



U.S. Department of the Interior
Bureau of Land Management

Coos Bay District
1300 Airport Lane
North Bend, OR 97459

September 2002



Coos County Natural Gas Pipeline Final Environmental Impact Statement



US Army Corps
of Engineers®

Cooperating Agency
PO Box 2946
Portland, Oregon 97208



Project Proponent
Coos County Board of Commissioners
250 N. Baxter
Coquille, Oregon



As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife; preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interest of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

BLM/OR/WA/PL-02/038+1792

Comments, including names and street addresses of respondents, will be available for public review at the Coos Bay District Office, 1300 Airport Lane, North Bend, during regular business hours (7:45 a.m. to 4:30 p.m.), Monday through Friday, except holidays. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety.

Summary

Summary of Changes between Draft and Final EIS

Based on public comments received on the Draft EIS, numerous corrections and clarifications were made to the Final EIS. Specific changes are identified at the beginning of each chapter. The following list summarizes the key changes.

- Clarification of the “No Action” alternative is summarized in this section.
- Additional information regarding air quality, including emissions fuel combustion was added to Chapter 4.
- Additional information regarding fire safety was added to Chapter 4.
- Appendix E, formerly the Aquatic Ecosystem Assessment, has been replaced with an Aquatic Biological Assessment due to the Federal Ninth Circuit Court of Appeals ruling on December 14, 2001 reinstating protections under the federal Endangered Species Act for Oregon Coho salmon.
- A revised Appendix H: Erosion Control Plan (ECP) has replaced the former ECP providing additional Project Design Criteria.
- A revised Appendix J: Pipeline Design, Construction, Operation and Maintenance has replaced the former Appendix J.
- Maps in Appendix C were replaced with 10 black and white sheets delineating BLM lands adjacent to the proposed action.
- Letters received during the 60-day comment period and responses to these letters have been added to this document as Appendix G-1 and G-2.

The Coos County Board of Commissioners is proposing to construct, operate and maintain a natural gas pipeline between Roseburg and Coos Bay, Oregon. This pipeline would begin at an existing natural gas pipeline a few miles south of Roseburg and terminate in the city of Coos Bay where a distribution facility would be built. This pipeline would be approximately 60 miles long and have a capacity of 70 million cubic feet of natural gas per day. The entire pipeline would be located within existing road and utility ROW. Approximately 3.0 miles of the pipeline would cross lands within utility ROW managed by the U.S. Department of Interior, Bureau of Land Management (BLM).

Coos County contracted three independent consulting corporations (Pipeline Solutions, Inc., Industrial Gas Service, Inc.) as professional advisors and Biological Information Specialists, Inc. for preparation of this FEIS.

To gain easements on public and privately owned lands, the Coos County Board of Commissioners filed an application with the BLM for a perpetual and renewable ROW in May 2000, and filed an application with Bonneville Power Administration (BPA) for consent to construct portions of the natural gas line within BPA utility corridors in August 2000.

Coos County submitted an application to the U.S. Army Corps of Engineers (COE) for permission to construct the pipeline across streams and wetlands in November 2000.

Agency Roles and Decisions to Be Made

Numerous agencies were involved in the preparation, consultation and permitting decisions for this project, as shown in Table S-1.

The BLM is the Lead Agency. The Secretary of the Interior, through the BLM, is mandated to process Mineral Leasing Act (MLA) applications across federal lands. Assuming the Record of Decision (ROD) selects the proposed action for construction of the pipeline, BLM will then issue authorization (ROW grant) under the MLA for use of federal lands.

Table S-1. Overview of Permit, Approval and Consultation Requirements for the Proposed Action

