United States Department of the Interior
Bureau of Land Management

Environmental Assessment for the 4 Hay Canyon Federal Natural Gas Wells

Grand Junction Field Office
2815 H Road
Grand Junction, Colorado 81506

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CHAPTER 1 - INTRODUCTION

1.1 IDENTIFYING INFORMATION

BACKGROUND: This Environmental Assessment (EA) has been prepared by the Bureau of Land Management (BLM) to analyze the construction of a new well pad located on federal surface, four horizontal natural gas wells on federal surface, as well as a new temporary road, rerouting of an existing two track road, rerouting of two existing buried natural gas pipelines, and two new natural gas pipelines on private land. Encana plans to drill the federal exploratory wells through farm out operations within Maralex Federal leases. The proposed action is reviewed to ensure there is no unnecessary or undue degradation of the public lands or resources.

Lease numbers COC-10372 and COC-10146. Encana Oil & Gas (USA), Inc. (Encana) submitted a Notice of Staking on September 23, 2011 and an 4 Applications for Permit to Drill (APD) for the well and pad, access road, and gas line on January 25, 2012. The APDs were complete on March 29, 2012.

The wells would access federal mineral estate. Figure 1 shows the location of the well pad, well bores, existing facilities, access roads and pipelines for the project area. The location would be built to accommodate a total of 4 natural gas wells for future field development if proven economical.

CASEFILE/PROJECT NUMBER: Leases COC-10372 and COC-10146

PROJECT NAME: 4 Hay Canyon Federal Natural Gas Wells

PLANNING UNIT: Grand Junction Field Office

1.2 PROJECT LOCATION AND LEGAL DESCRIPTION

LEGAL DESCRIPTION:

SENE Sec 34 T6S, R102W
Garfield County, CO

The proposal is located 22.7 miles north of the town of Loma, Colorado, in Garfield County. Figure 1 is a map of the proposal and project area. The project area can be reached by traveling north on Colorado State Highway 139 for 22.7 miles from the junction of Highway 6 and Highway 139. Turn right and proceed in a northeasterly direction approximately 0.15 miles on the existing road to the beginning of the proposed access road.

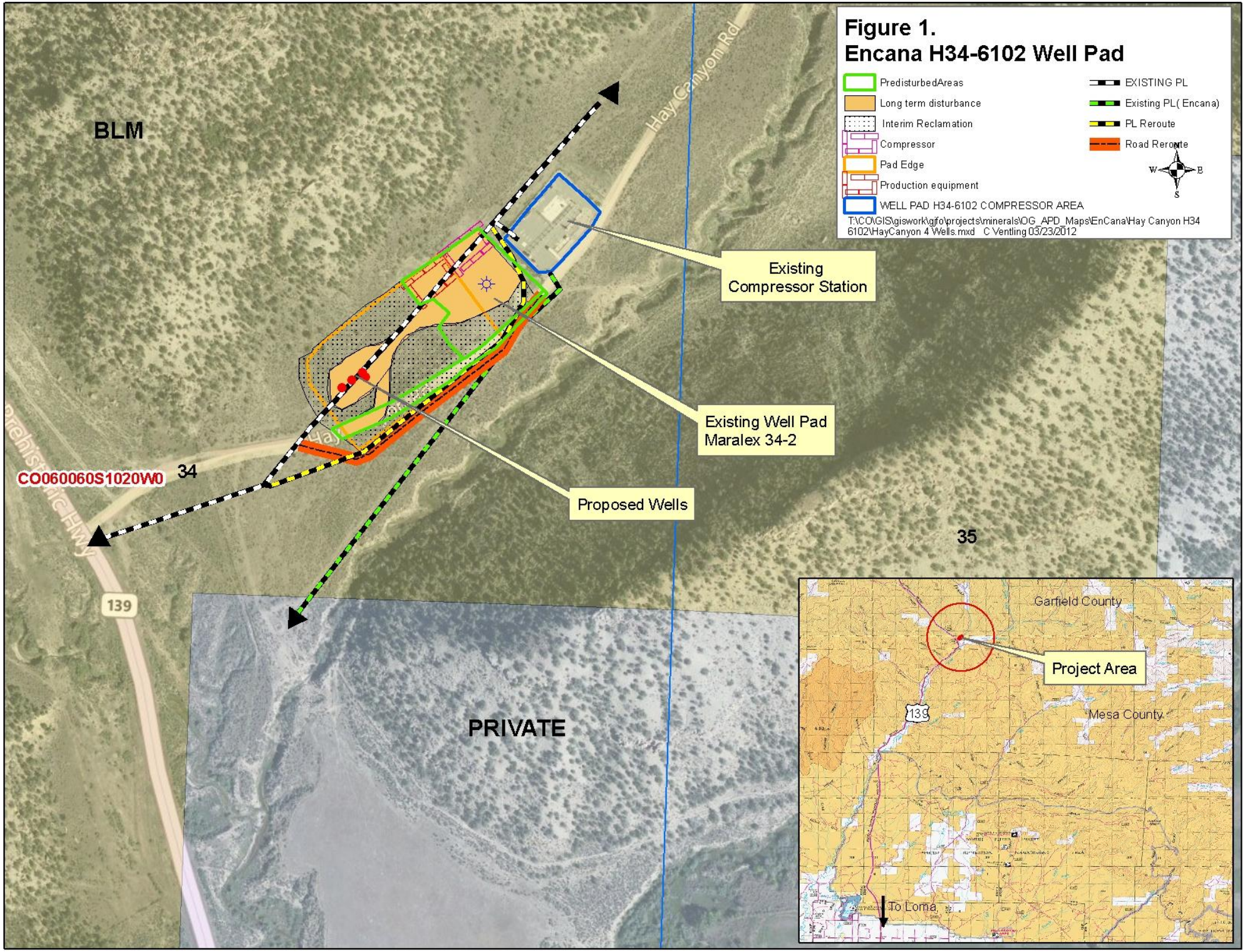
Figure 1.
Encana H34-6102 Well Pad
PredisturbedAreas
Long term disturbance
Interim Reclamation
Compressor
Pad Edge
Production equipment
WELL PAD H34-6102 COMPRESSOR AREA
EXISTING PL
Existing PL(Encana)
PL Reroute
Road Reroute
T:\CO\GIS\giswork\gjfo\projects\minerals\OG_APD_Maps\EnCana\Hay Canyon H34 6102\HayCanyon 4 Wells.mxd C Ventling 03/23/2012
BLM
Hay Canyon Rd
Existing Compressor Station
Existing Well Pad Maralex 34-2
Proposed Wells
CO060060S1020W0
34
35
139
PRIVATE
Garfield County
Project Area
Mesa County
To Loma

1.3 PURPOSE AND NEED

The purpose of the action is to access the valid and existing rights of the leased mineral resources under the Mineral Leasing Act of 1920 (MLA) and the Federal Land Policy and Management Act (FPLMA). The action is needed to respond to Encana's request for 4 APDs in the Hay Canyon area of Garfield County Colorado.

1.4 DECISION TO BE MADE

The BLM will decide whether to approve the proposed APDs for 4 natural gas wells based on the analysis contained in this EA. This EA will analyze the environmental impacts and determine whether activities would either 1) result in a Finding of No Significant Impact (FONSI) to the human environment or 2) that the Proposed Action warrants the development of an Environmental Impact Statement. The BLM may choose to: a) accept the project as proposed, b) accept the project with modifications/mitigation, c) accept an alternative to the Proposed Action, or d) not authorize the project at this time. The finding associated with this EA may not constitute the final approval for the Proposed Action.

Should the Proposed Action be approved, it would include mitigation measures identified during the analysis to alleviate resource impacts in accordance with the objectives and decisions of the Grand Junction Resource Area Resource Management Plan (1987), as well as other applicable policies, regulations, and laws that define BLM's multiple use mandate.

1.5 PLAN CONFORMANCE REVIEW

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

Name of Plan: GRAND JUNCTION Resource Management Plan

Date Approved: JANUARY, 1987

Decision Number/Page: Page 2-7, 2-36
Decision Language: The Grand Junction Resource Management Plan (RMP) and Record of Decision describe management decisions based on resource and geographic pieces of land called emphasis areas (USDI 1987; page 2-40). The RMP Oil and Gas Management objective is "To make federal oil and gas resources available for lease, except where prohibited by law or where administrative action is justified in the national interest; to make public land available for economically and environmentally sound exploration and development projects; to avoid health and safety hazards; to protect important, sensitive resource values from unacceptable impacts; and to minimize the impacts to lessees from sensitive resource protection and hazard avoidance." The proposed well pad lies within emphasis area Cc, with an emphasis on coal development. The Grand Junction Resource Management Plan and Record of Decision further states that "Within each emphasis area, the management of a particular resource will be emphasized over all other resources. That is not to say that one resource will be excluded. They will be allowed so long as they are compatible with management of the emphasized resource. Future proposals

will be evaluated in the context of the management philosophy of the emphasis area to determine whether the proposal is compatible."

In January 1997, the Colorado State Office of the BLM approved the Standards for Public Land Health and amended all RMPs in the State. Standards describe the conditions needed to sustain public land health and apply to all uses of public lands.

Standard 1: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form, and geologic processes.
Standard 2: Riparian systems associated with both running and standing water function properly and have the ability to recover from major disturbance such as fire, severe grazing, or 100-year floods.
Standard 3: Healthy, productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species and habitat's potential.
Standard 4: Special status, threatened and endangered species (federal and state), and other plants and animals officially designated by the BLM, and their habitats are maintained or enhanced by sustaining healthy, native plant and animal communities.
Standard 5: The water quality of all water bodies, including ground water where applicable, located on or influenced by BLM lands will achieve or exceed the Water Quality Standards established by the State of Colorado.

Because standards exist for each of these five categories, a finding must be made for each of them in an environmental analysis. These findings are located in Chapter 3 of this document.

Leases COC-10372 and COC-10146 were issued March 11, 1970 and December 19, 1969 respectively for the mineral resource area.

Table 1 Lease Summary

Lease Number	Stipulations
COC-10146	None
COC-10372	Oil Shale stipulations in 6S,101W, Section 27, NW½

1.6 PUBLIC PARTICIPATION AND SCOPING

1.6.1 Public Scoping: Scoping, by posting this project on the Grand Junction Field Office NEPA website and in the field office public room, was the primary mechanism used by the BLM to invite public involvement and identify issues. No comments were received. Other procedures are followed by operators during the Application for Permit to Drill process that includes posting and notices in conjunction with the Colorado Oil and Gas Conservation Commission. Additionally, this location is concurrently being permitted through the Colorado Oil and Gas Conservation Commission. BLM has received no negative feedback and/or comment on oil and gas activities on this project.

1.6.2 Internal Scoping: Maps of the parcel and description of the proposed action were distributed to the GJFO Interdisciplinary Team (IDT) and discussed at IDT meetings. Four IDT members, a CPW employee along with several Encana employees visited the proposed project site. Documentation of which resources would be impacted based on internal scoping and site visits is included in Table 3.

1.6.2 External Scoping: Colorado Parks and Wildlife (CPW) and Colorado Oil and Gas Conservation Commission (COGCC) were notified and invited to attend the on-site visit on October 27, 2012.

1.6.3 Issues Identified:

During the on-site visit, resource concerns were identified for the scenic byway, soils which tend to pipe underground in this area, potential raptor nesting habitat in the surrounding trees and cliffs and protection of ground water zones.

Based on internal scoping, the following issues were identified:

- How will the proposed action and alternatives affect the visual resources from the Key Observation point of the nearby Scenic Byway, Colorado Highway 139?

- How will the proposed action and alternatives affect the water quality in the Hay Canyon and Trail Canyon drainages (East Salt Creek)?

CHAPTER 2 - PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

The purpose of this chapter is to provide information on the Proposed Action and Alternatives. Alternatives considered but not analyzed in detail are also discussed.

2.2 ALTERNATIVES ANALYZED IN DETAIL

2.2.1 Proposed Action

Under the Proposed Action BLM would issue a permit for the construction of a well pad, 4 natural gas wells, 2 natural gas pipelines, rerouting 2 existing pipelines, rerouting an existing road and construction of a new access road. All of these facilities would be on public land. The proposed location is also adjacent to three authorized compressor station rights of way.

The proposed location would be adjacent to and partially utilize an existing well pad. The new footprint would encompass roughly 5 acres of initial disturbance with 2.1 acres of that within previous disturbance from the existing well pad and road. Portions (0.4 acres) of the existing un-reclaimed pad would be included in interim reclamation for the entire combined site. Long term disturbance (after interim reclamation) would encumber approximately 2.0 acres for the combined pads, access road and new facilities.

Two existing pipelines would require rerouting. Two pipelines (COC 25378F and COC 25378C) owned by Energy Transfer Company (ETC) would be rerouted northeast of the existing pad and then in the road/roadside around the new pad to reconnect at the southwest side of the pad. The existing pipeline rerouting would be completed by the right of way holder, ETC using standard industry practices. Approximately 945 feet of each pipeline would be abandoned and replaced with approximately 1,130 feet of two new pipelines. Additional buried wire for pipeline controls would be rerouted at the same time. Disturbance for the rerouted pipelines with would occur adjacent to the rerouted road for approximately 880 feet and divert away from the road for 250 feet of the pipeline alignment. Where pipeline occurs beside the road, approximately 20 feet of disturbance would occur in additional to the road work. In other areas, disturbance is expected to be approximately 50 feet wide.

Encana would install a buried steel natural gas fuel line for wellhead compression up to 2 inches in diameter and a buried steel flow line (production) up to 6 inches in diameter, that would run from the proposed H34 6102 location approximately 365 feet to the existing Hay Canyon Compressor Station NE of the pad. All of the production and fuel pipeline alignment would be inside previously disturbed areas from the adjacent well pad, not adding to any disturbance calculations.

The current pad access road would be abandoned for an improved approach with a smaller turning radius. An improved access road which would utilize the existing road southwest of the well pad would be used to replace the current well access. The Hay Canyon road would be rerouted around the new well pad by a varying offset of 75 to 35 feet for a length of about 900 feet. The width of the access road would be 18-22 feet travel way with associated construction

to total approximately 30 feet wide. Two 18 inch culverts with rip-rap outlets would be added to the rerouted portion of the road. Road base would be added for surfacing material. Road reroute disturbance would involve 0.8 acres. Long term disturbance for the road would average 22 feet in width to match the existing road. A portion of the existing road would be consumed in the proposed well pad. All road work will be done according to BLM Manual Section 9113 standards (USDI, BLM., 1985)

All proposed activities and reclamation activities would have a net gain of long term disturbance of approximately 0.3 acres. The existing well pad had little or no interim reclamation so the long term disturbance was nearly equal to construction disturbance. See Table 1 for a summary of disturbance. Figure 2 shows the proposed well pad, access road reroute, pipeline reroutes and installations as well as existing infrastructure that would be used for this project. Activities would begin as soon as practical after BLM approval. Work is estimated to take three months to construct, drill and complete.

Table 2 Disturbance Acreage Summary

	New	Reclaim	Previous Long-term	New Long-term	Net
Well Pads	5.2	2.5	1.6	1.7	+0.1
Roads	0.6	0	0.5	0.7	+0.2
Gas Pipeline	0.3	0.3	0	0	0
Total	6.1	2.8	2.1	2.4	+0.3

A dike would be constructed completely around any production facilities which contain fluids (i.e. production tanks, produced water tanks, etc.). These dikes would be constructed of compacted subsoil, be impervious, be lined with a minimum 24 mil impermeable line, hold 110% of the capacity of the largest tank, and be independent of the back cut.

All permanent equipment would be painted a flat non-reflective, earth tone color to match one of the standard environmental colors as determined by the five State Rocky Mountain Interagency committee. All production facilities would be painted within six months of installation.

Design features are standard operating procedures, Best Management Practices (BMP's) or are other measures used to reduce or avoid adverse impacts. Part of the Surface Use Plan of Occupancy (SUPO), submitted with the APDs, is included here and in its entirety as Appendix A to be referred to for specific design measures that would be used.

Access to the project area is via Colorado State Highway 139 and Hay Canyon Road. The proposed well is located approximately 23 miles north of Loma, in Garfield County Colorado. Existing access roads would be would be maintained in existing or better condition until final abandonment of the well.

LOCATION AND TYPE OF WATER SUPPLY

A. Water to be used for the drilling and completing of these wells may be delivered to the location by truck over the roads described for access. The water source may be from (1) recycled flow back water (frac water from completion operations), production water gathered from producing wells, or some combination thereof resulting from ongoing operations in the Piceance Basin that may be treated for reuse, or (2) fresh water from available water rights in the Piceance Basin.
B. The water provider is Encana. Encana maintains numerous water rights in the Piceance Basin. Any fresh water used in operations may come from various approved points of diversion along the Colorado River (reference decrees #CA-8303 and #CA-4004, case # 2010 CW 175), likely the DeBeque area alternate point of diversion or may be purchased from 3rd party supplier. Any recycled production water used in operations will come from various Encana-owned natural gas wells in the Piceance Basin, likely hauled from Encana's Middle Fork Water Treatment Facility located North of Parachute, CO, approximately 24.9 miles to De Beque, CO.
C. The estimated amount of water used for construction, drilling and dust abatement would be 8000 barrels (bbls) fresh water per well. Completions would use ~400,000 bbls per well of either produced or recycled water (4 well total = 1.6 million bbls or 68.5 million gallons or 240.35 acre foot). The routes the trucks would take if it becomes necessary to truck water would be east bound on Interstate 70 from Parachute, CO or DeBeque, CO to the Highway 139 to the project area.

SOURCE OF CONSTRUCTION MATERIALS

A. All necessary materials for earthwork construction are on this location. Encana would not be borrowing materials from any other location.
B. Root balls shall be buried or placed off location or access road to be scattered back over the disturbed area as part of the final reclamation.
C. There would be no additional fill required.

METHODS OF HANDLING WASTE MATERIALS

A. Cuttings would be stabilized in a steel cuttings bin (~45' x 12' x 10') and stockpiled on site. Cuttings Management: cuttings deposited in the steel bin would be solidified with sawdust. Cuttings would be moved from the steel bin to the cuttings area, on the Northwest side of the pad in the cutslope. The cuttings would be managed per the COGCC regulations. For reclamation cuttings would buried on location in the cut slope and capped with a minimum 3 inch of native material then spread topsoil and seed with appropriate stormwater management BMP's.
B. The steel cuttings bin and flare ditch would be constructed on the existing location and would not be located in natural drainages where a flood hazard exists or surface runoff would destroy or damage the walls. All pits would be constructed so as not to leak, break, or allow the discharge of liquids there from. All pits will be constructed, operated and maintained in accordance with the applicable BLM/COGCC rules and regulations.
C. Drilling fluids would be contained in a closed loop system. When drilling on a location is finished the fluids would be dewatered and transferred by truck and used on another drilling location.

