcement activities due to increases in traffic to the project area, which would increase the potential for traffic accidents on roads within the Monument. Road improvement and construction of new access roads would also increase the potential for vandalism and pot hunting at existing cultural resources sites within the proposed project area. The increase in potential traffic accidents would be a low and short-term impact that would occur during the construction and well drilling phase of the project. The increase in impacts to cultural resources, and potential subsequent increase in law enforcement activities would be a low and long-term impact.

Under the No Action Alternative on going law enforcement activities would not change.

Mitigation Measures

No mitigation measures for law enforcement are recommended.

8.3.6 Noise

The proposed well sites are located in areas with limited access and moderate existing activity levels related to oil and gas and mineral development. Additional background noise is created from access to the area for recreational use, firewood gathering, and grazing management. No background noise studies have been conducted for the project study area. There are no residences or businesses located within approximately two miles of the proposed project area.

Ambient sound levels in the project study areas vary greatly, depending on proximity to existing facilities, roadways, or other sources. The proposed well sites and flow line routes are generally located adjacent to or in the general vicinity of existing gravel, connector roads, primarily used for oil and gas development. The sound levels would fluctuate with variations in weather conditions including temperature, wind, and humidity and the general topography of the area. Private land holdings surrounding BLM lands are primarily rural.

Environmental Consequences

During construction of the Proposed Action there would be a direct short-term increase in project area ambient noise levels due to the operation of heavy equipment. Construction noise would range from 80-93 db(A) during the operation of a grader, 80-82 db(A) using a bull-dozer, and 83-94 db(A) using a truck (EPA, 1971). Drilling rig noise levels [74 dBA at 200 feet (USGS 1981)] would be expected to exceed other heavy equipment on location. The direct impact would be moderate and short-term. Noise impacts are expected to decrease during long-term operation and maintenance and would be dependant on the type and size of compressor or pumping equipment installed at the well (if any) to increase production of CO₂. Operational impacts would be low and long-term. Noise impacts during operation of the well would be limited to vehicular access and maintenance activities.

Under the Proposed Action, impacts from increases in area noise generation would be high and short-term during construction and drilling and low and long-term during production operations.

Under the No Action Alternative there would be no increases to project area ambient noise levels.

Design Criteria

Site workers would follow federal Occupational Safety and Health Administration requirements for hearing protection during proposed construction and drilling activities. The active well drilling areas would be secured from public access to avoid any excessive noise exposure to the general public.

8.3.7 Paleontology

A review of the monument paleontological records for the Proposed Action was conducted, and there are no known paleontological localities in the area of the Proposed Action. The area of the Proposed Action is located within the paleontology classification condition 3, an area considered unlikely to produce vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils based upon surficial geology.

Environmental Consequences

There would be no impacts to paleontological resources under the Proposed Action.

Under the No Action Alternative, ongoing impacts to paleontological resources would continue.

8.3.8 Rangeland Management

Grazing is a prominent land use in the proposed project area, the entire Burro Point area was designated as Livestock Management Emphasis Area in the San Juan/San Miguel Resource Management Plan (BLM 1985). The proposed project would be located within a common use permitted livestock allotment – the Burro Point Community Allotment (#08000). The allotment has three separate permittees that utilize the allotment. The allotment is permitted for 1,083

active AUMs and 134 suspended AUMs. The allotment had a Rangeland Health Assessment completed in 2003. The assessment indicated that the allotment was not meeting the rangeland health standards (Mike Jensen, Range Specialist, personal communication).

Environmental Consequences

Loss of vegetation in the proposed project area would occur due to blading work areas, clearing vegetation and trenching in pipeline route areas. A maximum of 62 acres of vegetation would be removed as a result of the development of the Proposed Action. The removal of vegetation could reduce the amount of forage available for cattle and increase the potential for noxious weed infestations in the project area. The reduction in forage impact would be moderate and long-term, as there would be a noticeable change in the composition of the project area vegetation. After reclamation of disturbed areas has been completed, reseeding may enhance the production of forage with the proposed project area. This impact would be long term and positive. The overall impact of the project activities would be monitored as part of the on-going rangeland health assessment activities.

Operation of the proposed wells and flow lines would not be expected to affect the surrounding flora, and impacts would be expected to be low and long-term. No impacts to existing fences or cattle guards would be expected.

Under the Proposed Action, potential impacts to grazing conditions and allotments would be low to moderate and long-term. There would be both potential long term positive and negative impacts. The potential for noxious weed introduction is low to moderate and long term. Impacts from operation of the wells and flow lines are expected to be low and long-term.

Under the No Action Alternative there would be no additional impacts to project area range conditions.

Mitigation Measures

These potential impacts would be minimized by the implementation of mitigation measures (BLM Surface Use COAs). Impacts to range forage from site clearing activities would be minimized through prompt reclamation of the non-actively used portions of the proposed project area, with a weed free BLM-approved seed mix (Table 6).

As required in the Surface Use COAs (Reclamation COA #11 - Appendix A) all areas that are reclaimed would be fenced until seedlings are well established and stable to improve site reclamation. Typically, the fence would remain in place for a minimum of three years, and would then be removed by Kinder Morgan upon instruction from BLM. If initial seeding is not successful, repeat seeding within reclaimed areas may be required to successfully establish native vegetation.

Table 6. BLM-approved seed mix for project reclamation.

| Kinder Morgan Burro Point Seed Mix | | | Drilled rate | | Broadcast rate | |
|------------------------------------|------------------------|---------------|--------------|---------------------------------|----------------|---------------------------------|
| Common Name | Species Name | Variety | Pounds/acre | Pure live seed/ ft ² | Pounds/acre | Pure live seed/ ft ² |
| Indian ricegrass | Achnatherum hymenoides | Rimrock | 6.2 | 20 | 11.7 | 38 |
| Squirrel tail | Elymus elymoides | Bottlebrush | 1.1 | 5 | 2.2 | 10 |
| Blue grama | Chondrosium gracile | Alma | 0.3 | 5 | 0.5 | 10 |
| Mutton grass | Poa fendleriana | VNS | 0.4 | 10 | 0.8 | 19 |
| Needle and Thread | Hesperostipa comata | VNS | 1.9 | 5 | 3.6 | 10 |
| Galleta | Hilaria jamesii | Viva, florets | 1.4 | 5 | 2.6 | 10 |
| | | Total | 11.3 | 50 | 21.4 | 95 |

Key:

VNS = variety not stated

8.3.9 Recreation Resources

Recreation management guidelines for BLM lands including a description of the classes of recreation opportunities (Recreation Opportunity Spectrum [ROS]) are provided in the San Juan-San Miguel RMP (BLM 1985). No Intensive/Special Recreation Management Areas as defined in the San Juan/San Miguel RMP occur within the boundary of the Monument. There are no designated recreational trails or recreation sites within the proposed project area or the general vicinity of the proposed project area. Moqui Lake, an informal recreational site, is located directly adjacent to the south flow line route, approximately 0.5 miles east of the GP #1 well pad (see Figure 2).

The public may periodically undertake the following recreational activities in the project area: hunting, hiking, mountain biking, birding, bouldering, driving for pleasure, and horseback riding. The interim management guidelines for the Monument (BLM 2000) do not allow any off road travel by motorized vehicle or bicycles. Recreational use of bicycles and off highway vehicles (OHVs) within the Monument is restricted to existing roads and designated trails.

The area surrounding the proposed well pads GP # 3 through 7 currently meets an ROS setting of Semi-primitive Motorized (SPM). Use levels and social encounters are low, access is on a narrow, un-maintained dirt two track, facilities are few and evidence of active management is low, and the setting is predominantly natural appearing.

The area of surrounding proposed well pads GP #1 and GP #2 currently meets an ROS setting of Roaded Natural (RN). Use levels and social encounters are low, access is on a well maintained and wide gravel road, facilities related to energy transmission and development are visible, and there are some deviations from the natural setting.

Environmental Consequences

Impacts to area recreation opportunities because of the proposed mineral development activities would primarily be a result of the effects to four setting indicators: access, remoteness, naturalness, and facilities and site management. These effects are expected to be moderate and long-term. The visible changes to the road width and surface, visible elements of well hardware including pipe and valves, visible evidence of active management, and changes to the natural setting as a result of surface disturbance would last longer than 5 years. The impacts would be moderate (easily detected) for the long-term during the production life of the wells.

Public use of the area for limited dispersed recreational purposes may decrease due to the presence of industrial facilities in the area during the drilling and construction phases of well development (moderate but short term). For the long term, for the GP #3 through #7 area, the proposed increase in the level of development and associated activities would change the recreation setting from an ROS of SPM to RN. This is a substantial change in the recreation setting due to long-term project effects.

In the vicinity of GP #1 and #2 project effects may create a Roaded Modified ROS Setting during the first decade as landscape restoration takes place. After this recovery the area may achieve the RN setting.

Under the Proposed Action, potential impacts to recreational resources would be moderate and short-term during construction and drilling and moderate and long-term during production operations.

Under the No Action Alternative there would be no impacts to project area recreation resources. The existing condition of ROS Class Semi-primitive Motorized would be maintained within the GP # 3 through 7, and RN ROS Class within the GP # 1 and 2 area.

Design Criteria

Kinder Morgan would provide public notices, signs, detours and precautions necessary to protect the health and safety of the public during construction and drilling activities. In addition, a staffed safety station would be setup in the road adjacent to all of the well drilling locations to control public access to the drilling locations. Visual impacts would be mitigated as described in Section 8.3.11.

8.3.10 Socioeconomics

The Proposed Action would increase CO₂ production from the McElmo Dome Unit by about 150 million cubic feet per day (approximately 15% increase above present production). This additional production will increase the amount of CO₂ that is transported by pipeline to West Texas for enhanced oil recovery.

The primary socioeconomic impacts associated with changes in CO₂ production are changes to local employment, income, and tax revenues. In 2005, 2% of employment and 4% of income in Montezuma County were derived from mining and utility sector jobs (Draft Canyons of the

Ancients National Monument RMP and DEIS – BLM 2007). Because mining sector jobs have the highest average wage in Montezuma County, these jobs have a relatively large impact on total income (BLM 2007). Kinder Morgan is one of the major employers in this sector in Montezuma County. Carbon dioxide properties and production currently comprise 50% of the property tax revenues in Montezuma County used to fund schools, special tax districts, and county operations (BLM 2007).

Environmental Consequences

The Proposed Action is expected to support five jobs during construction, drilling, completion, and operation of each well (See Section 2.1.2). As a result of the expansion in CO₂ production, Kinder Morgan is adding six new full-time jobs in Montezuma County for a total of 46 full-time employees. These new jobs will have a relatively large impact on income in Montezuma County because of higher average wages. Furthermore, increased CO₂ production volume and associated equipment will increase property tax revenues in Montezuma County. Although, the tax revenues generated annually fluctuate with CO₂ production and market prices, the Proposed Action is anticipated to increase property and associated severance tax revenues for Montezuma County in the long term (BLM 2007).

Overall, there would be minor and short-term beneficial economic impacts for a variety of contractors and businesses as a result of development of the Proposed Action. Additionally there would be minor and long term beneficial economic impacts related to increased employment, income, and tax revenues in Montezuma County.

Under the No Action Alternative the current levels of positive and negative impacts to project area socioeconomics would continue. It is likely that under the No Action Alternative the additional CO₂ production would eventually be developed on private land. Therefore, the increases in local employment, investment, and tax revenues associated with the Proposed Action could be realized even under the No Action Alternative.

Mitigation Measures

No mitigation measures recommended.

8.3.11 Soils

Surficial soils within the proposed project area are primarily associated with the Morrison Formation, Dakota Sandstone, and Burro Canyon geologic formations. Soil parent materials are predominantly colluvium, alluvium, and residuum, as well as eolian material and sources from sandstone and shale. Areas of biological or cryptogammic soil crusts in the soil surface of the project area are infrequent. The soils at individual project construction features are as follows.

The proposed project area soils are generally composed of red loess soils with sandy to silty textures. Specific soil types include Wetherill Loam, Gladel-Pulpit Complex and Romberg-CrossCan-Rock Outcrop Complex. Soil depths vary with distance from the rock outcrop areas (canyon edges), with thicker soil layers present in the middle of the mesa areas. Additional specific soil characteristics are provided in the report “Soil Survey of Cortez, Parts of Dolores

and Montezuma Counties” prepared by the Natural Resource Conservation Service (NRCS – 2001).

The Standard for Public Lands Health for upland soils is being met in the proposed project area. Soils observed in the general project area show minimal erosion impacts. Ground cover on these sites exhibits higher than expected areas of bare ground and lower than expected biological crust diversity and litter cover. The over-story vegetation lacks diversity and cover. Many of the expected species that would help intercept rainfall, improve infiltration and reduce runoff are missing or only present in minor amounts. The condition of these rangeland health indicators puts the site at risk to erosion. However, because the mesa top has little to no slope the risk of potential for is limited. The large woody debris remaining from the chaining activity also helps to slow overland flow.

Environmental Consequences

The Proposed Action would result in temporary displacement, compaction, and mixing of soils in the project area. Accidental spills or releases of hazardous substances could result in soil contamination requiring remediation or removal. Due to the susceptibility of the project area soils to wind and water erosion, construction activities would indirectly cause loss of upper soil layers. Reduced capacity for plant growth due to removal and/or disturbance of the soil would be an additional direct effect. These impacts are expected to be low to moderate and short-term, with a reduction to low and long-term through stabilization and reclamation activities after construction and drilling.

Under the Proposed Action, impacts to soils from construction of the proposed project would be low to moderate in the short-term. Project Design Criteria would be implemented during the operation and maintenance phase of the Proposed Action, and would provide soil stabilization and reclamation of unused areas, reducing the amount of soil disturbance. The impact from operation and maintenance would be low and long-term.

Under the No Action Alternative there would be no impacts to project area soils.

Design Criteria

Kinder Morgan would utilize best management practices (BMPs) to control erosion during construction of the proposed project, and during site reclamation. Vehicle and pedestrian traffic would be restricted to the county road and un-maintained dirt two track to prevent further soil mixing and compaction, vegetation and biological crust disturbance, and site disturbance outside the proposed project area. Spills or releases of hazardous or solid wastes would be removed and disposed in accordance with State and Federal regulations.

Mitigation Measures

Mitigation measures included in the project COAs (Appendix A) for construction and operation of the well pad and access road include stockpiling topsoils and prompt reclamation of non-used areas of the well pads, access roads and pipeline routes. Reclamation activities would include:

reseeding unused areas with a weed-free BLM approved seed mix to stabilize soils and to prevent erosion. These unused areas include: the temporary use areas around each well pad (12 acres) the flow line route portions of the construction corridors (28 acres) and approximately ½ of the 50 feet width of the access road areas (1 acre).

Additional COAs that would reduce impacts to soils include the following: construction activities would not be conducted during extended wet periods; the well pad area would be bermed to minimize off-site migration of disturbed soils; vehicle and pedestrian traffic would be restricted to the well pads, access roads and flow line alignments or established roads to prevent further soil mixing and compaction outside the proposed project area. Upon plugging and abandonment of the wells, the entire well pad areas, access roads, and pipeline routes would be reclaimed and reseeded to BLM specifications.

8.3.12 Sensitive Species

There are 34 sensitive species listed by the BLM that have the potential to occur in the proposed project area. The list includes BLM sensitive species compiled from the Colorado BLM State Director's Sensitive Species List (2000), Information Bulletin No. CO-2000-14, and consultation with the BLM Wildlife Biologist.