Agency	Permit/Authority
Federal Government	
U.S. Department of the Interior, Bureau of Land Management (BLM)	Record of Decision (ROD) Minerals Leasing Act: Title 1, Section 28 (c)(2) of the Mineral Leasing Act of 1920, as amended, November 16, 1973 authorizes the Secretary of the Interior to grant or renew ROW or permits and to enter into agreements with other land-managing federal agencies for the processing of applications for pipelines to transport oil natural gas, synthetic liquid or gaseous fuels, or refined products produced therefrom.
	ROW Grant Minerals Leasing Act
	Notice to Proceed
	Consultation
U.S. Army Corps of Engineers (COE)	Cooperating Agency
	Section 404 Clean Water Act
	Section 10 Rivers and Harbors Act
National Marine Fisheries Service (NMFS)	Consultation and Concurrence
U.S. Department of the Interior, Fish and Wildlife Service (USFWS)	Consultation and Concurrence
	Section 7 Endangered Species Act
Bonneville Power Administration (BPA)	ROW and consent to build sections of a natural gas pipeline within BPA utility corridors
All Land Owners Along the Pipeline ROW	
Pacific Power and Light (PP&L)	ROW and consent to build sections of a natural gas pipeline within PP&L utility corridors
Private land owners	ROW ownership agreements

Purpose and Need for Action

The purpose of the proposed action is to construct a 12 inch natural gas transmission pipeline from near Roseburg to Coos County. Natural gas transported by the pipeline would provide an alternative source of energy for existing or potential residential, commercial or industrial customers within the Coos County service area.

The total length of the pipeline is about 60 miles. Approximately 28 miles of smaller pipeline laterals would eventually be constructed to serve the Coos County cities of Coquille, Myrtle Point and possibly Bandon. This EIS provides the analysis necessary for BLM to make a decision on granting a discretionary right-of-way permit for the construction, operation, and maintenance of the pipeline on approximately three miles of BLM-administered land.

Coos County has never had direct access to natural gas as an energy source, but has relied on petroleum products and propane, electricity, or wood for energy sources. In 1999, Coos County leaders recognized the necessity for natural gas as critical to the community's economic survival. Government and civic leaders supported a public awareness campaign which resulted in a grant from the State of Oregon to publicly fund a gas pipeline. Ballot Measure #6-63, authorizing additional taxpayer funds for construction of a natural gas pipeline, was passed by a double majority of Coos County voters in November 1999.

Alternatives Analyzed in the Environmental Impact Statement (EIS)

Proposed Action: Natural Gas Pipeline

The proposed action responds to the above-stated Purpose and Need by transporting natural gas from Roseburg, Oregon, to Coos Bay, Oregon, at a lower cost than other alternatives.

The proposed natural gas pipeline would originate at an existing Williams Gas pipeline just south of Roseburg, extend southwest for approximately 60 miles where it would terminate at a distribution facility that would be built in Coos Bay. The proposed action would include construction of pipeline laterals supplying natural gas the communities of Coquille, Myrtle Point and possibly Bandon. The routes of these laterals are not yet finalized. Approximately 3.0 miles of the preferred pipeline route would cross BLM-managed lands within BPA utility ROW. The remainder of the pipeline would be located within the ROW of the Coos Bay Wagon Road (CBW Road), other public roads and utility ROW crossing privately owned properties. The pipeline would cross 188 streams and 1 wetland.

The pipeline would be a 12-inch diameter pipe, operating at a pressure from 500 to 800 pounds per square inch (psi). With the exception of line markers, test stations, bridge crossings and valve settings, the pipeline would be buried for its entire length.

No Action

For the purposes of this EIS the "No Action Alternative" is defined as the BLM would not grant Coos County a discretionary Right-of-Way permit for construction, operation, and maintenance of the natural gas pipeline on lands administered by the BLM. Affects addressed in the EIS associated with the No Action Alternative assume that the present conditions remain as they currently exist, that is, the pipeline would not be constructed.

However, if the Proposed Action as described in the EIS is denied, Coos County will proceed with plans to construct, operate, and maintain the natural gas pipeline within public roads and private easements included in the Proposed Action, avoiding crossing Federal land as necessary. Obtaining a right-of-way permit for crossing federal lands would not be necessary. Segments C, E, and G of the described Proposed Action would be built, mostly in the CBW Road. Approximately 86 percent of the proposed route would be built in the location described in the EIS Proposed Action. This re-route would result in the construction of approximately 4.0 additional miles of pipeline and cost an estimated \$2.3 million dollars more than the proposed action.

The Hwy 42 Alternative

This alternative would deliver natural gas from near Roseburg to Coos Bay by constructing a pipeline under or beside the road bed of Oregon Hwy 42 for approximately 83 miles. This route would cross sensitive wildlife areas and be located within difficult construction zones for approximately 7 miles. Construction would be more difficult due to the existing fiber optic cables buried on each side of the road. Construction along Hwy 42 would result in considerable traffic delays for an extended period of time.