D. In the event that adverse weather conditions prevent removal of the fluids from the mud system within this time period, an extension may be granted by the Authorized Officer upon receipt of a written request from Encana Oil & Gas (USA) Inc.
E. Salts are not encountered while drilling and Encana does not use salt based mud.
F. Chemicals would be stored on location in secondary containment and used as necessary to treat mud. The chemicals would be contained, used in the mud or transferred to another location. They would not be disposed of.
G. Produced fluids – liquid hydrocarbons produced during natural gas production operations would be confined to flow back tanks on location. Produced fluids may be recycled and reused in drilling/fracing operations on other area wells or locations. Excess water may be piped or trucked to permitted Encana-owned disposal wells and/or trucked to a licensed commercial disposal facility. Encana would use the DCU #1 (103-05083) located in the NWSW of Sec. 5, T3S, R101W and the Dragon Trail 1121 (103-09370) located in the NWSW of 33 T2S R102W for Encana operated disposal wells. The commercial disposal facility is Danish Flats Environmental Service, Inc. Office Headquarters: 616 W. Monument St. Colorado Springs, CO 80905. (719) 598.9735. Disposal Site (Evaporation Facility) I-70 @ Exit 214 Cisco, UT. Water hauling would be done by either Knowles Trucking (970) 434.1912 or RNI Trucking (970) 250.6495.
H. Sewage- self-contained, chemical toilets would be provided for human waste disposal. Upon completion of operations, or as needed, the toilet holding tanks would be pumped and the contents thereof disposed of by P.T.I Group USA (PO Box 670 Vernal, UT 84078 (435)789.0872) and taken to the Clifton Land Farm. Septic would be held in County approved engineered ISDS Vault and Haul systems. Waste materials generated by and from these units would be contained in wildlife proof containers and would be hauled weekly, or as needed.
I. Garbage and other waste material – garbage, trash and other waste materials would be collected in a portable, self-contained and fully enclosed trash cage during drilling and completion operations. Upon completion of operations (or as needed) the accumulated trash would be disposed of by Western Colorado Waste Service (1847 7 RD Mack, CO 81525 (970) 858.7518). The trash would be disposed of at either the Mesa County Landfill or the City of Rifle Garfield County Landfill. No trash would be burned on location.
J. Immediately after removal of the drilling rig, all debris and other waste materials not contained in the trash cage would be cleaned up and removed from the well location. No adverse materials would be left on the location.
K. All spills of oil, gas, and other potentially hazardous substances would be reported in accordance with applicable rules and regulations, and would be remediated on site, as appropriate, or removed to an approved disposal site.

ANCILLARY FACILITIES

Self-contained travel-type trailers may be used on site during drilling operations. Certified Colorado Department of Housing units would be provided for use in the extraction of gas on COGCC approved pads. These units would be used by Essential Personnel and would abide by Federal, State, and local regulations which directly pertain to Temporary Employee Housing (TEH) or Temporary Living Quarters (TLQ), depending on the County in which extraction would be taking place.

For more information on how the stormwater features of the well pad and road are handled during Preconstruction/Construction/Interim/Final Reclamation please refer to Douglas Creek Arch Stormwater Management Plan COR-039171 (July 2007) and General Reclamation Surface Management Guideline (March 2011). These plans are on file at the operator's field office and is available for review upon request.

Encana would set water storage tanks on the adjacent Maralex Pad with the Calf Canyon 34-2 located in the SENE of Sec. 34 T6S, R102W and run a temporary surface poly line to the proposed location during fracking operations.

Potable is water provided by water haulers certified by the Colorado Department of Public Health & Environment.

WELLSITE LAYOUT

A. The attached plat (Appendix A) specifies the drill site layout as staked. Cross sections have been drafted to visualize the planned cuts and fills across the location. All suitable topsoil material would be stripped and stockpiled, (topsoil to be stripped from this location, including the areas of cut, fill and/or subsoil storage) and stockpiled for future reclamation of the well site. The windrowed and/or stockpiled topsoil would be seeded after construction is completed. There is no excess balance on this location.
B. Topsoil conservation practices include stockpiling and/or windrowing available topsoil. The stockpiles would be tracked walk perpendicular to contour with a convex top and concave bottom then seeded and mulched. Depth and width would vary with availability and stormwater requirements. The estimated depth of the windrowed/stockpiled topsoil may vary between 6 inches to 10 feet.
C. Soil Unit Name: Battlement Loam (soil map unit 5) with 1-8 % slope. Ecological site: Foothill Swale; Drainage class: well drained.
D. In general, materials would be moved and returned according to a last out first in philosophy. No excessive rock was identified at the on-site.
E. The flare ditch would be unlined.
F. This pad is likely to have a small amount of standing water. This pad is designed to contain stormwater. Engineered designs have been included in pad layout exhibits to accommodate major stormwater events and interim reclamation concerns.
G. Methods of stabilization: Local factors would be evaluated to determine what BMPs are suitable and practical at the time of construction. BMPs would be employed in different combinations during construction activities and phases as conditions warrant. The following BMPs may be used: erosion control blankets, hydro seeding, terracing, vegetated buffers, topsoil stockpiles, etc. The tracked linear windrows promote topsoil stabilization because of compaction and reduced slope percent. The windrows are also seeded and hydro-mulched with a hydraulic erosion control mulch.
H. To control drainage, Local factors would be evaluated to determine what BMPs are suitable and practical at the time of construction. BMPs would be employed in different combinations during construction activities and phases as conditions warrant. The following BMPs may be used: toe berm, level spreader, run-on protection, etc.
K. For sediment control, Local factors would be evaluated to determine what BMPs are suitable and practical at the time of construction. BMPs would be employed in different

combinations during construction activities and phases as conditions warrant. The following BMPs may be used: stabilized construction entrance, sediment reservoirs, sediment traps, detention pond, slash, wattle, etc.

M. For more information on how the stormwater features of well pad and roads, topsoil and subsoil segregation are handled during Preconstruction/Construction/Interim/Final Reclamation please refer to the Douglas Creek Arch Stormwater Management Plan COR-039171 and General Reclamation Surface Management Guideline (March 2011). This plan is on file at the operator's field office and is available for review upon request.

PLANS FOR RECLAMATION OF THE SURFACE

A. PRODUCTION (Interim/Final Reclamation): The BLM would be contacted prior to commencement of any reclamation operations.

1. Immediately upon well completion, the well location and surrounding areas(s) would be cleared of all debris, materials, trash and junk not required for production.
2. Upon completion of the initial well, Encana would evaluate the economics of the area. There is a possibility of three different scenarios:
   a) Assuming the area proves to be economic, Encana may return to drill the remaining 3 wells that are planned for this location. Interim reclamation would be applied within 6 months of the completion of the 4th well to all wells.
   b) If the area is not economic enough at this time to warrant drilling the remaining 3 wells within a reasonable timeframe (1 year) then interim reclamation would be applied to the first well within the one year.
   c) If the wells are not economic at all the wells may be plugged-final reclamation standards would be applied to the pad.

   The pad would be reclaimed except the working area which is usually 100' off wellheads and 10-15' around production equipment. The proposed reclaimed pad with all 4 wells surface is approximately 2.7 acres. Please see sheet 6 of 11 of the survey package (Appendix A).
3. Waste and spoil materials would be disposed of immediately upon completion of drilling and work-over activities.
4. The portion of the location and access road not needed for production facility/operations would be reclaimed within six (6) months from the date of well completion, weather permitting.
5. If the well is a producer, Encana would upgrade and maintain access roads as necessary to prevent soil erosion, and accommodate year round traffic. Areas unnecessary to operations would have areas reshaped. Topsoil would be redistributed and disked. All areas outside the work area would be re-seeded according to the Bureau of Land Management recommendations for seed mixture.
6. All cuttings areas and would be closed as soon as possible.
7. A stormwater permit for the Douglas Creek Arch Area has been received from the Colorado Department of Public Health and Environment, Water Quality Control Division.
8. Methods of stabilization: Local factors would be evaluated to determine what BMPs are suitable and practical at the time of construction. BMPs would be

employed in different combinations during construction activities and phases as conditions warrant. The following BMPs may be used: revegetation, rip rap, diversion ditch, etc.

9. Control drainage: Local factors would be evaluated to determine what BMPs are suitable and practical at the time of construction. BMPs would be employed in different combinations during construction activities and phases as conditions warrant. The following BMPs may be used: culverts, Run on protection berm, diversion ditch, etc.
10. Sediment control: Local factors would be evaluated to determine what BMPs are suitable and practical at the time of construction. BMPs would be employed in different combinations during construction activities and phases as conditions warrant. The following BMPs may be used: Run on Protection, detention pond, diversion ditch, etc.
11. During interim and final reclamation of the site, fill material would be pushed into cuts and up over the back slope. Allowance to construct sediment traps/reservoirs to maintain compliance with the state. Topsoil would be distributed evenly over the location and seeded according to the recommended seed mixture. The access road and location would be ripped or disked prior to seeding. Perennial vegetation must be established. Additional work would be required in case of seeding failures, etc.
12. For interim and final reclamation topsoil would be redistributed and disked. All areas outside the work area would be re-seeded according to the Bureau of Land Management recommendation for seed mixture. Upon completion of backfilling, leveling and recon touring, the stockpiled topsoil would be evenly spread over the reclaimed area(s). Segregation of topsoil material and replacement of topsoil in its respective position (last out, first in) method would assist in the re-establishment of soil health and productivity. Topsoil would also be placed on its respective slopes, i.e. oakbrush shrub soil and pinyon juniper woodland soil would not be mixed. Prior to reseeding, all disturbed surfaces would be scarified and left with a rough surface. All disturbed surfaces would be re-seeded according to the Bureau of Land Management recommendation for seed mixture.
13. Slash/brush would be pushed to the terminal edge of disturbance along probable discharge edges as vegetation sediment control and during the life span of the site and kept in place to cold compost for final reclamation
14. There would be no additional fill required.
15. The fill would be separated mechanically and placed in 1 to 2 foot lifts using a dozer and blade.
16. At final reclamation all storm water management BMP's for drainage, sediment and erosion would be removed because the only remaining potential pollution source via stormwater would be runoff sediment. All sediment would be managed through revegetation practices (seeding on contour, crimping straw on contour and/or erosion control hydro-mulch, pocking and topsoil distribution. Perimeter wattles would remain until vegetation establishment meets minimum requirements.
17. In general, materials would be moved and returned according to a last out first in philosophy. No excessive rock was identified at the on-site.

18. The estimated surface disturbance for this well pad and proposed access roads:

Approximate Acreage Disturbance	
Well Disturbance	5.118
Access Road Disturbance	0.096
Access Re-Route	0.620
Pipeline Disturbance (overlaps pad)	0.461
Total =	6.295

After reclamation an area of +/- 2. 8 acres would remain.

19. Weed Control: A Weed Control Plan is on file at the operator's field office and is available for review upon request.

Pipeline Reclamation:

When the pipeline installation phase of the project is completed, the right-of-way would be restored as close as possible to pre-excavated grades and compaction. Topsoil would be redistributed as close to original salvage depths as possible. In areas with pre-existing rocky surface material, the stored rock would be spread over the right-of-way to maintain a surface appearance to that of adjacent undisturbed terrain. Every effort would be made to install permanent erosion control measures after re-contouring is complete. Any brush that was shredded would be spread evenly across the right-of-way. Seeding would take place with an approved seed mix and application rate provided by others. After seeding is complete the temporary BMP's would be replaced with permanent BMP's and monitored for any malfunctions. BMP's would continue to be inspected and maintained and any areas that do not have re-growth would be reseeded as necessary until final stabilization is achieved.

Revegetation contractor is responsible for sediment & pollution discharge control for preconstruction, construction & reclamation activities. This includes but is not limited to sediment removal from bar ditches, sediment traps, culvert inlets and culvert outlets.

1. Finish grading, drainage, and stormwater control & soil preparation per Stormwater Site Plans, including but not limited to, topsoil conservation/topsoil segregation, windrow, surface roughening, landforming /land grading and water bars.
2. Seed bed preparation: topsoil would be ripped to remove compaction up to a depth of 12".
3. Hydraulic amendment, seed, erosion control blanket and erosion control mulch applications.
4. Broadcast amendments, drill seeding and certified weed free straw crimping on slopes 2.5:1 or less.
5. Hydraulic amendment, seed and erosion control mulch applications on remaining areas and any areas found to be deficient.
6. Specified access road seeding and stormwater repair & modification per pre-reclamation meeting.
7. Seeding contractor is now responsible for acquiring straw that is harvested in a manner to reduce volunteer winter wheat. Wood mulch would also be considered, please submit with manufacturer's specifications.
8. In cases of winter wheat germination above 30% canopy, it is the seeding contractor's responsibility to ensure the winter wheat does not go to head or compete with the desired species. If there is more winter wheat than desirable species, reseeding would be required.

Final reclamation of the pipeline would be decided at the time at final reclamation per landowner requirements and directives. If for some reason Encana decides to abandon the pipeline during

final reclamation it would be cut and capped. The pipeline would be left in place to avoid causing surface disturbance.

Prevention and Detection of Noxious Weeds:

a) If noxious weeds are found, they shall be treated (if timing is appropriate) or removed (if plants have formed seeds) prior to ground-disturbing activities to limit weed seed production and dispersal. If the treatment timing is not appropriate for the weed species, ground-disturbing activities may proceed.

b) All disturbed surfaces shall be promptly revegetated with certified weed-free seed per agency policy. BLM policy is to use native species for revegetation. Exceptions may be granted under certain conditions, such as the use of non-invasive non-native forbs when native forbs are unavailable or unlikely to succeed due to adverse conditions. Also, non-native, non-persistent sterile grasses may be used to provide ground cover for soil stabilization and weed suppression during temporary reclamation.

c) Topsoil stockpiles shall be promptly re-vegetated to maintain soil microbe health and prevent weeds. Native or non-native, non-persistent sterile grasses may be used to seed stockpiles.

d) Straw, hay, or other mulch used in reclamation shall be certified weed-free.

Inventory and Mapping of Noxious Weeds:

a) The center points of List A and B weed infestations (with the exception of redstem filaree and quackgrass) shall be marked with a GPS unit, or, GPS lines or polygons along or around weed infestations.

b) A Noxious Weed Inventory record shall be completed each time a List A or B weed infestation is inventoried (with the exception of redstem filaree and quackgrass).

c) Inventories for the presence of noxious weeds shall be conducted at least once early in the growing season for all areas disturbed by oil and gas exploration and development. Weeds shall be treated in an appropriate manner if found during inventories. Follow-up inventories and re-treatment during the same growing season may be necessary to provide additional control and/or eradication.

Weed Control:

a) The operator shall implement the best available weed control technique(s) at the appropriate times based on the life history of the weed species.

b) A Pesticide Use Proposal (PUP) shall be approved by the BLM prior to use of herbicides on BLM lands.

c) Only adjuvants and herbicides approved by the BLM shall be applied to BLM lands.

d) A Pesticide Application record shall be filled out each time pesticides are applied to BLM. The operator shall maintain these records for a minimum of three years.

e) All List A species and those List B species designated in Appendix A shall be immediately reported to the appropriate County, BLM, and FS Weed Manager.

e) Herbicide use shall follow application rates, restrictions and warnings listed on the label.

f) In situations where noxious weeds have escaped from the project area into adjacent sites, the infested areas shall be treated to prevent further expansion into un-infested areas and re-infestation of the treated area.

g) The operator shall use pesticide applicators licensed by the Colorado Department of Agriculture.

20. Spill Prevention Control and Countermeasure Plan (SPCC): The SPCC plan has been prepared for the project and is on file at the operator's field office and is available for review upon request (2008). Encana is in substantial compliance with all 40 CFR part 112 rules.

B. For more information on how the stormwater features of well pads and roads, topsoil and subsoil segregation are handled during: Preconstruction/Construction/Interim/Final Reclamation please refer to Douglas Creek Arch Stormwater Management Plan COR-039171 (July 2007). This plan is on file at the operator's field office and is available for review upon request.

C. DRY HOLE /ABANDONED LOCATIONS

On lands administered by the BLM, abandoned well sites, roads or other disturbed areas would be restored to near their original condition.

This procedure would include:

1. Re-establishing irrigation systems where applicable,
2. Re-establishing soil conditions in irrigated field in such a way as to ensure cultivation and harvesting of crops and,
3. Ensuring revegetation of the disturbed areas to the specification of the BLM at the time of abandonment.
4. Monitoring the site annually for List A and List B noxious weeds and utilizing weed control methods, as deemed necessary under an objective-based management approach, in accordance with an approved PUP.

All disturbed surfaces would be recontoured to the approximate natural contours and re-seeded according to BLM specifications. Reclamation of the well pad and access road would be performed as soon as practical after final abandonment and reseeding operations would be performed in the fall or spring following completion of reclamation operations.

If the well is abandoned or a dry hole, Encana would restore the access road and location to approximate original contours. During reclamation of the site, fill material would be pushed into cuts and up over the back-slope. Allowance is made to construct sediment traps/reservoirs to maintain compliance with the state. In dry-land revegetation allowance is made to pock sites to create micro-catchments for water containment for seed establishment. Topsoil will be distributed evenly over the location and seeded according to the recommended seed mixture. The access road and location shall be

ripped or disked prior to seeding. Perennial vegetation must be established. Additional work shall be required in case of seeding failures, etc.

OTHER INFORMATION:

A. A Class III (intensive) Cultural Resource Inventory of the proposed drill sites, access roads and other facilities on federal lands has be conducted and a report filed with the appropriate BLM office. Grand River Institute has filed Cultural inventory. Wildlife or T&E surveys will be conducted by WestWater Engineering if required.
B. Encana respectfully requests to waive the timing limits for deer and elk winter range. The lease states that no surface use is allowed between 12/1-4/30. This area is near a Highway and the Hay Canyon Compressor station. The DOW has been consulted regarding this request.
C. If archaeological, historical or vertebrate fossil materials are discovered during the course of any construction activities, Encana will suspend all operations that further disturb such materials and immediately contact the appropriate BLM office. Operations in the area of discovery will not resume until written authorization to proceed has been issued by the BLM Authorized Officer (AO).
D. Encana will be fully responsible for the actions of their subcontractors. A copy of the approved APD and Conditions of Approval will be on location during drilling and completion operations.
E. Any construction activity in the areas shall be done with awareness that many natural gas pipelines are buried. Some are apparent as to location; some have grown over with weeds and brush. It is suggested that the contractor contact the operators in the area to locate all lines before digging.

2.2.2 No Action Alternative

NEPA requires that a No Action Alternative be considered in an EA, regardless of the purpose and need or proposal feasibility. Under the No Action Alternative, the proposed development would be denied by the BLM. No new well pad, access road, pipeline construction or impacts related to surface disturbance would occur in the project area beyond what is currently permitted and/or actions analyzed, documented and approved through previous NEPA decisions.

2.2.3 Alternatives

The Proposed Action takes advantage of existing access roads and other existing infrastructure, where possible, in order to minimize new disturbance, to minimize additional environmental impacts and to reduce exploration and development costs. The proposed action would support a total of 4 wells under full development conditions. No significant issues were identified in scoping that would lead to the development of additional alternatives. Consequently, no other viable alternatives have been identified.

CHAPTER 3 - AFFECTED ENVIRONMENT AND EFFECTS

3.1 INTRODUCTION

This section provides a description of the human and natural environmental resources that could be affected by the Proposed Action and presents comparative analyses of the direct, indirect and cumulative effects on the affected environment stemming from the implementation of the actions under the Proposed Action and other alternatives analyzed.