Of the listed sensitive fauna that were considered in this EA, potential habitat exists within the project area for eight species: longnose leopard lizard (*Gambelia wislizenii*), peregrine falcon (*Falco peregrinus anatum*), Townsend's big-eared bat (*Corynorhinus townsendii*), spotted bat (*Euderma maculatum*), Allen's (Mexican) big-eared bat (*Idionycteris phyllotis*), fringed myotis (*Myotis thysanodes*), Yuma myotis (*Myotis yumanensis*), and big free-tailed bat (*Nyctinomops macrotis*). In addition, the project area and vicinity provides potential habitat for golden eagle (*Aquila chrysaetos*) and Mesa Verde nightsnake (*Hypsiglena torquata loreala*), two species specifically mentioned in the Canyon of the Ancients proclamation. Golden eagles are also listed as a Bird of Conservation Concern by the USFWS. A summary of the species, their habitat requirements and Colorado Natural Heritage Program status are provided in Table 7.

The rocky cliffs of Yellow Jacket Canyon, located approximately one mile north of the proposed project area, provide suitable nesting and perching sites for peregrine falcon and golden eagle. Both of these species are specifically mentioned in the Monument proclamation. There are no known nest locations for peregrine falcon and golden eagle within one mile of the project area (Kathy Nickell pers. comm.); however, these species are known to utilize the Monument for hunting. A historic peregrine falcon eyrie is located on Sleeping Ute Mountain, approximately five miles south of the project area (BLM 1986). A telemetry study in Colorado has determined that peregrine falcons may use a home range during nesting of 358-1508 km² (222-935 square miles) (Enderson and Craig 1997). Hunting flights within these home ranges ranged from 12-26 miles from the eyrie.

The cliffs also provide foraging/roosting habitat for six bat species: Townsend's big-eared bat, spotted bat, Allen's (Mexican) big-eared bat, fringed myotis, Yuma myotis, and big free-tailed bat. The project area's piñon-juniper woodlands provide foraging habitat for all of these bat species, and potential roost sites for: fringed myotis, Yuma myotis and spotted bat. Water, a limiting factor for bat populations in arid habitats, is available in stock ponds, springs and

seasonal streams in the vicinity of the project area. The rocky cliffs adjacent to the project area provide suitable roost sites for spotted bats and big free-tailed bats. However, there is no potential breeding habitat (mines, caves) for the remaining bat species in the vicinity of the project area.

One BLM sensitive species, the longnose leopard lizard may have potential to occur within and in the general vicinity of the proposed project area. A 2006 BLM telemetry study on Cannonball Mesa found that long-nosed leopard lizards prefer more open habitats (Kathy Nickell, pers. comm.). Preliminary field surveys indicated that most of the project area consists of dense woodland habitat, unsuitable for long-nosed leopard lizards. One well pad, the GP #7, is located in more open habitat. On 7 March 2007, DPLO biologist Kristen Philbrook and Ecosphere biologist John Wickersham walked parallel transects across this proposed site to look for rodent burrows that could be utilized by long-nosed leopard lizard. No rodent burrows were identified at the site. Further consideration of the site found that while trees were scarce, shrub growth was relatively dense. Therefore, it was determined that the project area is not suitable habitat for long-nosed leopard lizard.

Of the BLM listed sensitive flora species considered in this EA, potential habitat exists for two species, Naturita milkvetch (*Astragalus naturitensis*) and Jones' bluestar (*Amsonia jonesii*). However, because the project area does not contain specific habitat components such as exposed sandstone ledges or crevices, or sandstone draws, the potential for these species occurring in the project area is low. No individuals of these species were observed within the project area during onsite biological surveys in December 2006, nor were they observed in January and March 2007. However, these surveys were conducted outside the normal growing season when identification of flowering plants is difficult.

Raptor surveys

A survey was conducted on 30 January 2007 to evaluate the potential habitat for sensitive raptor species (peregrine falcon and golden eagle) within or adjacent to the project area. The steep cliffs and ledges of Yellow Jacket Canyon, located approximately one mile north of the project area contain suitable nesting habitat for peregrine falcons and golden eagles. Large cottonwoods in the canyon bottom offer additional nest sites for golden eagles. Yellow Jacket Canyon also contains an active riparian system and seasonal water that provides habitat for several species of waterfowl and shorebirds that are known prey species for peregrine falcon (Wheeler 2003).

During the survey, no peregrine falcons or golden eagles were observed. No large stick nests (golden eagle) were observed. Several potential nest cavities and ledges (peregrine falcon) were observed in the canyon cliffs; however, surveys of possible nest locations outside the breeding season are inconclusive. Some ledges contained visible whitewash, suggesting potential perching and roosting locations; however, since no peregrine falcon or golden eagles were observed, raptor use of the canyon must be classified as "potential" since whitewash can indicate a variety of avian uses including raven, crow and owls. Additional raptor nesting habitat is located in Rock Canyon, immediately south of the flow line for the proposed GP #1 and GP #2 well pads. This canyon contains some smaller (30-50 ft) cliffs and small rock outcrops that offer some limited nesting potential. Peregrine falcons typically prefer larger cliffs and usually prefer

to nest near water. Rock Canyon, where it is close to the flow line, does not contain any riparian habitat or any evidence of seasonal or perennial water. While there is some potential for golden eagle nesting in Rock Canyon, no nests or any evidence of raptor use (whitewash) was observed during the 30 January survey.

The Colorado Division of Wildlife (CDOW) maintains a list of threatened and endangered wildlife species. No state-listed species have the potential to occur in the proposed project area.

Environmental Consequences:

The proposed project area provides potential habitat for six BLM Sensitive bat species, which may utilize the project area vicinity for foraging/roosting habitat. Because no potential roost sites would be directly impacted by project construction, potential indirect impacts to these species would include noise and human disturbance associated with well construction and operation which could impact adjacent roosting habitat. These impacts would be expected to be low and short-term during construction activities.

Clearing seven well pads may actually provide additional foraging opportunities for raptors, particularly after the sites have been re-vegetated and can provide some cover habitat for birds and small mammals. Studies have concluded that raptors may be sensitive to sudden and unfamiliar noise disturbances, but they often habituate and show little negative response to prolonged, regular noise—especially when humans are not visible (Richardson and Miller 1990).

The Monument Proclamation mentions “unique herpetological resources.” One species, Mesa Verde nightsnake (*Hypsiglena torquata*), while having no BLM or CNHP status, is specifically addressed in the Proclamation. Hammerson (1999) mentions that this species is likely more common than is currently known, and that its habitat is not currently threatened. Mesa Verde nightsnakes typically prefer rocky slopes and canyons (Hammerson 1999), habitat components which are absent from the project area. Therefore, impacts to this species from project construction would not be expected.

Under the Proposed Action, impacts to sensitive species would be low and short-term during construction and drilling operations, and low and long-term as a result of development and operation of the wells. The long-term impacts during operation of the wells and flow lines would occur from periodic human activity, vehicular traffic in the area, and from the conversion of habitat to industrial use.

Under the No Action Alternative there would be no increased impacts to project area sensitive species.

Mitigation Measures

Construction activities for all of the well sites would be confined to the proposed well pad, associated access road, and pipeline routes to avoid potential impacts to sensitive species possibly occurring outside the area surveyed during the biological survey. No timing stipulations

or additional surveys are recommended. Should any sensitive species be identified during project construction, BLM biologists would be contacted immediately.

Table 7. BLM sensitive species with potential to occur within the Dolores Public Lands Office Management area and/or the proposed project area.

| Common Name | Scientific Name | CNHP Status | Habitat | Potential to Occur in Project Area (PA) |
|--------------------------------|--------------------------------|----------------|---|--|
| MAMMALS | | | | |
| Allen's big-eared bat | <i>Idionycteris phyllotis</i> | No CNHP status | Roosts are associated with mines/caves. Known to forage in pinyon-juniper woodlands. | May occur foraging in piñon-juniper habitat adjacent to the project area; no mines or caves in the PA or vicinity. |
| Big free-tailed bat | <i>Nyctinomops macrotis</i> | S1 | Rocky cliffs with crevices and fissures required for roosting. | May occur foraging/ roosting in the rocky cliffs adjacent to the PA. |
| Spotted bat | <i>Euderma maculatum</i> | S2 | Cliff dwellers with diurnal roosts in cracks and crevices of canyons and cliffs. Known to forage in pinyon-juniper woodlands. | May occur foraging in piñon-juniper habitat adjacent to the project area; no mines or caves in the PA or vicinity. |
| Townsend's big-eared bat | <i>Corynorhinus townsendii</i> | S2 | Dependent on availability of abandoned or inactive mines. | May occur foraging in piñon-juniper habitat adjacent to the project area; no mines or caves in the PA or vicinity. |
| Fringed myotis | <i>Myotis thysanodes</i> | S3 | Breeds in caves and forages in piñon-juniper woodlands. | May use cliffs adjacent to PA for roost sites; no caves in the PA or vicinity |
| Yuma myotis | <i>Myotis yumanensis</i> | No CNHP status | Requires surface water and suitable roost sites in mines or caves. | May occur foraging/ roosting adjacent to the PA; no perennial water sources in the PA or vicinity. |
| BIRDS | | | | |
| Peregrine falcon | <i>Falco peregrinus anatum</i> | S3B | Prefers open country and high vertical cliff areas for nesting (>200 feet). | Potential nesting habitat on cliffs adjacent to the PA. |
| REPTILES and AMPHIBIANS | | | | |
| Long nose leopard lizard | <i>Gambelia wislizenii</i> | S1 | Generally below 5000 feet in extreme western Colorado associated with desert shrub. | Potential habitat for long nose leopard lizard exists in project area. No individuals observed during biological surveys. |
| PLANTS | | | | |
| Jones' bluestar | <i>Amsonia jonesii</i> | S1 | Runoff-fed draws on sandstone in pinyon-juniper and desert scrub habitats (3900-7000 feet). | PA is in pinyon-juniper habitat within the known elevational range for this species. No individuals observed during biological surveys |
| Naturita milkvetch | <i>Astragalus naturitensis</i> | S2S3 | Shallow pockets of soil on Sandstone mesas, ledges, crevices and slopes in PJ woodlands (5000-7000 feet). | PA is in pinyon-juniper habitat within the known elevational range for this species. No individuals observed during biological surveys |

S1-Critically Imperiled, S2- imperiled, S3-Vulnerable, S4-Apparently Secure, B-Breeding population, Canyons of the Ancients Monument proclamation species.

Source: Colorado BLM State Directors' Sensitive Species List, BLM Information Bulletin No. CO-2000-14 (June 2000) including CNHP listed species (August 2006) and Canyons of the Ancients Monument Proclamation sensitive species, Kathy Nickell and Leslie Stewart, personal communication.

8.3.13 Vegetation

The Burro Point area is comprised of primarily piñon-juniper woodland habitat type. This section of the Monument was chained and seeded by the BLM for range enhancement in the mid 1960s, and slash piles and stumps are still visible throughout the proposed project area and vicinity. One well pad, the proposed GP #7, occurs within a chained/burned clearing with scattered small piñon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) trees. The remaining proposed well sites occur within a re-growth of early to mid-seral piñon-juniper woodlands approximately 30-40 years old. The woodlands are relatively dense (approximately 250-350 trees per well pad) and are dominated by Utah juniper. They contain a mean tree height of two to three meters and an estimated canopy cover of 15-35%. Understory shrub species include big sagebrush (*Artemisia tridentata*), rubber rabbitbrush (*Chrysothamnus nauseosus*), broom snakeweed (*Gutierrezia sarothrae*), cliff-rose (*Purshia stansburiana*), mormon tea (*Ephedra viridis*) and yucca (*Yucca baccata*). Understory shrub cover is less than 20%. Herbaceous ground cover is approximately 5-15%; and, at the time of the field survey (5 December 2006), was composed primarily of toadflax penstemon (*Penstemon linarioides*), mountain pepperweed (*Lepidium montanum*), scarlet gilia (*Gilia aggregata*), groundsel (*Packera multilobata*), slender buckwheat (*Eriogonum microthecum*), crested wheatgrass (*Agropyron cristatum*), Indian ricegrass (*Achnatherum hymenoides*), galleta (*Pleuraphis jamesii*) and cheatgrass (*Anisantha tectorum*). Several weedy annual forbs occurred on the burned site, filaree (*Erodium cicutarium*), tall tumble mustard (*Sisymbrium altissimum*) and little hogweed (*Portulaca oleracea*). Because the field survey was conducted outside of the normal growing season for many herbaceous plant species, there are likely other species that inhabit the project area.

The proposed flow line routes would be located along existing oil and gas field access road and un-maintained dirt two track road as well as portions of a utility line corridor. Vegetation on the proposed flow lines consists primarily of shrubs (sagebrush, rabbitbrush, and snakeweed) and a variety of grasses.

The vegetation in the proposed project area and vicinity were qualitatively evaluated for overall health and productivity for the Standard for Public Land Health plant communities. The project area and vicinity were determined to not be meeting the standard primarily due to the lack of diversity of the expected structural and functional groups of species and the lower than expected annual productivity, presence of invasive plants, lack of litter, reduced reproductive capability, indications of plant mortality and lack of cover and diversity of biological crust communities.

Environmental Consequences:

The Proposed Action would result in the removal of 62 acres of vegetation, primarily piñon-juniper trees and associated woodland species. This impact would be moderate and long-term, as regeneration of trees in disturbed areas may take 30-50 years to establish dominance. Disturbed areas would also be at risk for establishment of invasive or noxious plant species, which would displace and/or prevent establishment of native species. These impacts would be low to moderate and long-term, shifting to low and long-term as unused portions of the well pads are reclaimed.

Under the Proposed Action, impacts to vegetation would be moderate to high and short-term during construction and drilling operations, and moderate and long-term after interim reclamation.

No impacts to project area vegetation would result from the No Action Alternative.

Mitigation

Per the project Surface Use Plan, Kinder Morgan would be responsible for interim reclamation of unused portions of the well pads and flow line routes, including spreading the large woody material removed during drilling reseeding with a BLM-approved seed mix (Table 6) and on-going noxious weed management for the duration of the operation and reclamation activities and final reclamation after the project is completed. Project specific mitigation measures for vegetation include the requirement that Kinder Morgan monitor the project area for a minimum of three years after construction to detect the presence of noxious/invasive species. If found, noxious weeds would be controlled using materials and methods approved in advance by the BLM.

8.3.14 Visual Resources

The general project area is currently dominated in the foreground and middle ground by dark green piñon-juniper and lighter sage-green desert scrub with broad, level mesa tablelands intersected by numerous deep draws and steep canyons. Sleeping Ute Mountain dominates the background view to the south; the Abajo Mountains dominate the background view to the west, the La Plata Mountains lie to the east, and the edge of Monument Valley is faintly visible to the southwest. Uniformly colored agricultural fields and rectangular farm buildings interspersed with piñon-juniper and widely scattered light-colored well pads are frequently visible in the far foreground to the north. Two carbon dioxide compressor stations (tan and dark green), existing dirt roadways and pipeline cuts, and a 115-kV power line are visible to the east and south from many portions of the project area.

Existing visual conditions along County Road N on the mesa top in the vicinity of proposed well pads GP #1 and #2 and the southern flow line route include a Level 4 gravel road, a 115-kV overhead transmission line, and a linear pipeline ROW with vegetation modifications located immediately adjacent to the road. Existing visual conditions in the vicinity of proposed well pads GP #3 to 7 and the northern flow line along the existing well pad access road are predominantly natural. Deviations include occasional range fencing, the narrow existing two track roadway, and a reclaimed well pad at the road terminus at the western end of the mesa.

The proposed project area is located approximately three miles to the west of the Goodman Point Outstanding Scenic Area (BLM 1985) (OSA), and approximately 18 miles from the Mesa Verde Rim OSA.