This route would cross 209 streams and 9 wetlands. A route summary of environmental and economic impacts is given in Table S-2.

Table S-2. Impacts and Route Summary Including No Action

Alternative	Proposed Action	Hwy 42	No Action
Total length (miles)	59.1	82.7	63.1
Total stream crossings	188	209	188
Total wetlands crossed	2	9	2
Federally listed species	No Impact	No Impact	No Impact
Survey and Manage species	No Impact	No Impact	No Impact
Estimated Costs	\$34 million	\$48 million	\$36.3 million

Alternatives Considered but Eliminated from Detailed Study

Alternatives to the proposed action that were determined not to meet the need included alternative sources of natural gas; Compressed Natural Gas (CNG), Liquefied Natural Gas (LNG), Pacific Gas Transmission (PGT) and an alternative route following Hwy 38 or direct route. All of these alternatives were rejected because they were not economically feasible.

Potential Impacts

Five categories were used to evaluate potential impacts to the natural and built environments: negative impact, no negative impact, no anticipated impact, no effect and beneficial impact. For the resources discussed in this EIS, potential impacts from construction and operation are estimated to be “negligible short-term” to “no effect.”

List of Acronyms Used Within this Document

ACEC	-	Area of Critical Environmental Concern
ACS	-	Aquatic Conservation Strategy
AD	-	Anno Domini
AMA	-	Adaptive Management Area
API	-	American petroleum Institute
BA	-	Biological Assessment
BIS	-	Biological Information Specialists
BLM	-	Bureau of Land Management
BMP	-	Best Management Practice
BP	-	Before Present
BPA	-	Bonneville Power Administration
CBW Road	-	Coos Bay Wagon Road
CEQ	-	Council on Environmental Quality
CHU	-	Critical Habitat Unit
CFR	-	Code of Federal Regulations
cfs	-	cubic feet per second
CNG	-	Compressed Natural Gas
COE	-	U.S. Army Corps of Engineers
CR	-	County Road
CSZ	-	Cascadia Subduction Zone
CWTD	-	Columbian White-Tailed Deer
CZMA	-	Coastal Zone Management Act
DLCD	-	Department of Land Conservation and Development
DEQ	-	Department of Environmental Quality
DOT	-	Department of Transportation
DSL	-	Department of State Lands (Oregon)
EA	-	Environmental Assessment
ECA	-	Equivalent Clearcut Area
ECP	-	Erosion Control Plan
ECR	-	Environmental Compliance Representative
EIS	-	Environmental Impact Statement
EPA	-	Environmental Protection Agency
ERMA	-	Extensive Recreation Management Area
ESA	-	Endangered Species Act (1973)
FLPMA	-	Federal Land Policy and Management Act

FONSI	-	Finding of No Significant Impact
FSEIS	-	Final Supplemental Environmental Impact Statement
GIS	-	Geographical Information System
GLO	-	General Land Office
GWV	-	Gross Weight Vehicle
ha	-	hectares
HUC	-	Hydrologic Unit Code
IDT	-	Inter-disciplinary Team
IMPLAN	-	Impact Analysis for Planning
km	-	kilometer
kV	-	kilovolt
Kw	-	Kilowatt
LCDC	-	Land Conservation and Development Commission
LNG	-	Liquefied Natural Gas
LRMP BO	-	Land Resource Management Plan Biological Opinion
LSR	-	Late Successional Reserve
LSOG	-	Late Successional-Old-Growth
LWD	-	Large Woody Debris
mi	-	miles
MAOP	-	Maximum Allowable Operating Pressure
MMCFD	-	Million Cubic Feet Per Day
MOP	-	Maximum Operating Pressure
NEPA	-	National Environmental Policy Act (1969)
NMFS	-	National Marine Fisheries Service
NRHP	-	National Register of Historic Places
NFP	-	Northwest Forest Plan
NTU	-	Nephelometric Turbidity Unit
O&C	-	Oregon and California (land designation)
O&M	-	Operation and Maintenance
ODF	-	Oregon Department of Forestry
ODFW	-	Oregon Department of Fish and Wildlife
ODOT	-	Oregon Department of Transportation
OHV	-	Off-highway Vehicles
OMP	-	Operation and Maintenance Plan
ONHP	-	Oregon Natural Heritage Program
OPUC	-	Oregon Public Utilities Commission
OCMP	-	Oregon Coastal Management Plan
OSHA	-	Office of Safety and Health Administration