This EA draws upon information compiled in the Grand Junction Resource Area RMP/ROD (BLM 1987) and the Grand Junction Resource Area DRMP/DEIS (BLM 1985).

3.1.1 Elements Not Affected

The following elements, shown in Table 3, were evaluated by the Interdisciplinary Team. Some resources were identified as not being present or not affected and will not be brought forward for additional analysis. If there were no resources on public land, then findings for Public Land Health will not be included.

Table 3– Potentially Impacted Resources

Resources	Not Present On Location	No Impact	Potentially Impacted	Mitigation necessary	BLM Evaluator Initial & Date	Comments
PHYSICAL RESOURCES						
Air and Climate	☐	☐	☒	☒		x
Geological	☐	☒	☐	☐	DSG 2/8/12	
Mineral Resources	☐	☐	☒	☐	DSG 2/8/12	x
Soils	☐	☐	☒	☒	ND 2/22/12	x
Water (surface & subsurface, floodplains)	☐	☐	☒	☒	ND 2/22/12	x
BIOLOGICAL RESOURCES						
Special Status Plants	☒	☒	☐	☐	JT 2/22/12	
Special Status Wildlife	☒	☒	☐	☐	JT 2/22/12	
Migratory Birds	☐	☒	☐	☐	JT 2/22/12	x
Other Important Wildlife Habitat	☐	☐	☒	☒	JT 2/22/12	x
Vegetation, Forestry	☐	☐	☒	☐	SC 2/10/12	x
Invasive, Non-native Species	☐	☐	☒	☐	MT 4/3/12	x
Wetlands/Riparian Zones	☐	☐	☒	☐	CARS 2/22/12	x
HERITAGE RESOURCES AND HUMAN ENV.						
Cultural or Historical	☐	☒	☐	☐	AIL 12/30/11	
Paleontological	☐	☐	☒	☐	DSG 2/8/12	x

Table 3– Potentially Impacted Resources

Resources	Not Present On Location	No Impact	Potentially Impacted	Mitigation necessary	BLM Evaluator Initial & Date	Comments
Tribal & American Indian Religious Concerns	☐	☒	☐	☐	AIL 12/30/11	
Visual Resources	☐	☐	☒	☒	CPP 2/24/12	x
Social/Economic	☐	☐	☒	☐	CLV 4/26/12	x
Transportation and Access	☐	☐	☒	☐	CPP 2/24/12	x
Wastes, Hazardous or Solid	☐	☐	☒	☐	AK 2/9/12	x
LAND RESOURCES						
Recreation	☐	☐	☒	☐	CPP 2/24/12	x
Special Designations (ACEC, SMAs, WSR)	☒	☐	☐	☐	CPP 2/24/12	
Wilderness & Wilderness Characteristics	☒	☐	☐	☐	CPP 2/24/12	
Range Management	☐	☒	☐	☐	SC 2/10/12	
Wild Horse and Burros	☒	☐	☐	☐	CLV 03/20/12	
Land Tenure, ROW, Other Uses	☐	☐	☒	☒	CLV 4/26/12	x
Fire Management	☐	☐	☒	☒	LJ 05/01/12	x

3.1.2 Past, Present, Reasonably Foreseeable Actions

NEPA requires federal agencies to consider the cumulative effects of proposals under their review. Cumulative effects are defined in the Council on Environmental Quality (CEQ) regulations 40 CFR §1508.7 as "…the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency…or person undertakes such other actions." The CEQ states that the "cumulative effects analyses should be conducted on the scale of human communities, landscapes, watersheds, or airsheds" using the concept of "project impact zone" or more simply put, the area that might be affected by the proposed action. For cumulative effects the 5th order watershed boundary was chosen for the analysis area, which includes 9,800 acres: 1,600 acres of private land and 8,200 acres of public land. The project is situated in the southern and most downstream portion of the 5th order watershed including all of Hay Canyon, Calf Canyon and Edd Canyon. To assess past, present and reasonably foreseeable actions that may occur within the affected area a review of Grand Junction Field Office (GJFO) NEPA log and field office Geographic Information System (GIS) data was completed. The following list includes all past, present and reasonably foreseeable actions known to the BLM, which may occur within the affected area:

Past Actions: Oil and gas exploration and development and grazing activities have been prevalent uses in the past. The watershed has 6,300 acres of authorized federal mineral leases. The COGCC database shows 15 wells in the watershed surrounding the proposed location. Of these wells, 5 show as drilled and abandoned, 6 show as plugged and abandoned, 3 show as producing and 2 show as shut in. The watershed has 35 miles of existing road. Hunting is also a reoccurring recreational activity in the fall for the vicinity. Most of the off highway vehicle use is associated with the ranching, farming, hunting and recreation. Public access to the Hay Canyon extends 2.0 miles from Highway 139 to a locked gate marking a private land parcel. The remaining 33 miles roads occur mostly on private land, through Hay Canyon, Calf Canyon Edd Canyon are accessed via private permission.

The area is within the East Salt grazing allotment which has 1.5 miles of fencing, 8.7 miles of cattle trails, 6.4 miles of water development pipeline, 10 water developments (dams or springs) and 495 acres of previous seeding projects.

Present Actions: Oil and gas extraction for this area has been flat to decreasing in the last 20 years. Several wells in the area have been plugged and the surface abandoned. However, Encana has recently to perform operations on several Maralex owned leases to establish and maintain production. A Notice of Staking was submitted for a new location 0.5 miles up Hay Canyon, which would support multiple wells on one location. Encana has had successful well completions in nearby areas using newer unconventional techniques. Encana has preliminary plans to expand or built 5 locations in the larger area in the next 5 years.

Reasonably Foreseeable Actions: Encana may drill 10 additional wells in the larger area over the next 2-8 years. New horizontal drilling technology that is currently being tested may increase the number of wells in this and surrounding areas in the near future. Past and Present Actions will continue into the foreseeable future. Oil and gas, agricultural and hunting activities in this area are expected to continue.

The project is located approximately 4.5 miles to the NE of the McClane Canyon Mine Project and 3 miles from a proposed coal lease modification. The proposed lease modification would add 320 acres to an existing coal lease. CAM also has a pending permit revision that would allow for new surface facilities for cleaning and storing the coal on their existing mine.

This list of past, present and reasonably foreseeable actions was considered when analyzing cumulative effects in the section 3 below.

3.2 PHYSICAL RESOURCES

3.2.1 Air Quality and Climate

Current Conditions: The primary sources of air pollutants in the region are fugitive dust from the desert to the west of the planning area, unpaved roads and streets, seasonal sanding for winter travel, motor vehicles, and wood-burning stove emissions. Seasonal wildfires throughout the western U. S. may also contribute to air pollutants and regional haze. The ambient pollutant levels are usually near or below measurable limits, except for high short-term increases in PM_{10} levels (primarily wind-blown dust), ozone, and carbon monoxide. Within the Rocky Mountain region, occasional peak ozone levels are relatively high, but are of unknown origin. Elevated

concentrations may be the result of long-range transport from urban areas, subsidence of stratospheric ozone or photochemical reactions with natural hydrocarbons. Occasional peak concentrations of CO and SO_2 may be found in the immediate vicinity of combustion equipment. Locations vulnerable to decreasing air quality include the immediate areas around mining and farm tilling, local population centers, and distant areas affected by long-range transportation of pollutants. Representative monitoring of air quality in the general area indicates that the existing air quality is well within acceptable standards.

The EPA General Conformity regulations require that an analysis (as well as a possible formal conformity determination) be performed for federally sponsored or funded actions in non-attainment areas and in designated maintenance areas when the total direct and indirect net air pollutant emissions (or their precursors) exceed specified levels. Since the GJFO is not within a non-attainment or a maintenance area, the Clean Air Act conformity regulations do not apply.

No Action
Direct and Indirect Effects: The No-Action alternative would have no direct, indirect, or cumulative impacts to air quality.

Cumulative Effects: No cumulative effects would occur as a result of the No-Action alternative.

Proposed Action Direct and Indirect Effects: Construction of the proposed facilities would result in low and short-term impacts on air quality during construction, drilling, completion and, to a lesser extent, from vehicles and gas processing and compression facilities during the production phase. Increases in the following criteria pollutants would occur due to combustion of fossil fuels during construction activities: carbon monoxide, ozone (secondary pollutant), nitrogen dioxide, and sulfur dioxide. Non-criteria pollutants such as nitric oxide, air toxics (e.g. benzene), and total suspended particulates (TSP) may also experience slight, temporary increases as a result of the proposed action (NAAQS have not been set for non-criteria pollutants). Even with an increase in these pollutants, the proposed action would be unlikely to result in an exceedance of NAAQS and CAAQS and would most likely be under Prevention of Significant Deterioration (PSD) thresholds. Soil disturbance resulting from construction, heavy equipment, and drill rigs is expected to cause increases in fugitive dust and inhalable particulate matter, specifically PM10 and PM2.5, in the project area and immediate vicinity. During these construction phases dust production is likely, especially when conditions are dry and/or are windy. Once the wells go into interim reclamation all the roads should have the topsoil redistributed and stabilized, the pipelines should be in final reclamation and the pads should be re-contoured and stabilized. As vegetation establishes in the reclaimed areas, the only dust production will occur when vehicles travel on the access roads to service the wells. The increase in airborne particulate matter from this project and the other permitted actions near the project area is not expected to exceed CAAQS or NAAQS on an hourly or daily basis. Emissions from drilling would cause low, short-term impacts to local air quality. Additional low, short-term impacts to air quality may occur due to venting of gas from the wells.

Cumulative Effects: Cumulative impacts to air quality resulting from the proposed action as well as other past, present, and reasonably foreseeable actions within the area are not anticipated to result in a n exceedance of NAAQS and CAAQS and are most likely to be under Prevention of

Significant Deterioration (PSD) thresholds. Impacts of the proposed action are described as being short term and would primarily be associated with construction.

Protective/Mitigation Measures: Restrict surface disturbing actions to periods when wind speeds are less than 35 mph.

3.2.2 Mineral Resources

Current Conditions: The natural gas target zone for these wells is the Niobrara within the Upper Cretaceous age Mancos Shale. Mineable coal resources exist around 2000 feet deep within the Upper Cretaceous age Williams Fork Formation. Several coal leases are located south of the proposed well pad.

No Action
Direct and Indirect Effects: Any gas within the target zone would remain in place and the coal beds would not be penetrated by gas wells.

Cumulative Effects: Any natural gas in the target zone could be extracted from other wells within the cumulative effects analysis area.

Proposed Action
Direct and Indirect Effects: Any natural gas in the target zone would be extracted and produced for consumptive use.

Cumulative Effects: Natural gas produced from these wells would add to whatever is being produced from nearby wells until this target zone is depleted.

3.2.3 Soils (Includes Finding on Land Health Standard 1)

Current Conditions: A review of the NRCS order III soil survey of Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties, Colorado was done to assess the affected environment at the proposed project site. Through this review it was determined that the only soil type directly affected by the proposed action is the Battlement Loam.

The Battlement Loam is a well-drained soil located in narrow valley floors, streams, and floodplains. It formed in alluvial material derived dominantly from sedimentary rocks. The native vegetation is mainly basin wild rye, western wheatgrass, basin big sagebrush, and fourwing saltbush. Elevation is 5,800 to 7,200 feet (1,768 to 2,195 meters)
And average annual precipitation is 12 to 16 inches, the average annual air temperature is 42 to 46 degrees Fahrenheit, and the average frost-free period is 80 to 105 days. Permeability is moderate in the Battlement loam and the available water capacity is high. The effective rooting depth is 60 inches or more. Runoff is medium, and the hazard of water erosion is slight. Small areas of this soil are subject to rare flooding for brief periods in spring and summer. This soil is

very slightly saline (4 mmhos/cm) and is only a fair source of reconstruction material because of excess lime (NRCS, 2003).

Finding on Public Land Health Standard 1: A formal Land Health Assessment was conducted within the proposed project area in 2009 by BLM. Soil health, biologic integrity, and water features were all identified as not meeting in this assessment. Active erosion, heavy livestock grazing, and the abundance of cheat grass and crested wheat grass were the primary factors leading to the assessment determination.

No Action

Direct and Indirect Effects: No impacts to soil resources would result from the No-Action alternative.

Cumulative Effects: No cumulative impacts would result from the No-Action alternative.

Proposed Action

Direct and Indirect Effects: The primary issues associated with the proposed action are soil erosion resulting from stormwater runoff and loss of soil productivity associated with mixing of soil horizons or contamination from spills of toxic substances. As discussed in the water quality section of this document, implementation of design features and BMPs outlined in the Operators State approved Storm Water Management Plan (SWMP) would have an attenuating effect on the amount of sediment lost from the proposed 6.1 acres of surface disturbance associated with the project. The water quality section indicates that with implementation of design features and stormwater BMPs, sedimentation rates to surface waters would likely not be quantifiable. Thus, it is anticipated that soil erosion from the project area would also be difficult to accurately quantify (when compared to background conditions) with successful implementation of BMPs.

Maintaining soil productivity for reclamation purposes could be problematic if topsoil is not properly segregated and preserved for future uses. However, design features of the proposed action specifically outline procedures to segregate and preserve topsoil. These design features along with BMPs for stormwater management will sufficiently preserve topsoil volume and productivity to successfully implement reclamation procedures. In the event of a spill of toxic materials, the operator's Spill Prevention Control and Countermeasures (SPCC) plans developed in accordance with 40 CFR Part 112 would protect or mitigate against long-term impacts to soil resources.

Cumulative Effects: The proposed action would result in 2.4 acres of new long-term surface disturbance within the Hay Canyon watershed. With increased development and surface disturbance, comes increased potential to deteriorate soil health. However, with implementation of design features and BMPs, these cumulative effects will be mitigated to the extent they are not distinguishable from existing background conditions.

Protective/Mitigation Measures: See water quality section.

3.2.4 Water (surface and groundwater, floodplains) (Includes Finding on Land Health Standard 5)

Current Conditions: Surface disturbance associated with the proposed project would be situated entirely within water quality stream segment 13a of the Lower Colorado River Basin. Stream segment 3 of the Lower Colorado River Basin would be indirectly affected by the proposed action as East Salt Creek is a perennial tributary to the Colorado River approximately 2 miles west of Mack, Colorado. Minimum standards for physical and biological, as well as numeric standards for inorganic and metals are identified in Regulation No. 37 Classifications and Numeric Standards for Lower Colorado River Basin (CDPHE 2012).

The 2012 CDPHE-WQCC Regulation No. 93 Section 303d List of Impaired Waters and Monitoring and Evaluation List, was reviewed to determine if Lower Colorado River stream segments 3, and 13a were listed. Stream segments 3 and 13a were not identified on the 303(d) or Monitoring and Evaluation list (CDPHE-WQCC, 2012b).

Surface water quality monitoring conducted by BLM starting in 2010 and continuing through present shows high concentrations of sulphate (>60%) and sodium salts (>20%). Average conductivity was 2840 µS while average pH and stream flow was 8.57 and 0.24 cfs (107.7 gallons/minute) respectively. Local geology is the primary agent currently affecting water quality in this area. However, the BLM water quality data did not include sampling for total petroleum hydrocarbons or other chemicals commonly associated with fluid mineral development. Other operators in the area (Maralex) may be impacting water quality at this time, but those impacts have not yet been detected or quantified.
Groundwater in the project area is confined to shallow near-stream alluvial aquifers. No groundwater data near the proposed project site in Hay Canyon exists. However, it is reasonable to assume that alluvial and colluvial deposits closest to Hay Canyon are perennially saturated, of similar water quality, and closely correlated with base-flow water elevations in the Hay Canyon.

No Action
Direct and Indirect Effects: No direct or indirect impacts to water resources would occur under the No-Action alternative because no development would occur.

Public Land Health Standard 5 would continue to be met under the no-action alternative.

Cumulative Effects: With no direct or indirect impacts, cumulative impacts would also not occur as a result of the No-Action alternative.

Proposed Action
Direct and Indirect Effects: The primary issues that would affect surface and groundwater quality in the project area are contamination due to stormwater runoff and contamination resulting from spills or leaks of toxic substances. Approximately 6.1 acres of new surface disturbance would result with implementation of the proposed action. Runoff associated with storm events may increase sediment/salt loads in surface waters down gradient of the disturbed areas. Sediment may be deposited and stored in minor drainages where it would be readily moved downstream during heavy convection storms. Some sediment from project activities may eventually be carried into East Salt Creek and ultimately to the Colorado River. Implementation

of design features and BMPs outlined in the Operators State approved Storm Water Management Plan (SWMP) would have an attenuating effect on the amount of sediment contributed by project activities to the creek. Likewise, surface disturbance for fluid mineral development would comply with BLM surface operating standards outlined in the BLM Gold Book 4th edition (USDOI 2007) further reducing potential impacts to water quality from stormwater. Surface erosion would be greatest during the construction and early production phases of the project and would diminish as interim reclamation is implemented. With proposed design features and implementation of stormwater BMPs, it is unlikely that any increase in sedimentation or decrease in water quality associated with surface disturbance could be quantified in Hay Canyon or East Salt Creek.

Because the proposed project area is situated on alluvial and colluvial sediments adjacent to Hay Canyon, surface and groundwater in this area would be vulnerable to contamination from leaks or spills of toxic substances. Contamination at the surface could infiltrate near stream sediments reaching shallow groundwater that supports surface flows in Hay Canyon and East Salt Creek. Spills or leaks of any toxic material associated with fluid mineral development may also be washed directly into surface waters or, if the toxin is relatively insoluble in water, may be adsorbed on the surface of the soil and transported to surface waters in sediment. The severity of potential impacts resulting from leaks or spills of environmentally hazardous substances such as fuels, antifreeze, lubricants, or condensate would largely depend on the substance spilled, quantity of the spill, and proximity of the spill to drainage paths. The operator would be required to have a SPCC plan for the project and provide BLM a copy of this to review. This plan outlines the efforts that would be made to contain, cleanup, and notify appropriate parties in the event of a spill.

EnCana will maintain Material Safety Data Sheets for any chemical products brought to the location. In compliance with the Colorado Oil and Gas Conservation Commission (COGCC) requirements, a chemical inventory will be maintained for each chemical product used down-hole, or stored for use down-hole during drilling, completion, and work-over operations, including fracture stimulation, in an amount exceeding five hundred pounds (cumulative maximum amount) during any calendar year quarter. The same inventory will be kept for fuel stored at the well site.

Water Rights: As outlined in the proposed action, EnCana would utilized valid existing water rights from the Colorado River or purchase water from a 3rd party supplier. Any changes in use type for valid existing water rights would be in compliance with State Law to ensure other downstream uses would not be injured. Water would be delivered to the proposed site via truck and no additional infrastructure is proposed to transport fresh water.

With successful implementation of design features, the proposed project is not anticipated to alter the current finding for Public Land Health Standard 5.