The San Juan San Miguel Resource Management Plan (RMP), which is the BLM's management document for the project area, states on page 26 that BLM would "establish site-specific visual quality objectives and design guidelines for landscape development projects during activity planning" (BLM 1991). Site specific objectives are developed through a Visual Resource

Inventory. A general inventory was completed in 2005 by the BLM for the Monument (BLM 2005). The results of this inventory classified the proposed project area as VRM Inventory Class II (BLM 2005). Under VRM Class II objectives, change is limited to relatively low levels, activities may be visible, but should not attract attention and should retain the existing character of the landscape (BLM 2007a).

The proposed project lies within Scenic Quality Rating Units (SQRU) 2, 3, and 4 as indicated in the July 2007 Scenic Quality Classification mapping of the Monument (BLM 2007b). SQRU 2 and 4 have been given SQRU ratings of “B+”; SQRU 3 has been previously rated as “A” by the BLM. The viewer Sensitivity Level Rating for the area is rated as “High” (based on Congressional designation of the Monument and local interest). Viewers are primarily recreational users, who are concerned about and have an expectation for high scenic quality. Existing visitation in the proposed project area is low and would likely continue to be low into the next decade.

To establish existing scenic conditions, evaluate potential impacts of the proposed activities on sensitive view shed locations within the Monument, and assist the BLM with developing site-specific visual quality objectives, inventory classes, and design guidelines for the Proposed Action, a visual resource inventory and visual contrast rating study and view shed analysis was completed for the project vicinity. The results of this study are detailed in a Visual Resources Assessment Report (Ecosphere 2007), provided as Appendix D to this EA. The results of the study and BLM’s VRM inventory are summarized in Table 8.

Critical view locations for this project include: the un-maintained dirt two track road with access to GP #3, GP #4, GP #5, GP #6 and GP #7, the south fork of County Road N (a Level 4 gravel road and access to GP #1 and GP #2) and sensitive viewpoints as identified in Tables 1 and 2 in the Visual Resources Assessment Report (Attachment D). The proposed project area can be viewed in all distance zones (foreground, middle ground, and background) from numerous locations.

As part of the visual impact assessment, twelve Key Observation Point (KOP) locations were developed through consultation with the BLM and were visited during the on-site inspection survey. Six of these 12 locations were identified as having representative views of the Proposed Action area (see Table 8). Visual contrast rating sheets and Visual Resource Inventory forms were completed for these 6 KOPs and are provided in the Visual Resources Assessment Report (see Appendix D) and summarized in Table 8. The data collected was used to confirm existing visual inventory classes for the areas associated with the KOP sites. Visual inventory classes do not establish management direction and only provide information to help consider visual values. Final approval for visual inventory classes in the project area would be coordinated by the BLM.

Based on the results of the analysis, the existing Visual Inventory Class II conditions identified by the BLM for the area were confirmed for the mesa top in the vicinity of the proposed well pads and flowline construction corridors. Visual resource inventory classes are defined in a manner similar to VRM classes, with Class II allowing minimal changes to the landscape, with management activities seen, but not attracting the attention of the casual observer. Class III

allows change to be moderate, with management activities potentially attracting the observer's attention, but not dominating it.

Environmental Consequences

As part of the visual impact assessment study, a viewshed analysis was completed to determine areas in the Monument where the proposed project may be visible (see details of the study in the Visual Resources Assessment Report provided in Appendix D.) The viewshed analysis determined that proposed project well drilling and construction activities would be visible from approximately 18% or 29,500 acres of the approximately 165,000 acre Monument during the short term of the drilling period. This number does not consider vegetative or atmospheric screening. Over the long term (6-20 years), proposed well head and well pads would be visible from approximately 10% or 16,389 acres of the area within the Monument. Again, this number does not consider vegetative screening, which would substantially reduce this figure, or that producing CO₂ well heads are relatively compact and generally protrude no more than 6 feet aboveground. These facilities would be present for the duration of the mineral development activities (approximately 10 to 20 years).

In many locations of the Monument as described in mapping and KOP analysis included in the Visual Resources Assessment Report, the towers of drill rigs would be visible above the trees during well drilling, resulting in moderate, short-term impacts.

The visual quality of the land within the immediate vicinity (visual foreground) of the proposed well pad, access road and flow line locations would be altered during the short-term by the Proposed Action. While the majority of the well pads may be partially or fully screened by vegetation at a short distance from the sites, the overall effect of the well pads, well access roads, and flow line disturbance would dominate the foreground scenery in the short term as viewed by travelers on the north and south forks of County Road N. These effects would primarily include the well pads and the 30- to 40-foot-wide well pad access roads and flow line corridors. Even with implementation of successful design measures and the COA (Appendix A), these linearly disturbed corridors would remain in distinct contrast to the adjacent piñon-juniper woodland in the short term until reclamation vegetation begins to mature. As identified in the Visual Resources Assessment Report (Appendix D), the current Visual Resource Inventory Class II management objectives, as defined in the study, would not be met in the short term (0-5 years) at the KOP locations as indicated below:

- KOP 1: Moqui Lake (Class IV – foreground zone);
- KOP 3: Big Point Dispersed Camping (Class III - middleground zone);
- KOP 5: County Road U Rock Climbing Site (Class III – middleground zone);
- KOP 10A: County Road N – North Fork (Class IV-foreground zone);
- KOP 11: Country Road N – South Fork (Class IV - foreground zone); and
- KOP 12: County Road U (Class III – middleground zone).

VRM Inventory Class II conditions should be met in the short term at KOPs 3, 5, and 12, following completion of well drilling when drill rigs are no longer visible.

Table 8. Summary of visual resource inventory class analysis.

| Location | Distance Zone/ Duration of Visibility/ Observer Position | Scenic Quality Rating Unit (SCRU) | Current/ Proposed SCRU Rating ¹ | Sensitivity Level Rating ² | Visual Resource Inventory Class (Existing/ Proposed) ³ | Visual Contrast Rating Results/ Anticipated VRI Classes ⁴³⁴ |
|--|--|---|---|---|--|--|
| KOP 1 – Moqui Lake | Foreground/ middleground Approximately 1-2 minutes Car on access road | 2 | 18/B+ 14/B | High | II/II | Flowline construction corridor clearing would be visible in foreground from KOP and roadway, changing vegetative texture, color, and lines and dominating view. VRI Class IV objectives met in short term; effects mitigated thru neckdowns and uneven edge effects on construction corridor. VRI Class II objectives are expected to be met in long term as reclaimed vegetation matures and returns to pre-construction levels |
| KOP 3 – Big Point Dispersed Camping | Foreground/ middleground Variable; over 5 minutes; over 5 minutes Standing at campsite | 4 | 17/B+ 15/B | High | II/II | Vertical lines of drill rigs and lights temporarily visible in middleground from KOP. Well pads and construction corridor clearing should not be visible due to topographic and vegetative screening. VRI Class III objectives would be met in the short term (several months). After completion of drilling, project should not be visible and VRI Class II objectives should be met. |
| KOP 5- County Rd U Rock Climbing Site | Foreground/ middleground Variable; over 5 minutes Standing on rim | 2 | 18/B+ 19/A | High | II/II | Vertical lines and lighting of drill rigs should be temporarily visible for several months in distant middleground. Well pad and construction corridor clearing may attract attention in distant middleground, though should not dominate the landscape. VRI Class III objectives would be met in short term until drilling is completed. VRI Class II objectives would be met in long term. |
| KOP 10A – North Fork County Road N | Foreground/ middleground Approximately 1-2 minutes Car on road | 2 | 18/B+ 12/B | High | II/II | Well pad and construction corridor clearing would occur immediately adjacent, changing vegetation line, texture, and color. Action would dominate view and be major focus. VRI Class IV objectives would be met in short term; effects should be mitigated through neckdowns and uneven edge effects on construction corridors and pads. VRI Class II objectives are expected to be met in long term as reclaimed |

| Location | Distance Zone/ Duration of Visibility/ Observer Position | Scenic Quality Rating Unit (SCRU) | Current/ Proposed SCRU Rating ¹ | Sensitivity Level Rating ² | Visual Resource Inventory Class (Existing/ Proposed) ³ | Visual Contrast Rating Results/ Anticipated VRI Classes ^{4,34} |
|--|--|---|---|---|--|--|
| | | | | | | vegetation matures and returns to pre-construction levels. |
| KOP 11 – South Fork County Road N | Foreground/ middleground Approximately 1-2 minutes Car on road | 2 | 18/B+ 13/B | High | II/II | Well pad and construction corridor clearing would occur immediately adjacent, changing vegetation line, texture, and color. Action would dominate view and be major focus. VRI Class IV objectives would be met in short term; effects should be mitigated through neckdowns and uneven edge effects on construction corridors and pads. VRI Class II objectives are expected to be met in long term as reclaimed vegetation matures and returns to pre-construction levels. |
| KOP 12 – County Road U | Foreground/ middleground Approximately 2-5 minutes Car on road | 2 | 18/B+ 18/B | High | II/II | Vertical lines and lighting of drill rigs should be temporarily visible for several months in distant middleground. Well pad and construction corridor clearing may attract attention in distant middleground, though should not dominate the landscape. VRI Class III objectives would be met in short term until drilling is completed. VRI Class II objectives would be met in long term. |

¹Scenic quality rating: A = 19 or more, B = 12-18, C = 11 or less. Agency ratings are for the entire Unit, and are not specific to the KOP point. Proposed ratings are for the specific KOP. Ecosphere's average rating for SQRU 2 is 15/B.

²The entire Monument has been designated by the BLM as "High" sensitivity due to Congressional designation (Burns 2007).

³VRI Class II = Change visible, but does not attract attention; Class III = Changes attracts attention, but is not dominant; Class IV = Change is dominant, but mitigated. Existing VRI classes = current BLM rating, Proposed VRI classes = classes identified during project-related analysis.

⁴Visual contrast rating analysis considered proposed mitigation and applicant-committed protection measures in determining the VRM classes that is expected to be achieved. Short term = 0-5 years, long term = 6-20 years.

Project work would be occurring immediately adjacent to KOPs 1, 10A and 11 and would likely attract the attention of a casual observer in the short term. It is anticipated that VRM Inventory Class II objectives would ultimately be met in the long term (6-20 years) for KOP sites 1, 10A, and 11 if design criteria as outlined below and in the COA are implemented. Specific designs relating to the location of “neck down” areas, uneven edges on the construction corridors and well pads, and other site development planning are expected to be identified in the COA following a project decision from the BLM. Currently, the only alternative being considered is the No Action Alternative. Under this alternative, no additional impacts to project area visual resources are anticipated.

Design Criteria and Mitigation

Application of the following BMPs, which incorporate practices identified in the Surface Use Plans (Haven 2006) are expected to result, in addition to mitigation outlined in the COA (Appendix A) and summarized below, in the project meeting VRM Inventory Class II objectives in all distance zones in the long term (6-20 years) and in distant middle ground zones as viewed from the vicinity of KOPs 3, 5, and 12 in the short term (within 1 year or after drilling is completed). Potential impacts to visual resources would be minimized by the implementation of design criteria described below and adherence to Kinder Morgan’s Surface Use Plans should the APDs be approved.

Design Criteria

General Design

1. Areas disturbed by earth-moving operations and vegetative clearing, including well pads, flowline construction corridors, and access roads, would have edge modification treatments implemented to create a varied organic, irregular shape along the linear aspects of the project and to increase the number of more “naturally” shaped openings. Specific locations for these treatments are expected to be identified in the final COA in coordination with the BLM. Locations should avoid known cultural sites. Work could be completed by hand (no ground disturbance) in sensitive locations to avoid effects to cultural sites and other resources. Slash from cut trees should be left in place, or stored outside the well pad perimeter and used for restoration of replanted/seeded areas.
2. The overall amount of ground disturbance would be limited to minimize impacts to visual resources. Access road and flow line routes should be kept to the 50-foot-wide maximum width of the construction corridor necessary to complete the proposed project development activities and within previously disturbed areas co-located with proposed project activities. Pipeline routes should be installed immediately adjacent to existing roads (within existing ditch areas if possible) with trench spoil piles kept within 10 feet of the trench edges to allow for safe driving on the access roads while construction activities occur. The total area of disturbance for access roads and pipeline routes would be kept to the minimum within the 50-foot-wide proposed construction area and existing ROW corridor

3. During construction activities, the construction contractor would periodically ‘neck down’ access road and pipeline construction corridor area widths. Representatives from the BLM and Kinder Morgan and/or Ecosphere should identify and flag neck down locations along each access road, pipeline construction corridor, and well pad prior to construction. Attempts should be made to disturb less than 15% of the construction corridor area to partially retain inventory class objectives. Necking down should involve leaving clumps of trees and shrubs that would provide visual buffers or breaks in ground disturbance. Buffer areas could be developed in locations where excavation activities could be performed from both sides of the ‘buffer’ while keeping the ‘buffer’ area free of spoil piles and vehicle access. The preservation of trees should not be done in a manner that would cause any equipment to be operated in an unsafe manner.
4. The existing roadway along the proposed northern flowline would be managed to prevent it from becoming a more developed travel route. This can be achieved partially by reclaiming the existing road to its original width after flow line construction activities are completed.
5. All surface equipment, including pipe guards, and permanent structures (onsite for six months or longer) constructed or installed would be painted a flat, non-reflective earth-tone color, typically Yuma Green (5Y 3/1), that best matches the surrounding environment as specified by the BLM from the list of 10 standard environmental colors designated by the Rocky Mountain Regional Coordinating Committee (RMRCC), and the PANTONE Architecture and Interiors Color Guide (2003).
6. Measures would be taken to control noxious weeds adjacent to disturbed areas throughout the course of operations (including production phase). Noxious weeds, which may be introduced due to soil disturbance or reclamation, should be treated by methods to be approved by the Authorized Officer. These methods may include biological, mechanical or chemical treatments. Should chemical or biological treatment be requested, Kinder Morgan would submit a Pesticide Use Proposal to the Authorized Officer 60 days prior to the planned application date.

Project Reclamation

1. Soil would not be scraped from the surface where topsoil stockpiles are to be placed. Suitable topsoil material should be conserved in stockpiles along the construction corridors, access roads, and at the well pads. Topsoil would be stripped to an average depth of 6 inches, stockpiled, and segregated from areas where subsoil materials are stored. Any stockpile not used within six months would be seeded to insure topsoil integrity and prevent erosion.
2. If production is established, unused portions of the well pad would be recontoured, topsoil spread, and reseeded per BLM requirements.
3. All disturbed areas would be recontoured to blend as nearly as possible with the natural topography. This includes removing all berms and refilling all cuts.
4. Stockpiled topsoil would be spread evenly over the areas designated for restoration. Enough topsoil should be kept to reclaim at a later date the portion of the well pad and access road

needed for production operations. This remaining topsoil stockpile would be seeded in place using prescribed seed mixtures as approved by the BLM.

5. Kinder Morgan (or contractor) would contact the BLM's San Juan Resource Area office in Durango, Colorado (970-247-4082), at least 48 hours prior to starting reclamation work and upon completion of restoration measures.

6. Seed would be broadcast between 1 September and 1 December (prior to ground frost). Seed may be drilled at half the rate of broadcast seeding. Seed depth equals ½ inch. All seeding rates would be in pounds of pure live (adapted varieties) seed.

7. Reclamation would be considered successful when the desired vegetative species are re-established, erosion is controlled, weeds are considered a minimum threat, and it is likely that ground cover would return to its pre-disturbance condition. Revegetation efforts would continue until this standard is met. Monitoring of reclamation success would be conducted on a yearly basis until revegetation requirements are satisfied or as identified by the BLM.