PDC	-	Project Design Criteria
PE	-	Polyethylene
POC	-	Port-Orford-cedar
pH	-	Potential of Hydrogen
PP&L	-	Pacific Power and Light
psi	-	pounds per square inch
psig	-	pounds per square inch gauge
PUE	-	Public Utility Easement
RCYBP	-	Radiocarbon Years Before Present
RMP	-	Resource Management Plan
ROD	-	Record of Decision
ROW	-	Right-of-Way
SC	-	Species of Concern
SCADA	-	Supervisory Control and Data Acquisition
SDP	-	Site Discovery Probes
SHPO	-	State Historic Preservation Office
SMYS	-	Standard Maximum Yield Strength
SWOCC	-	Southwest Oregon - Coos County
T&E	-	Threatened and Endangered
TMDL	-	Total Maximum Daily Load
T##S, R##W, Sec. ##	-	Township ## South, Range ## West, Section ##
USDI	-	United States Department of Interior
USFWS	-	United States Fish and Wildlife Service
USGS	-	United States Geological Service
VRM	-	Visual Resource Management
WA	-	Watershed Analysis
WAU	-	Watershed Analysis Unit

Table of Contents

Chapter 1	Purpose and Need	
	Purpose and Need	1
	Summary of Scoping and significant issues of the FEIS	1
	Conformance with BLM Resource Management Plan EIS	2
	Authorizing Actions and Relationship to Statutes and Regulations	2
	Interrelationship with Other Projects	2
	Interdependencies	3
Chapter 2	Alternatives Including the Proposed Action	
	Description of Proposed Action	5
	Location of the Proposed Action	5
	Description of the Proposed Action Corridor	7
	Pipeline Laterals	8
	Lateral Routes	8
	Proposed Action - Utility Corridors and the CBW Road	11
	No Action Alternative	11
	Hwy 42 Alternative (the South Route)	12
	Alternatives Considered But Rejected	13
Chapter 3	Affected Environment	
	Introduction	15
	General Setting of the Proposed Action	15
	Environment	16
	Air Quality	16
	Geology	16
	Natural Resources	16
	Cultural Resources (Including Native American Religious Concerns)	16
	Soils	16
	Proposed Action Vegetation	17
	Forest Types	17
	Vegetation of the Hwy 42 Alternative Route	17
	Farmlands, Prime and Unique	17
	Floodplain	17
	Water Quality, Quantity and Domestic Use	18
	Waters Along the Hwy 42 Alternative	19

Wild and Scenic Rivers	19
Wilderness or Wilderness Study Areas	19
Wildlife	19
Federally Listed, Proposed or Candidate Species	19
BLM Special Status Species	21
Survey and Manage Species	23
General Wildlife Groups	24
Human Environment	25
Area of Critical Environmental Concern (ACEC)	25
Public Health and Safety	26
Environmental Justice	26
Socio-economics in Coos County	26
Socio-economics within the Proposed Action	26
Waste - Solid or Hazardous	27
Land Uses	28
Transportation	29
Utility Corridors	32
Encumbrances	33
Chapter 4	Environmental Consequences
Introduction	35
Proposed Action Effects Summation	36
Environment	37
Air Quality	38
Natural Resources	39
Cultural Resources (Including Native American Religious Concerns)	39
Soils	39
Vegetation	40
Floodplains	42
Wild and Scenic Rivers	43
Wildlife	43
Aquatic Ecosystem	48
Human Environment	49
Areas of Critical Environmental Concern (ACEC)	62
Socio-economics	62
Environmental Justice	72
Public Health and Safety	72
Waste - Solid or Hazardous	73