Cumulative Effects: The proposed action would result in 2.4 acres of new long-term surface disturbance within the Hay Canyon watershed. With increased development and surface disturbance, potential for water quality degradation associated with stormwater runoff also

increases. However, with implementation of design features and BMPs, these cumulative effects will be mitigated to the extent they are not distinguishable from existing conditions.
The potential for cumulative effects to water quality resulting from spills or leaks of toxic substances would increase under the proposed action as additional development is occurring in the Hay Canyon watershed. However, with successful implementation of design features (e.g. drilling, casing, cementing) and SPCC plans the severity of these impacts should be reduced if they occur at all. Furthermore, water quality monitoring in the project area would help determine the degree of departure from baseline conditions if spills or leaks were to occur.

Protective/Mitigation Measures:
As discussed during the on-site, EnCana should collect water quality information from surface water (or groundwater if necessary) in Hay Canyon or East Salt Creek below the proposed well pad. Standard EPA protocols should be utilized to sample for total petroleum hydrocarbons and other chemicals commonly used to develop fluid minerals. Sampling these efforts should establish a baseline for water quality near the site prior to EnCana's development (prior development in this area was done by Maralex). EnCana should re-sample the site for the same parameters following well completion and interim reclamation efforts. All water quality data should be provided to BLM for review.

3.3 BIOLOGICAL RESOURCES

3.3.1 Invasive, Non-native Species

Current Conditions: Hay Canyon was inventoried for noxious weeds during the 2004 field season by BLM weed staff. The most abundant noxious weed for this area is hoary cress (aka whitetop). Isolated houndstongue can occur in this and adjacent canyons as well. Additionally, the BLM has worked with Encana and the adjacent landowner on controlling whitetop in Hay Canyon as well as on private lands along East Salt Creek.

No Action
Direct and Indirect Effects: Purely from a weed management standpoint, the less surface disturbance, the less chance for noxious weed invasion. The no-action would result in the least chance of additional weed infestations.

Cumulative Effects: Reducing disturbance over the long term from whatever source (oil and gas, recreation, etc.) would result in fewer weed infestations.

Proposed Action
Direct and Indirect Effects: The proposed plan does an adequate job of minimizing disturbance (e.g. using previously disturbed sites) and mitigating impacts from potential weed invasion in both the short and long term. The project proponent has a good history of weed management on their facilities and utilizing the *Weed Management Plan for Oil and Gas Operators (2007)*.

Cumulative Effects: Applying integrated weed management principles (inventory, treatment, reclamation) on this and all oil and gas facilities will result in acceptable vegetation communities with manageable levels of undesirable plants.

3.3.2 Vegetation (grasslands, forest management)

Current Conditions: Vegetation has been altered at the proposed site from historic down cutting of Hay Canyon Creek that dropped the water table changing the valley bottom from a riparian meadow to a dry valley bottom. Vegetation has been further altered from a prescribed fire in 2000 followed by a seeding treatment of non-native wheat grasses that now occur through the proposed site area. Currently, greasewood and Great Basin sagebrush are the main shrubs with good cover of crested wheat grass, western wheat grass and other wheat grasses through the shrub interspaces. Patches of cheat grass and pepper weed mixed with the wheat grasses also occur through the shrub interspaces. Juniper trees cover the hillside rising out of the valley floor just north of the proposed site.

Land Health Assessment conducted in 2009 concluded that the area of the proposed site is not meeting Land Health Standard 3 due to dominance of greasewood and lack of potential native perennial grasses.

No Action
Direct and Indirect Effects: Approximately 6.3 acres of vegetation would not be disturbed. No direct or indirect effects would occur that would change current conditions.

Cumulative Effects: Under the No Action Alternative vegetation would be expected to continue as it is and up to 6.3 acres would not be disturbed and reclaimed.

Land Health Standard 3: Not meeting Land Health Standard 3 would remain static as vegetation would continue as it is with greasewood, sagebrush and wheat grasses dominating the area.

Proposed Action
Direct and Indirect Effects: Up to 6.3 acres of vegetation would be damaged or removed. Less than one acre of vegetation would be permanently removed and the remaining acres would be re-vegetated through the reclamation plan for the project. The area would be monitored and treated for noxious weeds if they are found. Loss of vegetation would be limited to less than one acre once the reclamation work is completed with no overall negative impacts to vegetation in the valley expected. Planned protection measures are included in the project plan therefore impacts would be mitigated.

Cumulative Effects: Except for less than one acre at the proposed site and reclamation of the approximate remaining five acres, vegetation would be expected to continue as it is in the valley. Reclamation of the remaining disturbed area (approximately five acres) may increase cover of perennial vegetation compared to current vegetation cover that would further help stabilize the soil.

Land Health Standard 3: All but one acre of the 6.3 acres of disturbed land would be re-seeded helping to stabilize the soils and vegetation. Making progress towards meeting Land Health Standard 3 would be slow as the area is dominated by greasewood, sagebrush and wheat grasses.

3.3.3 Wetlands & Riparian Zones (includes a finding on Standard 2)

Current Conditions:
The project is located adjacent to riparian and wetland habitat that occurs along Hay Creek, which is approximately 0.5 mile north of the confluence of East Salt Creek, Trail Canyon Creek, and Hay Canyon Creek. The existing road is between 150 to 300 feet to the northwest of Hay Canyon Creek in the project location. Analysis of riparian habitat on Hay Canyon Creek was conducted by reviewing previous riparian assessments and aerial photography of the project area. Riparian habitat appears to be limited in this reach of the creek primarily to herbaceous vegetation.

Proper Functioning Condition (PFC) assessments were completed on Hay Canyon Creek in 1993 and 2006 and on East Salt Creek in 2006. Hay Canyon Creek was found to be Functioning at Risk (FAR) with an upward trend, during the 1993 assessment due to road encroachment, cattle grazing, and proximity of oil and gas facilities. PFC assessments completed on Hay Canyon Creek focused on reaches above the proposed facility. Riparian vegetation communities were also more extensive above the proposed facility. The 1993 assessment was conducted via data interpretation and visual inspection. Hay Canyon was determined to meet PFC standards during the 2006 assessment. During this assessment the Rosgen channel classification was determined to be a B type channel. Riparian vegetation observed along the Hay Canyon Creek included: willow, Wood's rose, bulrush, spikerush, cattail, sedges, and sweetclover.

Public Land Health Standard for riparian systems:
Properly functioning riparian systems have the ability to recover from major disturbances such as those associated with fire, grazing, and flooding. Riparian habitat along Hay Canyon Creek is meeting land health standards according to the most recent assessment completed in 2006.

No Action
Direct and Indirect Effects:
Under the No Action alternative the well pad and associated facilities would not be approved or built as proposed. Additional vegetation removal, soil disturbance, and increased truck traffic associated with the proposal would not occur on adjacent uplands. Indirect impacts from dust and sediment transport from proposed activities would not occur.

Public Land Health Standard for riparian systems:
Land health standards would continue to be met under this alternative.

Cumulative Effects:
There would be no new foreseeable impacts to riparian resources under this alternative. Historic grazing use and infrequent travel on the existing road would still occur.

Proposed Action
Direct and Indirect Effects:
Under the proposed action a portion of the road and pipeline would be shifted up to 100 feet to the southeast, which would move these facilities closer to Hay Canyon Creek. The proposed facilities would be approximately 100 to 200 feet from Hay Canyon Creek. There are no foreseeable direct impacts to riparian or wetland areas under the proposed action. Indirect

effects on wetland and riparian areas from the proposed action could include sediment transport off of disturbed surfaces during and following construction if facilities are not properly constructed and maintained. Closed loop drilling and berming the pad should help to reduce sediment transport to the creek. The primary source of sediment transport and dust would be the road. Frequent maintenance and dust suppression on the road would reduce long-term impacts from this facility. Increased sediment transport into the riparian area is expected to be slightly elevated during construction and prior to interim reclamation. Reducing sediment transport and runoff from the road would reduce the potential for bank erosion and deposition of sediment that may impact rushes, sedges, and other grasses and forbs.

Clearly marking the project boundary would ensure that an adequate buffer from the riparian area is maintained during construction of the facilities. Proposed seeding and ripping disturbed soils adjacent to the road and pad would also reduce sediment transport to the riparian area. The condition of the riparian area should be monitored by visual inspection during and following construction of the proposed facilities to ensure that excessive sediment transport or increased bank erosion does not occur.

> *Public Land Health Standard for riparian systems:*
> Under the proposed action the land health standard for riparian systems should continue to be met. The future ability of riparian systems to continue to meet the standard is protected by this action and monitoring.

Cumulative Effects:
The proposed project would have short term cumulative impacts lasting 1 to 3 years resulting from disturbance of upland areas near riparian areas. Long-term cumulative impacts to riparian areas are expected to be minimal as long as facilities are properly maintained.

Protective/Mitigation Measures:
None, Colorado State required Stormwater Management monitoring and enforcement during construction phases of development would preclude the need for further monitoring.

3.3.4 Wildlife (includes fish, aquatic and terrestrial) (includes a finding on Standard 3 & 4)

Current Conditions:

Threatened, Endangered, Candidate (Federal or State) or BLM Sensitive Species are not present in the area. A previously recorded golden eagle nest site is located 4600' SSE of the proposed/existing well pad location. Its current active or inactive status is unknown. The proposed activity lies within winter range for mule deer and elk, as well as winter concentration area for elk. The project area was surveyed for biological resources in November 2011 (Westwater 2011). Biologists surveyed approximately 36 acres of "good" woodland raptor nesting habitat and approximately 55 acres of "poor" woodland raptor nesting habitat. No raptor nests were observed during the surveys. The project is situated closest to the "poor" woodland nesting habitat with the "good" habitat upslope and northwest of the project area.

Finding on Public Land Health Standard 3 & 4: A formal Land Health Assessment was conducted within the proposed project area in 2009 by BLM. Soil health, biologic integrity, and water features were all identified as not meeting in this assessment. Active erosion, heavy livestock grazing, and the abundance of cheat grass and crested wheat grass were the primary factors leading to the assessment determination. Although No Special Status Species are known to inhabit the project area, the area does not meet Standard 3, and as a result would not meet Standard 4: as a healthy native plant habitat is not present.

No Action

Direct and Indirect Effects: This alternative would not have direct or indirect effects on wildlife that would change conditions from the current situation.

No changes to Standard 3 or 4 would be expected under the no action alternative.

Proposed Action

Direct and Indirect Effects:

The proposed action would directly disturb 2.4 acres of previously undisturbed sage and greasewood vegetation. As noted in Table 2, page 10, net loss after reclamation would be 0.3 acres. Six acres of area will be disturbed by the temporary presence of drilling activity, road and pipeline relocation, and reclamation activity making that acreage unusable by wildlife during those activities. If the activities were to occur during winter months, that acreage will be unavailable to elk and deer. If occurring during spring and summer, the acreage would be unavailable for breeding use by birds, reptiles and other wildlife. Impacts to species using existing habitat that will be lost in temporarily affected areas until reclamation vegetation reaches maturity.

Indirect impacts from noise and activity could cause disruption to wildlife activity beyond the well pad and associated activity. Effects would vary by species and season. Breeding raptors could be affected during spring and summer by land-clearing, drilling and other machinery-intensive activity. Wintering elk and deer could be driven away if the development took place in winter.. BLM records indicate no timing limitation for winter on these leases; therefore a permanent waiver is not applicable. The 60 day timing limitation would be applied to account for unforeseen winter conditions.

While the project area is not currently meeting Land Health Standards 3 & 4, the proposed project may move the area towards meeting land health standards if reclamation is fully successful.

Cumulative Effects: The cumulative effect is the long-term loss of 0.3 acres to well infrastructure.

Protective/Mitigation Measures:

Although BLM considers surveys conducted for a NEPA Environmental Assessment to be valid for 2 years, new nests may be built and occupied between the initial surveys and project implementation. To ensure compliance with the Migratory Bird Treaty Act, the operator should

schedule construction or drilling activities to begin outside the raptor nesting season (February 1 to August 15) if practicable. If initiation of construction, drilling, or completion activities during these dates cannot be avoided, the operator is responsible for complying with the Migratory Bird Treaty Act, which prohibits the "take" of birds or active nests (those containing eggs or young), including nest failure caused by noise and human activity.
Well development activity would be subject to a 60 day winter timing limitation for big game, specifically mule deer and elk from January 1 through March 1. No drilling, construction or completions activities may occur during this time without prior approval from BLM. Encana would need to request in writing exceptions to that condition on a case by case basis.

3.4 HERITAGE RESOURCES AND HUMAN ENVIRONMENT

3.4.1 Paleontological Resources

Current Conditions: The surface geology is composed of Quaternary age modern alluvium. This geologic unit is rated as a Class 2 using the BLM Potential Fossil Yield Classification (PFYC) system. It is given this rating because it has low potential for yielding vertebrate fossils or scientifically significant nonvertebrate fossils. There are no known paleontological sites surveyed within a square mile of the proposed drill pad.

No Action
Direct and Indirect Effects: There would be no construction activities, so no unknown subsurface paleontological sites would be discovered and/or damaged.

Cumulative Effects: If the no action alternative was chosen there would be no impacts to combine with impacts from other projects.

Proposed Action
Direct and Indirect Effects: Construction activities may uncover and/or damage unknown subsurface paleontological resources. However, the probability of impacting any paleontological resources is low.

Cumulative Effects: Any paleontological resources discovered during construction activities would add to current knowledge of the area. Any resources that are impacted would be in addition to resources damaged by other projects within the cumulative effects analysis area.
Protective/Mitigation Measures: A standard inadvertent discovery stipulation would require that construction activities cease in the direct area of any discovery of a vertebrate fossil or scientifically important invertebrate. The BLM AO would be notified and determine the best course of action to deal with the discovery. Construction could take place in other areas of the project.

3.4.2 Visual Resources

Current Conditions: The proposed project area is located at the mouth of Hay Canyon approximately 0.15 miles northeast of Colorado State Highway 139, which is part of the

Dinosaur Diamond Scenic and Historic Byway. The site lies within the northeast portion of the Colorado Plateau physiographic province. The project is sited within Visual Resource Inventory (VRI) Class III, Scenic Quality B (Scenic Quality Rating Unit 02) (BLM 2009).

The characteristic landscape is an enclosed valley at the base of a moderately sloping hillside. The topography is characterized by a relatively flat valley bottom with a steeply incised channel cut by East Salt Creek immediately east of the project site. To the west rises a hill/mountain exhibiting rounded diagonal form and line. Colors are predominantly mottled shades of dark green created by the pinyon-juniper vegetation, along with lighter shades of green, tan and grey, creating a medium to coarsely mottled texture on the landscape. Built elements include the existing compressor station and associated facilities which add distinct vertical and horizontal contrasts in form and line to the landscape, as well as adding moderate contrast in color and texture with the surrounding landscape.

The area is primarily used by travelers along Highway 139, ranchers, oil and gas operators, and hunters who would constitute the typical casual observer.

Under the current RMP, the proposed project site is in an area designated as Visual Resource Management Class III. VRM Class III objectives are "to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape" (BLM 1987).

No Action

Direct and Indirect Effects: There would be no direct or indirect effects under the No Action Alternative.

Cumulative Effects: Under the No Action Alternative the visual landscape would continue to change due to on-going natural gas drilling and gathering activities, maintenance and improvement of roads, recreation use and private land development. These activities would have a relatively long-term effect on the visual quality of the view shed.

Proposed Action

Direct and Indirect Effects: The casual observer would usually be traveling by vehicle along Colorado State Highway 139. The project site would be visible for approximately 20-30 seconds for northbound traffic traveling at the posted speed limit of 55 mph. The site would likely be unnoticed by southbound traffic due to the hillside blocking the view until vehicles are past the site. During construction, drilling and completion operations, the observer would likely see the drill rig, associated temporary structures, and vehicles, along with dust created by the development activities. During this phase (estimated at three months in length) the proposed development would introduce strong visual contrast to the landscape. Following completion operations, the visual contrast created by the remaining structures would be moderate.

The drill pad, pipelines and access roads would cause a weak contrast to the form of the land through vegetation removal, leveling and flattening the site and access road. It would cause

moderate line contrast through introduction of the pad and roads, both of which would be visible linear features. Exposing the soil would cause a weak contrast to the color in the landscape. The texture of the exposed soil would add smoothness to the landscape creating a weak contrast. The cylindrical and rectangular forms of the proposed structures would contrast moderately with the existing landform. They would introduce distinct vertical lines which would moderately contrast with the existing rolling landscape. The texture created by the addition of structures into the landscape would create moderate contrast with the texture of the characteristic landscape, which is primarily influenced by the rolling, mottled landform.

To lessen the visual impacts, Encana has committed to paint any structures that would be on site for 6 months or more with a flat non-reflective earth toned color, which would lessen the visibility of the facility from observation points within the immediate vicinity. The BLM recommended color for facilities at the site is Shale Green. Interim reclamation of the pad location would also lessen its contrast and visibility for the life of the wells.

The project area has a moderate level of existing contrast consisting of roads, agricultural land, fences, and other oil and gas development. Because the long-term visual modifications caused by this well facility would not dominate the landscape from observation points along Hwy 139, the Proposed Action would meet the objective of the VRM III classification. However, the designation of Hwy 139 as a National Scenic and Historic Byway, warrants careful adherence to best management practices for reclamation and visual mitigation to reduce visual contrast from the proposed developments.

Cumulative Effects: The visual landscape would continue to change due to on-going natural gas gathering activities, maintenance/improvement of roads, recreation use and changes in private land use. These activities would have a relatively long-term effect on the visual quality of the view shed.

3.4.3 Social

Current Conditions: This area is located in Garfield County, which has a population of approximately 56,389 (U.S. Census Bureau 2010). The closest town to the project area is Loma, which is in Mesa County, with a population of about 2,300 (U.S. Census Bureau 2010). Mesa County has a population of 146,723. Grand Junction, Colorado, with a population of 58,566 (U.S. Census Bureau 2010), is the closest large city and the regional hub of banking, health care, retail trade, and government services in western Colorado and eastern Utah. Rio Blanco County, located directly north of Garfield County, has a population of approximately 6,666 (U.S. Census Bureau 2010). Population growth in Garfield and Mesa Counties has grown constantly since 1970, with reduced growth rates from 1980 through 1990. Rio Blanco County's population dropped between 1980 and 1990, and in 2010 barely exceeded the 1980 population level (U.S. Census Bureau 2011). Additional important industries in these Western Colorado counties include tourism, energy services, health care, ranching, and fruit and vegetable farming. Tourism in the counties focuses on outdoor recreation activities, including hunting, fishing, rafting, kayaking, bicycling, hiking, and skiing.

During 2010, there were approximately 1,184 people directly employed in oil and gas production activities in Garfield, Mesa, and Rio Blanco counties (DOLA 2011). At least some of the labor associated with the Proposed Action would probably come from areas outside the above counties

and would not result in any permanent change to the social conditions or populations of Garfield or Mesa County.

No Action
Direct and Indirect Effects: There would be no direct or indirect effects to the local social structure under the No Action Alternative.

Cumulative Effects: As the local population continues to grow, as expected from Census predictions, the influx of people from outside the local area would change the social structure of the counties.

Proposed Action
Direct and Indirect Effects: Production operations would make a minor contribution to a more stable long-term workforce with its concurrent change in the social culture of the counties. However, the Proposed Action's effects on the social environment of the counties would be marginal.