8. Reclamation operations would start immediately after drilling or completion operations cease and should be completed as soon as weather conditions allow.

9. Interim reclamation of non-used portions of the well pad areas and the pipeline routes would be initiated as soon as possible after project construction activities are completed. Reclamation of areas adjacent to roads and construction corridor corridors should take priority and should be implemented at the completion of development activities. Interim and final project reclamation activities should be completed in accordance with Surface Use Plan and COAs.

10. As part of short term reclamation activities, cactus and yucca that could be destroyed during ground clearing activities would be removed and stockpiled, using appropriate methodology as identified and approved by the BLM, prior to ground-clearing activities. The stockpiled plants would be re-planted (typically within 60 days) in areas that would be immediately reclaimed after well drilling activities are completed.

11. All disturbed areas would be re-contoured to blend as closely as possible with the natural topography. This should include removing all berms, refilling all cuts, and removing or re-contouring gravel well pads.

Mitigation Measures

The following mitigation measures (currently outlined in Appendix A, COAs), in addition to the previously mentioned Design Criteria committed to by the applicant, should result in the project meeting VRM Inventory Class II objectives within six to 20 years following implementation of reclamation.

1. Portions of the well pads deemed unnecessary for production would be shaped to conform to the natural terrain. Topsoil stockpiled during construction would be spread back over the recontoured areas. Portions of the access roads and pipeline routes deemed unnecessary for

production would also be reseeded. The seed mixture shown in Table 6 would be used as a base for reclamation seeding. Native shrub and forb seeds, such as penstemon, fourwing saltbush, ephedra, fendlerbush, mountain mahogany, serviceberry, cliff rose, and desert bitterbrush, would also be considered for addition to the reclamation seed mix in appropriate locations as identified by the BLM. The seed would be distributed by drilling and broadcasting if a drill cannot access the reclamation area. The woody materials stockpiled during construction are to be spread evenly back over the reclaimed and seeded areas. This organic debris would provide cover and stabilizing material for the soil, seed mix, and young plants.

2. If the seed is broadcast, application rates should be twice the drilled rate and a rake or harrow would be used to incorporate the seed into the soil. Certified weed-free mulch may be required on locations with an inadequate supply of removed vegetation.

3. The seed mixture used must be certified weed free. There would be no primary or secondary noxious weeds in the seed mixture. Seed labels from each bag would be available for inspection while seeding is being accomplished. The seeding contractor would keep a record of the dates seeding was accomplished for each site and should send that information along with the seed labels from each bag to the Dolores Public Lands Office (29211 Highway 184, Dolores, CO 81323). The Surface Managing Agency representative (Tom Rice or Cara Gildar at 970-882-6845) should be notified seven days prior to seeding so that they may be present to witness reseeding activities. If grasses and native vegetation are not established after the first seeding application, subsequent applications would be required until grasses and/or native vegetation are established.

4. The Permit Holder (Holder) would be responsible for control of all State-listed noxious weed species on all disturbed areas. The Holder is responsible for consultation with the Authorized Officer and local authorities for acceptable weed control methods.

5. Upon final reclamation, all compacted areas and areas devoid of vegetation on location would be ripped, along the contour, to a minimum of 6 inches in depth, unless located on solid rock, before the re-spread of topsoil and subsequent reseeding.

6. The following standards would be applied to determine the success of reclamation efforts. The operator would continue re-vegetation efforts, at the direction of BLM, until these standards are met. Reclamation would be considered successful when the desired vegetative species are established, erosion is controlled, weeds are considered a minimal threat, and it is likely that ground cover would return to a desirable condition. The following parameters should be used to determine the success of re-vegetation efforts.

- a) Successful onsite establishment of species included in the planting mixture or other desirable species.
- b) Evidence of vegetation reproduction, either spreading by rhizomatous species or seed production.

7. The period of liability under the bond of record would not be terminated until each well is inspected and the surface rehabilitation approved.

8.3.15 Wildlife, Aquatic and Terrestrial

No perennial water sources are located within the proposed project area or within a ½-mile radius of any project elements. The closest perennial water source is Yellow Jacket Creek, located approximately 1 mile to the north of the proposed project area. Therefore no aquatic wildlife species are present within the area of affect for the proposed project.

The proposed project area is located on the Burro Point area, which is primarily composed of mixed age piñon-juniper woodland habitat. This habitat type provides cover and forage for a wide range of wildlife. In the fall, large flocks of pinyon jays feed on and cache piñon seeds, providing essential dispersal of piñon seeds. Several small mammals including the pinyon mouse (*Peromyscus truei*), which nests in hollow piñon trees, and the bushy-tailed woodrat (*Neotoma cinerea*) depend on piñon seeds for food. Some large mammals, including black bear (*Ursus americanus*), also utilize piñon seeds as a fall food source.

Bird species commonly found in piñon-juniper woodlands are described in Section 8.2.5. Non-game bird abundance and composition associated with the project area's woodland and shrubland habitats are considered representative and complete with no obvious deficiencies in composition. Small mammal populations and distribution are poorly documented; however, the species potentially occurring on these sites are widely distributed throughout the State and the Great Basin and Rocky Mountain Regions. All of these upland species display broad ecological tolerance and are documented from habitats ranging from foothill to alpine sites. No narrowly distributed or highly specialized species are known to occur in the proposed project area.

Overall, the woodland vegetation found in the proposed project area is too young (i.e., the trees are too small) to serve as nest substrates for raptor species such as red-tailed hawk (*Buteo jamaicensis*), northern goshawk (*Accipiter gentiles*), and great-horned owl (*Bubo virginianus*). Although golden eagles (*Aquila chrysaetos*) are relatively common in the region and there are suitable cliffs for nesting in the general vicinity, the project area woodland vegetation is too dense to provide appropriate hunting habitat for this species). However, the project area may provide foraging opportunities for smaller *Accipiter* species such as sharp-shinned hawk (*Accipiter striatus*) and Cooper's hawk (*Accipiter cooperii*), as well some smaller owl species such as northern saw-whet owl (*Aegolius acadiscus*).

During the biological survey conducted on 5 December 2006, five mule deer were seen and abundant deer and elk signs (i.e., scat, tracks) were observed. This piñon-juniper/mixed shrub habitat within the project area is used by big game generally from October through April or May as winter range, with year round use also occurring. Both deer and elk are known to occur as year-round residents in the Monument due to the proximity of the monument to developed agricultural fields (Kathy Nickell pers. comm.). No signs of raptor use or raptor breeding were observed within 500 feet of any of the proposed well pads, access roads or flow lines during the 30 January 2007 raptor survey.

Environmental Consequences:

The Proposed Action would remove a maximum of 62 acres of piñon-juniper woodland habitat that could be utilized by a variety of wildlife. Vegetation removal would result in moderate, long-term habitat loss and fragmentation. During construction activities there would be moderate, short-term impacts to area wildlife as a result of human and vehicular activity, and the associated noise. Wildlife would be temporarily displaced by construction activities, although after construction is complete, wildlife would likely return to the area.

The proposed project would result in a loss of habitat, primarily piñon-juniper woodland, but also some sagebrush grassland, which provides forage for big game species including mule deer and elk. Understory species such as mountain mahogany, antelope bitterbrush, and serviceberry that are found throughout the project area are an important food source for deer and elk, especially in winter. Mule deer and elk may also be affected by a temporary increase in vehicle traffic during construction resulting in a temporary disruption of foraging, displacement of big game from and around disturbed areas, and possibly some mortality from vehicle collisions and poaching due to increased road density. Disturbance may result in increased energy expenditure by big game animals, of particular concern during late winter and early spring when deer and elk are physiologically stressed and most susceptible to human-caused stresses. While individual deer and elk may be impacted by the Proposed Action, population-level impacts to big game herds are not expected.

Vegetation removal would result in a loss of habitat for a variety of ground and tree-nesting birds protected under the MBTA. These impacts are described in detail in Section 8.1.5.

Under the Proposed Action, potential impacts to area wildlife would be low and short-term during construction and drilling shifting to low and long-term during the production phase.

Under the No Action Alternative, no additional disturbance associated with commercial oil and gas development would occur to wintering big game, and no net loss of elk and deer winter range habitat would occur.

Design Criteria

Design Criteria for the Proposed Action include the stipulation that construction activities would be confined to the proposed well pads, access road, and pipelines to minimize disruption to wildlife. Because the project does not occur in severe winter range mapped by CDOW, no annual timing limitation would be applied to the proposed project activities.

9.0 CUMULATIVE IMPACTS SUMMARY AND UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS

Interrelation to Other Projects

The proposed project area is located within the Paradox Basin, a broad area of sustained development by oil and gas producers located in Colorado on the west side of Montezuma and Dolores counties. The area encompassed by the proposed project, as well as adjacent areas, has

been affected by oil and gas development since the early 1950s. Exploration and development of existing oil and gas leases on BLM administered lands within the Monument and in Montezuma County continues today. Developed resources include production of natural gas, crude oil and CO₂ gas. Past, present and future potential exploration activities include wildcat drilling and seismic exploration.

According to the 1985 San Juan/San Miguel Planning Area RMP and the 1991 Oil and Gas Amendment (BLM 1991 p. 4-30) for the San Juan/San Miguel Planning Area (SJ/SMPA), approximately 2% (1,430 acres) of the surface area within the management area would be impacted by oil and gas activities by 2011. That considers the potential drilling of 313 wells with an average surface disturbance of 4.0 acres per well (BLM 1991 pp. B-2 and B-49). The total disturbance for the Proposed Action is approximately 62 acres, which represents 0.04% the land area with the Monument. The BLM prepared a Reasonable, Foreseeable Development (RFD) document for oil, natural gas and CO₂ development within the Monument in April 2005 (BLM 2005). The RFD document states that 185 wells have been drilled within the Monument since the 1940s (p. 1), with an additional 150 wells estimated to be drilled in the next 20 years. Of these wells, 69 of the proposed new wells would be CO₂ wells (p. 1). Kinder Morgan's seven proposed wells would be within the number of wells estimated in the RFD document.

A review of COGCC records (COGCC, 2007) within the project area was made to quantify existing oil and gas disturbance within a one-mile and five-mile radius of the proposed project area. The summary of one and 5 mile radius area provides a nearby (one-mile) and general vicinity (5 mile) summary of the density of mineral development activities.

Existing or previous oil and gas development located within a 1-mile radius of the proposed project area consists of one temporarily shut in and two abandoned wells. Within a 5-mile radius of the proposed project area there are 75 well pad locations, as broken down in Table 9. The area searched within a 1-mile radius is 10 square miles or 6,400 acres. The area searched within a 5-mile radius is 100 square miles or 64,000 acres. Based on 4 acres of disturbance per well pad, the percent of impacted land from well pads is 0.2% and 0.5% within 1-mile and 5-mile radius respectively. The additional 7 wells would put the area of disturbance percentage at 1.8 % within a 1-mile radius. The amount would be less than the 2% of the area predicted in the 1991 RMP amendment. The addition of 7 wells to the area of disturbance within a 5-mile radius would be less than 0.1% increase in the area disturbed by well pads.

The proposed project area contains two existing utility corridors that run generally from east to west across the Burro Point mesa. The first utility ROW is for a Kinder Morgan flow line route (50-foot-wide ROW) which contains a subsurface CO₂ production line. The second ROW is for and Empire Electric overhead electricity transmission line route (100-foot-wide ROW).

There are currently 196 miles of roads within the Monument for access to oil and gas sites (Draft Canyons of the Ancients National Monument RMP and DEIS – BLM 2007). The Monument RFD document estimates that future oil and gas development activities within the Monument would require approximately 67 miles of additional roads. The proposed new access roads (2,490 feet/0.47 miles of new access roads would be included within the 67 miles of new oil and

gas access roads that would be constructed within the Monument. The length of new roads represents 0.24% of the existing oil and gas access roads within the Monument.

Table 9. Existing wells located within a 1-mile and 5-mile radius of proposed project area.

| Type of Well | 1-mile radius | 5-mile radius |
|-----------------------|---------------|---------------|
| Abandoned Location | - | - |
| Drilled and Abandoned | - | - |
| Injection well | - | - |
| Plugged and Abandoned | 2 | 24 |
| Producing | 0 | 26 |
| Shut-in | - | 15 |
| Temporarily Abandoned | 1 | 1 |
| Permitted Location | - | 9 |
| Compressor Stations | 0 | 1 |

Colorado Oil and Gas Conservation Commission, 2007

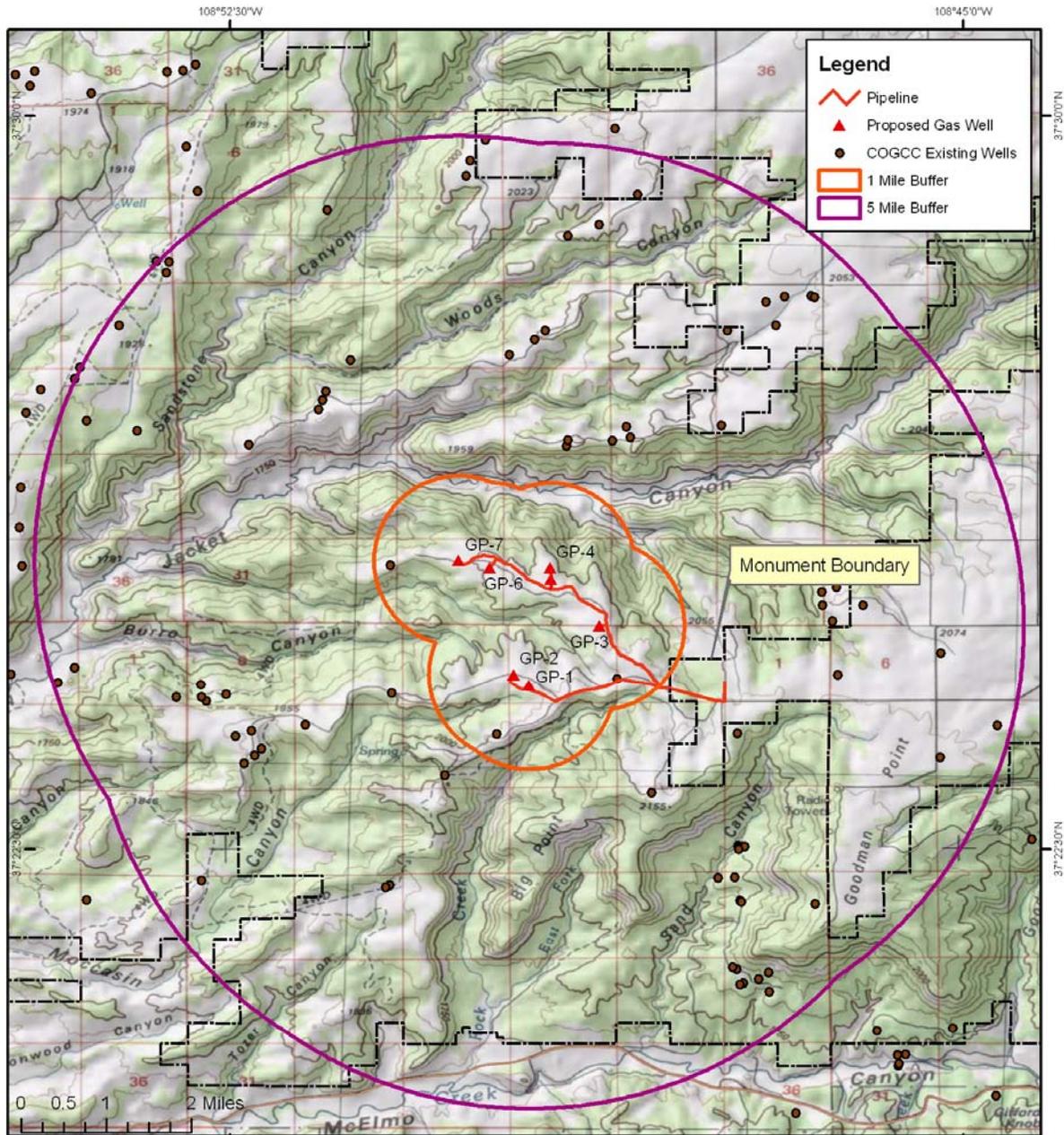
The only record for a compressor station within a 5-mile radius of the proposed project area is for the Kinder Morgan Goodman Point Compressor currently under construction. The Kinder Morgan Goodman Point Compressor Station is under construction on a 40-acre parcel, which includes the compressor and gas treatment building, office building, and parking and access areas. The actual treatment and compression facilities will include the following components:

- Separation and testing vessels;
- Storage tanks for water and glycol (used for dehydration);
- Dehydration equipment (contactor, glycol reboiler, utility pumps, etc.);
- Two (2) 5,000 horsepower reciprocating compressors, electrically driven, with fin fan coolers; and
- Other utility equipment as needed.