Land Uses	75
Transportation	76
Utility Corridors	78
Chapter 5	Consultation and Coordination
Consistency with other Agency Plans and Programs	81
List of Contributors	82
Organizations Consulted	83
Distribution List and Document Availability on the Internet	86
List of Appendices	
Appendix A	Geotechnical Engineering Report
Introduction	A-3
List of References	A-28
Appendix B	Cultural Resources
Introduction	B-2
References Cited	B-20
Appendix C	Sheets 1-10
Appendix D	Agency Management Plans for Resources Adjacent to the Proposed Action
Visual Resource Management	D-2
Riparian Reserve and Aquatic Conservation Strategy Management	D-2
Watershed Management Plans	D-3
Appendix E	Aquatic Biological Assessment
Introduction	E-2
Dichotomous Key for Section 7 Determination of Effects	E- 36
List of References	E-37
Appendix E1	Essential Fish Habitat Assessment
Appendix F	U.S. Fish and Wildlife Service Endangered Species Consultation Letter of Concurrence
Appendix G	Questions and Concerns from the Public
Questions	G-2
Comments	G-12

Appendix G1	Letters Received During Draft Environmental Impact Statement Comment Period	
Appendix G2	Responses to Letters Received During Draft Environmental Impact Statement Comment Period	
Appendix H	Erosion Control Plan	
	Best Management Practices (BMPs)	H-2
	Active Stream Crossing Project Design Criteria (PDC)	H-3
Appendix I	Watersheds and Streams	
Appendix J	Pipeline Design, Construction, Operation and Maintenance Plan	
	Construction Methods and Operations	J-2
	Directional Drilling and Reaming Procedures	J-7
	Operation Description	J-13
	Maintenance Description	J-13
Appendix K	Survey and Manage Species	
Appendix K1	Special Status Species	
Appendix L	Glossary of Terms	
Appendix M	List of References	
Appendix N	Consistency Determination	

List of Tables

Table 1: Proposed Action Segment Description	7
Table 2: Action Alternatives Route Summary	10
Table 3: Route Summary for Proposed action	11
Table 4: Route Summary for Alternative 3 (along Hwy 42)	12
Table 5: Special Status Fish Species in Streams Near the Proposed Action	23
Table 6: Portions of the CBW Road Affected	30
Table 7: Other Roads Affected by Pipeline	32
Table 8: Definition of Key, Direct, Indirect and Cumulative Impacts	35
Table 9: Metal Emissions from Fuel Combustion	38
Table 10: Airborne Emissions from Fuel Combustion	38
Table 11: Acreage of soil area impacted by watershed in the proposed action	40
Table 12: Noxious Weeds in Utility Corridor	41
Table 13: Stream Description and Crossing Type on Utility Corridor within the Lower South Umpqua Watershed (5th field HUC)	51
Table 14: Stream Description and Crossing Type on Road Corridor within the Ollala Creek/Lookingglass Creek Watershed (5th field HUC)	52
Table 15: Stream Description and Crossing Type on Utility Corridor within the Ollala Creek/Lookingglass Creek Watershed (5th field HUC)	53
Table 16: Stream Description and Crossing Type on Road Corridor within the East Fork Coquille Watershed (5th field HUC)	54
Table 17: Stream Description and Crossing Type on Utility Corridor within the East Fork Coquille Watershed (5th field HUC)	55
Table 18: Stream Description and Crossing Type on Road Corridor within the North Fork Coquille River Watershed (5th field HUC)	56
Table 19: Stream Description and Crossing Type on Utility Corridor within the North Fork Coquille River Watershed (5th field HUC)	57
Table 20: Stream Description and Crossing Type on Road Corridor within the Middle Main Coquille River Watershed (5th field HUC)	58
Table 21: Stream Description and Crossing Type on Road Corridor within the Lower Coos River/Coos Bay Watershed (5th field HUC)	59
Table 22: Stream Description and Crossing Type on Utility Corridor within the Lower Coos River/Coos Bay Watershed (5th field HUC)	60
Table 23: Pipeline Construction Spending for the \$48 Million Scenario	64
Table 24: Pipeline Construction Spending for the \$34 Million Scenario	64

Table 25: Direct Impact of \$48 Million in Pipeline Construction on Coos County in Year 2000 Dollars and Person-Years of Employment	65
Table 26: Direct, Indirect, Induced and Total Economic Impacts on Coos County From \$48 Million in Pipeline Construction Spending in Year 2000 Dollars and Person-Years of Employment	66
Table 27: Direct Impact of \$34 Million in Pipeline Construction on Coos County in Year 2000 Dollars and Person-Years of Employment	66
Table 28: Direct, Indirect, Induced, and Total Economic Impacts on Coos County From \$34 Million in Pipeline Construction Spending	66
Table 29: Annual Spending on Pipeline Operations (in 2000 dollars)	67
Table 30: Annual Direct Impact of Pipeline Operations Spending on Coos County in Year 2000 Dollars and Person-Years of Employment	68
Table 31: Annual Direct, Indirect, Induced, and Total Economic Impacts on Coos County Because of Pipeline Operations Spending in Year 2000 Dollars and Person-Years of Employment	68
Table 32: Comparative Population Growth Rates 1980-2000	70
Table 33: Propane and Heating Oil Dealers	71
Table 34: Statistics Involving Natural Gas Pipelines in Oregon and Washington (1984-2000)	75
Table 35: Impacts Summary	78
Table 36: Technical Consultation	83
Table 37: Pipeline Meetings	84
Table A-1: Survey of Foundation Soil and Rock, Coos County Natural Gas Pipeline	A-18
Table E-1: Proposed Action Route Summary	E-3
Table E-2: Matrix of Factors and Indicators (All WAs & NMFS, 1998)	E-7
Table E-3: Checklist for Documenting Environmental Baseline and Effects of Proposed Actions on Relevant Indicators (E. Fork Coquille)	E-13
Table E-4: Checklist for Documenting Environmental Baseline and Effects of Proposed Actions on Relevant Indicators (Lower Coos)	E-16
Table E-5: Checklist for Documenting Environmental Baseline and Effects of Proposed Actions on Relevant Indicators (N. Fork Coquille)	E-20
Table E-6: Checklist for Documenting Environmental Baseline and Effects of Proposed Actions on Relevant Indicators (Lower South Umpqua)	E-24
Table E-7: Checklist for Documenting Environmental Baseline and Effects of Proposed Actions on Relevant Indicators (Middle Main Coquille)	E-29
Table E-8: Checklist for Documenting Environmental Baseline and Effects of Proposed Actions on Relevant Indicators (Ollala-Lookingglass)	E-34
Table H-1: Fish-bearing Streams Identified for Avoiding Ground Disturbance within them	H-2
Table H-2: Specified ODOT Seed Mixture for Coast Range	H-14
Table I-1: Stream and Wetland Crossings within the Proposed Project Corridor	I-1
Table K-1: Survey and Manage Fungi, Lichens, Bryophytes and Vascular Plants	K-1
Table K1-1: Special Status Fungi, Lichens, Bryophytes and Vascular Plants	K1-1
Table K1-2: Special Status Fish	K1-4
Table K1-3: Special Status Invertebrates	K1-4
Table K1-4: Special Status Wildlife	K1-5

List of Figures

Figure A-1: West-east geologic cross-section along Oregon Hwy	A-5
Figure A-2: View of BPA powerline on steep hillside	A-11
Figure A-3: Rise of BPA powerline, up steep 20 percent slope	A-12
Figure A-4: View along Brewster Canyon at Mile 21 on CBW Road	A-13
Figure A-5: View along Brewster Canyon at Mile 26 on CBW Road	A-14
Figure B-1: Location of the Proposed Natural Gas Pipeline	B-3
Figure B-2: Survey status and location of recommended SDP, Coos Bay to Catching Creek	B-14
Figure B-3: Survey status and location of recommended SDP, Isthmus Slough to Sitkum	B-15
Figure B-4: Survey status, location of identified cultural materials, and location of recommended SDP, Sitkum to Flourney Valley	B-16
Figure B-6: Site Map	B-19
Figure H-1: Stream Crossing: Trenching across a flowing stream	H-7
Figure J-1: Directional-Drill Crossing: Pilot Hole	J-7
Figure J-2: Reaming Process	J-7
Figure J-3: Pull Back	J-7
Figure J-4: Typical Block Valve Setting	J-10

List of Maps

Map 1 - Alternative Routes

Map 2 - Preferred Alternative and Laterals

Sheets 1-10 - BLM managed lands adjacent to the proposed action.