Cumulative Effects: A trend of increasing shale gas wells is apparent and if continued could create another boom situation during extraction of that resource. As with past economic boom cycles, this would result in demographic changes as well as economic and population growth for Mesa County and to a lesser extent the surrounding Counties. Additional workers would immigrate to the area to meet the demand for labor in the energy industry, support services and general community. Common characteristics of a boom cycle include rising prices, increased investment and consumption and a decreased supply of local commodities. Boom cycles proceed bust cycles, if they occur, which are characterized by decreased production, lower prices and a surplus of local commodities.

3.4.4 Economic

Current Conditions: The construction resources would be drawn from Garfield, Mesa, and Rio Blanco Counties. County demographics are provided in the Social section (3.4.3). All of the counties experienced a substantial economic and demographic growth in the late 1970s and early 1980s as major energy companies attempted to develop oil shale as a national energy fuel source. After a decline in jobs and population from the boom levels, the number of jobs and people in the counties has remained static. Currently, the government sector makes up almost a third of all jobs in the county. The traditional farming and ranching sector has been supplemented in the last few years by a growing number of jobs in the oil and gas extraction industry as drilling and related processing activity has expanded. Almost all of the resources for development of the oil and gas resource come out of Garfield, Mesa, Rio Blanco Counties, or sometimes Utah and New Mexico. Most jobs are only on a temporary basis. In addition to oil and gas exploration and development, the other major economic activities that occurs in the project area is livestock grazing and hunting.

Long term throughout the production life of wells, the oil and gas industry injects cash flow into local and national economies through collected revenues as severance tax on production and ad valorem tax (County property tax). Federal revenues are collected through production royalties,

rents and lease bonuses. Half of the federal royalties collected is returned to the State where the mineral interest lies.

No Action
Direct and Indirect Effects: There would be no direct or indirect effects under the No Action Alternative.

Cumulative Effects: Economic conditions would continue to change from other activities under the No Action Alternative.

Proposed Action
Direct and Indirect Effects: The construction would employ workers already available in the region. Many would already reside in the western Colorado counties mentioned above. Motels, restaurants, grocery stores, gas stations, and vehicle and equipment repair shops may all experience slight and temporary additional activity from the construction activities. No impact on grazing costs or revenues is anticipated. The net effect of these impacts would be considered beneficial but low.

Cumulative Effects: The Proposed Action would add to the overall short-term change in economic conditions seen in Garfield, Mesa and Rio Blanco Counties; however the contribution of this one project would be negligible. The Proposed Action would add to the overall long-term revenue collections for subject County, the State of Colorado and the United States Treasury. The degree of these additions would be dependent upon the productivity of the well.

3.4.5 Transportation and Access

Current conditions: Access to the proposed project site is via Colorado State Highway 139 (paved) and the Hay Canyon Road (gravel). Highway 139 is the primary travel route between Grand Junction and Rangely. It is also part of the Dinosaur Diamond Scenic and Historic Byway. Annual average daily traffic on this section of Hwy 139 is estimated at 1,100 vehicles, 20.1% truck traffic (CDOT 2011.) The Hay Canyon Road is used primarily for access to nearby private property, existing oil and gas operations, and public land recreation opportunities. No BLM traffic counter data is available for the Hay Canyon Road, but traffic is generally light since this is not a through route for public travel.

No Action

Direct and Indirect Effects: Denial of the permit for these particular Encana wells would not have any impact on the transportation system.

Cumulative Effects: Access and Transportation effects from oil and gas operations and other activities in the area would continue, with impacts similar to those for the Proposed Action.

Proposed Action

Direct and Indirect Effects: Short-term increases in the volume of both heavy and light traffic would occur during the construction, drilling, and reclamation activities. Potential impacts to travel and access of other users would include minor temporary conflicts with existing traffic (including a potential for delays and increased vehicle accidents). The most likely conflicts with traffic flow and greatest potential for accidents would be at the intersection of Highway 139 and

the Hay Canyon Road where trucks associated with the drilling operations would be entering and exiting the highway. There would also likely be short-term traffic delays during construction of the rerouted section of the Hay Canyon Road. This impact would likely impact only a small number of travelers. Long-term impacts to travel and access would be minimal.

Degradation of the Hay Canyon Road may occur due to heavy truck traffic. However, Encana has committed to maintaining existing and re-routed roads in the same or better condition than prior to commencement of operations, and to continue that maintenance through abandonment and reclamation.

Cumulative Effects: The proposed wells when combined with other oil and gas activity in the area would incrementally add to heavy truck traffic on the roads leading to the project area. Projected increases in recreational use of the area would also add traffic and increase maintenance needs on roads accessing the project site.

Protective/Mitigation Measures: Encana would be required to obtain any necessary Transportation Permits from Mesa and Garfield County for oversize or overweight vehicles.

If traffic is disrupted during construction then suitable traffic control measures would be implemented. Traffic control measures would include warning signs, barriers or flagmen unless otherwise approved by the AO.

3.4.6 Wastes, Hazardous or Solid

Current Conditions:
Hazardous and solid wastes are not a part of the natural environment. However, they could be introduced through implementation of the Proposed Action. BLM Instruction Memoranda numbers WO-93-344 and CO-97-023 require that all NEPA documents list and describe any hazardous and/or extremely hazardous materials that would be produced, used, stored, transported, or disposed of as a result of a proposed project. The Glenwood Springs Resource Area, Oil & Gas Leasing and Development, Draft Supplemental Environmental Impact Statement (BLM, 1998), Appendix L, Hazardous Substance Management Plan, contains a comprehensive list of materials that are commonly used for projects of this nature in this region. It also includes a description of the common industry practices for use of these materials and disposal of the waste products. These practices are dictated by various Federal and State laws and regulations, and the BLM standard lease terms and stipulations which would accompany any authorization resulting from this analysis. The document is incorporated by reference into this Environmental Assessment.

The most pertinent of the Federal laws dealing with hazardous materials contamination are:

> **The Oil Pollution Act** (Public Law 101-380, August 18, 1990) - This law prohibits discharge of pollutants into waters of the US, which by definition would include any tributary, including any dry wash that eventually connects with the Colorado River.

The Comprehensive Environmental Response, Compensation, and Liability Act (Public Law 96-510 of 1980) - This law provides for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment. It also provides national, regional, and local contingency plans. Applicable emergency operations plans in place include the National Contingency Plan (40 CFR 300, required by section 105 of CERCLA), the Region VIII Regional Contingency Plan, the Colorado River Sub-Area Contingency Plan (these three are EPA produced plans), the Mesa County Emergency Operations Plan (developed by the Mesa County Office of Emergency Management), and the BLM Grand Junction Field Office Hazardous Materials Contingency Plan.

The Resource Conservation and Recovery Act (RCRA) (Public Las 94-580, October 21, 1976.) - This law regulates the use of hazardous substances and disposal of hazardous wastes. Note: While oil and gas lessees are exempt from RCRA, right-of-way holders are not exempt from this legislation. RCRA strictly regulates the management and disposal of hazardous wastes.

Emergency response to hazardous materials or petroleum products on BLM lands are handled through the BLM Grand Junction Field Office Contingency Plan (referenced above). BLM would have access to regional resources if justified by the nature of an incident.

No Action

Direct and Indirect Effects: None

Cumulative Effects: None

Proposed Action

Direct and Indirect Effects:

A variety of wastes would be generated during drilling, well completion, and post-completion operations. Hazardous materials would also be used on site. These wastes and hazardous materials are described below.

Drill Cuttings

During drilling operations, drill cuttings from the well bore (mainly shale, sand, and miscellaneous rock minerals) and drilling fluids (mud) will be generated. Drilling muds may contain small concentrations of a variety of contaminants, including mercury, cadmium, arsenic, and hydrocarbons, which could adversely affect soil and water resources if released to the environment.

Frac Water

During well completion operations, the typical method used for stimulating the formation to enhance the production of oil and gas consists of hydraulic fracture ('frac') treatment of the reservoir. Frac water could adversely affect soil and water resources if released to the environment.

Hazardous Materials

A variety of materials typical of oil and gas development could be at the site during construction and operations including lubricants, diesel fuel, gasoline, solvents, and hydraulic fluids. Hazardous materials which may be found at the site may include drilling mud and cementing products which are primarily inhalation hazards, and materials that may be necessary for well completion/stimulation activities such as flammable or combustible substances and acids/gels (corrosives). Hazardous materials stored on site could adversely affect soil and water resources if released to the environment.

Other Solid Wastes

Other solid wastes associated with drilling and well completion would include human waste and trash. These wastes could adversely affect soil and water resources if released to the environment.

Condensate and Produced Water

During post-completion operations, a separation/dehydration unit may be used to remove condensate (liquid hydrocarbon) from the gas, and aboveground tanks may be used to contain the gas condensate and additional produced water. Gas condensate, which resembles light crude oil, is composed of hydrocarbons in a liquid state. Produced water is typically high in salinity and typically contains some petroleum hydrocarbons and BTEX (benzene, toluene, ethylbenzene, and xylene) constituents. Typically, tanks are located on the well pad to contain condensate and produced water generated from the gas wells. These tanks would remain on site for the life of the wells. Long-term, undetected leaks from tank batteries are a potential source of groundwater contamination. Corrosion of steel tanks over the long term is quite likely. The high salt content of the produced water could very likely contribute to this process. Condensate would be transported to market by tanker trucks. The produced water would be recycled for use in drilling and completion operations at other nearby wells or trucked offsite to approved commercial disposal facilities. Potential releases of produced water and gas condensate could occur from tanking, piping, and transport trucks. This could be the result of an accident, or tank/piping failure. Spills of these substances would be covered under several hazardous materials response plans.

Surface waters could be negatively impacted by spills of condensate, produced water, or hazardous materials stored at the pad. In cases where petroleum hydrocarbon or BTEX concentrations in contaminated soil are above regulatory limits, soil removal is indicated. Another potential source of concern could be diesel fuel spills from ruptured fuel tanks. Diesel spills generally require removal of contaminated soils. Prompt response is necessary in the case of diesel or produced water spills in order to minimize negative impacts to surface/groundwater, plant and wildlife resources. With prompt and effective response, direct, indirect, and cumulative impacts would be expected to be minimal.

The possibility exists that regulated hazardous materials unrelated to the gas production process could be introduced to the produced water and disposed of, illegally, along with the water. While there is no evidence to suggest this is a common occurrence, it could

result in the subsurface contamination with regulated substances. It also could result in the contamination of groundwater resources, should there be a spill or leak at the tank battery.

Cumulative Effects:
Given the relative infrequency of hazardous materials releases at well sites, and the general success in rapid remediation of hazardous materials releases, the major impacts from such releases are those experienced immediately and directly after a release. Cumulative impacts should be minor.

3.5 LAND RESOURCES

3.5.1 Recreation

Current Conditions: According to the 1987 RMP, the project area lies within an unclassified Recreation Management category. The Off-Road Vehicle (ORV) Management Designation is "open – general areas where no significant ORV issues occur" (BLM 1987). Hunters in the area frequently use ORVs and hunting is the primary recreational activity. The ongoing revision process for the RMP proposes some changes to the 1987 RMP, including the travel management designations. Revised travel management designations for the project area have not been finalized. No developed recreational facilities, such as campgrounds or picnic areas are located within or near the project area. Recreation use in the area can be characterized as dispersed recreation with a relatively low level of intensity. The exception to this general description is big-game hunting in the fall. The Project Area is located in CPW GMU 30. This GMU has historically been very popular with big-game hunters and can be expected to remain so into the future. The GJFO manages three Special Recreation Permits (SRPs) for big game hunting and five SRPs for mountain lion hunting in the area. The following big game outfitters are authorized to operate in the project area: Mark Davies Outfitters, High Lonesome Lodge, Rimrock Outfitters. The following mountain lion outfitters are authorized to operate in the project area: Alameno Outfitters, Backcountry Outfitters, Biggerstaff Outfitters,Cat Track Outfitters, and Mark Davies Outfitters.

No Action

Direct and Indirect Effects: No impacts to recreation activities would occur if the proposed wells are not approved.

Cumulative Effects: Continued oil and gas activities in the area would continue to have an impact on recreation users for the long-term. Big game hunters would be impacted by changes to habitat and potential changes in animal distribution.

Proposed Action

Direct and Indirect Effects: The proposed action would result in increased vehicle traffic, noise, dust, and human activity during the construction, drilling, and completion phases of the project, and continuing to a more limited degree, throughout the operational life cycle of the project. Construction and well drilling activities would likely displace some game species in localized areas within close proximity to these activities, and both hunters and game would be displaced to other locations outside of the project area. The road construction, pipeline construction, and well

pad developments would contribute to a decline in the area's naturalness, altering the setting character for recreation opportunities in the area.

Cumulative Effects: The proposed action, along with other drilling activities in the area would incrementally reduce naturalness, and would likely alter game species use patterns, potentially reducing hunting opportunities and success rates. Other effects on recreation would be related to general recreation and demographic trends in the region.

3.5.2 Fire Management

Current conditions:
The proposed action is within Fire Management Unit Bookcliffs C-130-04, which has a large occurrence of wildfires. Most of the wildfire in the FMU are lightening caused. However the proposed action is near Highway 139 where there have been multiple human caused fires over the past couple decades. Wildfire response is usually fairly slow to this area due to long travel times. There is abundant cheat grass in this area that serves as a bed of fuel to carry fires in the bottom of drainages in this area. Thus causing most wildfires to be serveal acres in size by the time the first firefighters arrive on scene.

No Action
Direct and Indirect Effects: Under the no action alternative there would continue to be wildfires occurring on this landscape

Proposed Action
Direct and Indirect Effects: Direct effect on the proposed action would require more fire suppression resources to fires in this are to protect values at risk. However the existing compressor station adjacent to the propsed action would already heighten the response to wildfires in the area Once in production phase most natural gas pads are fairly fire resistance. Due to the proposed action there is some increase potential for additional human caused fires due to welding, equipment use etc.

Cumulative Effects: Overall the proposed action will put more values at risk on the landscape if a wildfire does occur. Human caused wildfire potential will slightly increase over the life of the proposed action due to increase human activity.
Protective/Mitigation Measures:
Operator or contractor personnel should call BLM Grand Junction Dispatch to report any wildfire started on BLM lands, (970)251-4800 or (970)244-3000.

3.5.3 Land Tenure, Rights of Way and other Uses

Current Conditions: There are 2 pipelines that run under the proposed well pad location, owned by ETC Canyon. The realignment of these pipelines would occur in conjunction with the pad construction but the ROW amendments would be handled through ETC. The BLM has consulted the realignment with ETC and the additional concerns about the soil conditions that cause piping on the creek side of the road (on an Encana pipeline ROW COC49003). There are several other ROWs in the vicinity which might be affected as long if the proponent does not contacts the holders to

communicate their proposal to prevent conflicts. A search of LR2000 resulted in Table 3.5, which shows the ROWs that are currently authorized in the project area.

Table 3.5 Rights of Way (ROW)

ROW Type	Holder	Serial Number
O&G Pipeline	ETC Canyon	COC 25378F
O&G Pipeline	ETC Canyon	COC 25378C
O&G Pipeline	Encana	COC 49003
O&G Pipeline	Northwest Pipeline	COC 011243
O&G Facility Site-compressor	Encana	COC 55150
O&G Facility Site-compressor	Maralex	COC 35158
O&G Facility Site-compressor	ETC Canyon	COC 25378
O&G Facility Site- cathodic protection	ETC Canyon	COC 25378J

No Action

Direct and Indirect Effects: Under the No Action alternative there would be no effects to land tenure, rights of way and other uses. There would be no need to move the existing pipelines

Cumulative Effects: Under the No Action alternative there would be no cumulative effects to land tenure, rights of way and other uses.

Proposed Action

Direct and Indirect Effects: Because the proposed action includes the cooperative realignment of the existing pipelines, there would be no direct effects. During the pipeline realignment work, a temporary loss of gas flow would occur. This would impact the supply but only negligibly and for a short time.

Cumulative Effects: The proposed action would have no cumulative effects to land tenure, rights of way and other uses

Protective/Mitigation Measures: The operator would be required to communicate the proposal and timing of work to all right of way holders in the vicinity to prevent conflicts**.**

CHAPTER 4 - CONSULTATION AND COORDINATION

4.1 LIST OF PREPARERS AND PARTICIPANTS

INTERDISCIPLINARY REVIEW

BLM - Grand Junction Field Office		
NAME	**TITLE**	**AREA OF RESPONSIBILITY**
Cathy Ventling	Natural Resource Specialist	Realty Authorizations, Oil and Gas
Aline LaForge	Archaeologist	Cultural Resources, Native American Religious Concerns
Chris Pipkin	Outdoor Recreation Planner	Transportation and Access, Recreation, VRM, Wilderness, ACECs
Scott Gerwe	Geologist	Minerals, Geology, Paleontology
Alan Kraus	Hazard Materials Specialist	Hazardous Materials
Heidi Plank	Wildlife Biologist	Migratory Bird Treaty Act, T&E Species, Terrestrial & Aquatic Wildlife
Anna Lincoln	Ecologist	Land Health Assessment, T&E Plant Species
John Toolen	Wildlife Biologist	Migratory Bird Treaty Act, T&E Plant & Animal Species, Terrestrial & Aquatic Wildlife
Scott Clarke	Range Management Specialist	Vegetation, Range,
Collin Ewing	Environmental Coordinator	Environmental Coordinator
Nate Dieterich	Hydrologist	Air Quality, Water Quality, Soils, Hydrology, Water Rights
Jacob Martin	Range Management Specialist	Forestry
Mark Taber	Range Management Specialist	Invasive, Non-Native Species (Weeds)
Lathan Johnson	Fire Ecologist Natural Resource Specialist	Fire Ecology, Fuels Management
Christina Stark	Natural Resource Specialist	Riparian, Floodplains, Realty

4.2 TRIBES, INDIVIDUALS, ORGANIZATIONS, OR AGENCIES CONSULTED

Encana Oil and Gas (USA), Inc.
Colorado Parks and Wildlife

CHAPTER 5 - REFERENCES

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APPENDIX A

CONDITIONS OF APPROVAL

Site-Specific Conditions of Approval

1. Air/Dust Control: The operator will restrict surface disturbing actions to periods when wind speeds are less than 35 mph.

2. Water: As discussed during the on-site, EnCana will collect water quality information from surface water (or groundwater if necessary) at minimum of one point in Hay Canyon or East Salt Creek below the proposed well pad prior to surface disturbance. Standard EPA protocols should be utilized to sample and test for total petroleum hydrocarbons and other chemicals commonly used to develop fluid minerals (BTEX, TVH, and TDS, pH, frac fluid components or an added isotopic tracer). Sampling these analytes should establish a baseline for water quality near the site prior to EnCana's development (prior development in this area was done by Maralex). EnCana should re-sample the original sample site(s) for the same parameters and provide results to BLM for review following 60 days of well completion and interim reclamation efforts.
3. Transportation: Encana would be required to obtain any necessary Transportation Permits from Mesa and Garfield County for oversize or overweight vehicles.

4. Transportation If traffic is disrupted during construction then suitable traffic control measures would be implemented. Traffic control measures would include warning signs, barriers or flagmen unless otherwise approved by the AO.

5. Fire Management: Operator or contractor personnel will call BLM Grand Junction Dispatch to report any wildfire started on BLM lands, (970)251-4800 or (970)244-3000.