After the ‘wet’ gas from the proposed wells has been treated at the facility, it would be sent to the existing Cortez Pipeline through the Sand Canyon ‘dry gas’ flow line that runs parallel to County Road N. Overhead electric service would be provided to the compressor facility from an existing Empire Electric Association transmission line.

In addition to the Goodman Point Compressor Station, that is currently under construction on private land, Kinder Morgan is drilling an additional four CO₂ production wells on private lands in the vicinity of the compressor station. The additional wells are being drilled in the same manner as the wells within the Monument, and the produced CO₂ will be collected, treated and transported in the Goodman Point Compressor Station.

The proposed activities represent Kinder Morgan’s reasonable foreseeable development for the next five years.



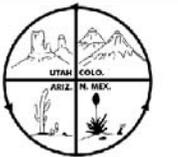
| | | |
|--|---|----------------------|
|  <p>ECOSPHERE ENVIRONMENTAL SERVICES</p> | <p>KINDER MORGAN</p> <p>GOODMAN POINT DEVELOPMENT PROJECT</p> | |
| | EXISTING GAS WELLS | FIGURE 4 |
| | TOWNSHIP 37N RANGE 18W, SECTIONS 34 & 35 | MONTEZUMA COUNTY, CO |
| TOWNSHIP 36N RANGE 18W, SECTIONS 2 & 3 | 3/2008 | |

Figure 4. Existing Well Development Within 1 and 5 miles of the Proposed Project Area

Cumulative Impacts Summary

Cumulative impacts are defined by CEQ regulations as “the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency or person undertakes such actions” (40 CFR 1508.7). Cumulative impacts are an aggregate of direct and indirect impacts and include actions that have occurred or can be reasonably expected to occur both within and outside of the project area in the future.

A qualitative description of the cumulative effects of the Proposed Action within the context of past, present and reasonable foreseeable future development activities and the basis for the effects determination is summarized in Table 10. Overall, cumulative impacts would be expected to be in conformance with the San Juan/San Miguel RMP and the 1991 San Juan/San Miguel Oil and Gas Amendment.

It is intended that Kinder Morgan’s proposed surface use protection measures and BLM’s Surface Use COAs would minimize the majority of potential impacts from the Proposed Action. As new development occurs in some areas, plugging and abandonment, including final reclamation, occurs in other areas. Potential reclamation would offset impacts associated with new development. In some cases, upon completion of final reclamation and abandonment, the general health of the land, including wildlife/livestock forage, soil stability, etc., has proven to be in a healthier state than surrounding areas that have remained undisturbed. This has been mostly due to noxious weed treatments and seeding with native grasses.

The direct and indirect impacts of the Proposed Action would contribute to impacts associated with other surface-related disturbance activities that are ongoing within the Monument, including ongoing oil, gas and mineral development, grazing, recreation activities and utilization, etc. Impacts related to these types of activities typically include, but are not limited to, road construction, soil compaction, littering, loss of vegetation, and modifications to the landscape.

Table 10. Cumulative impacts summary.

| Environmental Resource | Environmental Consequences | Cumulative Impact | Basis For Determination |
|-------------------------------|---|--------------------------|--|
| Vegetation | Vegetation and habitat loss due to clearing well pad areas, access roads and pipelines. Increase of invasive species. | Low-Moderate | Direct impacts would be confined to the area of disturbance (62 acres). Monitoring and treatment would avoid spread of noxious weeds. No indirect impacts to adjacent areas would occur. No threatened and endangered plant species would be impacted. |
| Soils | Soil transport and erosion, road damage, rutting. | Low | Direct impacts to project area soils due to well pad clearing, access road and pipeline construction would be confined to within the project area (62 acres). Topsoil would be segregated and utilized for interim reclamation within short term (less than 6 months) disturbance area (41 acres). Long term maintenance of roads would be completed by Kinder Morgan. |
| Surface Water | Potential low impacts to surface water from sediments and other pollutants. | Low | Lack of perennial surface water resources in the project area eliminates possibility of direct impacts to surface water. |
| Wildlife | Fragmentation and loss of habitat, noise disturbance, wildlife/vehicle encounters. | Low to Moderate | Direct impacts to individual species may occur, but population level impacts would not occur. Indirect impacts may include avoidance of the project area during the project construction activities, but there are large tracts of similar habitat type adjacent to the proposed project area. |
| Cultural Resources | 1) Potential to impact 33 historic sites; 2) fragmentation of cultural landscape, and 3) impacts to ancestral sites. | High | See “Cumulative Effects on Cultural Resource Properties” below (pages 72 – 74) and Cultural resources and Native American consultation sections (pages 24-32) for summary prepared in coordination with BLM archaeologists. |
| Access | Increased travel on Monument roads, increased dust from travel. | Low | Proposed road improvements represent a small portion of the Monument, the primary impact would be short term (6 months). |
| Recreation | Increased traffic noise and visual impacts. | Low | The proposed project area does not contain any designated recreation areas managed by the Anasazi Heritage Center. Informal recreational use of the project area will continue during and after project construction activities are completed. |
| Range | Short-term loss of 62 acres of forage, long term reclamation of disturbed areas may increase available forage. | Low | Reclamation of short term disturbance areas may increase forage within project area. |
| Visual | Reduction in scenic quality in the project area. | Low to Moderate | The Monument VRM Class conditions may not be met in the short term while oil and gas drilling operations are continuing, but are expected to be met in the long term as reclamation vegetation matures. Mitigation, including uneven edge effects, should reduce or eliminate impacts associated with linear project components over the long term. |
| Noise | Increase in noise levels during construction and drilling activities. | Low | Noise impacts would be limited to the period of well pad, road and pipe line construction (approximately 6 months). |
| Socioeconomic | Increases in employment, income and tax revenues for Montezuma County. | Low | Positive economic impact on surrounding communities. |

Cumulative Effects on Cultural Resource Properties

Cumulative effects on cultural resources are associated with past actions, the Proposed Action, and foreseeable future actions. In the past, cultural resources have been affected by both natural agents (erosion, bioturbation, and wildfires) and cultural agents (chaining, livestock grazing, recreation, vandalism, cultural resource investigations, and oil and gas development). For the purposes of the following discussion, the term study area refers to the land within a 1-mile radius of the proposed project area. The exception to this occurs in the discussion of oil and gas development, in which the term refers to the entire Monument.

Erosion, bioturbation and wildfires have had impacts on cultural resource sites. Data on the impact of these natural agents is limited and relies entirely on notes gathered during site recordation. Erosion was noted to have impacted five sites, bioturbation at one site, and wildfire at two sites in the 43 sites identified for the project. For the most part, it appears based on the data for the project and for data gathered on the recent cultural resource survey that these impacts have not been severe (Hovezak et al. 2002). In the foreseeable future, the dense vegetative growth in the study area makes sites susceptible to the effects of wildfires, like the one on nearby Burro Point that burned in the summer of 2006.

Chaining done for vegetation management purposes in the past was conducted over the entire proposed project area. Impacts noted to sites within the proposed project area include displaced and scattered surface artifacts; however, surface and subsurface site deposits retain their integrity.

Livestock grazing has occurred in this area of Southwestern Colorado area since the late 1870s (Horn 2004). Approximately 40% of the sites located or relocated during a recent cultural resources survey of the Burro Point area (Hovezak et al. 2002) were noted to have livestock impacts; most of the impacts noted were limited to trampling of the surface. One site, located near a water source was noted as having a heavy amount of disturbance, due to livestock concentrating around the water source.

Impacts to sites from vandalism have been noted at five sites. At three sites there is evidence of surface artifact collection and at two sites there is evidence of illegal excavation. This vandalism has affected both the scientific and heritage tourism values of the sites. A study of illegal vandalism in the 1970s noted a correlation between the sites located near roads having a higher frequency of looting (Nickens et al. 1981). Since the passage of the Archaeological Resources Protection Act of 1979, and an increased focus on public education about protection and stewardship of archaeological resources recreational digging of sites near roads by the general public appears to have decreased slightly. Another contributing factor may be increased public use of roads which possibly serves as a deterrent to illegal activities at sites located near roads

Two sites in the study area have been impacted by cultural resource investigations. One of these was excavated in association with oil and gas development (Mabry 1993) and the other in association with scientific research (Kent 1991). These investigations have had both negative and beneficial effects on cultural resource values. The negative effect is the destruction of

tangible and intangible aspects of the sites; the beneficial effect is the scientific knowledge gained about the sites.

Oil and gas development has occurred in the study area since 1911. Between 1911 and 1970 this work was conducted without concern for cultural resource values, and as a result an unknown number of cultural resource sites may have been impacted by development during that time period. Passage of the National Historic Preservation Act of 1966 (NHPA) required Federal agencies to consider the effects of undertakings upon historic properties. Compliance with NHPA has resulted in minimizing impacts to cultural resources by oil and gas developments.

To evaluate the past effects of oil and gas developments on cultural resources in the study area, a literature/GIS search was conducted at both the Colorado State Historical Preservation Office (SHPO) and the Anasazi Heritage Center. Data were obtained concerning the types and number of projects, and the number of acres surveyed, sites located during survey, sites discovered during construction, and sites tested and/or mitigated for the projects (see Table 11). While these files were queried for projects on the Monument, the figures below are slightly inflated since some of these projects extended outside the Monument, some of the acreage has been resurveyed for different projects, and some of the sites have been relocated multiple times.

Table 11. Cultural resource sites located on past oil and gas development projects.

| Project Summary | | Acres Surveyed | Sites | |
|-----------------|--------------------|----------------|--------------|------------|
| Type | Number of Projects | | Located | Affected** |
| Well | 136 | 4,437* | 425* | 3 |
| Seismic | 80 | 17,285 | 1118 | 0 |
| Road | 13 | 337 | 36 | 5 |
| Powerline | 5 | 1,138 | 165 | 0 |
| Pipeline | 21 | 2754 | 372 | 39 |
| Facility | 6 | 125 | 8 | 3 |
| Total | 261 | 26,076 | 2,124 | 50 |

*Number is probably inflated, as many well surveys also included roads and pipelines.

**Five of these sites are located on private lands outside the Monument.

Summary information regarding cumulative effects to cultural resources is based upon the information presented in Table 11. The data projections contained in Table 11 for future development, and carried forward into the cumulative development are based upon the following methods and assumptions:

Projected Number of Sites Located: The basis for projection was calculated from the inventory data for the proposed action, which resulted in a site frequency of 1 site per 3.8 acres. The site frequency then was multiplied by the number of projected acres of disturbance in the “Reasonable, Foreseeable Development: Oil, Natural Gas, and Carbon Dioxide in Canyons of the Ancients National Monument” (RFD) to result in the projected number of sites located.

Projected Number of Sites Affected: This is projected based upon the percentage of sites affected by the current project (proposed action) which is 77%; which is multiplied by the projected number of sites.

Projected Number of Sites Discovered: The projection is based upon the rate of discovery during construction (44%) derived from historic oil and gas development (the number of sites discovered divided by the number of sites affected). The rate of discovery is used as a multiplier for the number of sites affected to project the number of sites discovered.

All projected values are approximations.

Archaeological inventories conducted for historic oil and gas development project from 1940 to 2007 have located approximately 2,124 of the total of 6,000 documented archaeological sites on the Monument (CANM). This represents approximately 35% of known/documented sites in the Monument. **Note that the total does not account for re-locating previously recorded sites and consequently contains a high number of duplication.** Forty four sites were located during the inventory for the proposed action (this project), bringing the total number of known/documented sites on the Monument to 6,043 sites. It is projected that archaeological inventories conducted for projected future oil and gas development will locate approximately 522 additional sites; this represents 8% of known/documented sites. Historic, present, and projected future inventories are estimated to locate a total of (cumulative) 2,690 archaeological sites, which represents 29% of the known/documented sites in CANM.

The projected number of archaeological sites affected by oil and gas development through time, as well as the corresponding percentage of the total of known/documented sites in CANM is as follows:

- Historic Development: 50 sites (0.8% of all known/documented sites in CANM)
- Proposed Action: 33 sites (0.5% of all known/documented sites in CANM)
- Future Development: 402 sites (6.1% of all known/documented sites in CANM)
- Cumulative Development: 485 (5.2% of all known/documented sites in CANM)

The number of archaeological sites projected to be discovered (during construction) through time, and the corresponding percentage of the total of known/documented sites in CANM that those numbers represent is as follows:

- Historic Development: 22 sites (0.4% of all known/documented sites in CANM)
- Proposed Action: 19 sites (0.3% of all known/documented sites in CANM)
- Future Development: 177 sites (2.7% of all known/documented sites in CANM)
- Cumulative Development: 218 sites (2.3% of all known/documented sites in CANM)

The cumulative total of the number of archaeological sites in CANM that may be potentially impacted by oil and gas development is the sum of the cumulative totals of “affected sites” (485) and “discovered sites” (218) which equals 703 sites and represents 7.6% of all known/documented sites in CANM. For the proposed action, 33 sites will be affected, and it is projected that 19 additional sites will be discovered. The proposed action will potentially impact 52 sites, or 0.8% of all known/documented sites on the CANM. This represents nearly a tenth of the sites projected to be potentially impacted in the foreseeable future by oil and gas development in CANM.

Avoidance of significant historic properties archaeological is the preferred management strategy of CANM during oil and gas development. The known discoveries of archaeological sites made during the historic development to date, demonstrate that the potential for encountering archaeological remains that are not evident on the ground surface during construction is a reality.

The historic archaeological mitigation (investigation) work that was conducted at the 50 sites was of a limited nature; investigations focused on single features at 24 sites (human remains were encountered during testing in a room), and at 16 sites investigations consisted of surface mapping, artifact collection, and testing. The information recovered from investigations with such a narrow, mitigation orientation often have limited utility in application to the broader archaeological context.

Archaeological knowledge of the region has been enhanced as a result of information collected through inventories resulting from past oil and gas development, although the nature of “project” oriented inventories limit utility for broader applications of the survey data. Archaeological work has contributed to some recent regional research projects.

Unavoidable Adverse Impacts

The 21 acres of long-term disturbance and 41 acres of short-term disturbance associated with the development of the Proposed Action would result in unavoidable adverse impacts to cultural resources (discussed above), soils, visual resources, recreation resources, wildlife, and vegetation. The removal of 62 acres of wildlife habitat would contribute to the habitat fragmentation that exists throughout the area from existing roads, pipelines, and well pads. Less noticeable unavoidable adverse environmental impacts include increases in impacts to local air resources and noise levels during well drilling and construction activities. Impacts to local air resources would primarily result from dust created by vehicular travel on unpaved roads, and exhaust from rig and vehicle operation. These impacts are expected to be short-term and of low impact.