6. Land Tenure, Rights of Way and Other Uses: The operator is required to communicate the proposal and timing of work to all right of way holders in the vicinity to prevent conflicts (see table 3.5 below).

7. Timing/Disturbance Limitations

   a. *Big Game Winter Range Timing Limitation.* Well development activity will be subject to a 60 day winter timing limitation for big game, specifically mule deer and elk from January 1 through March 1. No drilling, construction or completions activities may occur during this time without prior approval from BLM. Encana will need to request in writing exceptions to that condition on a case by case basis.

   b. *Migratory Birds.* To ensure compliance with the Migratory Bird Treaty Act, the operator should schedule construction or drilling activities to begin outside the raptor

nesting season (February 1 to August 15) if practicable. If initiation of construction, drilling, or completion activities during these dates cannot be avoided, the operator is responsible for complying with the Migratory Bird Treaty Act, which prohibits the "take" of birds or active nests (those containing eggs or young), including nest failure caused by noise and human activity.

Table 3.5 Rights of Way (ROW)

ROW Type	Holder	Serial Number
O&G Pipeline	ETC Canyon	COC 25378F
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O&G Pipeline	Northwest Pipeline	COC 011243
O&G Facility Site-compressor	Encana	COC 55150
O&G Facility Site-compressor	Maralex	COC 35158
O&G Facility Site-compressor	ETC Canyon	COC 25378
O&G Facility Site- cathodic protection	ETC Canyon	COC 25378J

Standard Conditions of Approval

1. Administrative Requirements. The operator shall notify the BLM representative at least 48 hours prior to initiation of construction or reclamation activities. If requested by the BLM representative, the operator shall schedule a pre-construction meeting, including key operator and contractor personnel, to review all lease stipulations and conditions of approval (COAs), prior to initiation of surface disturbance.

2. Pre-Construction and Limit of Disturbance. Before surface disturbance, stakes, snow fence or flagging shall be installed to mark boundaries of permitted areas of disturbance, including pre-construction BMPs and soils storage areas. As necessary, slope, grade, and other construction control stakes shall be placed to ensure construction in accordance with the Surface Use Plan. All boundary markers shall be maintained in place until final construction cleanup is completed. If disturbance boundary markers are disturbed, they shall be replaced before construction proceeds.

3. Soils. Cuts and fills shall be minimized when working on erosive soils and slopes in excess of 30 percent. Cut-and-fill slopes shall be stabilized through revegetation practices with an approved seed mix shortly following construction activities to minimize the potential for slope failures and excessive erosion. Fill slopes adjacent to drainages shall be protected with well-anchored silt fences, straw wattles, or other acceptable BMPs designed to minimize the potential for sediment transport. On slopes greater than 50

percent, BLM personnel may request a professional geotechnical analysis prior to construction.

4. Construction, Vegetation Removal, Topsoil Stripping and Storage. When saturated soil conditions exist on access roads or pads, construction shall be halted until soil material dries or thaws or until construction can proceed without soil damage. No topsoil shall be stripped when soils are saturated or frozen below the stripping depth. Prior to construction or pipeline installation, areas of such approved activities shall be cleared of trees, which shall be chipped or shredded in place, then salvaged and stored with topsoil. No stump left in place shall exceed six inches in height. Brushy vegetation may be windrowed before topsoil stripping and scattered on reclamation areas.

   All topsoil shall be stripped following removal of vegetation during construction of well pads, pipelines, roads, or other surface facilities. In areas of thin soil, a minimum of the upper 6 inches of surface material shall be stripped. The BLM may specify a stripping depth during the onsite visit or based on subsequent information regarding soil thickness and suitability. The stripped topsoil shall be stored separately from subsoil or other excavated material and replaced prior to final seedbed preparation. The BLM best management practice (BMP) for the **Windrowing of Topsoil** shall be implemented for well pad construction whenever topography allows (refer to the BLM 2009 PowerPoint available upon request). Topsoil berms shall be seeded within 30 days to maintain soil microbe health, reduce erosion, and prevent weed establishment.

5. Road Construction and Maintenance. Roads shall be crowned, ditched, surfaced, drained with culverts and/or water dips, and constructed to BLM Gold Book standards. Initial gravel application shall be a minimum of 6 inches. The operator shall provide timely year-round road maintenance and cleanup on the access roads. A regular schedule for maintenance shall include, but not be limited to, blading, ditch and culvert cleaning, road surface replacement, and dust abatement. When rutting within the traveled way becomes greater than 6 inches, blading and/or gravelling shall be conducted as approved by the BLM. Ditches shall be allowed to vegetate and/or shall include large rocks or stones to slow the velocity of drainage and allow sediment to settle out. Ditches may be seeded where soils are erodible.

6. Dust Abatement. The operator shall prevent and abate fugitive dust as needed. The BLM may direct the operator to change the level and type of treatment if dust abatement is insufficient. BLM approval is required before application of surfactants, binding agents, or other dust-suppression chemicals on roadways within public lands. Speed control measures on all project-related unpaved roads shall also be required.

7. Jurisdictional Waters of the U.S. The operator shall obtain appropriate permits from the U.S. Army Corps of Engineers (USACE) prior to discharging fill material into waters of the U.S. in accordance with Section 404 of the Clean Water Act. Waters of the U.S. are

defined in 33 CFR Section 328.3 and may include wetlands as well as perennial, intermittent, and ephemeral streams. Permanent impacts to waters of the U.S. may require mitigation. Contact the USACE Colorado West Regulatory Branch at 970-243-1199 ext. 17 (Travis Morse). Copies of any printed or emailed approved USACE permits or verification letters shall be forwarded to the BLM.

8. Drainage Crossings and Culverts. Construction activities at perennial, intermittent, and ephemeral drainage crossings (e.g. burying pipelines, installing culverts) shall be timed to avoid high flow conditions. Culverts at drainage crossings shall be designed and installed to pass a 25-year or greater storm event. On perennial and intermittent streams, culverts shall be designed to allow for passage of aquatic biota. The minimum culvert diameter in any installation for a drainage crossing or road drainage shall be 24 inches. Crossings of drainages deemed to be jurisdictional waters of the U.S. pursuant to Section 404 of the Clean Water Act may require additional culvert design capacity. Due to the flashy nature of area drainages and anticipated culvert maintenance, the U.S. Army Corps of Engineers (USACE) recommends designing drainage crossings for the 100-year event. Contact the USACE Colorado West Regulatory Branch at 970-243-1199 ext. 17 (Travis Morse).

   Pipelines installed beneath stream crossings shall be buried at a minimum depth of 4 feet below the channel substrate to avoid exposure by channel scour and degradation. Following burial, the channel grade and substrate composition shall be returned to pre-construction conditions.

   Low-water crossings shall conform to the natural channel shape and slope and be designed to minimize bank failures, channel incision and scour, and aggradation at the crossing. Crossings shall be constructed at-grade and consist of an armored channel bottom and banks using local rock material, appropriately sized rock material, or rock gabions. Additionally, design specifications shall be produced by a qualified and certified engineer and these specifications shall be available to the BLM upon request prior to commencement of construction activities.

9. Range Management. Damage to range improvements (fences, gates, reservoirs, pipelines, etc.) shall be avoided during development of oil and gas resources. If range improvements are damaged during exploration and development, the operator shall repair or replace the damaged range improvements. If a new or improved access road bisects an existing livestock fence, a steel frame gate or a cattleguard with bypass gate shall be installed across the roadway to control grazing livestock.

10. Reclamation. Prior to interim reclamation, the operator shall meet with BLM to inspect the disturbed area, review the existing reclamation plan, and agree upon any revisions to the plan. The objectives of interim reclamation are to return the disturbed area to productive use and meet the objectives of the land and the resource management plan. Interim reclamation will be considered successful when disturbed areas not needed for long-term production operations or vehicle travel have been recontoured and stabilized;

revegetated with a self-sustaining, vigorous, diverse, native (or otherwise approved) plant community that minimizes visual impacts, provides forage and stabilizes soils. Seeded species will be considered firmly established when at least 50 percent of the new perennial plants are producing seed.

Deadline for interim reclamation earthwork and seeding.
Interim reclamation to reduce a well pad to the maximum size needed for production, including earthwork and seeding of the interim reclaimed areas, shall be completed within 6 months following completion of the last well planned on that pad. Deadline is subject to extension on a case-by-case basis upon approval of the BLM, based on season, timing limitations, or other constraints. If an extension is needed, a request shall be submitted writing to the BLM. If an extension is granted, temporary surface stabilization (hydro-mulch, erosion matting, etc) may be required.

Seedbed preparation.
Seedbed Preparation: For cut-and-fill slopes, initial seedbed preparation shall consist of backfilling and recontouring to achieve the configuration specified in the reclamation plan. For compacted areas, initial seedbed preparation shall include ripping to a minimum depth of 18 inches with a maximum furrow spacing of 2 feet. Where practicable, ripping shall be conducted in two passes at perpendicular directions. Following final contouring, the backfilled or ripped surfaces shall be covered evenly with topsoil. The BLM may require also require soil amendments if topsoil is inadequate. Final seedbed preparation shall consist of scarifying (raking or harrowing) or roughening the spread topsoil prior to seeding.

Seed Mixes.
All disturbed areas shall be seeded with a seed mixture approved by the BLM and be consistent with BLM standards in terms of species and seeding rate for the specific habitat type within the project area. The seed shall contain no noxious, prohibited, or restricted weed seeds and shall contain no more than 0.5 percent by weight of other weed seeds. Seed tags or other official documentation shall be submitted to BLM at least 14 days before the date of proposed seeding for acceptance. Seed that does not meet the above criteria shall not be applied to public lands.

Seeding procedures. Seeding shall be conducted no more than 24 hours following completion of final seedbed preparation.

i. Where practicable, seed shall be installed by drill-seeding to a depth of 0.25 to 0.5 inch. Where drill-seeding is impracticable, seed may be installed by broadcast-seeding at twice the drill-seeding rate, followed by raking or harrowing to provide 0.25 to 0.5 inch of soil cover or by hydroseeding and hydromulching. Hydroseeding and hydromulching shall be conducted in two separate applications to ensure adequate contact of seeds with the soil.

ii. If interim revegetation is unsuccessful, the operator shall implement subsequent reseedings until interim reclamation standards are met.

Site Protection. Following interim reclamation, the pad shall be fenced to BLM standards to exclude livestock grazing for the first two growing seasons or until seeded species are firmly established, whichever comes later. The seeded species will be considered firmly established when at least 50 percent of the new plants are producing seed. The BLM will approve the type of fencing.

Mulch. Mulch shall be applied within 24 hours following completion of seeding. Mulch may consist of either hydromulch or of certified weed-free straw or certified weed-free native grass hay crimped into the soil.

NOTE: Mulch is not required in areas where erosion potential mandates use of a biodegradable erosion-control blanket (straw matting).

Erosion Control. Cut-and-fill slopes shall be protected against erosion with the use of water bars, course surface roughening, lateral furrows, or other measures approved by the BLM. Cut-and-fill slopes along drainages or in areas with high erosion potential shall also be protected from erosion using hydromulch designed specifically for erosion control or biodegradable blankets/matting, bales, or wattles of weed-free straw or weed-free native grass hay. A well-anchored straw wattles shall also be placed at the toe of cut-and-fill slopes along drainages or to protect other sensitive areas from deposition of soils eroded off the slopes. Additional BMPs shall be employed as necessary to reduce soil erosion and offsite transport of sediments.

Monitoring. The operator shall conduct annual monitoring surveys of all sites categorized as "operator reclamation in progress" and shall submit an annual monitoring report of these sites to the BLM by December 31 of each year. The annual report shall document whether attainment of reclamation objectives appears likely. If one or more objectives appear unlikely to be achieved, the report shall identify appropriate corrective actions.
Weed Control. The operator shall regularly monitor and promptly control noxious weeds or other undesirable plant species as set forth in the joint BLM/ Forest Service *Noxious and Invasive Weed Management Plan for Oil and Gas Operators*, dated March 2007. A Pesticide Use Proposal (PUP) must be approved by the BLM prior to the use of herbicides. Annual weed monitoring reports shall be submitted to the authorized officer by December 1.

11. Visual Resources. Production facilities shall be placed to avoid or minimize visibility from travel corridors, residential areas, and other sensitive observation points—unless directed otherwise by the BLM due to other resource concerns Facilities shall be placed as indicated on the plats attached to the APD, unless an alternative placement is approved

by the BLM. All permanent structures installed on the location will be painted a flat non-reflective Shale Green, of the standard environmental colors.

12. Heritage Resources - Cultural and Paleontological. All persons in the area who are associated with this authorization shall be informed that any person who, without a permit, injures, destroys, excavates, appropriates or removes any vertebrate fossil, historic or prehistoric ruin, artifact, object of antiquity, Native American remains, Native American cultural item, or archaeological resources on public lands is subject to arrest and penalty of law (16 USC 433, 16 USC 470, 18 USC 641, 18 USC 1170, and 18 USC 1361). Any heritage resource discovered requires that work in the area must stop and the BLM Authorized Officer notified. Strict adherence to the confidentiality of information concerning the nature and location of archeological resources would be required of the proponent and all of their subcontractors (Archaeological Resource Protection Act, 16 U.S.C. 470hh).

Inadvertent Discovery:

a. The National Historic Preservation Act (NHPA) [16 USC 470s., 36 CFR §800.13], as amended, requires that if newly discovered historic or archaeological materials or other cultural resources are identified during the Proposed Action implementation, work in that area must stop and the BLM Authorized Officer (AO) must be notified immediately. Within five working days the AO will determine the actions that will likely have to be completed before the site can be used, assuming in place preservation is not necessary §800.13(b)(3).
b. The Native American Graves Protection and Repatriation Act (NAGPRA) [25 USC 3001 et seq., 43 CFR 10.4] requires that if inadvertent discovery of Native American Human Remains or Objects of Cultural Patrimony occurs, any activity must cease in the area of discovery, a reasonable effort made to protect the item(s) discovered, and immediate notice be made to the BLM Authorized Officer, as well as the appropriate Native American group(s) (IV.C.2). Notice may be followed by a 30-day delay (NAGPRA §3(d)).
c. The Paleontological Resources Preservation Act (PRPA) [16 U.S.C. 470aaa] requires the proponent to immediately suspend activities in the vicinity, protect the discovery from damage and notify the BLM Authorized Officer of any paleontological resources discovered as a result of operations under this authorization. The Authorized Officer will evaluate, or will have evaluated, such discoveries as soon as possible, but not later than 10 working days after being notified. Appropriate measures to mitigate adverse effects to significant paleontological resources will be determined by the Authorized Officer after consulting with the operator. Within 10 days, the operator will be allowed to continue construction through the site, or will be given the choice of either (1) following the Authorized Officer's instructions for stabilizing the fossil resource in place and avoiding further disturbance to the fossil resource, or (2) following

the Authorized Officer's instructions for mitigating impacts to the fossil resource prior to continuing construction through the project area.

d. If human remains are discovered on private or state land associated with this authorization, the BLM will notify the State of Colorado Archaeologist immediately, who will comply with Colorado Revised Statutes (Appendix) regarding the discovery of human remains (24-80-1302).
e. In the case of a new discovery, the operator may relocate activities to avoid the expense or mitigation and delays associated with this process, as long as the new area has been appropriately inventoried and has no resource concerns, and the exposed materials are recorded and stabilized. Otherwise, the operator shall be responsible for mitigation costs. The BLM authorized officer will provide technical and procedural guidelines for relocation and/or to conduct mitigation. Upon verification from the BLM authorized officer that the required mitigation has been completed, the operator will be allowed to resume construction.

Drilling Conditions of Approval

1. Twenty-four hours *prior* to (a) spudding, (b) conducting BOPE tests, (c) cementing/running casing strings, and (d) within twenty-four hours *after* spudding, the Grand Junction Field Office shall be notified.
2. Contact this office for a verbal approval prior to commencing remedial work, plugging operations on newly drilled boreholes, changes within the drilling plan, sidetracks, changes or variances to the BOPE, deviating from conditions of approval, and conducting other operations not specified within the APD.
3. If a well control issue or failed test (e.g. kick, blowout, water flow, casing failure, or a bradenhead pressure increase) arises during drilling or completions operations, Bob Hartman 970-244-3041 (office) shall be notified within 24 hours from the time of the event. IADC/Driller's Logs and Pason Logs (mud logs) will be forwarded to the Grand Junction Field Office within 24 hours of a well control event.
4. The BOPE shall be tested and conform to Onshore Order No. 2 for a **5M** system and recorded in the IADC/Driller's log. A casing head rated to 5,000 psi or greater shall be utilized.
5. As a minimum, cement shall be brought to 200 feet above the Mesaverde. After WOC for the production casing, a CBL shall be run to verify the TOC and an <u>electronic copy in .las and .pdf format will be submitted to the Grand Junction Field Office within 48 hours.</u> If the TOC is lower than required or the cement sheath of poor quality, then within 48 hours from running the CBL and prior to commencing fracturing operations contact this office to discuss remedial operations.

   A greater volume of cement may be required to meet the 200 foot cement coverage requirement for the Williams Fork Fm./Mesaverde Group. Evaluate the top of cement on the first cement job on the pad (Temperature Log). If cement is below 200 foot cement coverage requirement, adjust cement volume to compensate for low TOC/cement coverage.

6. On the first well drilled on this pad, a triple combo open hole log shall be run from the base of the surface borehole to surface, and from TD to bottom of surface casing shoe. This log shall be in submitted within 48 hours in .las and .pdf format to the Grand Junction Field Office
7. Submit the (a) mud/drilling log (e.g. Pason disc), (b) driller's event log/operations summary report, (c) production test volumes, (d) directional survey, and (e) Pressure Integrity Test results within 30 days of completed operations (i.e. landing tubing) per 43 CRF 3160-9 (a).

APPENDIX B

SURFACE USE PLAN OF OPERATIONS

Encana APDs –Hay Canyon HC H34 6102WELL PAD
Encana Oil & Gas (USA) Inc.
Federal Surface Use Plan

Lease No COC-10146

No.	Well Number	Bottom Hole Locations
1	DHS1C-34 H34 6102	SESE Sec 34 T6S, R102W
2	DHS3C-34 H34 6102	SWSE Sec 34 T6S, R102W
Lease No COC-10372		
3	DHN3C-27 H34 6102	NWNE Sec 27 T6S, R102W
4	DHN1C-27 H34 6102	SENE Sec 27 T6S, R102W

1. EXISTING ROADS

A. The proposed well-site is staked and reference stakes are present as shown on attached Topo maps.
B. Access Roads – refer to *Topo Maps "A" and "B"*.
C. Access Roads within a one-mile radius – refer to *Topo Map "B"*.
D. The existing roads will be maintained in the same or better condition as existed prior to the commencement of operations and said maintenance will continue until final abandonment and reclamation of the well location. Excessive rutting or other surface disturbance will be avoided.
E. Proceed in a northwesterly direction from Grand Junction, CO on Highway 6 approximately 15.3 miles to Loma, Colorado; Turn right on HWY 139 and proceed in a northerly, then northeasterly direction approximately 22.7 miles to the junction of this road and the existing road to the northeast; Turn right and proceed in a northeasterly direction approximately 0.15 miles to the beginning of the proposed access road to the northeast; follow road flags in a northeasterly direction approximately 140' to the proposed location. Total distance from Grand Junction, CO to the proposed well location is approximately 38.15 miles.
F. Onsite Inspection was held on October 27, 2011 with the BLM.

2. PLANNED ACCESS ROADS

Proposed access roads are shown on Topo Map "B".

A. The roadway length of the existing road to the HC H34 6102 pad (1360') will be re-routed approximately 900' to run around the east side of the pad. A 140' of the existing road will remain as an entrance to the pad at the South end and will be improved to all weather condition for safety considerations and the nature of anticipated truck traffic. All road work will be done according to BLM Manual Section 9113 standards.
B. Access road disturbance will be approximately 18'-22' width, with a 30' construction width.

C. The maximum grade on the proposed access road will be about 5%.
D. The topsoil along the road will be stripped. Topsoil berms will be constructed generally parallel to the road.
E. All cut and fill slopes will be seed bed prepped and revegetated.
F. An 18"culvert will be installed on the road near corner 2 and another 18" culvert on the re-routed road near corner 8 of the pad, as well as two bar ditches at the fork of the entrance access and the re-routed road on the south end of the location
G. No major cuts and fills on the road.
H. 3 inch road base will be used for road surfacing.
I. Capping or sloping and dipping the roadbed as necessary to provide a well-constructed and safe road.
J. Prior to upgrading the roadway shall be cleared of any snow cover and allowed to dry completely.
K. No gates, cattle guards or fence cuts are required.
L. Road maintenance – during the drilling and production phase of operations, the road surface and shoulders will be kept in a safe and legal condition and will be maintained in accordance with the original construction standards. The access road will be kept free of trash during operations.
M. Dust will be controlled on the roads and locations during construction and drilling by periodic watering of the roads and locations.
N. If the well is a producer, Encana will upgrade and maintain access roads as necessary to prevent soil erosion, and accommodate year around traffic.
O. For more information on how the stormwater features of access roads are handled in the Preconstruction/Construction/Interim/Final Reclamation stages please refer to Douglas Creek Arch Stormwater Management Plan COR-039171 (July 2007) and General Reclamation Surface Management Guideline (March 2011). This plan is on file at the operator's field office and is available for review upon request.

3. LOCATION OF EXISTING WELLS WITHIN A ONE MILE RADIUS
Please refer to *Topo Map "C"*

4. LOCATION OF EXISTING AND/OR PROPOSED FACILITIES

B. At each drill location, surface disturbance will be kept to a minimum. Each drill pad will be leveled using cut and fill construction techniques as noted in the attached survey.
C. Should drilling result in established commercial production the following will be shown:
   1. Proposed location and attendant lines, by flagging, if off well pad.
   2. Dimensions of facilities.
   3. Construction methods and materials.
   4. Protective measures and devices to protect livestock and wildlife.
   5. Encana will need to install pipelines into a new 55' ROW.
      +/- 365' long x 55' width = .46 estimated acres of disturbance.
   6. Encana intends to install an up to 2" natural gas fuel line for wellhead compression, up to 6" Flow line that will run from our proposed H34 6102 location 365' to Hay Canyon Compressor Station NE of the pad. See Topo D

It is our intention to bury these pipelines. All disturbances will be reclaimed according to BLM requirements.

The area used to contain the proposed production facilities will be built using native materials. If these materials are not acceptable, arrangements will be made to acquire appropriate materials from private sources.

7. A dike will be constructed completely around any production facilities which contain fluids (i.e. production tanks, produced water tanks, etc.). These dikes will be constructed of compacted subsoil, be impervious, be lined with a minimum 24 mil impermeable line, hold 110% of the capacity of the largest tank, and be independent of the back cut.
8. All permanent (onsite for six months or longer) above-the-ground constructed or installed, including pumping units, will be painted a flat non-reflective, earth tone color to match one of the standard environmental colors as determined by the five State Rocky Mountain Interagency committee. All production facilities will be painted within six months of installation. Facilities that are required to comply with Occupation Health and Safety Act Rules and Regulations will be excluded from this painting requirement.
9. If different production facilities are required, a sundry notice will be submitted.
10. Run off and sediment Best Management Practices will be implemented and maintained according to the Douglas Creek Arch Storm Water Management Plan.
11. Encana Oil & Gas (USA) Inc. shall protect all survey monuments, witness corners, reference monuments and bearing trees in the affected areas against disturbance during construction, operation, maintenance and termination of the facilities authorized herein.

Encana Oil & Gas (USA) Inc. shall immediately notify the authorized officer in the event that any corners, monuments or markers are disturbed or are anticipated to be disturbed. If any monuments, corner or accessories are destroyed, obliterated or damaged during construction, operation or maintenance, Encana shall secure the services of a Registered Land Surveyor to restore the disturbed monuments, corner or accessories, at the same location, using surveying procedures found in the Manual of surveying Instructions for the Survey of the public Lands of the United States, latest edition. Encana shall ensure that the Registered Land Surveyor properly records the survey in compliance with the Colorado Revised Statues 38-53-101 through 38-53-112 (1973) and shall send a copy to the authorized officer.

D. During drilling and subsequent operations, all equipment and vehicles will be confined to the access road right of way and any additional areas as specified in the approved Application for Permit to Drill.
E. Interim reclamation of disturbed areas no longer needed for drilling/completion operation will be accomplished by grading, leveling and seeding as recommended by the Bureau of Land Management.

F. Encana Oil & Gas (USA) Inc. will be responsible for road maintenance from the beginning to completion of operations.
G. *See Sheet 6 of 11* for proposed location of Production Facilities.
H. The production facility may consist of 4-500 bbls water tanks, 8- 500 bbls condensate tanks, 4 separators, 1 combuster, 1 dehy, 1 compressor and 1 meter house. Pad Sales meters and buildings are approximately 6' x 6'.

5. LOCATION AND TYPE OF WATER SUPPLY

D. Water to be used for the drilling and completing of these wells may be delivered to the location by truck over the roads described in items #1 and #2. The water source may be from (1) recycled flow back water (frac water from completion operations), production water gathered from producing wells, or some combination thereof resulting from ongoing operations in the Piceance Basin that may be treated for reuse, or (2) fresh water from available water rights in the Piceance Basin.
E. The water provider is Encana. Encana maintains numerous water rights in the Piceance Basin. Any fresh water used in operations may come from various approved points of diversion along the Colorado River (reference decrees #CA-8303 and #CA-4004, case # 2010 CW 175), likely the DeBeque area alternate point of diversion or may be purchased from 3rd party supplier. Any recycled production water used in operations will come from various Encana-owned natural gas wells in the Piceance Basin, likely hauled from Encana's Middle Fork Water Treatment Facility located North of Parachute, CO, approximately 24.9 miles to De Beque, CO.
F. The estimated amount of water used for construction, drilling and dust abatement is 8000 bbls fresh water per well. Completions will use ~400,000 bbls per well of either produced or recycled water. The routes the trucks will take if it becomes necessary to truck water would be the route indicated in the driving directions from Parachute, CO. See Section 1- E.

6. SOURCE OF CONSTRUCTION MATERIALS

C. All access roads crossing Federal land are described under Item #2, and shown on *Topo Map "A".*
D. All necessary materials for earthwork construction are on this location. We will not be borrowing materials from any other location.
E. Root balls shall be buried or placed off location or access road to be scattered back over the disturbed area as part of the final reclamation.
D. There will be no additional fill required.

7. METHODS OF HANDLING WASTE MATERIALS

L. Cuttings will be stabilized in a steel cuttings bin (~45' x 12' x 10') and stockpiled on site. Cuttings Management: cuttings deposited in the steel bin will be solidified with sawdust. Cuttings will be moved from the steel bin to the cuttings area, on the Northwest side of the pad in the cutslope. The cuttings will be managed per the COGCC regulations. For reclamation we bury the cuttings on location in the cut slope and capped with a minimum

3' of native material then spread topsoil and seed with appropriate stormwater management BMP's.

M. The steel cuttings bin and flare ditch will be constructed on the existing location and will not be located in natural drainages where a flood hazard exists or surface runoff will destroy or damage the walls. All pits will be constructed so as not to leak, break, or allow the discharge of liquids there from. All pits will be constructed, operated and maintained in accordance with the applicable BLM/COGCC rules and regulations.
N. Drilling fluids are contained in a closed loop system. When drilling on a location is finished the fluids are dewatered and transferred by truck to another drilling location.
O. In the event that adverse weather conditions prevent removal of the fluids from the mud system within this time period, an extension may be granted by the Authorized Officer upon receipt of a written request from Encana Oil & Gas (USA) Inc.
P. Salts are not encountered while drilling and we do not use salt based mud.
Q. Chemicals are stored on location in secondary containment and used as necessary to treat mud. The chemicals are contained, used in the mud or transferred to another location. They are not disposed of.
R. Produced fluids – liquid hydrocarbons produced during natural gas production operations will be confined to flow back tanks on location. Produced fluids may be recycled and reused in drilling/fracing operations on other area wells or locations. Excess water may be piped or trucked to permitted Encana-owned disposal wells and/or trucked to a licensed commercial disposal facility. Encana will use the DCU #1 (103-05083) located in the NWSW of Sec. 5, T3S, R101W and the Dragon Trail 1121 (103-09370) located in the NWSW of 33 T2S R102W for Encana operated disposal wells. The commercial disposal facility is Danish Flats Environmental Service, Inc. Office Headquarters: 616 W. Monument St. Colorado Springs, CO 80905. (719) 598.9735. Disposal Site (Evaporation Facility) I-70 @ Exit 214 Cisco, UT. Water hauling will be done by either Knowles Trucking (970) 434.1912 or RNI Trucking (970) 250.6495.
S. Sewage- self-contained, chemical toilets will be provided for human waste disposal. Upon completion of operations, or as needed, the toilet holding tanks will be pumped and the contents thereof disposed of by P.T.I Group USA (PO Box 670 Vernal, UT 84078 (435)789.0872) and taken to the Clifton Land Farm.
T. Garbage and other waste material – garbage, trash and other waste materials will be collected in a portable, self-contained and fully enclosed trash cage during drilling and completion operations. Upon completion of operations (or as needed) the accumulated trash will be disposed of by Western Colorado Waste Service (1847 7 RD Mack, CO 81525 (970) 858.7518). The trash will be disposed of at either the Mesa County Landfill or the City of Rifle Garfield County Landfill. No trash will be burned on location.
U. Immediately after removal of the drilling rig, all debris and other waste materials not contained in the trash cage will be cleaned up and removed from the well location. No adverse materials will be left on the location.
V. All spills of oil, gas, other potentially hazardous substances will be reported in accordance with applicable rules and regulations, and will be remediated on site, as appropriate, or removed to an approved disposal site.

8. ANCILLARY FACILITIES

Self-contained travel-type trailers may be used on site during drilling operations. Certified Colorado Department of Housing units will be provided for use in the extraction of gas on COGCC approved pads. These units will be used by Essential Personnel and will abide by Federal, State, and local regulations which directly pertain to Temporary Employee Housing (TEH) or Temporary Living Quarters (TLQ), depending on the County in which extraction will be taking place.

For more information on how the stormwater features of the well pad and road are handled during Preconstruction/Construction/Interim/Final Reclamation please refer to Douglas Creek Arch Stormwater Management Plan COR-039171 (July 2007) and General Reclamation Surface Management Guideline (March 2011). This plan is on file at the operator's field office and is available for review upon request.

Encana will set tanks on the adjacent Maralex Pad with the Calf Canyon 34-2 located in the SENE of Sec. 34 T6S, R102W and run a temporary surface poly line to the proposed location during fracking operations.

Potable is water provided by water haulers certified by the Colorado Department of Public Health & Environment.
Septic will be held in County approved engineered ISDS Vault and Haul systems. Waste materials generated by and from these units will be contained in wildlife proof containers and will be hauled weekly, or as needed.

9. WELLSITE LAYOUT

I. The attached plat specifies the drill site layout as staked. Cross sections have been drafted to visualize the planned cuts and fills across the location. All suitable topsoil material will be stripped and stockpiled, (topsoil to be stripped from this location, including the areas of cut, fill and/or subsoil storage) and stockpiled for future reclamation of the well site. The windrowed and/or stockpiled topsoil will be seeded after construction is completed. There is no excess balance on this location.

J. Topsoil conservation practices include stockpiling and/or windrowing available topsoil. The stockpiles are to be tracked walk perpendicular to contour with a convex top and concave bottom then seeded and mulched. Depth and width will vary with availability and stormwater requirements. The estimated depth of the windrowed/stockpiled topsoil may vary between 6 inches to 10 feet.

K. Soil Unit Name: Battlement Loam (soil map unit 5) with 1-8 % slope. Ecological site: Foothill Swale; Drainage class: well drained.

L. In general, materials will be moved and returned according to a last out first in philosophy. No excessive rock was identified at the on-site.

M. The flare ditch will be unlined.

N. This pad is likely to have a small amount of standing water. This pad is designed to contain stormwater. Engineered designs have been included in pad layout exhibits to accommodate major stormwater events and interim reclamation concerns.

O. Methods of stabilization: Local factors will be evaluated to determine what BMPs are suitable and practical at the time of construction. BMPs will be employed in different combinations during construction activities and phases as conditions warrant. The following BMPs may be used: erosion control blankets, hydro seeding, terracing, vegetated buffers, topsoil stockpiles, etc. The tracked linear windrows promote topsoil stabilization because of compaction and reduced slope percent. The windrows are also seeded and hydro-mulched with a hydraulic erosion control mulch.

P. To control drainage, Local factors will be evaluated to determine what BMPs are suitable and practical at the time of construction. BMPs will be employed in different combinations during construction activities and phases as conditions warrant. The following BMPs may be used: toe berm, level spreader, run-on protection, etc.

K. For sediment control, Local factors will be evaluated to determine what BMPs are suitable and practical at the time of construction. BMPs will be employed in different combinations during construction activities and phases as conditions warrant. The following BMPs may be used: stabilized construction entrance, sediment reservoirs, sediment traps, detention pond, slash, wattle, etc.

M. For more information on how the stormwater features of well pad and roads, topsoil and subsoil segregation are handled during Preconstruction/Construction/Interim/Final Reclamation please refer to the Douglas Creek Arch Stormwater Management Plan COR-039171 (July 2007) and General Reclamation Surface Management Guideline (March 2011). This plan is on file at the operator's field office and is available for review upon request.

10. PLANS FOR RECLAMATION OF THE SURFACE

B. PRODUCTION (Interim/Final Reclamation): The BLM will be contacted prior to commencement of any reclamation operations.

1. Immediately upon well completion, the well location and surrounding areas(s) will be cleared of all debris, materials, trash and junk not required for production.
2. Upon completion of the initial well, Encana will evaluate the economics of the area. There is a possibility of three different scenarios:
   a) Assuming the area proves to be economic, Encana may return to drill the remaining 3 wells that are planned for this location. Interim reclamation will be applied within 6 months of the completion of the 4th well to all wells.
   b) If the area is not economic enough at this time to warrant drilling the remaining 3 wells within a reasonable timeframe (1 year) then interim reclamation will be applied to the first well within the one year.
   b) If the wells are not economic at all the wells may be plugged-final reclamation standards will be applied to the pad.

   The pad will be reclaimed except the working area which is usually 100' off wellheads and 10-15' around production equipment. The proposed reclaimed pad with all 4 wells surface is approximately 2.098 acres. *Please see sheet 6 of 11 of the survey package.*

3. Waste and spoil materials will be disposed of immediately upon completion of drilling and work-over activities.
4. The portion of the location and access road not needed for production facility/operations will be reclaimed within six (6) months from the date of well completion, weather permitting.
5. If the well is a producer, Encana will upgrade and maintain access roads as necessary to prevent soil erosion, and accommodate year round traffic. Areas unnecessary to operations will have areas reshaped. Topsoil will be redistributed and disked. All areas outside the work area will be re-seeded according to the Bureau of Land Management recommendations for seed mixture.
6. All cuttings areas and detention ponds will be closed as soon as possible.
7. A stormwater permit for the Douglas Creek Arch Area has been received from the Colorado Department of Public Health and Environment, Water Quality Control Division.
8. Methods of stabilization: Local factors will be evaluated to determine what BMPs are suitable and practical at the time of construction. BMPs will be employed in different combinations during construction activities and phases as conditions warrant. The following BMPs may be used: revegetation, rip rap, diversion ditch, etc.
9. Control drainage: Local factors will be evaluated to determine what BMPs are suitable and practical at the time of construction. BMPs will be employed in different combinations during construction activities and phases as conditions warrant. The following BMPs may be used: culverts, Run on protection berm, diversion ditch, etc.
10. Sediment control: Local factors will be evaluated to determine what BMPs are suitable and practical at the time of construction. BMPs will be employed in different combinations during construction activities and phases as conditions warrant. The following BMPs may be used: Run on Protection, detention pond, diversion ditch, etc.
11. During interim and final reclamation of the site, fill material will be pushed into cuts and up over the back slope. Allowance to construct sediment traps/reservoirs to maintain compliance with the state. Topsoil will be distributed evenly over the location and seeded according to the recommended seed mixture. The access road and location shall be ripped or disked prior to seeding. Perennial vegetation must be established. Additional work shall be required in case of seeding failures, etc.
12. For interim and final reclamation topsoil will be redistributed and disked. All areas outside the work area will be re-seeded according to the Bureau of Land Management recommendation for seed mixture. Upon completion of backfilling, leveling and recon touring, the stockpiled topsoil will be evenly spread over the reclaimed area(s). Segregation of topsoil material and replacement of topsoil in its respective position (last out, first in) method will assist in the re-establishment of soil health and productivity. Topsoil will also be placed on its respective slopes, i.e. oakbrush shrub soil and pinyon juniper woodland soil will not be

mixed. Prior to reseeding, all disturbed surfaces will be scarified and left with a rough surface. All disturbed surfaces will be re-seeded according to the Bureau of Land Management recommendation for seed mixture.

13. Slash/brush will be pushed to the terminal edge of disturbance along probable discharge edges as vegetation sediment control and during the life span of the site and kept in place to cold compost for final reclamation
14. There will be no additional fill required.
15. The fill will be separated mechanically and placed in 1 to 2 foot lifts using a dozer and blade.
16. At final reclamation all storm water management BMP's for drainage, sediment and erosion will be removed because the only remaining potential pollution source via stormwater will be runoff sediment. All sediment will be managed through revegetation practices (seeding on contour, crimping straw on contour and/or erosion control hydro-mulch, pocking and topsoil distribution. Perimeter wattles will remain until vegetation establishment meets minimum requirements.
17. In general, materials will be moved and returned according to a last out first in philosophy. No excessive rock was identified at the on-site.
18. The estimated surface disturbance for this well pad and proposed access roads:

Approximate Acreage Disturbance		
Well Disturbance	5.118	
Access Road Disturbance	0.096	
Access Re-Route		0.620
Pipeline Disturbance	0.461	
Total =		6.295

After reclamation an area of +/- 2.098 acres *(see sheet 6 of 11)* will remain.

19. Weed Control: A Weed Control Plan is on file at the operator's field office and is available for review upon request.