Specific management criteria that may be monitored to ensure regulatory compliance and to evaluate cumulative impacts of the Proposed Action include:

- Air quality monitoring by the National Park Service at Mesa Verde National Park;
- Water quality monitoring by the CDPHE and the BLM at McElmo Creek gauging stations;
- On going range land health assessments performed on the Burro Point Community grazing allotment;
- Invasive species monitoring and management within the area of disturbance;
- Periodic compliance inspections of the proposed project area by BLM Natural Resource Protection staff to ensure compliance with Surface Use COAs, and other environmental compliance; and
- Bi-weekly Storm Water Management Plan inspections to ensure NPDES compliance during project construction and interim reclamation/permit operation period.

Table 12. Past, present, projected future, and cumulative cultural resource information for oil and gas development projects on the Monument.

| Oil and Gas Projects 1940-2008 | | | | | |
|---------------------------------------|---------------------------|-------------------------|--------------------------|-----------------------------|-------------------------------------|
| Project Type | Number of Projects | No. Ac. Surveyed | No. Sites Located | No. Sites Affected # | Number of Sites Discovered + |
| Well | 136 | 4,437 | 425 | 3 | 0 |
| Seismic | 80 | 17,285 | 1118 | 0 | 0 |
| Road | 13 | 337 | 36 | 5 | 0 |
| Powerline | 5 | 1,138 | 165 | 0 | 0 |
| Pipeline | 21 | 2754 | 372 | 39 | 0 |
| Facility | 6 | 125 | 8 | 3 | 0 |
| Total | 261 | 26,076 | 2124* | 50* | 22 |

| This Project | | | | | |
|---------------------|---------------------------|-------------------------|--------------------------|-----------------------------|-------------------------------------|
| Project Type | Number of Projects | No. Ac. Surveyed | No. Sites Located | No. Sites Affected # | Number of Sites Discovered + |
| Well | 1 | 58 | 24 | 33 | 0 |
| Seismic | 0 | 0 | 0 | 0 | 0 |
| Road | 1 | 3 | 0 | 0 | 0 |
| Powerline | 0 | 0 | 0 | 0 | 0 |
| Pipeline | 1 | 55 | 20 | 0 | 0 |
| Facility | 0 | 0 | 0 | 0 | 0 |
| Total | 3 | 116 | 44 | 33 | 19 |

| Future Oil and Gas Development-Per RFD | | | | | |
|---|---------------------------|-------------------------|--------------------------|-----------------------------|-------------------------------------|
| Project Type | Number of Projects | No. Ac. Surveyed | No. Sites Located | No. Sites Affected # | Number of Sites Discovered + |
| Well | 121 | 883 | 232 | 179 | 79 |
| Seismic | 15 | 1,102 | 290 | 223 | 98 |
| Road | 67 | 0 | 0 | 0 | 0 |
| Powerline | 0 | 0 | 0 | 0 | 0 |
| Pipeline | 53 | 0 | 0 | 0 | 0 |
| Facility | 8 | 0 | 0 | 0 | 0 |
| Total | 249 | 1985 | 522 | 402 | 177 |

| Cumulative (Historic, this project, and future development) | | | | | |
|--|---------------------------|-------------------------|--------------------------|-----------------------------|-------------------------------------|
| Project Type | Number of Projects | No. Ac. Surveyed | No. Sites Located | No. Sites Affected # | Number of Sites Discovered + |
| Well | 258 | 5,378 | 681 | 215 | 95 |
| Seismic | 95 | 18,387 | 1,408 | 223 | 98 |
| Road | 81 | 340 | 36 | 5 | 2 |
| Powerline | 5 | 1,138 | 165 | 0 | 0 |
| Pipeline | 75 | 2,809 | 392 | 39 | 17 |
| Facility | 14 | 125 | 8 | 3 | 1 |
| Total | 503 | 27,799 | 2,690 | 485 | 218 |

*does not account for multiple site relocations, number is high.

Site affected frequency calculated on the basis of this project (CANM06-023 and CANM07-006). 66 sites divided by 250 ac. surveyed = 0.264 x 640=169 sites/sq. mile, **frequency of 1 site per 3.8 acres.**

^ Projected site discovery rate = 44 percent (on the basis of discoveries made 1940-present).

10.0 RESIDUAL IMPACTS

10.1 Irreversible Commitments

Irreversible commitments are those that generally cannot be reversed, such as the extinction of a species or the extraction of a mineral. If the Proposed Action is approved and the wells are determined to be productive, the CO₂ gas would be extracted. The CO₂ generated from the project would be transported to out of state markets for utilization in tertiary oil recovery projects. Because the CO₂ would not be expected to regenerate, the extraction of the CO₂ would be an irreversible commitment.

The Proposed Action would cause irreversible commitments of cultural resources. As described in the cumulative effects section above, the Proposed Action would impact 33 sites, approximately 3 from full mitigation, 10 from limited testing, and 20 from auger testing. The irretrievable commitment of resources would occur due to the destruction of tangible and intangible aspects of the sites.

10.2 Irretrievable Commitments

If the proposed wells, pipelines and access roads are approved, approximately 21 acres of long-term disturbance would remain after interim reclamation activities have been completed. The 21 acres of disturbance would be unavailable for forage production, vegetation, and wildlife habitat for the length of the proposed project (estimated 10-20 years) and therefore be irretrievable for as long as the development remains. The 20 acres would remain in use by Kinder Morgan until the CO₂ wells are deemed unproductive. At that time the wells would be properly plugged and abandoned per BLM and COGCC requirements, and final reclamation would be performed. Final reclamation would restore the areas of disturbance to natural, pre-disturbance conditions and retrieve the 21 acres. In some cases, final reclamation has resulted in restoring sites to conditions that are an improvement over site conditions that existed before disturbance. This has been primarily due to weed treatments and seeding with native grasses.

11.0 CONSULTATIONS

Individuals and agencies listed below have been consulted in the preparation and review of this Environmental Assessment:

Table 13. Individuals consulted and area of responsibility.

| Name | Office/Agency | Title |
|------------------|--------------------------|---|
| Tom Rice | DPLO – BLM | Natural Resource Specialist – Oil and Gas |
| Eric La Price | DPLO - BLM/USFS | Biological Scientist/NEPA Coordinator/Project Manager |
| Mike Jensen | DPLO - BLM/USFS | Rangeland Management Specialist |
| Kathy Nickell | DPLO - BLM/USFS | Wildlife Biologist |
| Shauna Jensen | DPLO – BLM/USFS | Hydrologist |
| Leslie Stewart | DPLO - BLM/USFS (former) | Ecologist |
| Jennifer Burns | DPLO - BLM/USFS | Landscape Architect |
| Vince MacMillan | DPLO - BLM/USFS | Archaeologist |
| LouAnn Jacobson | BLM - Monument | Monument Manager/Authorized Office |
| Linda Farnsworth | BLM – Monument | Archaeologist |
| Bob Clayton | Kinder Morgan | Construction Supervisor |

The following organizations and individuals were contacted and/or consulted during preparation of this document.

- U.S. Fish and Wildlife Service regarding listed flora and fauna;
- Colorado National Heritage Program regarding Montezuma County species of concern;
- BLM State Director’s Office - List of BLM Sensitive Species;
- Native American Tribes included in the tribal consultation (see Appendix B for complete list of Tribes);
- Norman Utley, Utley Construction
- Jerry Fetterman, Woods Canyon Archeological Consultants

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APPENDIX A

BLM SURFACE USE CONDITIONS OF APPROVAL

Surface Use Conditions of Approval

**Kinder Morgan CO₂ Company, LP (Kinder Morgan)
Goodman Point Development Project
Canyons on the Ancients National Monument
Montezuma County, Colorado**

The following Conditions of Approval (COA) take precedence over any or all terms and conditions set forth in the APD Surface Use Plan. Kinder Morgan and its contractors should refer to these COAs and the Surface Use Plan for specific information associated with construction, drilling, production, and reclamation.

The COA are presented below by type of on site activity expected for the Kinder Morgan Goodman Point Development Project.

Special Conditions of Approval

1. A copy of these Conditions of Approval and the operators Surface Use Plan must be on location at all times.

Conditions of Approval

Cultural Protection Conditions of Approval:

1. It is the responsibility of the operator to inform all employees, contractors, and subcontractors before beginning operations of the specific protective measures for cultural resources, and that any disturbance to, defacement of, or collection or removal of archaeological, historic, or sacred material will not be permitted. Violations of the laws that protect these resources will be treated as law enforcement/administrative issues by the BLM.
2. Disclosure or release of information regarding the nature and location of archaeological, historic, or sacred sites, without written approval by the Bureau of Land Management, is prohibited under provisions of the Archaeological Resources Protection Act. Cultural resource and other permittees of the Bureau of Land Management are allowed to use this information during course of the project for site protection purposes only. Unauthorized use or distribution of this information (which includes site location information present in cultural resource reports) is considered a violation of Federal statute.
3. A permitted archaeologist will monitor all ground disturbance for potential subsurface cultural manifestations that may not be visible on the surface. Monitoring results will be submitted in writing at agreed upon intervals. If cultural resources or human remains, funerary items, sacred objects, or objects of cultural patrimony are discovered during construction, activity in the vicinity of the resource will cease, the resource will be protected, and the Canyons of the Ancients National Monument Archaeologist, Linda

Farnsworth (970-882-5614) notified immediately and the following procedures will be carried out: Should cultural resources be discovered during construction, activity in the vicinity of the resource will cease, the resource will be protected, and the Canyons of the Ancients National Monument Archaeologist, Linda Farnsworth (970-882-5614) notified immediately. The operator shall take any measures requested by the BLM to protect the resources until they can be evaluated and treated. The discovered resources will be documented and evaluated by a permitted archaeologist. The permitted archaeologist, in consultation with the BLM archaeologist, will make a determination of the nature and significance of the discovery, and will determine the appropriate method of treatment for it. Avoidance is the preferable treatment. However, if the resources cannot be avoided, the appropriate treatment method will be determined, and the permitted archaeologist will prepare any and all necessary treatment plans. These plans will be reviewed and approved by the BLM. Treatment activities will be conducted after all necessary consultations have been completed as required by Section 106 of the National Historic Preservation Act, the Native American Graves Protection and Repatriation Act, and the Archaeological Resources Protection Act. The BLM will be responsible for conducting all necessary consultations. Construction within the area of the discovery will be allowed to proceed after the appropriate treatment has been completed.

4. Pursuant to 43 CFR 10.4 the holder of this authorization must notify the Canyons of the Ancients National Monument Archaeologist, Linda Farnsworth (970-882-5614), by telephone, with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. The operator must stop activities in the vicinity of the discovery and protect it until notified to proceed by the authorized BLM officer.
5. All work, staging and parking of equipment will be confined to the approved areas specified in the EA.
6. Procedures and methods of marking sites for avoidance during the project will be established prior to any project activities between the permitted archaeologist and the Monument Archaeologist.

Construction and Drilling

1. The operator or his contractor will contact the authorized officer, at the Anasazi Heritage Center in Dolores, Colorado; seven (7) days before beginning any surface-disturbing activities and before beginning any reclamation.
 - Tom Rice (970) 882-6845 or
 - LouAnn Jacobson (970) 882-6841
2. The operator will assure that all project-related vehicle traffic is limited to the bladed/traveled road surface. No pullouts or off-road parking will be allowed unless specifically authorized. "Keep vehicles on the road surface" signs must be installed by the operator to assist with compliance as needed. No shortcutting by any motor vehicles

operated by employees or contractors, on roads not identified as access routes in the APD. Vehicular access to the pad will be strictly limited to authorized vehicles only; these vehicles are restricted to use on the drill pad only -no off pad or off road parking.

3. Surface disturbing activities will not be conducted during extended wet periods or when vehicles and/or construction equipment will leave excessive ruts and damage to roads associated with the Project. If vehicles and/or construction equipment create surface ruts in excess of 4 inches in depth, for a length of at least 10 feet, soil conditions are too wet to adequately support construction equipment. Construction activities will not be allowed until soil conditions improve.
4. If vegetation clearing activities are to occur within the within the migratory bird breeding season (April – August) then a nest inventory will be performed prior to clearing vegetation. If active nests are found, vegetation removal will be postponed until after the nest either successfully fledges young or fails.
5. The proposed access road designs will be prepared by a registered engineer and the design plans will be submitted to the BLM for review and approval prior to initiation of road construction activities.
6. The access roads and well pads will be adequately surfaced and shall be wetted down and compacted where needed to avoid dust and loss of soil. If production is achieved, a minimum of 18-inch culverts will be placed in the permanent road as needed and will be installed as outlined in the oil and gas “Gold Book” to reduce erosion per San Juan/San Miguel Resource Area policy. Culverts shall be designed for the 50-year event or be at least 18” in diameter with energy dissipaters downstream. BLM may require additional culverts, if erosion or road damage is not well-controlled by initial construction.
7. All brush, limbs, crushed stumps and other woody material will be stockpiled separately from the topsoil just outside the well pad perimeter, within the construction zone buffer. The stripped vegetation and 6 inches of topsoil shall be stockpiled separately just outside the well pad perimeter. The stripped vegetation shall not be removed from the location (it will be used later for reclamation). If the topsoil stockpile is not used within six months it will be seeded to insure topsoil integrity and prevent erosion.
8. The reserve pits will be sealed to prevent leakage of the fluids. Methods available to insure containment of drilling fluids in the reserve pits include lining the inside of the pit with at least 12 millimeter plastic. The bottom of the pit shall be smooth and free of any sharp rocks. If any of the pits has a rocky bottom, it shall be bedded with a geotextile material to avoid the possibility puncturing the liner. A minimum of not less than a 2-foot freeboard will be maintained in the pit at all times. All oil or floating debris will be removed from the pit immediately after the drilling phase of the well.
9. During the drilling phase of the program, a perimeter fence will be placed around each of the reserve pits. They shall be fenced on three (3) sides, and built in such a manner as to prohibit entry of wildlife. The fences shall be constructed with “woven wire.” Measures

should also be taken to prohibit avian species from entering the pit area (i.e. bird netting). The fourth side of the pit area will be fenced immediately upon removal of the drilling rig and the fencing will be maintained until all pits are backfilled. In the event that one pit is closed prior to the other, the perimeter fence will then be placed around the remaining opened pit until such time as it is backfilled. At no given time, shall any open pits be unfenced.

10. Prior to rigging up, storm water controls will be placed around the perimeter of the well pad and any natural moisture will be diverted off of the pad and away from the location. In addition, ditches will be dug around all equipment on site and any fluids from machinery will be diverted into the reserve pit in the case of a spill. The well pad would be designed in such a manner as not to allow runoff water to enter the pad. Drainages from the berm shall be armored and have an apron at the discharge end to disperse the water. A lined sump pit may be utilized to contain such fluids.
11. Heavy equipment will be pressure-washed at an offsite location prior to entering the site. This is a preventive measure for reducing noxious weed infestation at the drilling sites. If equipment is moved directly from site to site while on this Project, then pressure washing between sites is not required. However, if equipment is removed from a site, used elsewhere, then brought back to the project area, pressure washing is required before the equipment can be used in the project area. This pertains to heavy equipment such as bulldozers, backhoes, etc. Pickup trucks and passenger vehicles do not require pressure washing prior to entering these sites.
12. The integrity of any fence and associated cattle guard must not be compromised during the construction, production, or reclamation phase of the project. All cattle guards, gates, and fence brace panels should be well constructed and regularly maintained. Toxins, such as ethylene glycol, should be kept off the ground where livestock can reach them. The operator is responsible for noting these problems in the field and correcting them before the function of fences/cattle guards/gates is comprised. Once notified by the BLM that a problem exists and that the BLM attributes it to the operator's activities, the operator has 24 hours to correct fence/cattle guard/gate problems resulting from their activities.
13. Water withdrawals from surface waters require notification to the State of Colorado by the company and the water rights holder if using a private water right that is not decreed for industrial use. Colorado requests notification two weeks prior to the beginning of surface waters withdrawals to determine if there is a call on or below the withdrawal point. Regardless of when or how fresh water is used, the State of Colorado will be notified and allowed to respond before water is withdrawn from any surface waters in Colorado. The contact office for Southwestern Colorado is the Division of Water Resources in Durango, Colorado (970-247-1845), and for the Water Commissioner for the Dolores River is (970) 565-0694. After the drilling operations are completed a final estimate of the volume of water used for all activities should be submitted in writing to the State of Colorado. If required by the state of Colorado, the operator must apply and obtain water rights prior to water withdrawals.

14. For any well pad locations with any slope across the pad area, an “eyebrow ditch” shall be installed above the locations on the up-hill side. The intent of the eyebrow ditch is to intercept surface water flows, and disperse the water to either side of the location. The ends of the ditch, or “daylight” ends should be placed in native soils, within undisturbed areas.
15. Well pad and pipeline clearing activities will be completed in a manner to minimize ‘linear’ construction as much as possible. To achieve this goal the edges of the construction areas should ‘varied’ or ‘rounded’ to provide less of a linear shape. In addition, selected locations along the pipeline routes should have clumps or individual trees preserved within the route, to provide a visual break from the linear clearing. The preservation of trees should not be done in a manner that would cause any equipment to be operated in an unsafe manner.
16. The reserve pit will be sealed to prevent leakage of the fluids and to protect surface-water and ground-water quality. Methods available to insure containment of drilling fluids in the reserve pit include lining the inside of the pit with at least 12 mil plastic. If a plastic liner is used, the bottom of the pit shall be smooth and free of any sharp rocks. If the pit has a rocky bottom, it shall be bedded with a material such as soil, sand, straw or hay to avoid the possibility of puncturing the liner. A minimum of not less than a 2-foot freeboard will be maintained in the pit at all times. All oil or floating debris will be removed from the pit immediately after the drilling phase or the well. The pit will be placed in cut material.
17. No fill will be placed in ephemeral drainages.

Production

1. All permanent structures (on site for six months or longer) constructed or installed as part of the development, will be painted with a flat, non-reflective, earth-tone color which will be **Yuma Green** (5Y 3/1) from the list of 10 standard environmental colors designated by the Rocky Mountain Regional Coordinating Committee (RMRCC), and the PANTONE Architecture and Interiors Color Guide, 2003.
2. All production equipment located within the Monument shall be equipped with hospital type mufflers. Regardless of whether the operation is at the construction, drilling, or production phase, if the BLM determines that noise has become a nuisance, additional muffling techniques will be applied to achieve adequate noise reduction and acceptable noise levels.
3. Noxious weeds which may be introduced due to soil disturbance or reclamation will be treated by methods approved by the Authorized Officer. These methods may include biological, mechanical or chemical treatments. Should chemical or biological treatment be requested, the operator must submit a Pesticide Use Proposal to the Authorized Officer 60 days prior to the planned application date (see Reclamation COA #7).

4. The access roads shall be maintained reasonably smooth, and free of ruts in excess of 3-4 inches, soft spots, chuckholes, rocks, slides and washboards. The BLM, San Juan Resource Area road specifications, professional engineer prepared design standards and "Gold Book" shall be followed for specifications on road design and culvert installation. All weather surfacing will be required if well becomes a producer. A regular maintenance program shall include blading, ditching, sign replacement, surfacing, and culvert maintenance. The operator is required to correct maintenance deficiencies when documented and directed by the Authorized Officer. All vehicles servicing the well are restricted to use of the approved access road and well pad.
5. Accidental spills will be cleaned up immediately, and contaminated soils will be removed to a permitted disposal site. BLM spill reporting procedures will be followed.
6. Each reserve pit and that portion of the location and access road not needed for production or production facilities will be reclaimed as described in the reclamation section.
7. Compaction and construction of the berms surrounding the tank or tank batteries (if utilized) will be designed to prevent lateral movement of fluids through the utilized materials, prior to storage of fluids. The berms must be constructed to contain at a minimum 120% of the storage capacity of the largest tank within the berm.

All load lines and valves shall be placed inside the berm.

8. No gravel or other related minerals from new or existing pits on Federal land will be used in construction of roads, well sites, etc., without prior approval from the Surface Managing Agency.

Reclamation

1. Immediately upon completion of each well, all trash and debris will be collected from the location and the surrounding area and removed to an approved sanitary landfill.
2. Portions of the well pads deemed unnecessary for production shall be shaped to conform to the natural terrain. Topsoil stockpiled during construction should be spread back over the recontoured areas. Portions of the access roads and pipeline routes deemed unnecessary for production should also be reseeded. The seed mixture shown in the table below shall be used. The seed should be distributed by drilling where possible, and broadcasting if a drill cannot access the reclamation area. The woody materials stockpiled during construction are to be spread evenly back over the reclaimed and seeded areas (see COA #7 below).
3. As part of short term reclamation activities, plant material that would be destroyed during ground clearing activities (cacti and yucca) should be removed and stockpiled prior to

ground clearing activities. The stockpiled plant material should be re-planted in areas that would be immediately reclaimed after well drilling activities are completed.

Table A-1 -- Seed Mix – Pinyon-Juniper Area

| Kinder Morgan Burro Point Seedmix | | | Drilled rate | | Broadcast rate | |
|-----------------------------------|------------------------|---------------|--------------|---------------------------------|----------------|---------------------------------|
| Common Name | Species Name | Variety | Pounds/acre | Pure live seed/ ft ² | Pounds/acre | Pure live seed/ ft ² |
| Indian ricegrass | Achnatherum hymenoides | Rimrock | 6.2 | 20 | 11.7 | 38 |
| Squirrel tail | Elymus elymoides | Bottlebrush | 1.1 | 5 | 2.2 | 10 |
| Blue grama | Chondrosium gracile | Alma | 0.3 | 5 | 0.5 | 10 |
| Mutton grass | Poa fendleriana | VNS | 0.4 | 10 | 0.8 | 19 |
| Needle and Thread | Hesperostipa comata | VNS | 1.9 | 5 | 3.6 | 10 |
| Galleta | Hilaria jamesii | Viva, florets | 1.4 | 5 | 2.6 | 10 |
| | | Total | 11.3 | 50 | 21.4 | 95 |

If the seed is broadcast, application rates will be twice the drilled rate and some means such as a rake or harrow will be used to incorporate the seed into the soil. Certified weed-free mulch may be required on locations with an inadequate supply of removed vegetation.

The seed mixture used must be *certified* weed free. There shall be NO primary or secondary noxious weeds in the seed mixture. Seed labels from each bag shall be available for inspection while seeding is being accomplished. **The seeding contractor shall keep a record of the dates seeding was accomplished for each site and shall send that information along with the seed labels from each bag to Cara Gildar at the Dolores Public Lands Office (29211 Highway 184, Dolores, CO 81323).**

In the event grasses and native vegetation are not established after the first seeding application, subsequent applications will be required until grasses and/or native vegetation are established, as per the standards shown in Reclamation COA #9 below.

Native shrub seeds (penstemon, fourwing saltbush, ephedra, mountain mahogany, serviceberry, cliff rose, fendlerbush, and desert bitterbrush) may be added to the reclamation seed mix as identified above in appropriate locations as identified by the BLM and in coordination with Kinder Morgan.

4. Notify Surface Managing Agency representative (Tom Rice at 970-882-6845) seven (7) days prior to seeding so that they may be present to witness reseeding activities.
5. Upon final reclamation, all compacted areas and areas devoid of vegetation on location shall be ripped, along the contour, to a minimum of 6 inches in depth before the re-spread of topsoil and subsequent reseeding.
6. Upon final reclamation, all access roads will be shaped to conform to the natural terrain and left as rough as possible to deter vehicle travel. Access will be ripped, along the

contour when possible, to a minimum depth of 6 inches, water barred and reseeded. All erosion problems created by the development must be corrected prior to acceptance of release. Water bars should be spaced as shown below along the fall line of the slope:

Table A-2 – Water Bar Spacing Interval

| Slope (%) | Spacing Interval (feet) |
|---------------|-------------------------|
| Less than 2 % | 200 |
| 2 to 4 % | 100 |
| 4 to 5 % | 75 |
| 5 to 10 % | 50 |
| 10 to 15 % | 30 |

7. The brush, limbs, crushed stumps and other woody material stockpiled during construction, if any, should be spread back over reclaimed areas and associated pipelines after seeding. This organic debris will provide cover and stabilizing material for the soil, seed mix, and young plants.
8. The Permit Holder (Holder) shall be responsible for control of all State listed noxious weed species on all disturbed areas. The Holder is responsible for consultation with the Authorized Officer and local authorities for acceptable weed control methods, and shall comply with the following:
 - a) Use of pesticides shall comply with all applicable Federal and State laws. Pesticides shall be used only in accordance with their registered uses within limitations imposed by the Secretary of the Interior. Prior to the use of pesticides, the Holder shall obtain approval from the Authorized Officer of a Pesticide Use Proposal showing the type and quantity of material to be used, pests to be controlled, method of application, locations of storage and disposal of containers, and any other information deemed necessary by the Authorized Officer.
 - b) All pesticide applicators must hold a valid Colorado Qualified Supervisor license or Certified Operator license, and the license must be valid for the applicable pesticide application category. **For all areas treated, Pesticide Application Records (BLM Form 3-3-94) must be submitted to the BLM Dolores Field Office by November 1 of each year.** Pesticide Application Records must be completed no later than 14 days following the pesticide application and must be maintained for ten years.
9. The following standards will be applied to determine the success of reclamation efforts. Reclamation should be considered successful when the desired vegetative species are established, erosion is controlled, weeds are considered a minimal threat, and it is likely that ground cover will return to a desirable condition. The following parameters should be used to determine the success of re-vegetation efforts.

- a) Successful onsite establishment of species included in the planting mixture or other desirable species.
- b) Evidence of vegetation reproduction, either spreading by rhizomatous species or seed production

The operator should continue re-vegetation efforts, at the direction of BLM, until these standards are met.

- 10. The period of liability under the bond of record will not be terminated until each well is inspected and the surface rehabilitation approved.
- 11. A fence shall be installed around the perimeter of the area undergoing reclamation. The fence shall be maintained in a manner to prevent cattle from entering the area, and shall be constructed as follows: Posts to be no more than 16' apart; fence wire: four wires of at least 12.5 gauge, double strand twisted; two stays between posts; wire stretched taut between brace panels, wire spacing from the ground up: 14", 22", 30", 42". The fence shall be maintained in place for a minimum of 3 years, and will be removed by the Operator when so instructed by BLM.
- 12. All reserve pit fluids must be removed or evaporated from the pit before starting reclamation procedures. Enhanced evaporation of the reserve pit fluids shall have prior approval of the authorized officer. The liner shall be cut off at the mud level and removed to an approved disposal site. The reserve pit must be reclaimed within 12 months (but no later than the following August 31) from the date the well is spudded. The reserve pit solids will not be squeezed out of pit, however the solids may be mixed with stockpiled materials as the pit is reclaimed. Mixing stockpiled materials and reserve pit solids can facilitate drying the reserve pit solids (by mixing damp solids with dry dirt), aid in compaction of materials in the pit, prevent subsequent settling of the pit, and shorten the time needed for the reserve pit reclamation. The pit liner will not be cut during mixing of damp solids with dry dirt. There will be a minimum of 2 feet of overburden on the pit prior to replacing the topsoil and seeding.

APPENDIX B

TRIBAL CONSULTATION SUMMARY

Tribal Consultation Summary
Kinder Morgan Goodman Point Wells 1-7,
Associated Pipelines and Access Roads, Montezuma County, Colorado

Tribes Consulted :

- 1-Acoma, Pueblo of**
- 2-Cochiti, Pueblo of**
- 3-Hopi Tribe**
- 4-Isleta, Pueblo of**
- 5-Jemez, Pueblo of**
- 6-Jicarilla Apache Nation**
- 7-Laguna, Pueblo of**
- 8-Nambe, Pueblo of**
- 9-Navajo Nation**
- 10-Northern Ute Tribe**
- 11-Picuris, Pueblo of**
- 12-Pojoaque, Pueblo of**
- 13-San Felipe, Pueblo of**
- 14-San Ildefonso, Pueblo of**
- 15-San Juan, Pueblo of**
- 16-Sandia, Pueblo of**
- 17-Santa Ana, Pueblo of**
- 18-Santa Clara, Pueblo of**
- 19-Santo Domingo, Pueblo of**
- 20-Southern Ute Indian Tribe**
- 21-Taos, Pueblo of**
- 22-Tesuque, Pueblo of**
- 23-Ute Mountain Ute Tribe**
- 24-Zia, Pueblo of**
- 25-Zuni Pueblo**

1. Initial letter of 2 July 2007 from the BLM to the tribes listed above notifying them of the proposal, providing them with the cultural inventory information/BLM “adverse effect” determination, and initiating consultation for the undertaking.

2. Response from **Pueblo of Laguna**, 16 July 2007, stating that “The Pueblo of Laguna has determined that the proposed undertaking will not have a significant impact at this time.” Laguna would like to be notified if new sites discovered and any artifacts recovered to review items.

3. Response from the **Hopi Tribe**, 16 July 2007. States that Hopi claim cultural affiliation to the prehistoric culture groups in the Monument. Do not concur with the recommended determination of effect contained in the inventory report of “no effect” on eligible historic properties. Hopi determine “adverse effect.” Ask BLM to make appointment to attend an

administrative meeting with the staff of the Hopi Cultural Preservation Office to discuss their opposition to the project.

4. A review of tribal responses to Environmental Assessments conducted on the monument in the past 2 years was conducted by Linda Farnsworth, Monument archaeologist. This review determined that the **Hopi, Laguna, Acoma, and Zia** have actively participated at least once during this period. No documented responses were received from the remainder of the tribes during this period. It was determined on the basis of these results to focus follow-up efforts on **Hopi, Acoma, and Zia**.

5. Telephone follow-up with **Hopi Cultural Preservation Office**:

July 6 and 10, 2007--left message requesting to set up a meeting regarding this project.

13 July 2007-spoke to Leland Dennis, he scheduled us for the 18 July 2007 administrative meeting at 1:00 p.m. LouAnn not available, I called back and cancelled.

23 & 26 July, 7 August 2007: left messages with Terry Morgart acknowledging receipt of letter, and calling to schedule an administrative meeting as requested.

9 August 2007: Terry Morgart left message asking if we could make a meeting on Aug. 22. Farnsworth returned call, left message that we can make an 8/22 meeting, let me know what time and where.

13 August 2007: Spoke to Terry Morgart, meeting at 2:30 p.m. at the Hopi Dept. of Natural Resources building conference room.

6. Telephone follow-up with the **Pueblo of Acoma**:

6 & 13 July, and 8 August 2007: left messages with Theresa Pasqual, Director, Acoma Historic Preservation Department, stating that following up to our letter about the project, offering to schedule a meeting if they would like to get more detailed information, or a field visit.