Pipeline Reclamation:

When the pipeline installation phase of the project is completed, the right-of-way will be restored as close as possible to pre-excavated grades and compaction. Topsoil will be redistributed as close to original salvage depths as possible. In areas with pre-existing rocky surface material, the stored rock will be spread over the right-of-way to maintain a surface appearance to that of adjacent undisturbed terrain. Every effort will be made to install permanent erosion control measures after re-contouring is complete. Any brush that was shredded will be spread evenly across the right-of-way. Seeding will take place with an approved seed mix and application rate provided by others. After seeding is complete the temporary BMP's will be replaced with permanent BMP's and monitored for any malfunctions. BMP's will continue to be inspected and maintained and any areas that do not have re-growth will be reseeded as necessary until final stabilization is achieved.

Revegetation contractor is responsible for sediment & pollution discharge control for preconstruction, construction & reclamation activities. This includes but is not limited to sediment removal from bar ditches, sediment traps, culvert inlets and culvert outlets.

9. Finish grading, drainage, and stormwater control & soil preparation per Stormwater Site Plans, including but not limited to, topsoil conservation/topsoil segregation, windrow, surface roughening, landforming /land grading and water bars.
10. Seed bed preparation: topsoil will be ripped to remove compaction up to a depth of 12".
11. Hydraulic amendment, seed, erosion control blanket and erosion control mulch applications.
12. Broadcast amendments, drill seeding and certified weed free straw crimping on slopes 2.5:1 or less.
13. Hydraulic amendment, seed and erosion control mulch applications on remaining areas and any areas found to be deficient.
14. Specified access road seeding and stormwater repair & modification per pre-reclamation meeting.
15. Seeding contractor is now responsible for acquiring straw that is harvested in a manner to reduce volunteer winter wheat. Wood mulch will also be considered, please submit with manufacturer's specifications.
16. In cases of winter wheat germination above 30% canopy, it is the seeding contractor's responsibility to ensure the winter wheat does not go to head or compete with the desired species. If there is more winter wheat than desirable species, reseeding will be required.

Final reclamation of the pipeline will be decided at the time at final reclamation per landowner requirements and directives. If for some reason Encana decides to abandon the pipeline during final reclamation it would be cut and capped. The pipeline would be left in place to avoid causing surface disturbance.

Prevention and Detection of Noxious Weeds:

e) If noxious weeds are found, they shall be treated (if timing is appropriate) or removed (if plants have formed seeds) prior to ground-disturbing activities to limit weed seed production and dispersal. If the treatment timing is not appropriate for the weed species, ground-disturbing activities may proceed.

f) All disturbed surfaces shall be promptly revegetated with certified weed-free seed per agency policy. BLM policy is to use native species for revegetation. Exceptions may be granted under certain conditions, such as the use of non-invasive non-native forbs when native forbs are unavailable or unlikely to succeed due to adverse conditions. Also, non-native, non-persistent sterile grasses may be used to provide ground cover for soil stabilization and weed suppression during temporary reclamation.

g) Topsoil stockpiles shall be promptly re-vegetated to maintain soil microbe health and prevent weeds. Native or non-native, non-persistent sterile grasses may be used to seed stockpiles.

h) Straw, hay, or other mulch used in reclamation shall be certified weed-free.

Inventory and Mapping of Noxious Weeds:

d) The center points of List A and B weed infestations (with the exception of redstem filaree and quackgrass) shall be marked with a GPS unit, or, GPS lines or polygons along or around weed infestations.

e) A Noxious Weed Inventory record shall be completed each time a List A or B weed infestation is inventoried (with the exception of redstem filaree and quackgrass).

f) Inventories for the presence of noxious weeds shall be conducted at least once early in the growing season for all areas disturbed by oil and gas exploration and development. Weeds shall be treated in an appropriate manner if found during inventories. Follow-up inventories and re-treatment during the same growing season may be necessary to provide additional control and/or eradication.

Weed Control:

a) The operator shall implement the best available weed control technique(s) at the appropriate times based on the life history of the weed species.

b) A Pesticide Use Proposal (PUP) shall be approved by the BLM prior to use of herbicides on BLM lands.

c) Only adjuvants and herbicides approved by the BLM shall be applied to BLM lands.

d) A Pesticide Application record shall be filled out each time pesticides are applied to BLM. The operator shall maintain these records for a minimum of three years.

e) All List A species and those List B species designated in Appendix A shall be immediately reported to the appropriate County, BLM, and FS Weed Manager.

e) Herbicide use shall follow application rates, restrictions and warnings listed on the label.

f) In situations where noxious weeds have escaped from the project area into adjacent sites, the infested areas shall be treated to prevent further expansion into un-infested areas and re-infestation of the treated area.

g) The operator shall use pesticide applicators licensed by the Colorado Department of Agriculture.

20. Spill Prevention Control and Countermeasure Plan (SPCC): The SPCC plan has been prepared for the project and is on file at the operator's field office and is available for review upon request. Encana is in substantial compliance with all 40 CFR part 112 rules.

B. For more information on how the stormwater features of well pads and roads, topsoil and subsoil segregation are handled during: Preconstruction/Construction/Interim/Final Reclamation please refer to Douglas Creek Arch Stormwater Management Plan COR-039171 (July 2007). This plan is on file at the operator's field office and is available for review upon request.

C. DRY HOLE /ABANDONED LOCATIONS

On lands administered by the BLM, abandoned well sites, roads or other disturbed areas will be restored to near their original condition.

This procedure will include:

5. Re-establishing irrigation systems where applicable,
6. Re-establishing soil conditions in irrigated field in such a way as to ensure cultivation and harvesting of crops and,
7. Ensuring revegetation of the disturbed areas to the specification of the BLM at the time of abandonment.
8. Monitoring the site annually for List A and List B noxious weeds and utilizing weed control methods, as deemed necessary under an objective-based management approach, in accordance with an approved PUP.

All disturbed surfaces will be recontoured to the approximate natural contours and re-seeded according to BLM specifications. Reclamation of the well pad and access road will be performed as soon as practical after final abandonment and reseeding operations will be performed in the fall or spring following completion of reclamation operations.

If the well is abandoned or a dry hole, Encana will restore the access road and location to approximately the original contours. During reclamation of the site, fill material will be pushed into cuts and up over the back-slope. Allowance to construct sediment traps/reservoirs to maintain compliance with the state. In Dry-land Revegetation allowance to pock sites to create micro-catchments for water containment for seed establishment. Topsoil will be distributed evenly over the location and seeded according to the recommended seed mixture. The access road and location shall be ripped or disked prior to seeding. Perennial vegetation must be established. Additional work shall be required in case of seeding failures, etc.

11. SURFACE OWNERSHIP:

BLM- Grand Junction.
2815 H Road
Grand Junction, CO 81506
970-244-3000

12. OTHER INFORMATION:

F. A Class III (intensive) Cultural Resource Inventory of the proposed drill sites, access roads and other facilities on federal lands has be conducted and a report filed with the appropriate BLM office. Grand River Institute has filed Cultural inventory. Wildlife or T&E surveys will be conducted by WestWater Engineering if required.

G. Encana respectfully requests to waive the timing limits for deer and elk winter range. The lease states that no surface use is allowed between 12/1-4/30. This area is near a Highway and the Hay Canyon Compressor station. The DOW has been consulted regarding this request.

H. If archaeological, historical or vertebrate fossil materials are discovered during the course of any construction activities, Encana will suspend all operations that further disturb such materials and immediately contact the appropriate BLM office. Operations in the area of discovery will not resume until written authorization to proceed has been issued by the BLM Authorized Officer (AO).
I. Encana will be fully responsible for the actions of their subcontractors. A copy of the approved APD and Conditions of Approval will be on location during drilling and completion operations.
J. Any construction activity in the areas shall be done with awareness that many natural gas pipelines are buried. Some are apparent as to location; some have grown over with weeds and brush. It is suggested that the contractor contact the operators in the area to locate all lines before digging.

13. REPRESENTATIVES AND CERTIFICATION:

The Operator will be fully responsible for the actions of its subcontractors. A complete copy of the approved Application for Permit to Drill will be furnished to the field representatives to ensure compliance and shall be on location during all construction and drilling operations.

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions that currently exist; that I have full knowledge of the State and Federal Laws applicable to this operation; that the statements made in this APD Package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD Package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for filing false statements.

Dated 03/29/2012, Executed this 29th day of March, 2012.

_____

Heather Mitchell
Regulatory Analyst
Encana Oil & Gas (USA) Inc.
370 17th Street, Suite 1700
Denver, CO 80202
(720) 876-3070

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
GRAND JUNCTION FIELD OFFICE

FINDING OF NO SIGNIFICANT IMPACT

Hay Canyon 4 Natural Gas Wells
DOI-BLM-CO-130-2012-022-EA

Based on the analysis of potential environmental impacts contained in the attached environmental assessment and considering the significance criteria in 40 CFR 1508.27, I have determined that the Proposed Action will not have a significant effect on the human environment. An environmental impact statement is therefore not required.

BACKGROUND

The Bureau of Land Management prepared an Environmental Assessment which analyzed the effects of the construction of a natural gas well pad, access road, pipeline and associated facilities in order to drill 4 horizontal natural gas well in an area north of Loma, Colorado. The EA considered a range of alternatives potentially causing impacts from the current 2.1 acres to the proposed action of 2.4 acres of public land.

The EA identified the applicant's [Encana Oil & Gas (USA) Inc.] Plan of Development as the Proposed Action.

Intensity

I have considered the potential intensity/severity of the impacts anticipated from the Hay Canyon 4 Natural Gas Wells Project decision relative to each of the ten areas suggested for consideration by the CEQ. With regard to each:

1. Impacts that may be both beneficial and adverse. This project may have minor adverse and short term impacts to air, soils, water, vegetation, wildlife, visual, traffic and recreation. However these impacts would be limited primarily to the construction period and are not significant. This project will add to the social change already occurring. There will be minor beneficial impacts to invasive species, minerals and economics utilizing the gas as an energy source.

2. The degree to which the proposed action affects public health and safety. The Proposed Action is not expected to impact public health and safety. Encana will follow their contingency plan for health, safety and wildfires.

3. Unique characteristics of the geographic area such as proximity of historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

There are no significant impacts to cultural, riparian vegetation, parklands, prime farmlands, wetlands, or ecologically critical areas within the project area. There are no municipal water supplies, wild and scenic rivers, rivers found suitable for inclusion in the wild and scenic rivers system, or lands with wilderness characteristics in the project area.

4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.

The impacts of oil and gas activities are generally well known and documented in the academic and practicing communities. Therefore the environmental effects are not likely to be controversial.

5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

Oil and gas activities have a long history in the region and pose no unique or unknown risks.

6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

This decision is like one of many that have previously been made and will continue to be made by BLM responsible officials regarding oil and gas exploration and development on public lands. The decision is within the scope of the Resource Management Plan and is not expected to establish a precedent for future actions. The decision does not represent a decision in principle about a future consideration.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.

There are no significant cumulative effects on the environment, either when combined with the effects created by past and concurrent projects, or when combined with the effects from natural changes taking place in the environment or from reasonably foreseeable future projects.

8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historic resources.

Three Sites were recorded as part of the cultural resource inventory and two historic sites were classified as not eligible and one pre-historic site was classified as potentially eligible (needs data) for the National Register of Historic Places (NRHP). These resources are located outside of the proposed footprint of the project and will not be impacted by the proposed project and no further work is recommended. The Standard Education/Discovery stipulations for cultural resource protection, as required by the NHPA (36 CFR 800.13), and the requirements of the Colorado State Statute (CRS 24-80-1301 *Historic, Prehistoric, and Archaeological Resources, and Unmarked Human Graves*, would protect any newly discovered cultural resources.

9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

No impacts are expected to endangered or threatened species or their designated critical habitats.

10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

This decision complies with other Federal, State, or local laws and requirements imposed for the protection of the environment.

FINDING OF NO SIGNIFICANT IMPACT

On the basis of the information contained in the EA, and all other information available to me, it is my determination that: 1) the implementation of the Proposed Action or alternatives will not have significant environmental impacts beyond those already addressed in the "Record of Decision and Resource Management Plan, (January, 1987)"; (2) the Proposed Action is in conformance with the Resource Management Plan; and (3) the Proposed Action does not constitute a major federal action having a significant effect on the human environment. Therefore, an environmental impact statement or a supplement to the existing environmental impact statement is not necessary and will not be prepared.

This finding is based on my consideration of the Council on Environmental Quality's (CEQ) criteria for significance (40 CFR 1508.27), both with regard to the context and to the intensity of the impacts described in the EA.

Catherine Robertson _____ 5/16/12 _____

Field Manager
Grand Junction Field Office

Date

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
GRAND JUNCTION FIELD OFFICE

DECISION RECORD
Hay Canyon 4 Natural Gas Wells
DOI-BLM-CO-130-2012-0022-EA

DECISION: It is my decision to authorize the Proposed Action as described in the attached EA. The proposed project includes: Construction of a well pad, 4 natural gas wells, 2 natural gas pipelines, rerouting 2 existing pipelines, rerouting an existing road and construction of a new access road, all located on BLM-managed federal land. The proposed action also includes a request for a waiver for the timing limitations attached to the lease. There is no specific timing limitation attached to the lease and therefore no waiver is necessary. However, mitigation identified for impacts to wintering wildlife will include the application of a 60-day timing limitation, pursuant to 43 CFR 3101.1-2. This decision requires the applicants to follow all of the mitigation measures and monitoring requirements included in the EA and their Plan of Development as well as the Conditions of approval. Mitigation measures are included as site-specific Conditions of Approval and are included as Attachment A.
Scoping, by posting this project on the Grand Junction Field Office NEPA website and at the Field Office reception area, were the primary mechanisms used by the BLM to initially identify issues. No comments were received. We have determined that the project will have no effect on federally listed species or designated critical habitat. Additionally, the proposed project was discussed at the BLM's NEPA review meeting held February 21, 2012 and the proposed site was visited October 27, 2011.

A Finding of No Significant Impact (FONSI) has been prepared and executed. Based on the analysis of potential environmental impacts contained in the attached environmental assessment, and considering the significance criteria in 40 CFR 1508.27, I have determined that the Proposed Action will not have a significant effect on the human environment. An environmental impact statement is therefore not required.

RATIONALE: I have considered the potential intensity/severity of the impacts anticipated from the Hay Canyon 4 Natural Gas Wells Project decision. Issues identified in the internal scoping related were analyzed and mitigated as necessary. This project may have minor adverse and short term impacts to air, soils, water, wildlife, visual, transportation, and invasive species. However, with the incorporation of mitigating measures, these impacts would be limited primarily to the construction period and are not significant. This project will add marginally to the social change already occurring. No significant cumulative impacts would occur.
As proposed with the design criteria and attached mitigation, there would be no effect on the current status or trends for the Public Land Health Standards. Other items considered are documented in the FONSI for the action.

MITIGATION MEASURES\MONITORING: Mitigation measures that are to be incorporated as Conditions of Approval for the Application for Permit to Drill are included in the EA as Appendix A.

PROTEST/APPEALS:
This decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 CFR, Part 4 and using Form 1842-1. If an appeal is taken, your notice of appeal must be filed in this office (2815 H Road, Grand Junction, Colorado) within 30 days from receipt of this decision. The appellant has the burden of showing that the decision appealed from is in error.

If you wish to file a petition (request) pursuant to regulation 43 CFR 2801.10 or 43 CFR 2881.10 for a stay (suspension) of the effectiveness of this decision during the time that your appeal is being reviewed by the Board, the petition for a stay must accompany your notice of appeal. A petition for a stay is required to show sufficient justification based on the standards listed below. Copies of the notice of appeal and petition for a stay must also be submitted to each party named in this decision and to the Interior Board of Land Appeals and to the appropriate Office of the Solicitor (see 43 CFR 4.413) at the same time the original documents are filed with this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

NAME OF PREPARER: Cathy Ventling, Natural Resource Specialist

NAME OF ENVIRONMENTAL COORDINATOR: Collin Ewing

DATE:

SIGNATURE OF AUTHORIZED OFFICIAL:

Grand Junction Field Manager

DATE SIGNED: 5/16/12

ATTACHMENTS:

Environmental Assessment DOI-BLM-CO-130-2012-022-EA

ATTACHMENT A
Site-Specific Conditions of Approval

4 Federal Wells, Encana Pad H34-6102
Leases COC-10372 and COC-10146
SENE Sec 34 T6S, R102W, Garfield County, CO

1. Air/Dust Control: The operator will restrict surface disturbing actions to periods when wind speeds are less than 35 mph.

2. Water: As discussed during the on-site, EnCana will collect water quality information from surface water (or groundwater if necessary) at minimum of one point in Hay Canyon or East Salt Creek below the proposed well pad prior to surface disturbance. Standard EPA protocols should be utilized to sample and test for total petroleum hydrocarbons and other chemicals commonly used to develop fluid minerals (BTEX, TVH, and TDS, pH, frac fluid components or an added isotopic tracer). Sampling these analytes should establish a baseline for water quality near the site prior to EnCana's development (prior development in this area was done by Maralex). EnCana should re-sample the original sample site(s) for the same parameters and provide results to BLM for review following 60 days of well completion and interim reclamation efforts.
3. Transportation: Encana would be required to obtain any necessary Transportation Permits from Mesa and Garfield County for oversize or overweight vehicles.

4. Transportation If traffic is disrupted during construction then suitable traffic control measures would be implemented. Traffic control measures would include warning signs, barriers or flagmen unless otherwise approved by the AO.

5. Fire Management: Operator or contractor personnel will call BLM Grand Junction Dispatch to report any wildfire started on BLM lands, (970)251-4800 or (970)244-3000.

6. Land Tenure, Rights of Way and Other Uses: The operator is required to communicate the proposal and timing of work to all right of way holders in the vicinity to prevent conflicts (see table 3.5 below).

7. Timing/Disturbance Limitations

   Big Game Winter Range Timing Limitation. Well development activity will be subject to a 60 day winter timing limitation for big game, specifically mule deer and elk from January 1 through March 1. No drilling, construction or completions activities may occur during this time without prior approval from BLM. Encana will need to request in writing exceptions to that condition on a case by case basis.

   Migratory Birds. To ensure compliance with the Migratory Bird Treaty Act, the operator should schedule construction or drilling activities to begin outside the raptor nesting season (February 1 to August 15) if practicable. If initiation of construction,

drilling, or completion activities during these dates cannot be avoided, the operator is responsible for complying with the Migratory Bird Treaty Act, which prohibits the "take" of birds or active nests (those containing eggs or young), including nest failure caused by noise and human activity.

Table 3.5 Rights of Way (ROW)

ROW Type	Holder	Serial Number
O&G Pipeline	ETC Canyon	COC 25378F
O&G Pipeline	ETC Canyon	COC 25378C
O&G Pipeline	Encana	COC 49003
O&G Pipeline	Northwest Pipeline	COC 011243
O&G Facility Site-compressor	Encana	COC 55150
O&G Facility Site-compressor	Maralex	COC 35158
O&G Facility Site-compressor	ETC Canyon	COC 25378
O&G Facility Site- cathodic protection	ETC Canyon	COC 25378J