9 Aug 2007: Spoke to Theresa Pasqual. She did not recall seeing our letter and the report, not sure if it had made it over from the Governor's office yet. She said that she would track it down and look it over. She stated that she is concerned about the small buffer. She will call if she can't find it, and I will send another copy. She said she will get back to us about a meeting.

7. Telephone follow-up with the **Pueblo of Zia**:

8, 9 & 14 August 2007: Left messages with Celestino Gachupin, Manager, Zia Natural Resources Department, stating that following up to our letter about the project, offering to schedule a meeting if they would like to get more detailed information, or a field visit.

14 August 2007: Called the Zia tribal office to see if Gachupin is still in position of Manager of Natural Resources department-offices closed for feast days 8/14-16. Re-open Aug. 17.

20 August 2007: Called the Zia tribal office to see if Gachupin is still in position of Manager of Natural Resources department, he is. Called his number, and left a message to call me in reference to the project, and input that the Zia may have.

8. Follow-up letters to **Acoma and Zia** on August 15, 2007. The letters referenced the 2 July 2007 letter and information about the project. Requested input on the project d.o.e., traditional cultural property identifications, and offered to meet with them, or provide additional information if desired.

9. Administrative meeting with **Hopi** Cultural Preservation Office Director, Leigh Kuwanwiswma, and Terry Morgart, Legal Researcher. Morgart criticized and disagreed with the d.o.e. of “no historic properties effected” recommended by Woods Canyon Archaeological Consultants in the report.

They expressed a concern that some features contained in sites may be culturally significant to the Hopi (and not recognized by non-Hopi during inventory). Especially in sites recommended as not eligible. Stated a need to know what future development plans are in order to properly assess cumulative effects. They inquired as to why the monument manager was willing to allow a smaller buffer than the standard state-wide 100 meters, she stated that she is trying to work with the operator. The Hopi representatives stated that legislation should be initiated in order to modify the Monument Proclamation to exclude further oil and gas development within the monument in order to protect the cultural landscape.

Their final recommendation was to schedule a field visit for members of the Hopi Cultural Resources Advisory Task Team to assess certain sites and features within the context of Hopi traditional knowledge.

10. Telephone conversation between Terry Morgart, **Hopi** Cultural Preservation Office and Linda Farnsworth on 6 September 2007. Terry stated that they will assert that an EIS is necessary for this proposal, he will send a letter stating this. They feel that this proposal is the place to draw the line on this scope of development in the monument. He asked me to send him the portions of the Monument Proclamation that address the purpose of, and protection of the objects-specifically in regard to oil and gas development.

11. Letter from **Hopi** Cultural Preservation Office dated 16 September 2007.

- Asserts the Hopi claim of cultural affiliation to prehistoric groups in the Monument, and supports the identification and avoidance of prehistoric archaeological sites and traditional cultural places.
- Cites the contradiction of potential energy development within the Monument and within BLM special area designations (Mockingbird Mesa Cultural Resource Emphasis Area and the Anasazi Cultural Multiple Use Area of Critical Environmental Concern).
- States that the Hopi do not concur with the survey report recommendation that “The building of the project will have no effect on eligible cultural resources...”

- States the concern with the small avoidance buffers between site boundaries and construction areas.
- Asserts that the Hopi conclude that the proposal will result in significant adverse effects to numerous cultural resources significant to the Hopi Tribe; and that an Environmental Impact Statement and Hopi Ethnographic and Traditional Cultural Property Study are necessary to evaluate whether this proposal will create new impacts that interfere with the proper care and management of the objects protected by the Proclamation.
- Requests the Monument to schedule a preliminary site visit by CRATT members.

12. Telephone message from Peter Pino, Tribal Administrator, **Zia Pueblo** to LouAnn Jacobson on 18 September 2007. She returned his call, and he said that he had been contacted by Kinder Morgan about the project, and that the Zia had no concerns about the project. He will send a letter stating this.

13. Follow-up letter of Sept. 18, 2007 to **Acoma**, Theresa Pasqual reiterating the BLM contact efforts regarding this proposal, and stating that no input had been received, therefore, consultation will be concluded. Stated that Acoma will be provided an EA for review.

14. 18 September 2007 Telephone call from Linda Farnsworth to Terry Morgart, **Hopi** CPO. Left a message:

- thanked Terry for their response letter, and asked him to call me to schedule a field visit.
- Told him that we would proceed with 106 for the proposal with an “adverse effect” d.o.e., and the Environmental Assessment process to determine if an EIS is necessary.

15. Letter of response to Hopi of 20 September 2007, updating them on how their input considered and incorporated into project d.o.e.; how project would move forward.

APPENDIX C

BLM - FISH AND WILDLIFE CLEARANCE LETTER PLANT AND WILDLIFE LIST

FISH AND WILDLIFE CLEARANCE REPORT

PROJECT NAME: Kinder Morgan Goodman Point Development Project

Table 1. Survey Results.

| | | | |
|---|--|----------------------|-------------------|
| | | | |
| X | Field surveys were completed on 24 October 2006, 5 December 2006, 30 January 2007, and 7 March 2007 by Ecosphere Environmental Services. | | |
| | | | |
| | No field survey is required. | | |
| | | | |
| | A field survey is needed, but cannot be completed by required date due to: | | |
| | Inappropriate season | Inadequate lead time | Higher priorities |

SPECIES CONSIDERED

Table 2. Federally Listed Species for Proposed Action, in Montezuma County, Colorado

| Species | Status | Habitat Present In Project Area? | Species Affected? |
|----------------------------------|------------|-------------------------------------|----------------------|
| Canada lynx | Threatened | No | No |
| Gunnison sage grouse | Candidate | No | No |
| Mexican spotted owl | Threatened | No | No |
| Southwestern willow flycatcher | Endangered | No | No |
| Yellow-billed cuckoo | Candidate | No | No |
| Bonytail | Endangered | No | No |
| Colorado pikeminnow | Endangered | No | No |
| Humpback chub | Endangered | No | No |
| Razorback sucker | Endangered | No | No |
| Uncompahgre fritillary butterfly | Endangered | No | No |
| Mesa Verde cactus | Threatened | No | No |
| Mancos milkvetch | Endangered | No | No |
| Sleeping Ute milkvetch | Candidate | No | No |
| Knowlton's cactus | Endangered | No | No |
| Pagosa gilia | Candidate | No | No |

Table 3. Colorado Bureau of Land Management Sensitive Fish, Plant, and Wildlife Species Based on Information Bulletin No. CO-2000-14 (April 2000) for the San Juan Public Lands

| Species | Habitat Present In Project Area? | Species Impacted? |
|--------------------------------|---|--------------------------|
| Allen's big-eared bat | Yes (foraging only) | Possible |
| Big free-tailed bat | Yes (foraging only) | Possible |
| Fringed myotis | Yes (foraging only) | Possible |
| Spotted bat | Yes (foraging only) | Possible |
| Townsend's big-eared bat | Yes (foraging only) | Possible |
| Yuma myotis | Yes (foraging only) | Possible |
| Black tern | No | NA |
| Ferruginous hawk | No | NA |
| Gunnison sage grouse | No | NA |
| Northern goshawk | No | NA |
| White-faced ibis | No | NA |
| Peregrine falcon | Yes (foraging only) | Possible |
| Bluehead sucker | No | NA |
| Colorado River cutthroat trout | No | NA |
| Flannelmouth sucker | No | NA |
| Roundtail chub | No | NA |
| Longnose leopard lizard | Marginal | Possible |
| Desert spiny lizard | No | NA |
| Jones blue star | Yes | NA |
| Cronquist milkvetch | No | NA |
| Naturita milkvetch | Yes | NA |
| Sandstone milkvetch | No | NA |
| Little green sedge | No | NA |
| Fragile rockbreak | No | NA |
| Giant helleborine | No | NA |
| Kachina daisy | No | NA |
| Comb Wash buckwheat | No | NA |
| Pagosa bladderpod | No | NA |
| Dolores River skeleton plant | No | NA |
| Eastwood monkey-flower | No | NA |
| Aromatic Indian breadroot | No | NA |

DISCUSSION:

This project does not conflict with RMP guidelines.

There is potential for incidental bald eagle occurrences in the winter months. These occurrences are expected to be temporary fly-overs with very limited habitat utilization. Bald eagles were removed from the US FWS Threatened and Endangered species list in August 2007, but are protected under other federal laws and BLM management plans.

Potential habitat for longnose leopard lizards exists in the project areas and vicinity although site characteristics limit the potential for occurrence. If present, potential impacts to longnose leopard lizards include loss or degradation of potential habitat. If present beneath rocks or other cover, it is possible that individuals could be killed during site ground clearing activities. No longnose leopard lizards were identified during the on-site visits to the proposed project sites. A site evaluation was completed by SJPL biologist Kristin Philbrook on 7 March 2005 and the project area was judged to be marginal habitat only.

Foraging habitat exists for the six sensitive bat species. Because the project would not require the removal of any potential roosts, impacts to these species are expected to be low. It is expected that bats currently utilizing project area habitat would disperse into similar available habitat surrounding the project area.

Because potential nest sites exist within the vicinity of the project area, peregrine falcons may utilize project area habitat for foraging. Potential foraging, however, is limited by the dense woodland throughout the project area. A raptor survey was conducted on 30 January, and no potential nest sites were identified within 1.0 mile of the project area.

Some potential for naturita milkvetch and Jones' bluestar occurrence exists in the project area. However, because the project area does not contain exposed sandstone ledges or draws, important habitat components for these plants, potential for occurrence is low. No individual naturita milkvetch or Jones' bluestar was identified during the field examinations. It is not expected that project construction would impact either of these species.

MITIGATION MEASURES

No mitigation measures for threatened, endangered or sensitive species have been identified for this project.

CONCLUSIONS

Threatened and Endangered Species

| | |
|----------|--|
| X | There are no federally listed or proposed species known to occur within the project area. |
| | The Proposed Action will have no effect on the following federally listed or proposed species: |
| | The Proposed Action will have no effect on designated or proposed critical habitat for the following species: |

| | |
|--|--|
| | The Proposed Action may affect but is not likely to adversely affect the following federally listed species and their habitats. <i>Effects are expected to be beneficial, insignificant (unmeasurable), or discountable (extremely unlikely).</i> |
| | The Proposed Action may affect and is likely to adversely affect the following federally listed species and their habitats. <i>Effects are expected to be adverse or detrimental.</i> |

BLM Sensitive Species

| | |
|---|--|
| | The Proposed Action will have no impact on any of the sensitive species listed in Table 3. |
| | The Proposed Action will have a beneficial impact on the following sensitive species: None |
| X | The Proposed Action may adversely impact individuals but is not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range wide on the following sensitive species: Longnose leopard lizard, peregrine falcon, Allen’s big-eared bat, Big free-tailed bat, Fringed myotis, spotted bat, Townsend’s big-eared bat, Yuma myotis |
| | The Proposed Action may adversely impact individuals and is likely to result in a loss of viability on the planning area, in a trend to federal listing, or in a loss of species viability rangewide on the following sensitive species: None |

A Biological Evaluation is not required for BLM sensitive species; this Clearance Form completes the assessment of these species.

SPECIALIST

Date:

**PLANTS OCCURRING IN THE
KINDER MORGAN CO₂ GAS WELL
PROJECT AREAS**

Forbs

| | |
|------------------------------|---------------------|
| <i>Sisymbrium altissimum</i> | tumblemustard |
| <i>Packera multilobata</i> | groundsel |
| <i>Erodium cicutarium</i> | filaree |
| <i>Ipomopsis aggregata</i> | skyrocket gilia |
| <i>Eriogonum microthecum</i> | slender buckwheat |
| <i>Descurainia pinnata</i> | tansy mustard |
| <i>Lepidium montanum</i> | mountain pepperweed |
| <i>Penstemon linarioides</i> | flaxleaf penstemon |
| <i>Portulaca oleracea</i> | little hogweed |

Grasses

| | |
|-------------------------------|-------------------------|
| <i>Achnatherum hymenoides</i> | <i>Indian ricegrass</i> |
| <i>Agropyron cristatum</i> | Crested wheat grass |
| <i>Anisantha tectorum</i> | cheatgrass |
| <i>Pleuraphis jamesii</i> | Galleta |

Shrubs

| | |
|---------------------------------|--------------------|
| <i>Amelanchier utahensis</i> | serviceberry |
| <i>Artemisia tridentata</i> | big sagebrush |
| <i>Chrysothamnus nauseosus.</i> | rubber rabbitbrush |
| <i>Gutierrezia sarothrae</i> | broom snakeweed |
| <i>Ephedra viridis</i> | Mormon Tea |
| <i>Purshia stansburiana</i> | cliff-rose |
| <i>Cercocarpus montanus</i> | mountain mahogany |

Cacti

| | |
|----------------------------|---------------------|
| <i>Opuntia polyacantha</i> | prickly pear cactus |
|----------------------------|---------------------|

Trees

| | |
|------------------------------|--------------|
| <i>Juniperus osteosperma</i> | Utah juniper |
| <i>Pinus edulis</i> | Piñon pine |

**COMMON WILDLIFE WITH POTENTIAL TO OCCUR IN THE
KINDER MORGAN CO₂ GAS WELL
PROJECT AREAS**

Mammals

| | |
|------------------------------|-------------------------|
| <i>Canis latrans</i> | Coyote |
| <i>Cervus elaphus</i> | American elk |
| <i>Cynomys gunnisoni</i> | Gunnison's prairie dog |
| <i>Dipodomys spectabilis</i> | Bannertail kangaroo rat |
| <i>Erethizon dorsatum</i> | Porcupine |
| <i>Lepus californicus</i> | Blacktail jackrabbit |
| <i>Mephitis mephitis</i> | Striped skunk |
| <i>Odocoileus hemionus</i> | Mule deer |
| <i>Sylvilagus auduboni</i> | Desert cottontail |
| <i>Ursus americanus</i> | Bear |
| <i>Vulpes vulpes</i> | Red fox |

Birds

| | |
|----------------------------------|---------------------|
| <i>Apelocoma coerulescens</i> | Scrub jay |
| <i>Buteo jamaicensis</i> | Red-tailed hawk |
| <i>Carpodacus mexicanus</i> | House finch |
| <i>Cathartes aura</i> | Turkey vulture |
| <i>Chordeiles minor</i> | Common nighthawk |
| <i>Colaptes auratus</i> | Northern flicker |
| <i>Corvus corax</i> | Common raven |
| <i>Eremophila alpestris</i> | Horned lark |
| <i>Euphagus cyanocephalus</i> | Brewer's blackbird |
| <i>Falco spawerius</i> | Sparrow hawk |
| <i>Gymnorhinus cyanocephalus</i> | Piñon jay |
| <i>Pica pica</i> | Black-billed magpie |
| <i>Sialia mexicana</i> | Western bluebird |
| <i>Sturnella neglecta</i> | Western meadowlark |
| <i>Turdus migratorius</i> | Robin |

Reptiles

| | |
|--------------------------------|----------------------|
| <i>Crotalus viridis</i> | Prairie rattlesnake |
| <i>Pituophis melanoleucus</i> | Bull snake |
| <i>Sceloporus stansburiana</i> | Side-blotched lizard |
| <i>Sceloporus graciosus</i> | Sagebrush lizard |

APPENDIX D

VISUAL IMPACT ASSESSMENT REPORT

APPENDIX E

RESPONSE TO PUBLIC COMMENTS

**Kinder Morgan CO₂ Company, L.P.
Proposed CO₂ Development Wells
Goodman Point Development Project**

Environmental Assessment #CO-800-2007-043

Responses to Public Comments:

The following responses are arranged in the order they were received: