BUREAU OF LAND MANAGEMENT
New Mexico State Office

BUREAU OF INDIAN AFFAIRS
Navajo Regional Office
Southern Pueblos Agency
Western Regional Office

Environmental Assessment for the Mid-America Pipeline Company, LLC (MAPL) Western Expansion Project

June, 2005

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
New Mexico State Office
1474 Rodeo Road
P.O. Box 27115
Santa Fe, New Mexico 87502-0115
www.nm.blm.gov/

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In Reply Refer To:
NM-109581
2880 (NM930)

June 15, 2005

Dear Reader:

Enclosed for review is the Environmental Assessment (EA) for the Mid-America Pipeline Company Western Expansion Project. The EA and a comment form are also available at www.nm.blm.gov. In the event this web site is not accessible, a CD containing the EA and a comment form may be obtained by contacting Ms. Barbara Neary of O & G Environmental Consulting, the National Environmental Policy Act Contractor for the project, at telephone number (720) 529-9777 or electronic mail at bneary@ogenvironmental.com.

The proposal consists of construction, operation, and maintenance of 12 separate pipeline loop sections accumulating approximately 202 miles, entirely in Wyoming and New Mexico, on an approximate 840-mile route between the Granger and Wamsutter areas of Wyoming, and Hobbs, New Mexico. The proposal also includes upgrading pump stations in Wyoming, Utah, Colorado, and New Mexico. Additional information about the proposed project can be obtained at the applicant's web site at http://www.epplp.com/mapl/overview.htm.

Please note the following Freedom of Information Act information. Comments, including names and street addresses of respondents will be available for public review at the Bureau of Land Management, Farmington District Office during regular business hours (7:45 am-4:30 pm). Individuals may request confidentiality. If a person wishes to withhold their name, home address, and telephone number from public review or from disclosure under the Freedom of Information Act, that person must state this prominently at the beginning of their comments. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individual identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety.

There is a 30-day availability period for review and comment on the Environmental Assessment. If you want to comment, written comments on the EA must be postmarked or otherwise delivered by 4:30 p.m. on July 22, 2005. Comments should be mailed to the Bureau of Land Management, Jerry Crockford, Project Manager, Bureau of Land Management, Farmington District, 1235 La Plata Hwy., Suite A, Farmington, NM 87401. Comments may also be made by electronic mail to jcrockfo@blm.gov.

Please contact me with questions at telephone (505) 599-6333.

Sincerely,

Jerrold E. Crockford

Jerrold E. Crockford
Project Manager

Enclosure

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AAQS	Ambient Air Quality Standards
ACEC	Area of Critical Environmental Concern
ADWP	Albuquerque Drinking Water Project
AIRFA	American Indian Religious Freedom Act of 1978
AM	Aerial Marker
ANSI	American National Standards Institute
AOI	Area of Influence
AOPL	Association of Pipe Lines
APE	Area of Potential Effect
API	American Petroleum Institute
AQB	Air Quality Bureau
AREMA	American Railway Engineering and Maintenance of Way Association
ARM	Ambient Ratio Method
ARPA	Archaeological Resources Protection Act of 1979
ATV	all terrain vehicle
AUM	animal unit month
AUY	animal unit year
BA	Biological Assessment
bcfd	billion cubic feet per day
BIA	Bureau of Indian Affairs
BISON-M	Biota Information System of New Mexico
BLM	Bureau of Land Management

BMP	Best Management Practices
BNSF	Burlington Northern and Santa Fe
B.P.	before the present
bpd	barrels per day
CAA	Clean Air Act
CDPHE	Colorado Department of Public Health and Environment
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
cfs	cubic feet per second
COE	U.S. Army Corps of Engineers
CP	cathodic protection
CSU	conditional surface use
CWA	Clean Water Act
dB	decibel
dBA	decibels on the A-weighted scale
DEQ	Department of Environmental Quality
DOI	U.S. Department of Interior
DOT	U.S. Department of Transportation
DR	Decision Record
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency

EPOLP	Enterprise Products Operating LP
ERW	electric resistance weld
FEMA	Federal Emergency Management Agency
FLPMA	Federal Land Policy and Management Act of 1976
FONSI	Finding of No Significant Impact
FR	Federal Register
gpm	gallons per minute
GPS	global positioning system
g/s	grams per second
HCA	High Consequence Areas
HDD	horizontal direction drill
HMA	Herd Management Area
hp	horsepower
HUC	hydrologic unit code
HUD	U.S. Department of Housing and Urban Development
IMP	Integrity Management Program
L_{dn}	day-night sound level
MAOP	Maximum Allowable Operating Pressure
MAPCO	Mid-America Pipeline Company
MAPL	Mid-America Pipeline Company LLC
MFL	magnetic leak flux
$\mu g/m^3$	micrograms per cubic meter
MLA	Mineral Leasing Act
MP	milepost
MSDS	Material Safety Data Sheet

NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NGL	Natural Gas Liquids
NHPA	National Historic Preservation Act of 1986
NMBG&MR	New Mexico Bureau of Geology and Mineral Resources
NMDED	New Mexico Department of Economic Development
NMDTR	New Mexico Department of Taxation and Revenue
NMEDSWQB	New Mexico Environment Department Surface Water Quality Bureau
NMEM&NR	New Mexico Energy, Minerals, and Natural Resources (Department)
NMSEO	New Mexico State Engineer's Office
NMWQCC	New Mexico Water Quality Control Commission
NO_X	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSO	no surface occupancy
NTP	Notice to Proceed
NTSB	National Transportation Safety Board
NWI	National Wetland Inventory
NWP	Nationwide Permit
OGCC	Oil and Gas Conservation Commission
OHV	off-highway vehicle (off-road vehicle)
OPS	Office of Pipeline Safety
OSHA	Occupational Safety and Health Act

POD	Plan of Development
ppb	parts per billion
ppm	parts per million
PSD	Prevention of Significant Deterioration
psig	pounds per square inch, gauge
QA/QC	Quality Assurance/Quality Control
RAMP	Recreation Area Management Plan
RFDS	Reasonably Foreseeable Development Scenario
RMP (BLM)	Resource Management Plan
RNA	Research Natural Area
ROW	right-of-way
SCADA	supervisory control and data acquisition
SDA	Special Designated Area
SHPO	State Historic Preservation Officer
SJWC	San Juan Water Commission
SMA	Special Management Area
SMYS	Specified Minimum Yield Strength
SOA	Specially Designated Area
SRMA	Special Recreation Management Area
SRMD	Special Recreation Management Areas
SWEDA	Sweetwater Economic Development Association
SWPPP	Storm Water Pollution Prevention Plan
SWSRC	Southwest Wild and Scenic River Campaign
TCP	traditional cultural properties
TES	Threatened and Endangered Species

TMDL	Total Maximum Daily Load
TUA	Temporary use area
TUP	Temporary use permit
UDEQ	Utah Department of Environmental Quality
U.S.C.	United States Code
USDOT	U.S. Department of Transportation
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VRM	Visual Resource Management
WDAI	Wyoming Department of Administration and Information
WDAQ	Wyoming Air Quality Division
WDEQ	Wyoming Department of Environmental Quality
WEP	MAPL Western Expansion Project
WGF	Wyoming Game and Fish Department
WHMA	Wild Horse Management Area
WO&GCC	Wyoming Oil and Gas Conservation Commission
WSA	Wilderness Study Area

GLOSSARY OF TERMS

Alluvial	material composed of riverbed or delta material.
Ancillary facilities	facilities associated with the pipeline system, including pump stations, pressure control stations, terminals, valves, metering stations, densitometers, etc.
Aquifer	a layer of underground sand, gravel, or porous rock in which water collects; a source of groundwater.
Attenuation	mechanisms that retard and reduce the movement of contaminants, including dispersion, sorption, volatilization, abiotic chemical degradation, and biological degradation.
Barrel	42 gallons of petroleum product.
Block valve	a valve that can block the flow of product in both directions within the pipeline when closed.
Caliper pig	a deformation and bend radius internal inspection tool. This tool locates gross structural abnormalities along the pipeline.
Cathodic protection	a method to reduce corrosion by an electrochemical process that makes the pipe the cathode and is thereby protected from corrosion metal loss.
Cave	as defined in 43 CFR 37.4 (b) a cave is any naturally occurring void, cavity, recess, or system of interconnected passages beneath the surface of the earth or within a cliff or ledge, including any cave resource therein, and which is large enough to permit a person to enter, whether the entrance is excavated or naturally formed. Such term shall include any natural pit, sinkhole, or other feature that is an extension of a cave entrance or which is an integral part of the cave.
Check valve	a passive valve that allows product to flow in only one direction, preventing the reverse flow of product. Check valves are held open by flowing product and close automatically when pressure is reduced.
Corrosion	an electrochemical process that occurs when steel is exposed to an electrolyte, such as soil or water. Corrosion occurs along the internal or external surface of the pipe and gradually can result in metal loss. External corrosion is reduced by cathodic protection and pipeline coatings. Internal corrosion only occurs when liquid water is present. It can be reduced by corrosion inhibitors. Corrosion is monitored by internal inspection tools (internal and external) and corrosion coupons (internal).
Depth	of cover: in new construction areas, the burial depth typically would be 36

	inches from the top of the pipe to the natural grade. No depth of cover is specified for existing pipe under OPS regulations.
Easement	a legal instrument, usually negotiated with the landowner that is used to convey a right-of-way to the pipeline company. The easement gives the pipeline company the right to construct, operate and maintain its pipeline and ancillary facilities in the permanent ROW and, in return, compensates the landowner for the use of the land.
Fugitive dust	a non-point source of air pollution, such as from unpaved roads, agricultural croplands, and construction sites.
High Consequence Areas (HCAs)	OPS-defined areas subject to the Integrity Management Rule. HCAs are high-density population areas, waters where commercial navigation occurs, and areas that are unusually sensitive to environmental damage.
Horizontal Directional drilling	technology used for vertical drilling has been modified for the horizontal installation of pipelines beneath major obstacles, such as rivers, railroads and highways.
Hydrostatic testing	Pressure testing of a pipeline to test its structural integrity. Typically the line is tested to at least 125 percent of the MAOP and the pressure is held for 8 hours. Hydrostatic testing is a destructive test to evaluate the integrity of the pipe by attempting to cause the failure of critical defects that might be present in the wall of the pipe. These defects could include manufacturing flaws (e.g., anomalies along the longitudinal weld), corrosion (internal and external), dents, gouges, and stress-induced cracks. This method is considered the most reliable method for detecting detrimental longitudinal weld seam anomalies. A pipe that passes this test is considered safe to operate at pressures less than or equal to the MAOP.
Impressed current cathodic protection	cathodic protection that uses an external power source to place a small electrical charge on the steel pipe to prevent external corrosion (requires the use of rectifiers).
Integrity Management Rule	as defined in 49 CFR 195.450 and 195.452, this OPS rule increases requirements for inspection, enhanced damage protection, improved emergency response, and other measures to prevent and mitigate pipeline leaks in HCAs.
Internal inspection tool	a "smart pig" tools that assess the pipeline's integrity. At this time, there are three primary types of internal inspection tools: caliper pigs, magnetic leak flux (MFL) pigs, and ultrasonic pigs. Each type of internal inspection tool has certain detection capabilities and limitations.
Karst	is a region of irregular topography with sinks, underground streams, and

	caves that were formed by dissolution of limestone.
L_{dn}	Day-night (average sound) level.
Liquefaction	the process by which water-saturated sediments lose strength and may fail during strong earthquake induced ground shaking. Liquefaction can result in the loss of ground bearing capacity or lateral spreading, both of which could potentially damage pipelines and ancillary facilities. Soil liquefaction hazards are associated with unconsolidated alluvial soils with a high water table.
Internal inspection tool	the tool is a high resolution axial MFL tool. MFL tools can detect metal loss, such as corrosion-type defects and gouges, along the pipe through the use of a magnetic field. It provides information on the location, size, and depth of any defect that it finds, both on the interior and exterior of the pipe. The high-resolution MFL tool is recognized as the current industry standard and data from these tools are considered by the OPS to be reliable indicators of pipeline integrity.
Maximum Operating Pressure (MOP)	a rating indicating the maximum pressure at which a pipeline or segment of a pipeline may be operated under the OPS regulations in normal conditions. The MOP is defined as 80% of the hydrostatic test pressure. It is also called the pressure rating.
Notice to Proceed	a document that authorizes construction or other activities to begin. Signed by the lead agencies authorizing officer.
One-call systems	a system by which operators and other underground utility operators have joined together in state-level one-call notification programs. The program acts as a clearinghouse of information to excavators, which and marks the location of underground utilities prior to excavation.
Operating pressure	pressures within the pipeline are dependent on product characteristics, product batch size, batch location within the pipeline, flow rate, pipeline elevation, and discharge pressure at each pump station.
Pig	a plug, often made of polyurethane, designed to be pushed along the inside of a pipeline. Pigs can be used to separate materials, clean, or inspect the pipeline's interior surface.
Prime farmland soils	land that has the best combination of physical and chemical characteristics (as defined by the Natural Resources Conservation Service) for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses.
Pump station	ancillary facility where pumps are used to maintain pipeline pressure required to move product through the pipeline.
Refined	flammable or corrosive products obtained from distilling and processing

petroleum products	crude oil, unfinished oils, natural gas liquids, blend stacks, and other miscellaneous hydrocarbon compounds, including diesel fuel, fuel oil, gasoline, gasoline and fuel oil mixtures, jet fuel, kerosene, oil and gasoline mixtures, turbine fuel, xylene, and benzene.
Right-of-Way (ROW)	a legal right of passage over another's property. Typically, the ROW would consist of a 25-foot-wide permanent easement and, during construction, an additional 25-foot to 50-foot temporary use area. After construction and reclamation, the permanent ROW would revert to a 25-foot-wide easement.
ROW grant	as defined in 43 CFR 288. A document authorizing a non-possessory, non-exclusive right to use specified federal lands for the limited purpose of construction, operation, maintenance, and termination of a pipeline. Typically, the grant includes agency stipulations, conditions imposed on the project as a result of the NEPA review, a complete POD, and approvals from other federal agencies.
Scraper trap	a short section of pipe controlled by valves that interconnect with the main pipeline to launch and receive cleaning and inspection tools ("pigs") that travel inside the pipeline.
Smart pig	an internal inspection tool that passes inside a pipe and contains electronic devices capable of measuring pipe integrity.
Subsidence	sinking or settling of the land's surface.
Temporary Use Area (TUA)	areas located outside the 25-foot permanent ROW where additional space is required for construction.
Terminal	a facility along the pipeline where product is stored and distributed using storage tanks and truck loading racks.

1.0 INTRODUCTION

This Environmental Assessment (EA) has been prepared to analyze the potential impacts of a proposal to expand the existing Mid-America Pipeline Company LLC (MAPL) natural gas liquids (NGL) pipeline system in Wyoming, Utah, Colorado, and New Mexico. The EA is a site-specific analysis of potential impacts that may result from the implementation of a proposed action or alternatives to the proposed action. The EA will assist the Bureau of Land Management (BLM) in project planning and ensuring compliance with the National Environmental Policy Act (NEPA). It will also determine whether any "significant" impacts could result from the analyzed actions. "Significance" is defined by NEPA and is found in regulation 40 CFR §1508.27. An EA provides evidence for the BLM to prepare and issue a Decision Record and a "Finding of No Significant Impact" (FONSI), or for determining whether an Environmental Impact Statement (EIS) must be prepared.

The EA will analyze the proposed action for conformance with the current BLM Resource Management Plans (RMPs) listed below:

Kemmerer Resource Management Plan – Kemmerer, Wyoming Field Office
Green River Resource Management Plan - Rock Springs, Wyoming Field Office
Great Divide Resource Management Plan – Rawlins, Wyoming Field Office
Book Cliffs Resource Management Plan – Vernal, Utah Field Office
Grand Resource Area Resource Management Plan – Moab, Utah Field Office
San Juan/San Miguel Resource Management Plan – Durango, Colorado Public Lands Center
Farmington Resource Management Plan – Farmington, New Mexico Field Office
Rio Puerco Resource Management Plan – Albuquerque, New Mexico Field Office
Roswell Resource Management Plan – Roswell, New Mexico Field Office

A Decision Record (DR), which includes a FONSI statement, is a document that briefly presents the reasons why implementation of the selected action will not result in "significant" environmental impacts. If the decision maker determines that this project has "significant" impacts following the analysis in the EA, then an EIS would be prepared for the project. If not, a Decision Record may be signed for the EA approving the proposed action or an alternative selected.

The BLM has been designated the lead Federal agency for preparation of this EA. The BLM has selected a Nation-wide Projects Manager, reporting to the Washington, DC office of the BLM to oversee the preparation of this EA. The BLM New Mexico State Office has delegated signature authority to the Farmington District Manager for the Federal right-of-way (ROW) grant for the Project. The Bureau of Indian Affairs (BIA) is a cooperating Federal agency and will issue ROW grants for Indian Allotment, Navajo Nation Tribal land, Santa Ana Pueblo and Zia Pueblo lands. Tribal, state, and local agencies and the public have been invited to participate in the environmental documentation process.

1.1 OVERVIEW

1.1.1 Background and History of Events Leading Up to Proposal

- The existing 840 mile MAPL pipeline system transports NGL from Wyoming, Utah, Colorado, and New Mexico to end-users in the Gulf Coast and Mid-Continent markets.

- In 1972, Mid-America Pipeline Company (MAPCO) constructed and put into service an 8-inch pipeline for NGL from the Huerfano Pump Station in San Juan County, New Mexico to the Hobbs Station in Gaines County, Texas crossing New Mexico diagonally from northwest to southeast.

- In 1982, MAPCO constructed and put into service the Rocky Mountain NGL Pipeline, a 10/12-inch pipeline project that originated in Rock Springs, Wyoming and connected with the MAPCO line in the Four Corners Area. A 10/12-inch loop of the original 8-inch diameter New Mexico pipeline was also constructed in 1982.

- In 1995, a second pipeline loop (12-inch diameter) was constructed. The 12-inch looping project was referred to as the Four Corners Loop. It is parallel and adjacent to the 8-inch and 10/12-inch pipeline for its entire length between the Huerfano Pump Station and the Hobbs Station in Texas.

- In 1999, a 10/12-inch, and 16-inch pipeline expansion of the Rocky Mountain Pipeline was constructed, and was referred to as the Rocky Mountain Pipeline Loop Project. It looped the original 10/12-inch Rocky Mountain NGL line from Brown's Park, Utah to Bloomfield, New Mexico.

- In 2002, Enterprise purchased the assets of Mid-America Pipeline Co. and established the subsidiary MAPL. MAPL evaluated the existing NGL system and determined that system capacity may require an NGL delivery expansion based on increased natural gas production out of the Rocky Mountain and Four Corners regions.

- MAPL considered an expansion project in early 2003 and filed an application with the BLM at that time. In April 2003, MAPL chose to delay the project and the application was withdrawn.

- MAPL decided to reactivate the project again in late 2003 and filed a new application and Draft Plan of Development (POD) for a pipeline looping project in April 2004. In addition, MAPL proposes to upgrade the existing pump stations along the pipeline route. These pump station upgrades will be addressed by amending the existing grant authorizations.

1.1.2 Proposed Action

The proposed pipeline looping and pump station upgrade project is known as the MAPL Western Expansion Project (WEP). No new pump stations are required. Installation of associated aboveground facilities including valves, pig launchers/receivers, markers, fencing, cathodic protection systems, and signs will also be part of the WEP. This expansion will increase the capacity of the existing MAPL NGL system by 50,000 barrels per day (bpd).

Expansion of its existing MAPL system in Wyoming, Utah, Colorado, and New Mexico would cross Federal, Tribal, state, and private lands. The expansion project, also known as a pipeline looping project, proposes to construct 12 separate pipeline looping segments at specific locations along the existing 840 mile MAPL NGL system. These looping segments will be located adjacent and parallel to MAPL's existing NGL pipeline extending from southwest Wyoming to Hobbs, New Mexico. The combined total mileage of the 12 separate pipeline looping segments will be approximately 202 miles. In addition, the project will upgrade 23 existing pump stations along the existing pipeline.

This EA examines the potential environmental impacts of the installation and operation of the proposed NGL pipeline looping segments and existing pump station upgrades (the Proposed Action), and a No Action alternative. Pipeline segments and existing pump stations are illustrated on Figure 1.1-1.

Before the expansion project can be constructed, MAPL must obtain a variety of Federal, Tribal, state, and local authorizations, easements and permits. Federal authorizations from the following agencies are required: the BLM, the BIA, the Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (COE).

The proposed expansion Project crosses Federal (BLM, BIA/Tribal), state and private lands. Table 1.1-1 lists the jurisdiction of lands crossed by the Project.

Increased system capacity requires a modification to the existing MAPL Pipeline System's major equipment, specifically pumps and drivers at existing pump stations. In addition, larger capacity pumps and increased horsepower drivers are necessary at the existing pump stations to increase the capacity.

Existing pump stations at the locations listed in Table 1.1-2 would be upgraded by re-rating pumps, changing pumps, up-rating drivers, relocating pumps, installing new units, or modification of existing facilities.

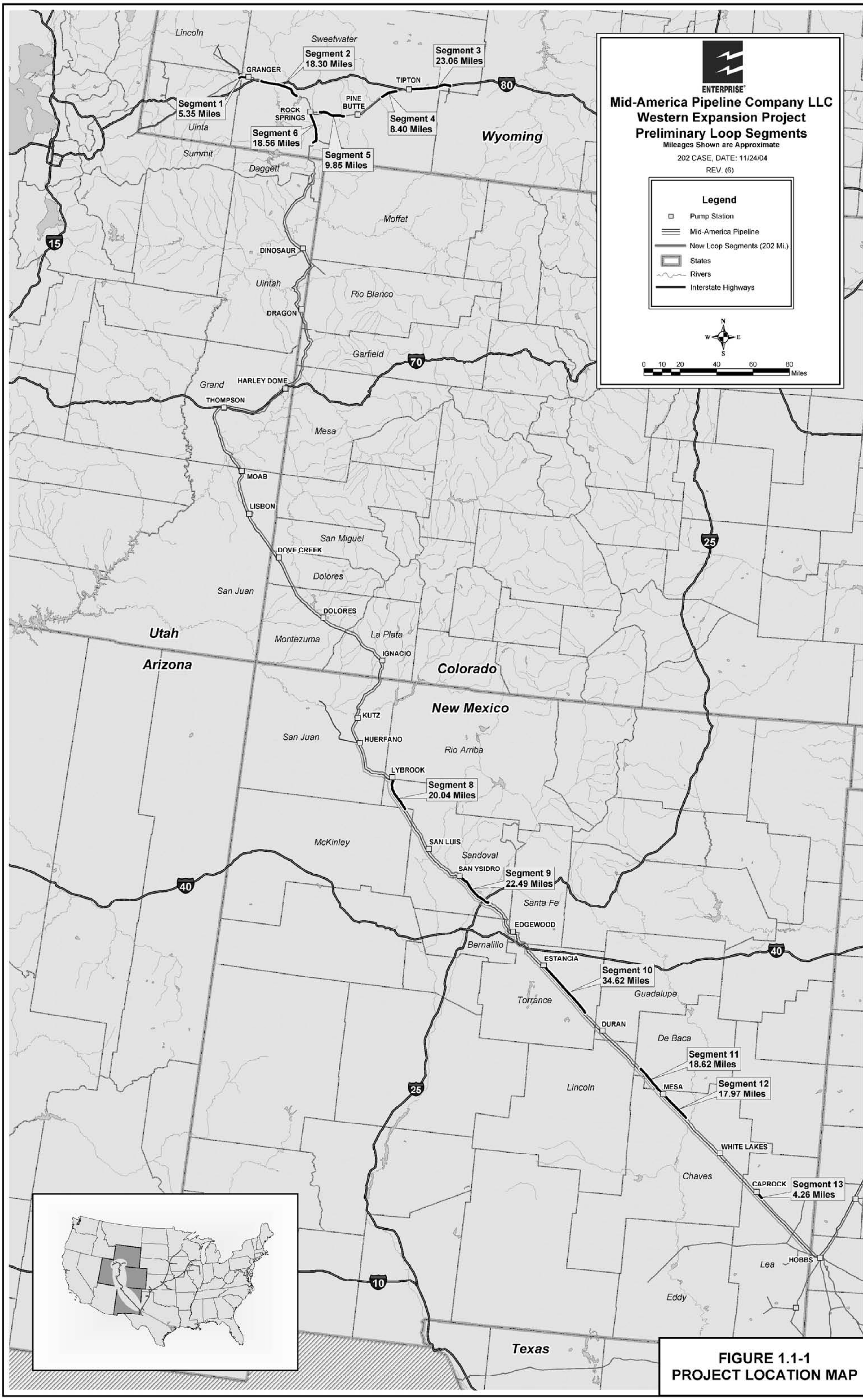


FIGURE 1.1-1
PROJECT LOCATION MAP

Table 1.1-1 MAPL Western Expansion Project Segment Descriptions

Segment	State	Length (miles)	Land Jurisdiction			
			BLM	BIA	State	Private
Miles Crossed						
1	Wyoming	5.35	2.3	0.0	0.7	2.4
2	Wyoming	18.30	5.8	0.0	1.5	11.0
3	Wyoming	23.06	9.8	0.0	1.0	12.2
4	Wyoming	8.40	2.8	0.0	0.0	5.6
5	Wyoming	9.85	4.0	0.0	0.0	5.9
6	Wyoming	18.56	15.0	0.0	0.0	3.6
8	New Mexico	20.04	8.3	10.3	0.0	1.5
9	New Mexico	22.49	1.4	19.4	0.5	1.2
10	New Mexico	34.62	0.0	0.0	5.3	29.3
11	New Mexico	18.62	1.9	0.0	0.0	16.7
12	New Mexico	17.97	3.4	0.0	0.8	13.8
13	New Mexico	4.26	0.0	0.0	2.2	2.0
Total Length (miles)		**201.5**	**53.4**	**30.0**	**13.1**	**105.1**
Percent of Total		**100**	**26**	**15**	**7**	**52**

NOTE: Table 1.1-1 does not include a Segment 7. During the MAPL Project design and analysis, this segment was eliminated from the Project.

Table 1.1-2 MAPL Western Expansion Project Existing Pump Stations

Pump Station	Land Ownership	Location
Granger	BLM	NW4, S8, T18N, R111W, Sweetwater Co., Wyoming
Pine Butte	BLM	NW4, S10, T16N R101W, Sweetwater Co., Wyoming
Tipton	Private	E1/2, S7, T19N, R96W, Sweetwater Co., Wyoming
Rock Springs	BLM	NW4, S20, T16N, R105W, Sweetwater Co., Wyoming
Dinosaur	BLM	S19, T6S, R25E, Uintah Co., Utah
Dragon	State	SE4, S2, T12S, R25E, Uintah Co., Utah
Harley Dome	Private	NE4, S10, T19S, R25E, Grand Co., Utah
Thompson	BLM	S29, T21S, R20E, Grand Co., Utah
Moab	BLM	SW4, NW4, S12, T27S, R22E, San Juan Co., Utah
Lisbon	BLM	S29, T30S, R24E, San Juan Co., Utah
Dove Creek	Private	NE4, S9, T41N, R19W, Dolores Co., Colorado
Dolores	Private	SE4, S31, T37N, R14W, Montezuma Co., Colorado
Ignacio	Private	NE4, S2, T33N, R9W, La Plata Co., Colorado
Huerfano	BLM	NW4 SW4, S21, T26N, R10W, San Juan Co., New Mexico
Lybrook	Private	NW4, S14, T23N, R7W, Rio Arriba Co., New Mexico
San Luis	BLM	NW4 S13, T17N, R3W, Sandoval Co., New Mexico
San Ysidro	Private	NW4, S19, T15N, R2E, Sandoval Co., New Mexico
Edgewood	Private	NW4, S3, T10N, R7E, Santa Fe Co., New Mexico
Estancia	State	NE4SE4, S27, T8N, R10E, Torrance Co., New Mexico
Duran	BLM	SW4 S1, T2N, R16E, Guadalupe Co., New Mexico
Mesa	Private	NE4, S13, T4S. R22E, Chaves Co., New Mexico
White Lakes	State	S16, T9S, R29E, Chaves Co., New Mexico
Caprock	State	NW4, S27, T12S, R33E, Lea Co., New Mexico

1.2 PURPOSE AND NEED

1.2.1 Need for the Proposed Action

As natural gas production increases in the Rockies, the existing capacity of the MAPL Rocky Mountain pipeline system will not be sufficient to transport the anticipated increase of NGL production over the next decade. NGLs consist of ethane, propane, butane, and natural gasolines. Currently, the system can transport approximately 225,000 bpd, and is currently flowing at near capacity. It is projected that approximately 50,000 bpd additional NGL will be produced from the region. This Project would increase the capacity of the existing pipeline system to approximately 275,000 bpd.

When natural gas is removed from the ground, it is compositionally different than what is transported through natural gas transmission systems and ultimately used as an energy source for end users such as home heating and cooking, and industrial energy. When removed from the ground, the mixture is predominately methane, but also includes heavier hydrocarbons and inert gases. Although the mixture can vary greatly, a typical stream may include 85 percent methane, 10 percent heavier hydrocarbons (NGLs), and 5 percent inert gases. Some of the NGLs and inert gases must be removed to make the natural gas salable and transportable.

In addition to being necessary, the removal of NGLs from the natural gas stream can also enhance the value of the components removed. Although only 10 percent of the stream by weight, the NGLs can contribute approximately 15 percent of the energy of the stream. This higher energy content of the NGLs makes them more useful in other applications:

- Ethane is primarily used for the production of plastics.
- Propane is typically used for heating purposes in areas without access to natural gas, but can also be utilized in the production of plastics.
- Butanes and natural gasoline are primarily used for motor gasoline blending.

Since NGLs must be removed up to a certain level and are often removed in greater quantities for economic purposes, regional NGL production tracks with regional natural gas production. Specifically in the Rocky Mountain region of the United States, as natural gas production grows, NGL production will grow.

The Rocky Mountains are a significant contributor to the supply of natural gas in the United States, producing approximately 25 percent of U.S. produced gas. Over the next decade, the Rocky Mountains will provide a significant portion of the growth in supply that will be necessary to satisfy the growth in natural gas demand.

It is anticipated that the Rocky Mountain natural gas supply will increase by about 2.0 billion cubic feet per day (bdfd) within the next decade. Using typical average NGL content (2 gallons per thousand cubic feet) and an average NGL recovery factor (50 percent), this 2 bcfd of natural gas growth will produce approximately 50,000 bpd of NGLs.

As the Rocky Mountain region becomes a larger proportion of the supply of natural gas in the U.S., it will also become a larger proportional provider of NGLs to the U.S. These produced NGLs are consumed in the local market when economically possible. Once the local demand has been satisfied, the NGLs must be transported to other markets. The largest markets for NGLs are on the Gulf Coast and in the Mid-Continent region. NGLs that are not consumed locally can be transported to alternate markets in three primary ways:

- Truck: At approximately 200 barrels per truck, it would take approximately 250 trucks per day to accommodate the 50,000 bpd expected growth.
- Rail: At approximately 600 barrels per rail car, it would take approximately 85 rail cars per day to accommodate the 50,000 bpd expected growth.
- Pipeline

The numbers of trucks or rail cars in the example above are used for transporting one day of production. If it takes a particular truck seven days to make a round trip from NGL processing plant to market and back, the 250 trucks per day would amount to a total of 1,750 trucks.

When the produced NGL volume increases, or the distance from production to market is great, the logistics and economics of trucking or railing NGLs are not competitive with a pipeline. Given that MAPL already has a base infrastructure to transport NGLs from the Rockies to the Gulf Coast, it is more efficient to expand the pipeline system to transport the NGLs.

1.2.2 Purpose of the Proposed Action

The controlled permitting of use, occupancy, and development of public (Federal) lands by qualified entities such as major energy development and transmission companies is a responsibility of the Secretary of Interior. Section 28(a) of the Mineral Leasing Act (MLA), as amended [30 United States Code (U.S.C.)185] authorizes the Secretary of the Interior to grant qualified applicants ROWs through Federal lands for transporting oil, gas, synthetic liquid or gaseous fuels, or other refined products. The MLA also accommodates issuance of Temporary Use Permits (TUPs) to supplement the pipeline ROW for purposes of constructing, operating, maintaining and terminating the pipeline, protecting the natural environment, and providing for public safety. The Act does not authorize BLM issuance of a grant of easement across Indian lands.

Issuing this ROW across Federal lands by the Department of the Interior (DOI) is authorized by the MLA, Sec. 28 (c)(2). The BLM, as the authorized agency of the DOI (excluding Indian lands), administers provisions of the MLA under the ROW regulations included in 43 CFR 2800 and 2880. The MLA (42 U.S.C. 4332) requires terms and conditions to protect the environment including the following:

1) restoring, revegetating, and curtailing erosion;
2) avoiding violation of applicable air and water quality standards, and related facility-siting standards;
3) preventing or controlling damage to the environment including to fish and wildlife habitat;

4) preventing damage to public or private property; and
5) avoiding creation of hazards to public health and safety.

The BIA is authorized to issue right-of-way grants on Tribal land and Indian Allotments under authority of 25 U.S.C §§ 321 or 323 as implemented by 25 CFR Part 169. Through the cooperative NEPA compliance process and this EA, the BLM and BIA will evaluate the proposed pipeline and existing pump station modification Project in terms of the proposal's impact on natural resources and potential for damage, the technical feasibility and committed measures that will minimize adverse impacts to natural resources and national security, and the extent to which the proposed Project minimizes conflicts with applicable RMPs.

The Federal Land Policy and Management Act of 1976 (FLPMA)/MLA's requirement of terms and conditions contributes to criteria or standards for deciding whether and how to grant the ROW and TUP.

FLPMA establishes policies and procedures for managing Federal lands, including the policy of managing Federal lands in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resources, and archeological values; that where appropriate, will preserve and protect certain Federal lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use (43 U.S.C. 1701).

FLPMA (43 U.S.C. 1765) requires certain terms and conditions when granting a ROW across Federal lands. Those terms and conditions must address the following:

1) minimizing damage to scenic and aesthetic values, fish and wildlife habitat, and otherwise protect the environment;
2) requiring compliance with applicable air and water quality standards;
3) requiring compliance with state standards for public health and safety; environmental protection; and siting, construction, operation, and maintenance of ROWs;
4) protecting Federal property and economic interests; and
5) locating the ROW on a route that will cause least damage to the environment while taking into consideration feasibility and other relevant factors.

1.3 CONFORMANCE WITH APPLICABLE RESOURCE MANAGEMENT PLANS

Under the FLPMA, the BLM is mandated to prepare RMPs for Federal lands under their jurisdiction. According to BLM policy, all actions authorized subsequent to issuance of the plans must conform to the approved RMP. To be in conformance, an action must be specifically mentioned in the RMP or be clearly consistent with the decisions of the RMP. In addition, to be clearly consistent, an action must comply with: 1) all stipulations, conditions, and constraints listed in an RMP and 2) all stipulations developed specifically for the proposed Project for the purpose of avoiding or reducing impacts on sensitive resources identified in the RMP.

The RMPs listed below address the types of development activities on public lands included in this proposed Project. As previously noted, the BLM grants ROWs to qualified individuals and businesses with the stipulation that natural and cultural resources will be protected as part of the granting process. ROWs are located to promote the maximum use of existing ROW corridors, including joint use when possible. At the same time, the BLM strives to ensure that mineral development would be carried out in a manner which minimizes environmental damage and provides for the rehabilitation of affected lands.

The BLM has reviewed the proposed WEP to determine conformity with the following applicable approved land use plans. Specifics regarding conformance with applicable resource management plans are as follows:

Kemmerer RMP, Kemmerer Field Office (approved April 29, 1986) (BLM, 1986): Management direction regarding pipeline construction indicates that ROW grants will be issued incorporating surface reclamation stipulations specified in the soils section of the RMP and other mitigation measures specified in Appendix A-1 of the RMP (Wyoming BLM Standard Mitigation Guidelines for Surface-Disturbing Activities). A review of the Kemmerer RMP finds that this Project is in conformance with those stipulations. MAPL has committed to adopt best management practices (BMPs) for soil erosion control, mitigation of surface disturbance, and ROW reclamation for the entire Project. The RMP also establishes management objectives that protect trails from visual intrusion and surface disturbance and maintain the integrity of the setting. Management of historic trails will emphasize preservation coupled with increased visitor use and appreciation of the trail system. To provide a protective corridor for the trail, the RMP states that visual intrusion and surface disturbance will generally be restricted or prohibited within 1,320 feet from either side of an historic trail (may depend on topography and existing surface disturbance), or within the visual horizon of the trail, whichever is closer. The Project was found to be in conformance with these management objectives.

Green River RMP, Rock Springs Field Office (approved August 8, 1997) (BLM, 1997a): This RMP specifies that "Areas designated as utility windows, rights-of-way concentration areas, and existing communication sites will be preferred locations for future grants." "Windows ½ mile in width have been identified for the placement of utilities." RMP Map 9 (Right-of-Way Windows and Communication Sites) has been reviewed. This map shows that the proposed MAPL Segments 2 (eastern end), 4, 5, and 6 are entirely located within the existing right-of-way windows for utility construction. Regarding historic trails, the RMP also lists management objectives. The area within 1/4 mile or the visual horizon (whichever is less) of any contributing trail segment will be an avoidance area for surface disturbing activities (RMP Map 3 and Table 2). Developments such as roads, pipelines, and power lines may be allowed to cross trails in areas where previous disturbance has occurred and the trail segment has lost the characteristics that contribute to its National Register significance. Segments of historic trails found to be contributing will be avoided in accordance with RMP objectives.

Great Divide RMP, Rawlins Field Office (approved November 8, 1990) (BLM, 1990): Management direction for utility/transportation systems notes that "All BLM administered public lands will be open to consideration for placement of utility/transportation systems, but such systems will be located next to existing facilities whenever possible. Areas with important resource values will be avoided where possible in planning for new facility placement and routes." A review of the areas with important resource values (Map 8 of the Great Divide RMP) shows that Segment 3 of the proposed Project avoids areas with important resource values. Furthermore, Segment 3 follows existing utility ROWs along Interstate Highway 80.

Book Cliffs RMP, Vernal Field Office (approved June 3, 1985) (BLM, 1985a): This RMP notes that "Rights-of-way will be encouraged within identified corridors while protecting or mitigating other resource values." The only upgrades planned for the MAPL Project within the Book Cliffs Resource Area will be on sites previously developed for the existing pipeline and compressor stations.

Grand Resource Area RMP, Moab Field Office (approved June 24, 1985)(BLM, 1985b): This RMP designates "…de facto corridors as official utility corridors. Such designation will minimize both the adverse environmental impacts and proliferation of separate rights-of-way." The only upgrades planned for the MAPL Project within the Grand Resource Area will take place on sites located within these utility corridors as depicted on Figure 8 of the RMP.

San Juan/San Miguel RMP, San Juan Public Lands Center (approved September 5, 1985) (BLM, 1985c) : This RMP states that "In general, public land is available for utility and transportation corridor development; however, applicants will be encouraged to locate new facilities within existing corridors to the greatest extent possible." The only upgrades planned for the MAPL Project within the San Juan Resource Area will be on sites previously developed for the existing pipeline and compressor stations.

Farmington RMP, Farmington Field Office (approved September 29, 2003) (BLM, 203b): This RMP has been reviewed and it is determined that the proposed MAPL Project is in conformance with the following stipulations: "To the extent possible, new ROWs will be located within or parallel to existing ROWs or ROW corridors to minimize resource impacts. ROW corridors identified by the 2002 Western Utility Group revision of the 1992 Western Regional Corridor Study are designated for utility and pipeline use. Specific proposals will require site-specific environmental analysis and compliance with established permitting processes." All of Segment 8 of the proposed Project (located within the Farmington Resource Area) is adjacent to existing utility rights-of-way. One of the exclusion areas listed is the Lybrook Fossil Area of Critical Environmental Concern (ACEC) which will be crossed by Segment 8 of the proposed Project. However, this crossing will occur within an existing multi-pipeline ROW and paleontological monitoring will be conducted during construction of the ACEC crossing, in accordance with the management prescriptions. No other exclusion or avoidance areas are crossed by Segment 8 which is located within the Farmington Resource Area.

Rio Puerco RMP, Albuquerque Field Office (approved January 16, 1986) (BLM, 1986b): The October 1992 Update of this RMP states planning criteria for rights-of-way corridors. The first of these criteria states that "Public lands in which there are now multiple compatible rights-of-way will be considered for corridor designation." Segments 9 and 10 of the proposed Project (located within the Rio Puerco Resource Area) follow existing multi-pipeline ROWs. Furthermore, the October 1992 update states that "…rights-of-way are issued so as to protect natural and cultural resources associated with the public lands and adjacent lands." MAPL has committed to follow BLM directives for the protection of natural and cultural resources.

Roswell RMP, Roswell Field Office (approved October 10, 1997b): This RMP states that "Whenever possible, facilities will be confined to existing alignments, minimizing width requirements and maximizing multiple occupancy." One of the exclusion areas listed is the Roswell Cave Complex ACEC which is in the vicinity of Segment 11 of the proposed Project. Actual boundaries of the ACEC are not publicized by the BLM, but a review of the pipeline route by Roswell BLM resource specialists verified the MAPL WEP does not cross the ACEC (BLM, 2005).

Based on the BLM's review of the proposed Project and the pertinent RMPs, the BLM has determined that the proposed MAPL WEP is consistent with the management objectives of these plans subject to:

1. Site-specific RMP conditions of approval, such as seasonal closures;
2. Site-specific conditions of approval for crossing special management areas; and
3. Other general and specific measures needed to reduce or eliminate impacts to resources.

1.4 RELATIONSHIP TO STATUTES, REGULATIONS, OR OTHER PLANS

1.4.1 Relationships of Federal Agencies and Applicable State Agencies to the Project

This EA was prepared in accordance with NEPA and in compliance with the CEQ regulations (40 CFR 1500-1508), U.S. Department of the Interior (USDI) requirements (Department Manual 516, Environmental Quality), and guidelines listed in BLM NEPA Handbook, H-1790-1 (BLM, 1988) and in BLM NEPA Guidebook (BLM, 2004a). This EA addresses RMP stipulations for pipeline construction and operation and existing pump station modifications for all BLM-administered Federal lands affected by the proposed Project. It was also prepared in accordance with state requirements for pipeline construction and operation and existing pump station modification.

The specific agencies and requirements to be met in permitting this Project are presented in Table 1.4-1. Applicable Federal, Tribal, state, and local governmental agencies and their requirements are listed in this table.

Table 1.4-1 Permits and Approvals Applicable to the Project

Agency	Coverage/Consultation
FEDERAL	
Bureau of Land Management (Wyoming, Utah, Colorado, and New Mexico)	NEPA analysis and FONSI/Decision Record; right-of-way grant (ROW) on Federal lands & Notice To Proceed (NTP)
U.S. Army Corps of Engineers	Section 404/401 of the Clean Water Act (CWA)

Agency	Coverage/Consultation
	Nationwide Permit (NWP) 12 – water crossings
U.S. Fish and Wildlife Service	Section 7 of the Endangered Species Act –consultation and Biological Opinion
Bureau of Indian Affairs –Southern Pueblos Agency Office, Southwest Region	NEPA review for Zia and Santa Ana Pueblo Tribal lands; ROW grant on Indian lands & NTP
Bureau of Indian Affairs – Navajo Regional Office	NEPA review for Navajo Tribal lands and Indian Allotments; ROW grant on Indian lands & NTP
Environmental Protection Agency Region 6	Section 402 of the Clean Water Act - National Pollutant Discharge Elimination System (NPDES)
Environmental Protection Agency Region 6	Section 401 of the Clean Water Act - certification on Zia and Santa Ana lands, water quality
Environmental Protection Agency Region 8	Section 401 of the Clean Water Act – certification in Wyoming, Colorado and Utah, water quality Air Emission
Environmental Protection Agency Region 9	Section 401/402 of the Clean Water Act - certification on Navajo Nation lands. Air Emissions Permitting – Native American airspace
Environmental Protection Agency with implementation by involved state(s) with primacy, as applicable	Storm Water Pollution Prevention Plan (SWPPP), Section 402 of the CWA - construction projects disturbing greater than 5 acres; minimize erosion
National Resource Conservation Service	Consultation on location and protection of prime and unique farmlands
Advisory Council on Historic Preservation	Consultation, as needed, for protection of cultural resources in compliance with 36 CFR 800; National Historic Preservation Act, Section 106 compliance
WYOMING (WY)	
WY Department of Environmental Quality (DEQ)	Section 402 of The Clean Water Act - National Pollutant Discharge Elimination System (NPDES) and Hydrostatic Test Discharge Permit Air Quality Construction and Operating Permits
WY State Historic Preservation Office	Consultation and National Historic Preservation Act, as amended (NHPA), Section 106 compliance
WY State Land Office	Consultation and administration of state lands
WY Game and Fish Department	Section 7 of the Endangered Species Act – consultation
WY State Engineer	Appropriation of State Water, and Temporary Water Use Permit
WY Department of Transportation	Road and Highway Crossing Permits
Sweetwater and Uinta Counties	Consultation; County Special Use Permits; road crossing permits
UTAH (UT)	
UT Department of Environmental Quality	Air Quality Construction and Operating Permits
UT State Historic Preservation Office	Consultation and NHPA, Section 106 compliance
UT State Land Office	Consultation and administration of state lands
UT Division of Wildlife Resources	Section 7 of the Endangered Species Act – consultation
COLORADO (CO)	
CO Department of Public Health & Environment (CDPHE)	Air Quality Construction and Operating Permits

Agency	Coverage/Consultation
CO State Historic Preservation Office	Consultation and NHPA, Section 106 compliance
CO State Land Office	Consultation and administration of state lands
CO Division of Wildlife	Section 7 of the Endangered Species Act – consultation
NEW MEXICO (NM)	
NM Environment Department	Section 401 of The Clean Water Act – water quality Section 402 of The Clean Water Act - hydrostatic test discharge permit
NM Environment Department	Air Quality Construction and Operating permits
NM State Land Office	Consultation and administration of state lands
NM Fish and Game	Consultation: fish and wildlife
NM State Historic Preservation Office	Consultation and NHPA, Section 106 compliance
NM State Engineer	Appropriation of State Water, and Temporary Water Use Permit
NM Department of Transportation	Road and Highway Crossing Permits
San Juan, Rio Arriba, McKinley, Sandoval, Bernalillo, Santa Fe, Torrance, Guadalupe, Lincoln, DeBaca, Chaves, and Lea Counties	Consultation; County Special Use Permits; road crossing permits
INDIAN TRIBES	
Navajo Nation	Consultation; issuance of road crossing permits; approval of ROW on Navajo Nation land
Santa Ana Pueblo	Consultation; issuance of road crossing permits; approval of ROW grant on Santa Ana Pueblo land
Zia Pueblo	Consultation; issuance of road crossing permits; approval of ROW grant on Zia Pueblo land
CITIES	
City of Albuquerque, Open Space Advisory Board	Extra-ordinary Facilities Application for crossing city-held Open Space land (Placitas)
UTILITIES	
Union Pacific Railroad	Railroad Crossing Permits
Burlington Northern Railroad	Railroad Crossing Permits
Middle Rio Grande Conservancy	Utility Crossing License for canal crossing

Laws, executive orders and regulations that apply to the Project are provided in Table 1.4-2.

Table 1.4-2 Laws, Executive Orders, and Regulations

Law/Executive Order/ Memoranda	Resources Protected/Impacts/Treatment
National Environmental Policy Act of 1969 (NEPA), as amended, 42 USC 4321, et seq.	Environment.
Environmental Quality Improvement Act of 1970, 42 USC 4371-4374	Environment.
*Clean Air Act, as amended, 42 USC 7401, et seq.	Air quality/air emissions and permits.

Law/Executive Order/ Memoranda	Resources Protected/Impacts/Treatment
*Clean Water Act (CWA) 1977, as amended. Section 404 Permits, 33 USC 1251, et seq.	Surface waters of the U.S./crossing, diversion of ephemeral washes.
*Safe Drinking Water Act 1974, as amended, 42 USC 300f et seq.	Surface and ground water.
Pollution Prevention Act of 1990, 42 USC 13101, et seq. (1970)	Water quality.
*National Historic Preservation Act of 1966, as amended. Antiquities Act of 1906, 16 USC 470 et seq., 36 USC 3001	Cultural resources.
*American Indian Religious Freedom Act of 1978, 42 USC 1996.	Native American religious concerns.
Archaeological Resources Protection Act, as amended, 16 USC 470aa, et seq.	Archeological resources.
Native American Graves Protection and Repatriation Act 1990, 25 USC 3001	Archeological resources.
*Safe Water Drinking Act, as amended, 42 USC 300f, et seq.	Water quality – drinking/ground.
*Clean Water Act of 1977, 33 USC 1251, et seq.	Water quality – drinking/ground.
Federal Water Pollution Control Act and Section 404 of the CWA.	Water quality/discharge into surface waters from point sources.
Storm Water Pollution Prevention Plan, Section 402 of the CWA	Water quality/construction projects disturbing greater than 5 acres; minimize erosion.
Colorado River Salinity Control Act 1974, amendment of 1984: Public Law 93-320	Water quality/mandated control of salinity runoff into the Colorado River Basin.
*Federal Land Management and Policy Act, as amended, (FLPMA) of 1976, 43 USC 1701, et seq.	Special Management Areas, Areas of Critical Environmental Concern, Research Natural Areas, and other special emphasis areas.
*Surface Mining Control and Reclamation Act of 1977, 30 USC 1201, et seq.	Prime and unique farm lands.
*Wild and Scenic Rivers Act of 1966, as amended, 16 USC 1271	Wild and scenic rivers.
*FLPMA, as amended, 43 USC 1701, et seq.	Wilderness.
*Wilderness Act of 1964 16 USC 1131, et seq.	Wilderness.
*Endangered Species Act of 1973, as amended (Section 7), 16 USC 1531, et seq.	Threatened or endangered plant and animal species.
Bald and Golden Eagle Protection Act	Eagles.
Migratory Bird Treaty Act, 16 USC 703-711, Executive Order – January 11, 2001	Migratory birds, nests, and eggs.
*Resource Conservation, and Recovery Act of 1976, 42 USC 6901, et seq.	Environment/use of hazardous materials.
*Comprehensive Environmental Response,	Environment/use and disposal of listed

Law/Executive Order/ Memoranda	Resources Protected/Impacts/Treatment
Compensation and Liability Act of 1980, as amended, 42 USC 9615, et seq.	hazardous materials.
Noise Control Act of 1972, as amended, 42 USC 4901, et seq.	Sound quality.
Taylor Grazing Act of 1934, 43 USC 315	Livestock land use.
Federal Noxious Weed Act 1974, as amended and Executive Order 13112.	Environment/noxious and invasive non-native weeds.
*Executive Order (EO) 11988, as amended, May 24, 1977	Floodplains.
*EO 11990 May 24, 1977	Wetlands; riparian zones.
EO 12088	Environment/Federal compliance with pollution control standards.
EO 12898, February 1994	Environmental Justice/impacts to environmental and health conditions in minority and low-income communities.
EO 13007	Indian sacred sites.
EO 13084	Cultural resources/consultation and coordination with Indian Tribal Governments.
EO 13112	Environment/control of invasive species.
EO 11512	Environment/protection and enhancement of environmental quality.
EO 11514	Environment/protection and enhancement of environmental quality.
EO 11593	Cultural resources/national historic preservation.
BLM National/State Instruction Memoranda	BLM and state sensitive species and habitats.
* - Critical elements of the human environment required by the BLM NEPA Handbook.	

Note: This table may not provide an all-inclusive list of laws, Executive Orders or memoranda that may apply and is subject to revision and addition.

1.4.2 Relationship to BIA and Tribal Policies and Plans

As a cooperating agency under NEPA and as Trustee of Indian Lands, the BIA must adequately analyze and disclose the environmental impacts of the proposed Project to determine whether the pipeline ROW should be approved.

Segments 8 and 9 will traverse Indian Trust lands administered by the BIA. In northwestern New Mexico, there will be Navajo Nation Trust lands and Navajo Allotted lands (Navajo Allotted lands are those lands owned by individual Navajo Indians and administered by the BIA). In the Rio Grande/San Ysidro area, there will be Zia Pueblo and Santa Ana Pueblo Trust lands. Currently these lands are not zoned or classified for specified uses. There are no adopted land uses or comprehensive plans known to be in place for these three tribes/pueblos.

The Santa Ana Pueblo has developed a Forest Stewardship Plan (Kinsman, 1995) that provides recommended goals for the management of the Rio Grande floodplain cottonwood forest. These management goals include restricting access; wildlife habitat improvement; opportunities for traditional Pueblo medicinal and food-gathering uses; reestablishment of native species and removal of exotic invader plants such as salt cedar (tamarisk); and opening certain areas for economic development, recreational uses, and outside-fee paying use. The plan contains no recommendations or guidelines concerning the siting, or mitigation for above- and below-ground utilities that cross this segment of the Rio Grande Valley. ROW acquisition across the Zia and Santa Ana Pueblo lands requires a resolution from the respective Tribal councils. On Navajo Nation lands, the Resource Committee of the Navajo Tribal Council reviews the proposed Project and must issue a Committee Resolution authorizing the President of the Navajo Nation to issue written authority, and to the BIA, to approve and issue a Grant of Easement to the applicant.

Procedures for granting pipeline easements on reservation land begin with simultaneous application submittals to the BIA and the respective Tribal authorities. Review and inspections are conducted within the preferred administrative framework of the various tribes. Typical reviews include cultural, geological, and economic assessments. Simultaneously, a prospective applicant may request “access” or “crossing” permits to conduct land, sensitive species and cultural resources surveys. The Tribal authorities may enter into negotiations with the pipeline applicant. The standards and requirements for such negotiations must be in conformance with 25CFR, Part 169. If the Tribal authorities approve the grant of easement request, this approval is communicated to the BIA and an easement is granted pursuant to the conditions imposed by the BIA and the Tribe. Similar procedures (also in conformance with 25CFR, Part 169), exist for obtaining consent and approval of the individual Navajo Allottees prior to issuance of a grant of easement by the BIA.

1.5 APPROVAL PROCESS AND AUTHORIZING ACTIONS

This EA will determine whether the Proposed Action or an alternative to the Proposed Action would accomplish the purpose and need of the Project in conformance with provisions of the NEPA or other applicable Federal laws. Because BLM lands represent the majority of Federal surface land required for construction of the Proposed Action, the BLM has been designated lead Federal agency for this Project and the BIA is a cooperating agency. Because the BLM and BIA have separate authorities over portions of the Project Area, the agencies may issue a joint Decision Record (DR) with respect to the level of anticipated environmental impacts which would result from implementation of the Project and whether or not the Project would be authorized on lands managed by the respective agencies.

As discussed in Section 1.3, approval of the Project would require conformance with those RMPs regulating development on BLM lands. Those RMPs have undergone NEPA compliance prior to adoption and provide the regulatory framework for issuance of an ROW grant. As previously stated in item 1.4.3, there are currently no known adopted comprehensive land use plans of the Tribal and Indian Allotment lands.

The decision-makers for the BLM, BIA, and Tribes shall determine whether the analysis presented in this NEPA document is complete and whether the Proposed Action or an alternative action warrants the issuance of a FONSI. A decision to proceed with more detailed analysis in a subsequent EIS would be made in the event a FONSI could not be issued. The decision-makers may reach different conclusions regarding the level of impacts to those lands under their respective management. Approval, however, might be made in the context of additionally required mitigating measures and a FONSI could be issued by the Lead Federal Agency with the support of those Cooperating Agencies.

The decision-makers would also consider the alternative of No Action, selection of which would amount to a denial of permission to construct the proposed Project on Federal land. However, as discussed subsequently, the ability of the decision makers to select the No Action Alternative is constrained. A decision to select the No Action Alternative would require that neither the Proposed Action nor an alternative which would accomplish the purpose and need of the Project could be accommodated within the requirements of existing Federal land use management plans.

1.6 SCOPING AND IDENTIFICATION OF ISSUES

1.6.1 Agency and Public Participation

The BLM conducted an internal and public scoping process in June, July, and August 2004. A scoping letter was prepared and mailed to over 270 individuals, agencies, and organizations in the vicinity of the Project. A copy of the scoping letter is in Appendix A. In addition to the mailing, the scoping letter was sent to Post Offices in the vicinity of the Project, with a request to post the notice for 30 days. A list of the Post Offices to which the scoping letter was sent is also provided in Appendix A. Public and agency meetings were held in Rock Springs, Wyoming on June 17, in Bernalillo and Placitas, New Mexico on the afternoon and evening of June 29, respectively, and in Roswell, New Mexico on June 30, 2004. A copy of the scoping letter is presented in Appendix A. The BLM received nine comment forms and one letter. Eight of the nine comment forms and the letter were from residents of Placitas, New Mexico. The scoping period was originally to end on July 15, but was extended to August 15, 2004, to allow more public access for review. A meeting was held with the BIA and Tribal representatives on August 27, 2004.

1.6.2 Identification of Issues

A number of issues were raised during public scoping. These issues have been summarized in Appendix B. Each of the issues has been organized by resource area, along with the source of the comment and the section of the EA in which the comment is addressed. The comment source indicates an identifying number for the origin of the comment.

The issues derived from agency and public scoping are addressed in Chapters 3 and 4 of this EA, which describes the existing environment and environmental consequences of the proposed Project.

1.7 VICINITY MAPS

Maps of the MAPL WEP are provided in Appendix C.

1.8 LEGAL DESCRIPTIONS

Legal descriptions of lands crossed by the MAPL WEP are provided in Appendix C.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

This chapter describes the proposed MAPL WEP (Proposed Action) for the expansion of the NGL transportation system and alternatives, including the No Action Alternative. Selection of the No Action Alternative would prevent the construction and operation of the proposed Project. The BLM and/or BIA would not authorize the ROW grant for construction on Federal and/or Tribal lands or modification of pump stations located on BLM- or BIA-administered lands.

2.2 PRE-NEPA ANALYSIS/PLANNING SURVEYS

The following sections describe activities that have been completed in support of the NEPA analysis. Activities conducted include legal survey, cultural surveys, biological habitat mapping, and raptor nest identification surveys for the proposed pipeline looping segments and existing pump stations subject to upgrade modifications.

2.2.1 Legal Survey

To accurately define the extent and locations of project-related activities and facilities, land survey crews located and placed markers for pipeline segment center lines using high-accuracy global positioning system (GPS) equipment. Survey crews used existing roads and trails to reach the proposed route and adjacent pipeline ROWs by vehicles. Existing roads or trails/two tracks were used to travel to and along the proposed pipeline route, where present. Where vehicle/truck access was precluded by topography or other barriers, crews traveled the proposed route on all terrain vehicles (ATVs) or on foot. Access to control points outside of the proposed pipeline ROWs was achieved by ATV or on foot.

Prior to civil survey, permission to conduct the civil, cultural, and biological surveys were obtained from private landowners. Two landowners, one in Wyoming and one in New Mexico denied access for environmental surveys but granted access for civil survey. Federal (BLM and BIA), Tribal, and state agencies were contacted and permission obtained to conduct the field surveys.

2.2.2 Cultural Resources Class I and Class III Inventory

In addition to reviewing the results of a previous file search (Class I inventory) that was completed for the Project, a supplemental file search was completed for the proposed pipeline looping segments. The supplemental file search was conducted in preparation for the detailed field inventory for archaeological and historical sites, both known and undiscovered, that occur in the proposed ROW and adjacent buffer areas that make up the area of potential effect (APE) for the Project’s cultural inventory. The civil survey and the staking of the proposed pipeline ROWs, including temporary use areas (TUAs), were conducted in spring-summer 2004 followed by the Class III field inventory. Access to the proposed ROW by field archaeologists/historians was again achieved by vehicle using existing roads and trails, and subsequently on foot for the systematic pedestrian clearance survey of the proposed ROW and associated buffers.

A Class I inventory was completed for pump stations in Colorado and Utah, and submitted to the BLM on August 31, 2004. The Colorado and Utah pump stations files searches revealed that the area of the existing pump stations and proposed temporary and permanent use areas had been previously inventoried. The TUAs proposed for the Project were found to have no impact on known cultural resources in the vicinity of the pump stations with the exception of the Dragon and Moab pump stations, where the proximity of proposed activities to known cultural resource sites resulted in a recommendation to monitor those areas during construction.

Class III cultural resources surveys were conducted on pipeline looping segments in Wyoming and New Mexico. The existing pump stations in Wyoming and New Mexico are located near or within the pipeline segment survey areas. Therefore, Class III surveys were also conducted at all existing pump stations in Wyoming and New Mexico. Cultural resources surveys covered a 200-foot wide area for each proposed pipeline segment in Wyoming and a 150-foot wide area for each segment in New Mexico, except where landowner access was denied, and covered the planned TUAs and required buffers at each Wyoming and New Mexico pump station. The survey width was wider in Wyoming than New Mexico to meet BLM requirements for cultural resources survey buffers. An additional 50-foot width was surveyed on Segment 3 to allow coverage of a revised alignment in an area where the Entrega Pipeline Project is proposed to be constructed (Hoefer, 2005).

Locations of observed artifacts were recorded using GPS equipment and, if features warranted a site designation, the site was pin-flagged to define site boundaries and intrasite spatial patterning. Site locations were plotted on a 7.5 minute topographic map using GPS technology, and a semi-permanent datum, a rebar stake with an aluminum cap stamped with the site's field number, was set in place to aid in relocation. A detailed narrative description of the site was prepared using a standard form supported by a map/drawing of the site. The documentation of all sites is compiled into two reports, one for Wyoming segments and the second for New Mexico segments. These reports compile the cultural resources to be potentially affected by the construction and operation of the proposed Project and provide the basis for preparing the affected environment and environmental consequences sections of this EA for cultural resources.

2.2.3 Special Status Species and Habitat Survey

Field surveys to map wildlife habitat were completed during the spring and summer of 2004. Habitat was mapped to assist in evaluating potential impacts the Project's disturbance may have to federally listed species and other sensitive species, including raptors. The habitat mapping and raptor nest survey effort also provided information to assist in planning additional wildlife clearance surveys if required by the FWS, BLM, BIA or other land-management agencies. Obtaining wildlife clearance and evaluating and mitigating impacts on species will be necessary in order to obtain the BLM ROW grant for the project.

Habitat mapping and raptor nest surveys were conducted on pipeline looping segments in Wyoming and New Mexico and 23 existing Project pump stations. Habitat mapping and raptor nest surveys covered a one-mile buffer around each pipeline segment and pump station, except for portions of Segments 3, 4, and 10 where landowner access was denied.

Surveys were conducted from 4x4 vehicles, ATVs, and on foot, where necessary. Each biology survey team was equipped with a Garmin GPS unit, binoculars, camera, field notebook, project alignment sheets showing proposed project ROW, line lists showing land ownership, mapping software, personal safety equipment, and an assortment of wildlife reference materials.

2.3 NO ACTION ALTERNATIVE

Implementation of the No Action alternative would likely result in the continuation of current land uses and resource development trends on BLM-administered, BIA-administered, Tribal, state, and private lands crossed by the proposed pipeline looping segments and those lands that would be affected by actions planned at several existing pump stations located on Federal land. The BLM and BIA would not issue a ROW grant to Enterprise for the MAPL WEP or special use permits for actions at the existing pump stations. Implementation of this alternative could result in MAPL abandoning the Project, withdrawing the Project as proposed and submitting a revised proposal for BLM consideration, or preparing an EIS for the Project as proposed.

2.4 PROPOSED ACTION

MAPL proposes to construct approximately 202 miles of looping pipeline in 12 segments as part of the MAPL WEP between the Granger and Wamsutter areas of Wyoming and Hobbs, New Mexico. In addition to expanding pipeline capacity, the Project would include the modification or upgrade of 23 existing pump stations distributed along the existing MAPL NGL Pipeline System in Wyoming, Utah, Colorado, and New Mexico. No new pump stations are required. The proposed WEP would increase the transportation capacity of the system by 50,000 barrels per day (bpd) from 225,000 bpd to 275,000 bpd of NGL.

MAPL seeks a ROW grant of 30 years, with an option to renew, for construction and operation of this pipeline from the BLM. MAPL seeks a similar ROW from the BIA. A construction temporary use area (TUA) of 75 feet that includes a permanent ROW of 25 feet has been requested to accommodate maintenance and construction activities within the existing ROW in 11 of the 12 pipeline looping segments. For one pipeline loop segment in Wyoming, which would require construction of a 16-inch pipeline, a construction TUA of 85 feet that includes a permanent ROW of 35 feet has been requested. The new pipeline looping segments will predominantly be located approximately 25 feet away from existing MAPL pipelines and adjacent to existing MAPL rights-of-way (ROWs) (MAPL multiple NGL Pipeline system). It will involve overlapping pipeline ROWs for temporary use in construction.

The ROW grant application filed by MAPL (c/o Enterprise) proposes the following:

- Construction, operation, and maintenance of a buried, steel pipeline included in 12 separate loop sections. Hydraulic modeling determined the diameter, length, location, and number of pipeline looping segments needed to increase system capacity to the desired volume.

- The proposed looping pipeline and associated existing pump station upgrades would be located in the following states/counties: <u>Wyoming</u> – Sweetwater and Uinta counties; <u>Utah</u> – Uintah, Grand, and San Juan counties; <u>Colorado</u> – Dolores, Montezuma, and La

Plata counties; New Mexico – Chaves, De Baca, Guadalupe, Lea, McKinley, Rio Arriba, Sandoval, San Juan, Santa Fe, and Torrance counties.

- These pipeline looping segments have a total length of approximately 202 miles on an approximately 840-mile long existing pipeline route. They commence at MAPL's Rock Springs, Wyoming Pump Station and extend easterly, westerly, and southerly in six pipeline looping segments totaling approximately 84 miles in Wyoming. In New Mexico, the discontinuous looping segments commence at the existing MAPL Lybrook Pump Station located in Rio Arriba County and extend along the existing pipeline route in a southeasterly direction into Lea County, approximately 30 miles west of the New Mexico/Texas state line. The New Mexico portion consists of six looping segments and totals approximately 118 miles.

- Twenty-three of the existing pump station locations along the existing corridor in Wyoming, Utah, Colorado, and New Mexico are proposed to be modified and/or upgraded within existing site boundaries or with minor boundary adjustments. No new pump stations are proposed for this expanded pipeline system.

- Pipeline appurtenances primarily consist of block and check valve locations, pig launchers and receivers, cathodic protection systems, and pipeline markers. These will be constructed/placed above grade in a configuration similar to existing facilities.

It is anticipated that Project activities during the period from April 2004 through the end of September 2005 will consist of ROW acquisitions, obtaining permits, cultural clearances, granting of easements on public lands, material procurement, and contractor selection. Construction is projected to start in October 2005 and be completed by December 2006. Construction sequence is dictated by production availability timing (i.e. is market driven) and by adherence to construction timing limitations in sensitive wildlife areas.

2.4.1 Construction of Facilities

2.4.1.1 Pipeline and Ancillary Surface Facilities

Pipeline and Ancillary Facilities Specifications

The maximum allowable operating pressure (MAOP) for the 12 new pipeline looping segments would be 1,650 pounds per square inch gauge (psig). The pipe would be carbon steel in accordance with American Petroleum Institute (API) Standard 5L. All flanges, valves, and fittings would be rated as American National Standards Institute (ANSI) Class 900 flange rating for all valves and fittings.

Carbon steel pipe specifications would vary with the engineering design requirements of each segment (Table 2.4-1).

Table 2.4-1 MAPL WEP Pipeline Loop Segment Design Specifications

Segment	State	Length (miles)	Pipe Design Characteristics			
			Pipe Outside Diameter (inches)	Design Maximum Operating Pressure (psig)	Standard Wall Thickness (inch)	Increased Wall Thickness[1] (inch)
1	Wyoming	5.35	10.75	1,650	0.25	0.5
2	Wyoming	18.30	10.75	1,650	0.25	0.5
3	Wyoming	23.06	8.625	1,650	0.25	0.5
4	Wyoming	8.40	8.625	1,650	0.25	0.5
5	Wyoming	9.85	8.625	1,650	0.25	0.5
6	Wyoming	18.56	16.00	1,650	0.312	0.5 to 0.625
8	New Mexico	20.04	16.00	1,650	0.312	0.5 to 0.625
9	New Mexico	22.49	16.00	1,650	0.312	0.5 to 0.625
10	New Mexico	34.62	16.00	1,650	0.312	0.5 to 0.625
11	New Mexico	18.62	16.00	1,650	0.312	0.5 to 0.625
12	New Mexico	17.97	16.00	1,650	0.312	0.5 to 0.625
13	New Mexico	4.26	16.00	1,650	0.312	0.5 to 0.625
Total Length (miles)		**201.5**				

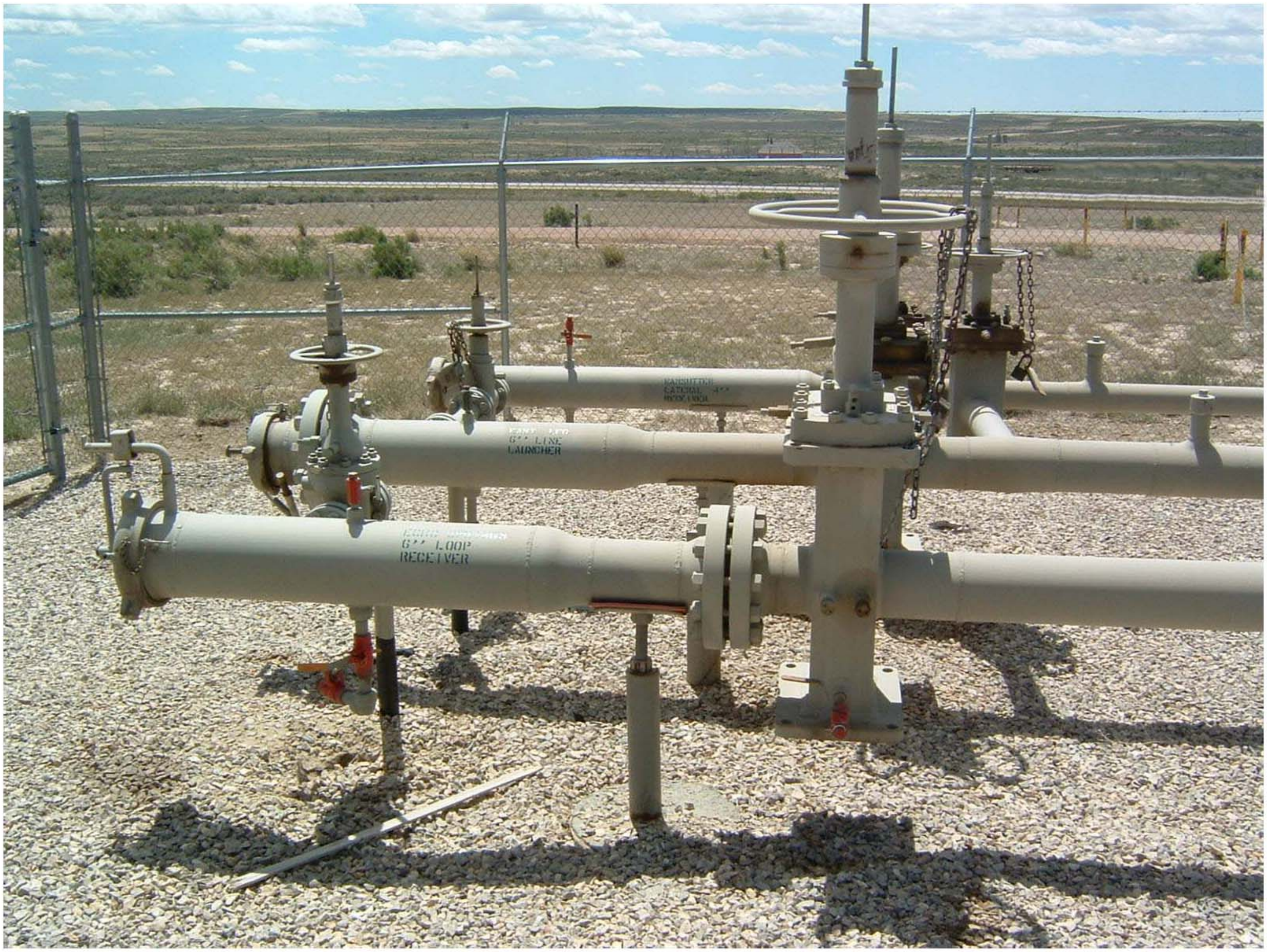
[1] Increased pipe wall thickness would be required for portions of some pipeline looping segments to minimize risk of pipeline damage at some road, stream, and railroad crossings, and in proximity to residential areas.

Associated aboveground facilities including cathodic protection components, valves, pig launchers/receivers, pipeline markers, fencing, and signs would be installed as part of pipeline construction. Mainline valves would be installed at approximately 10-mile intervals alongside existing valves (Figure 2.4-1) for each proposed new segment, and at edges of environmentally sensitive areas, such as river crossings. Valves would accommodate the passage of internal inspection and cleaning “pigs”. Mainline valve spacing generally would follow the same spacing as the existing pipeline system. All mainline valves would be constructed above ground and secured with appropriate safety measures. Existing valve sites would typically be expanded to accommodate new valve sites, and fencing expanded around the sites if necessary (Figure 2.4-2).

Typical launcher/receiver access points for “pigging” equipment would be located at standard intervals along each segment (Figure 2.4-3). Pipeline markers would be located above the installed pipeline looping segments at intervals. Signs are located at all existing facilities to identify ownership and to provide appropriate warnings to minimize potential hazards to the public.

	Enterprise Products Partners, LP	**Figure 2.4-1** **Typical Mainline Valve**
	Not to Scale	MAPL Western Expansion Project

	Enterprise Products Partners, LP	**Figure 2.4-2** **Security Fencing**
	Not to Scale	MAPL Western Expansion Project



	Enterprise Products Partners, LP	**Figure 2.4-3** **Typical Pigging Facilities**
	Not to Scale	MAPL Western Expansion Project

Pipeline line markers would be installed within line-of-sight, and at road crossings, rail crossings, and all river and stream crossings to identify the pipeline locations and to provide emergency contact information. Aerial markers currently indicate the locations of adjacent pipelines and would be used to assist in identification of the proposed pipeline looping segments.

Depth of pipeline burial would vary with local conditions. The cover from the top of the pipe to ground level would generally be at least 36 inches, except in rocky terrain, where cover would be a minimum of 24 inches. Minimum burial depths would be increased to four feet in residential and commercial areas, and to five feet in “blow sand” areas. Minimum burial depth for highway crossings would be in accordance with agency requirements, generally 4 feet below the borrow ditch, resulting in approximately 5.5 feet under the road surface. Minimum burial depth for uncased railroad crossings would be in accordance with the specific railroad’s requirements and American Railway Engineering and Maintenance of Way Association (AREMA) specifications, generally 10 feet or more below the tracks.

Land Requirements

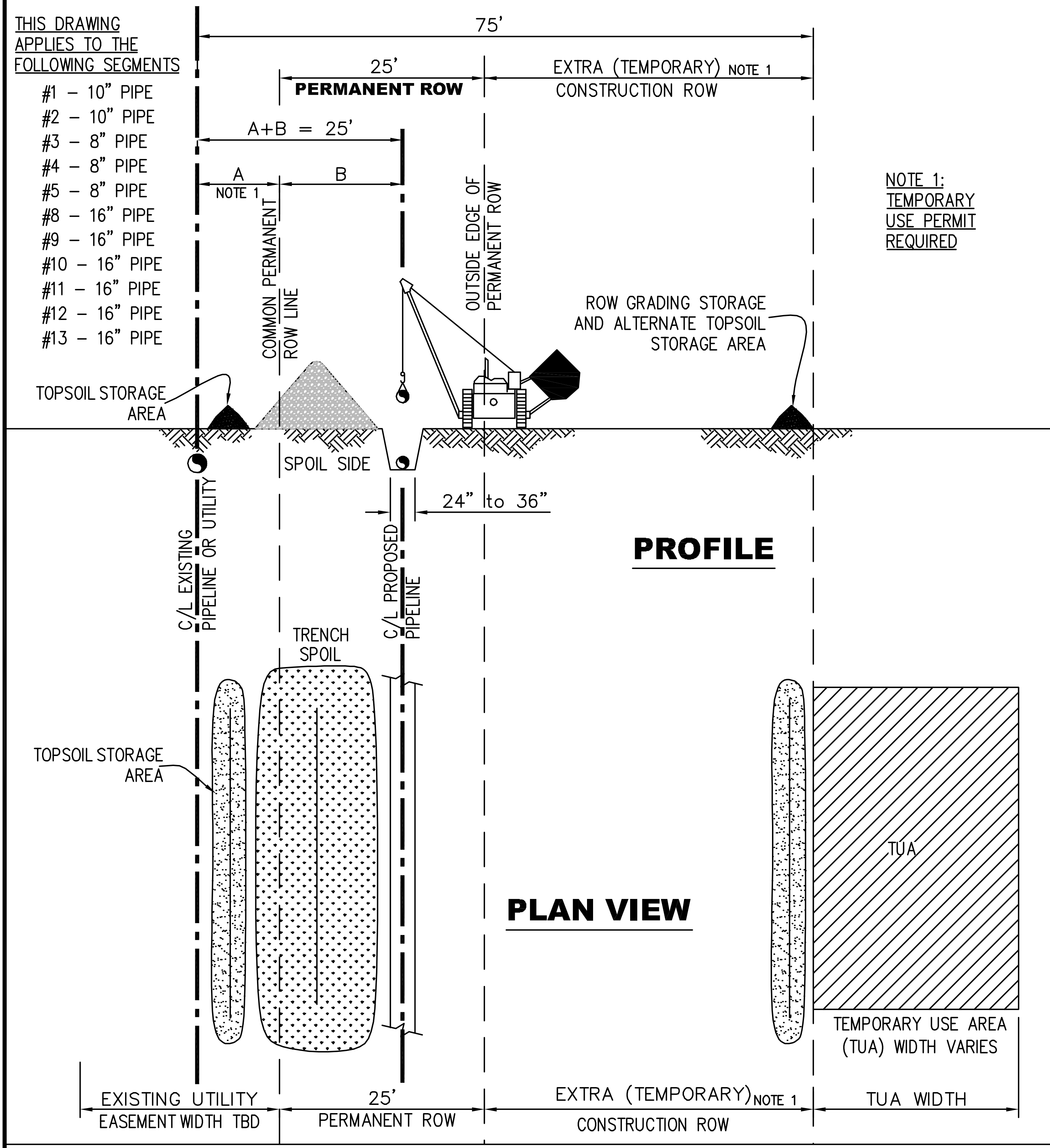
The pipeline looping segments would be installed predominantly adjacent to and in parallel with existing pipeline or utility ROWs along all 12 segments. The pipe would typically be installed 25 feet away from the existing pipeline or utility. Figure 2.4-4a illustrates, both in plan and profile, the typical ROW cross-section for eight-inch to 16-inch diameter pipeline looping segments, which are representative of land requirements for all segments except Segment 6. Figure 2.4-4b illustrates, both in plan and profile, the typical ROW cross-section for the proposed 16-inch diameter pipe to be installed for Segment 6.

For all segments other than Segment 6, the total working width of the ROW that would be disturbed by construction would be 75 feet. Twenty-five feet of this distance would represent the width of the permanent ROW for the MAPL WEP segments other than Segment 6. The remaining 50 feet would represent the width of extra linear TUA needed to construct the pipeline (Figure 2.4-4a).

For Segment 6, total working width of the ROW that would be disturbed by construction would be 85 feet. Thirty-five feet of this distance would represent the width of the permanent ROW for the MAPL WEP Segment 6. The remaining 50 feet would represent the width of extra linear TUA needed to construct Segment 6 (Figure 2.4-4b). The extra ten feet of permanent ROW allows space to accommodate maintenance and construction activities within the existing ROW in this area of difficult topography.

The acreage associated with the permanent ROW and linear TUA for each segment is provided in Table 2.4-2. A total of approximately 633 acres of permanent ROW is requested, and an additional approximate 1,221 acres of TUA for the linear pipeline construction.

TYPICAL ROW CROSS SECTION FOR 8" TO 16" DIAMETER PIPE



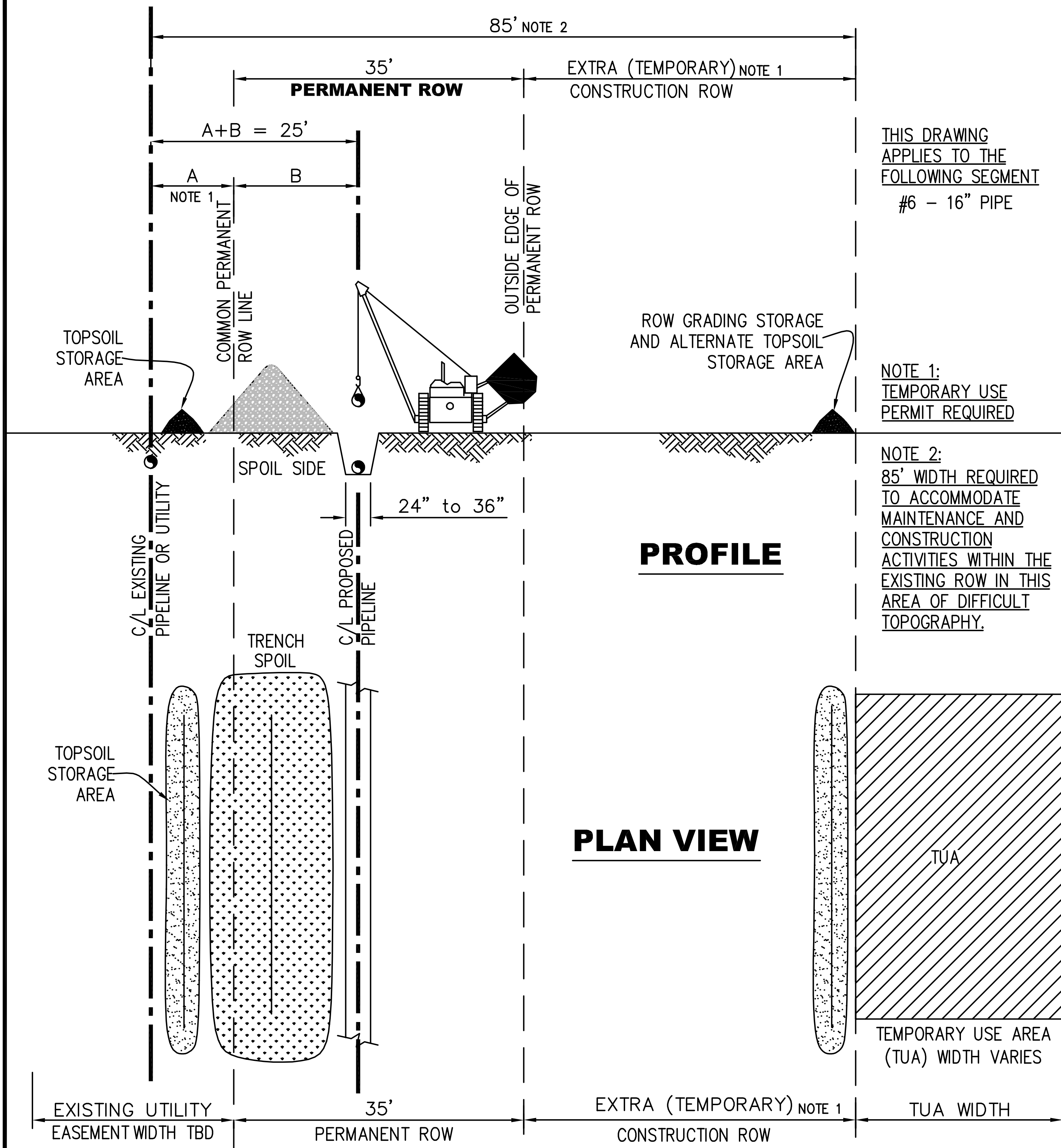
ENTERPRISE®

MID–AMERICA PIPELINE COMPANY LLC

TYPICAL RIGHT OF WAY CROSS SECTION FOR 8" TO 16" PIPE

DRAWN BY	CHECKED BY	APPROVED BY	REVISION		DATE	
BO	DW		DATE 5–12–05	NO. E	7–22–2004	FIGURE 2.4–4a

TYPICAL ROW CROSS SECTION FOR SEGMENT 6



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MID-AMERICA PIPELINE COMPANY LLC

TYPICAL RIGHT OF WAY CROSS SECTION FOR SEGMENT 6

DRAWN BY	CHECKED BY	APPROVED BY	REVISION DATE	REVISION NO.	DATE	
BO	DW		5-12-05	E	7-22-2004	FIGURE 2.4-4b

The 50 foot TUA associated with linear pipeline construction may include a portion of the adjacent utilities' permanent ROW (for topsoil storage), and the remainder of the linear TUA would be on the working side of the proposed Project (Figure 2.4-4a). The permanent ROW requested for the MAPL pipeline looping segments abuts the edge of the adjacent utility's permanent ROW, with no overlap. The new permanent ROW width of 25 feet and the linear TUAs will be considered short term disturbances since they will revegetate within a few years. Based on these general criteria, a minimum of approximately 633 acres of permanent ROW and 1,221 acreas of linear TUAs will be temporarily disturbed as listed in Table 2.4-2. Additional TUAs are also associated with the Project, and are described in the following paragraphs.

Table 2.4-2 MAPL WEP Pipeline Segment Land Requirements

Segment	State	Total Acreage		BLM Acreage		BIA Acreage		State Acreage		Private Acreage	
		Linear TUA	Perm. ROW	Linear TUA	Perm. ROW	Linear TUA	Perm. ROW	Linear TUA	Perm. ROW	Linear TUA	Perm. ROW
1	Wyoming	32.4	16.2	13.9	7.0	0.0	0.0	4.2	2.1	14.2	7.1
2	Wyoming	110.9	55.5	35.3	17.7	0.0	0.0	9.1	4.5	66.5	33.2
3	Wyoming	139.8	69.9	59.6	29.8	0.0	0.0	6.1	3.0	74.1	37.0
4	Wyoming	50.9	25.5	17.2	8.6	0.0	0.0	0.0	0.0	33.7	16.8
5	Wyoming	59.7	29.8	24.2	12.1	0.0	0.0	0.0	0.0	35.5	17.7
6	Wyoming	112.5	78.7	90.9	63.6	0.0	0.0	0.0	0.0	21.6	15.1
8	New Mexico	121.5	60.7	50.3	25.2	62.3	31.2	0.0	0.0	8.8	4.4
9	New Mexico	136.3	68.2	8.5	4.2	117.3	58.7	3.0	1.5	7.5	3.7
10	New Mexico	209.8	104.9	0.0	0.0	0.0	0.0	32.0	16.0	177.8	88.9
11	New Mexico	112.8	56.4	11.5	5.8	0.0	0.0	0.0	0.0	101.3	50.7
12	New Mexico	108.9	54.5	20.6	10.3	0.0	0.0	4.8	2.4	83.5	41.7
13	New Mexico	25.8	12.9	0.0	0.0	0.0	0.0	13.5	6.7	12.4	6.2
Total Acres		**1221.3**	**633.2**	**332.2**	**184.3**	**179.6**	**89.8**	**72.7**	**36.4**	**636.8**	**322.7**

Notes: For all pipeline looping segments except Segment 6, acreage was calculated based on a 25 foot permanent ROW and 50 foot linear TUA that may be potentially disturbed during construction. For Segment 6, acreage was calculated based on a 35 foot permanent ROW and 50 foot linear TUA. Rounding results in slight discrepancies in totals. There is no Segment 7.

In addition to the proposed 50 feet of linear TUAs needed for pipeline construction, additional TUAs would be required at road, railroad, canal and river crossings, horizontal directional drill (HDD) and horizontal bore sites, valve sites, pipeline crossovers, above-ground facility construction sites, difficult construction areas, access roads, and other areas where additional construction space is necessary. Location, type, and amount of disturbance for each TUA are provided in Appendix C. A summary of temporary disturbance from TUAs by land ownership for each segment is presented in Table 2.4-3.

Table 2.4-3 Non-Linear TUA* Disturbance of Federal, State, and Private Lands by MAPL WEP Pipeline Segment (acres)

Segment	BLM	BIA	State/City	Private	Total
1	4.82	0.00	1.89	3.10	**9.81**
2	5.31	0.00	2.47	11.97	**19.74**
3	0.73	0.00	0.00	16.34	**17.07**
4	0.00	0.00	0.00	0.17	**0.17**
5	3.30	0.00	0.00	8.49	**11.79**
6	7.17	0.00	0.00	0.17	**7.35**
8	4.39	8.08	0.00	1.03	**13.51**
9	1.03	21.58	4.13	0.00	**26.74**
10	0.00	0.00	0.09	4.62	**4.71**
11	0.00	0.00	0.00	2.67	**2.67**
12	0.34	0.00	0.00	4.56	**4.91**
13	0.00	0.00	0.00	2.58	**2.58**
Total	**27.1**	**29.7**	**8.6**	**55.7**	**121.1**

*non-linear TUAs consist of extra work spaces at road, canal, river crossings, etc.

The disturbance acreage from use of these 363 individual TUAs distributed along the 12 segments would total approximately 121 acres. This would bring the project total of TUAs to approximately 1,342 acres. All TUAs would result in short term land disturbance. Additional land requirements for TUAs are discussed in greater detail in later sections of this description of the Proposed Action for the WEP under the heading of Special Construction Methods and Equipment.

MAPL would establish pipe storage yards on private land adjacent to several rail yards located along or near the proposed pipeline looping segments. At these locations, pipe would be unloaded from rail cars and reloaded on trucks that would transport pipe to the construction ROW. MAPL has identified one pipe storage yard location in Wyoming (Figure 2.4-5) and four in New Mexico (Figure 2.4-6) for this Project. The New Mexico sites were also used in 1995 when the previous loop project was constructed. These areas will be cleared for use with respect to cultural resources and threatened and endangered species prior to use. These pipe storage yard locations, their size, and the existing land use and ecological condition are described below:

> Rock Springs, Wyoming. An approximately 10-acre site is expected to be located in a commercial rail off-loading and pipe storage facility near Rock Springs. The sites being considered have already been developed and are currently used for that purpose.
>
> Vaughn Siding, New Mexico. This 6-acre site is located adjacent to a railroad siding on the northeast side of the town of Vaughn, New Mexico and has been previously surveyed and used for this purpose. The present use of this area is vacant land covered by native grasses.
>
> Poe Siding near Roswell, New Mexico. This 4.5-acre site is located adjacent to a railroad siding on the northeast side of the city of Roswell. The present use of this area is vacant land covered by native grasses.

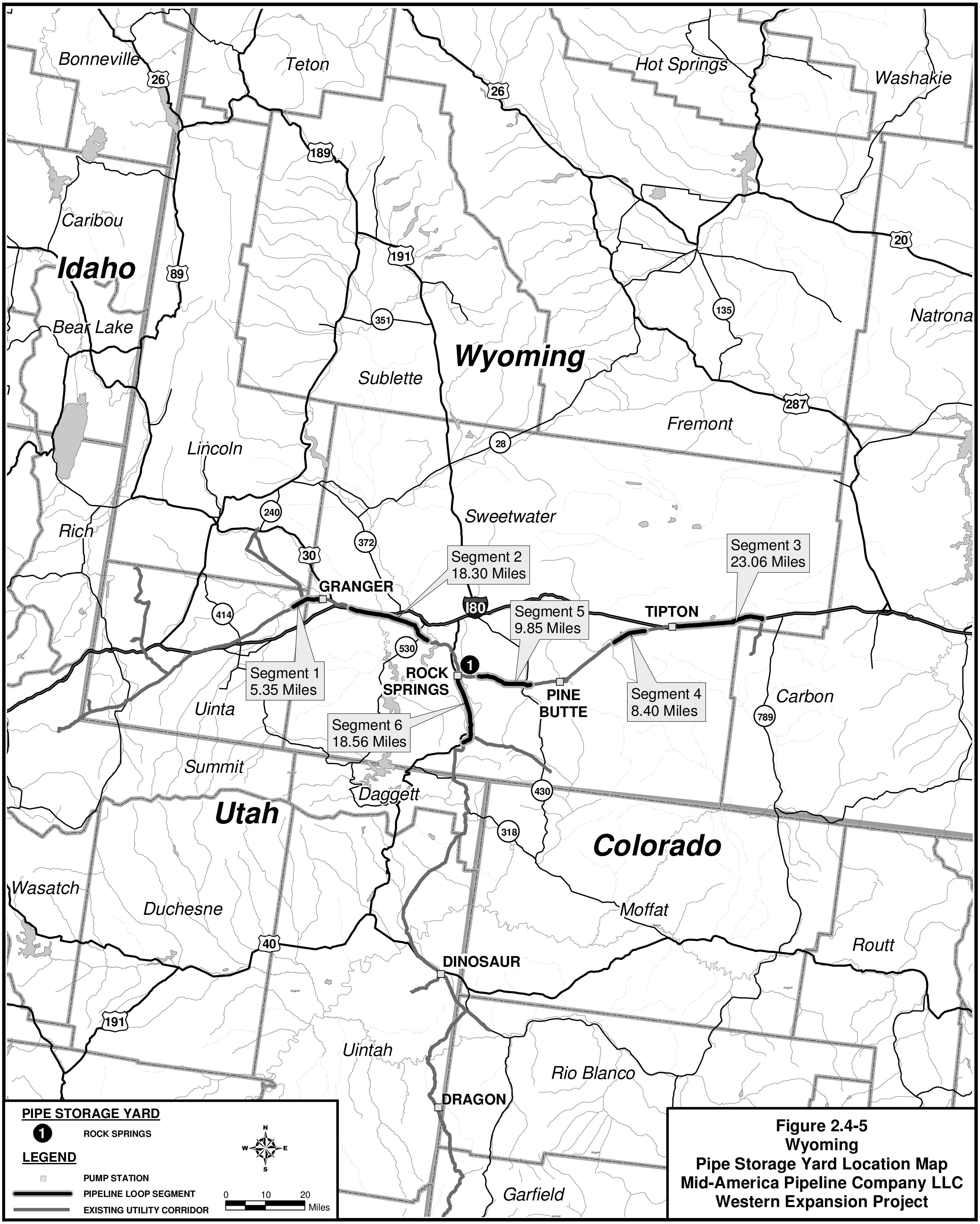


Figure 2.4-5
Wyoming
Pipe Storage Yard Location Map
Mid-America Pipeline Company LLC
Western Expansion Project

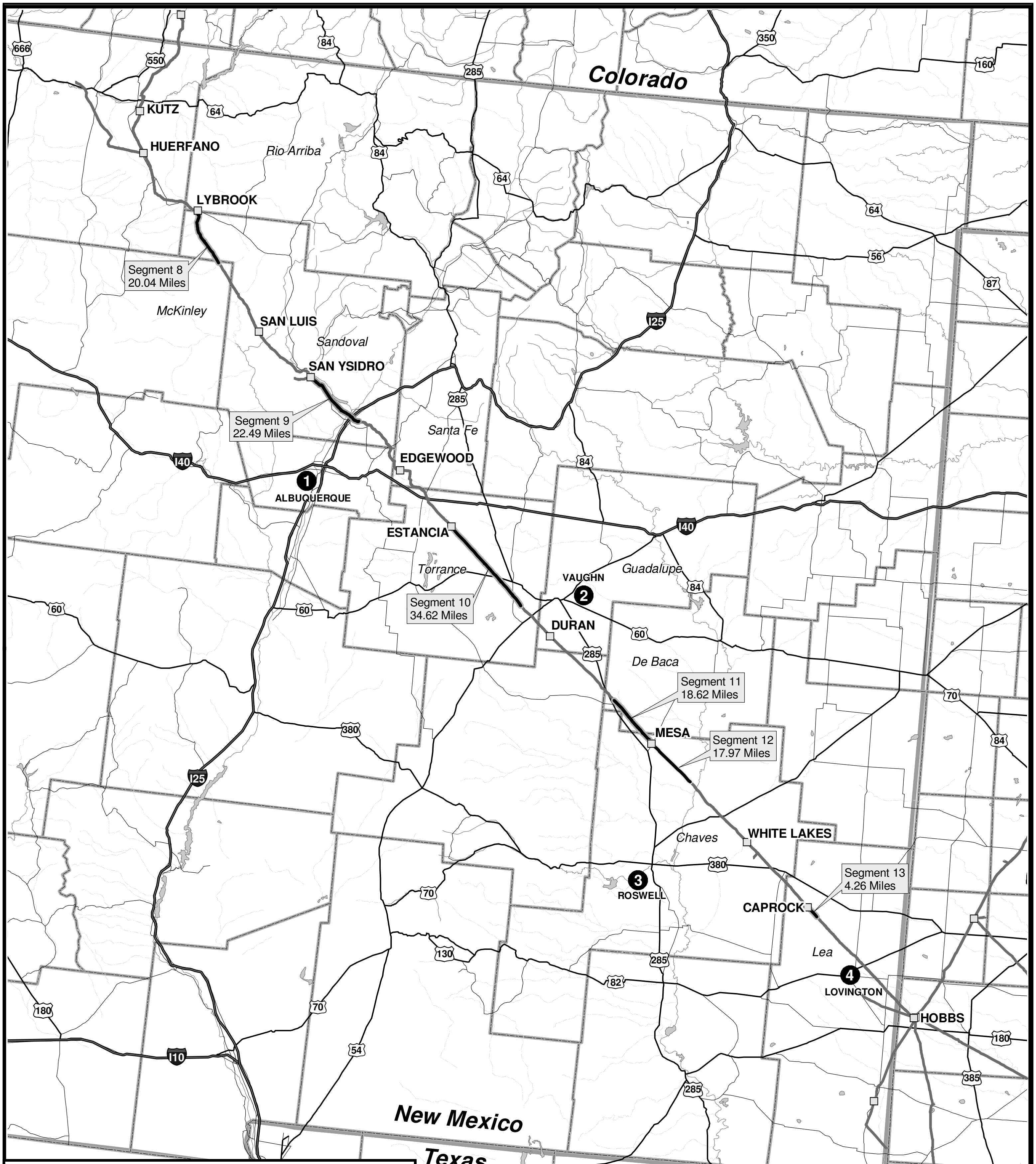


Figure 2.4-6
New Mexico
Pipe Storage Yard Location Map
Mid-America Pipeline Company LLC
Western Expansion Project

> Lovington, New Mexico. This 3-acre site is located within the town of Lovington adjacent to a railroad siding and is bounded on the north by a residential area. The site is currently vacant land, and the vegetation is previously disturbed native grasses.
>
> Albuquerque, New Mexico. This 11.4-acre site is located adjacent to a railroad siding within an industrial area between the Rio Grande and Interstate 25 in southern Albuquerque. The present use of this land is for industrial equipment storage. It has been entirely cleared of vegetation.

The pipe storage yards would add approximately 35 acres of land to the project. Of these 35 acres, 21.5 acres would be industrial uses devoid of vegetation, and 13.5 acres of land previously disturbed and revegetated with native grasses. These acres would be in addition to the pipeline ROW, linear TUAs and other TUAs identified earlier in this section.

Water Requirements

MAPL would require water for dust control along the ROW and along unpaved access roads during construction. Specific volumes of water needed for dust control would depend upon weather conditions encountered during construction, but an average of 1,000 to 4,000 gallons of water (one typical water truck) may be needed per day on each construction spread. This would result in the use of 175,000 to 700,000 gallons (0.53 to 2.1 acre-feet) of water for the entire Project. Approximately 40 percent of the total is anticipated to be used in Wyoming, and 60 percent of the total used in New Mexico during pipeline construction.

The hydrostatic testing procedure is described in the Hydrostatic Testing section later in this chapter, but the quantities anticipated to be needed for the Project are described in this section. Water for hydrostatic testing will be acquired by the Construction Contractor from permitted sources, and discharged in accordance with permit requirements. Sources such as private wells, ponds, or municipalities will be the most desired sources and water will be transported to the job sites. MAPL will consult with the USFWS as appropriate for any Colorado River water depletions associated with surface water used for dust abatement or hydrostatic testing. Incremental test water volume requirements are small due to the segmented nature of the project and the numerous elevation changes encountered. It is expected that test water will be acquired by the construction contractor in relatively small volume increments. Table 2.4-4 lists the number of hydrostatic test sections within each segment, the largest volume required for any one of the test sections (anticipating water can be reused within a single segment), and the total volume of water that would be used if the water could not be pushed or reused. As shown on the table, the anticipated total quantity of water required for hydrostatic testing of the pipeline looping segments will be at least 2.6 million gallons (8.02 acre-feet) for 49 different test sections. Any volume greater than 2.6 million gallons (with a maximum estimate of 24.8 acre-feet) will be dependent on the construction schedule (e.g. different construction time periods for adjacent test sections). This quantity is exclusive of water required for directional drilling operations.

Table 2.4-4 MAPL WEP Anticipated Hydrostatic Test Water Volumes

Segment	Estimated Number of Test Sections within Segment	Largest Hydrostatic Test Section Volume within Each Segment in gallons and (acre-feet)[1]	Maximum Volume-Each Segment in gallons and (acre-feet)[2]	Possible Fill Location	Possible Discharge Location
1	1	121,175 (0.37)	121,175 (0.37)	Granger Station	Discharge through dewatering structure at Opal Meter Site
2	6	135,538 (0.42)	414,181 (1.27)	Far east end, closest to town of Green River	Discharge through dewatering structure at tie-in
3	4	90,263 (0.28)	327,956 (1.01)	Tipton Station	Discharge through dewatering structure at tie-in at Wamsutter Junction
4	1	119,493 (0.37)	119,493 (0.37)	West tie-in location	Discharge through dewatering structure at east tie-in site
5	3	47,407 (0.15)	140,127 (0.43)	West tie-in location MLV site	Discharge through dewatering structure at east tie-in site
6	9	231,187 (0.71)	945,035 (2.90)	Rock Springs Station	Discharge through dewatering structure at south tie-in site
8	4	302,903 (0.93)	1,021,845 (3.14)	Lybrook Station	Discharge through dewatering structure at the valve site at the south end
9	6	313,572 (0.96)	1,144,092 (3.51)	San Ysidro Station	Discharge through dewatering structure; dewater at crop area between 1-25 and Rio Grande.
10	7	300,974 (0.92)	1,763,144 (5.41)	Estancia Station	Discharge through dewatering structure at valve site tie-in at south end
11	3	451,933 (1.39)	947,886 (2.91)	Mesa Station	Discharge through dewatering structure at north tie-in valve site
12	4	281,960 (0.87)	914,774 (2.81)	Mesa Station	Discharge through dewatering structure at south tie-in valve site
13	1	216,606 (0.67)	216,606 (0.67)	South tie-in valve site	Discharge through dewatering structure at Caprock Station
Wyoming	**24**	**745,063 (2.29)**	**2,067,967 (6.35)**		
New Mexico	**25**	**1,867,948 (5.73)**	**6,008,349 (18.44)**		
Totals	**49**	**2,613,011 (8.02)**	**7,096,844 (24.79)**		

[1]assumes reuse and "push" of test water
[2]assumes no reuse or "push" of test water

Transportation System Requirements

To the greatest extent practicable WEP pipeline looping segments would be constructed using existing roads previously used as construction access routes into the existing pipeline/utility line corridor. These roads would include Federal highways, state highways, county paved and unpaved roads, Tribal roads, BLM roads, and private field roads. In some locations, additional roads have been identified that were previously used for construction. No new roads would be constructed. Access roads used for the project are shown on project location maps in Appendix C and additional information on access roads is provided in Appendix C.

The primary interstate highways that would be used to transport pipe, equipment, and work crews to the WEP pipeline looping segments would be Interstate Highway 80 in Wyoming and Interstate Highways 25 and 40 in New Mexico. State highways that may be used include Wyoming State Highways 430 and 530, and New Mexico State Highway 550, 285, and 380. Pipe transported via railroad would possibly use the Union Pacific Railroad system in Wyoming or the Burlington-Northern and Santa Fe Railroad in New Mexico.

Appendix C lists access roads currently anticipated to be used during construction of the MAPL WEP pipeline looping segments, the description of each road, and the approximate pipeline milepost at the access point. Possible road improvements may be required for one two-track road on BLM land in Wyoming and four roads on BLM, BIA, and private land in New Mexico, resulting in a disturbance of approximately 5.5 acres as listed in Appendix C. Existing roads that are used in conjunction with the ROW would undergo periodic maintenance.

At the request of nearby residents, the BLM, the BIA, or a Tribe/Pueblo; unsurfaced roads that pass within 0.25 mile of occupied dwellings would be watered, or chemical dust suppressants approved by the county and/or the BLM would be applied. No chemical dust suppressants would be applied to BIA or Tribal roads.

Workforce Requirements

The construction work force is anticipated to include approximately 600 personnel. The pipeline construction crews would utilize many different skills including laborers, equipment operators, and welders. MAPL would use in- or out-of-state contractors, depending upon the availability of equipment and skills needed to complete the Project. MAPL anticipates that a large percentage of the work force would include people from Wyoming and New Mexico, but would likely also include other workers from adjacent states and other parts of the United States. The work force anticipated to be needed to construct the pump station upgrades differs from pump station to pump station and state to state based on the extent of upgrades. The schedule and workforce requirements for pump station upgrades will be established in summer 2005.

Compliance with the Navajo Preference in Employment Act and the Navajo Business Preference Act would be required of the general contractor for project construction across Navajo lands in northwestern New Mexico. MAPL has submitted and implemented an affirmative action plan that involves training, screening of applicants for abilities in different trades, supervisor training, and subcontracting instruction. All applicants completing the training and screening programs would be made available to the general contractor. The general contractor would be required to document the extension of work opportunities to these individuals and companies as a condition of compliance with the Navajo preference acts.

Pipeline Segment Construction

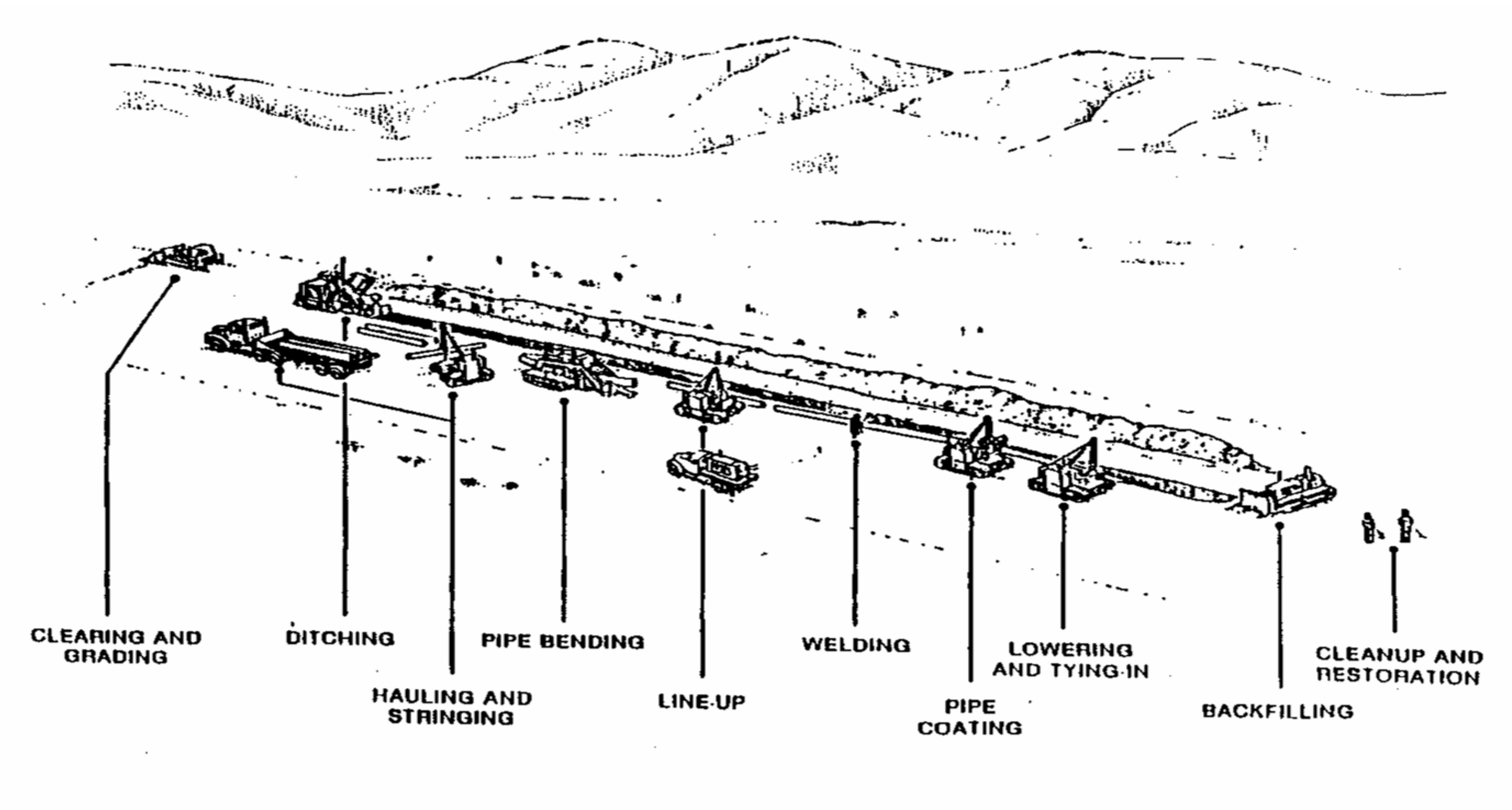
This section describes standard procedures for pipeline construction, followed by descriptions of procedures and environmental protection measures for special construction areas such as stream and river crossings, wetland crossings, road and railroad crossings, residential areas, and pipeline crossovers.

Construction of the proposed pipeline and other facilities is scheduled to commence in October 2005 and extend into 2006, once necessary authorizations are obtained, and wildlife limitations are considered. Construction sequence and spreads will be finalized beginning in summer 2005. For purposes of this EA, construction is anticipated to be divided into two spreads or construction sections of approximately 300 workers each. The crews for each spread would typically work six days a week. The Wyoming Spread would construct Segments 1 through 6, a pipeline length of 83.5 miles. Construction would take approximately three months of actual working time. Pipeline construction progress would be approximately one mile per day.

The New Mexico Spread would construct Segments 8 through 13, a pipeline length of 118 miles. Construction would take approximately four months of actual working time. Construction progress of approximately one mile per day is expected.

General Construction Procedures. The general pipeline construction phases that are common to all pipelines include: preconstruction surveys, clearing, grading, excavation, stringing, bending, welding, coating, lowering, backfilling, hydrostatic testing, cleanup, restoration, and commissioning (Figure 2.4-7). The proposed pipeline construction techniques are similar to those for standard pipeline construction, and would be in conformance with all applicable DOT and Occupational Safety and Health Act (OSHA) regulations. The following sections briefly outline the major construction steps.

Preconstruction Surveys. MAPL would survey and stake the proposed ROW adjacent to the existing pipelines in the pipeline/utility corridor. After this initial survey is completed, cultural resource, sensitive species, and wetland surveys would be completed along the proposed pipeline ROW. Depending upon the results of these surveys, adjustments in the pipeline centerline would be made to avoid or reduce impacts to sensitive resources. The ROW staking for the pipeline construction contractor would include the centerline, ROW boundaries, TUAs, cultural sites, and environmentally sensitive areas. The lathe staking would be marked with different flagging color combinations to define the type of use or avoidance area. The Authorized Officer or landowner would determine distance intervals between stakes consistent with the Quality Assurance/Quality Control Compliance (QA/QC) Plan which is summarized in Appendix D-1. Typically the distance between stakes is 250 feet or less (100 to 150 feet) in areas of sensitive resources, where topography or vegetation obscures vision, and in potentially “busy” areas, i.e., pipeline tie-ins, road junctions, and directional and horizontal drilling locations.



	Enterprise Products Partners, LP	**Figure 2.4-7** **Typical Construction Sequence for MAPL Western Expansion Project**
	Not to Scale	MAPL Western Expansion Project

Fencing and Livestock Management. MAPL would minimize the disturbance to existing fences and would install gates or temporary fences for the construction period, as necessary. When construction associated with the pipeline looping segments break or disrupt a natural barrier used for livestock control, gaps thus opened would be temporarily fenced to protect passage (drift) of livestock. The fence would be constructed per BLM, Tribal or private standards, as applicable. MAPL would contact the the involved BLM or BIA Offices concerning the grazing lessee(s) under their respective jurisdictions prior to crossing any fence on private, public, BIA or tribal land, or fences between public and private land. Each fence crossed by a MAPL WEP pipeline loop segment ROW would be braced and secured to prevent slacking of the wire before cutting for pipeline construction. The opening created would be closed during construction, and only opened when necessary, to prevent the passage of livestock. BLM will be notified if any fence on public lands is disturbed by construction activities. After construction, MAPL would restore the fences to at least the same condition as they were found.

Topsoil Removal. Topsoil and small vegetative debris will be removed from the trench and working side areas, as well as areas involving cut and fill, such as on side slopes. In other areas the ROW may be "bladed" or "scalped" as needed to minimize the danger of fire from welding or vehicle traffic. Topsoil will only be segregated on BLM and Tribal lands where topsoil is available, as well as on privately owned lands as requested by the landowner. Topsoil and spoil will be replaced in the proper order during backfilling and final grading. When soils have a high content of cobbles, rocks, or boulders, or when surface fines are less than 6 inches deep, topsoil salvaging may not be possible; however, if requested by the jurisdictional agency office, topsoil will be salvaged regardless of surface rock content or depth of soil surface. Where shallow soils or soils with stony subsoil are encountered, segregating the topsoil will be reduced to approximately 6 inches and efforts will be made to segregate the entire topsoil layer, avoiding mixing with the underlying horizons, and to stockpile topsoil separately from all subsoil.

Surface rock, where present and where it is useful for reclamation, will be scraped or raked and windrowed with the topsoil windrow. After backfilling, the rock will be separated from the topsoil and then spread over disturbed areas to visually blend the areas with the adjoining undisturbed land, or utilized as erosion control (rock) mulch.

Appropriate measures will be taken as necessary to prevent erosion, and slope breakers would be constructed to: (1) ensure that unconsolidated soils do not erode from the disturbed right-of-way; (2) simulate the imaginary contour line of the slope (ideally with a grade of 1 or 2 percent); (3) drain away from the disturbed area; and (4) begin and end in vegetation or rock where possible. A closer spacing of slope breakers would be required on steep slopes to reduce channelization. Slope breakers would be installed according to the specifications or as determined based on potential runoff. The maximum slope distance between the slope breaker structures will be as follows:

- grades of 5 percent to 15 percent, the slope distance will be 300 feet
- grades of greater than 15 percent to 30 percent, the slope distance will be 200 feet
- grades of greater than 30 percent, the slope distance will be 100 feet

Clearing and Grading. Clearing, grading, and other disturbances to soil and vegetation on the ROW and TUAs would be limited to the area required for construction. For all but Segment 6, the width of disturbance would be 75 feet. The disturbed width of ROW for Segment 6 would be 85 feet. Additional TUAs would be required in certain instances, as dictated by safety and local conditions. These may result from soil type, rocky areas, slopes, road or stream crossings, or areas with difficult access. These additional areas are expected to be adjacent to the ROW.

MAPL would clear woody vegetation from the 75 to 85-foot wide permanent ROW and linear TUA for the pipeline looping segments by cutting larger trees (in areas where trees are present) and using a brush mower for smaller shrubs. Clearing practices would minimize the removal of root systems in shrub-lands and in areas where remaining roots may temporarily provide stability through scalping of the existing vegetation. In general:

1) Clearing of the ROW in non-forested areas (e.g. sagebrush flats, grasslands, etc.) would consist of mowing the area with a brush hog or similar device, as required. Scalping of the brush and grass would be held to the width required in ditch areas and in welding areas to prevent fire. Grass cover or low growth vegetation would not be removed except immediately over the ditch line or in rough or broken terrain. Clearing of vegetation in storage areas would occur when leveling of topographical features is required.
2) Clearing the ROW in forested areas that consist of pinyon-juniper type vegetation may include cutting wood to reasonable lengths and piling it along the ROW or disposing it in accordance with private landowner requests or public land management requirements. However, trees would not be pushed into piles and mixed with the soils.
3) Grading of the ROW would follow the general topography, especially in benched terrain. Trees, brush, other woody material and rocks graded from the ROW would be placed to one side of the ROW or placed inside a TUA until reclamation occurs. Rocks may be hauled off the ROW at landowner request to a commercial disposal site or private land. In order to control the spread of noxious weeds, agency-specified procedures for noxious weed control would be followed. Such agency procedures have been incorporated into the Noxious Weed Management Plan which is summarized in Appendix D-2.

Graded areas and soil stockpile areas would be protected in accordance with the Project Stormwater Pollution Prevention Plan (summarized in Appendix D-3) and other erosion control measures to prevent soil erosion losses from the ROW and sedimentation impacts to drainages. Typical protection measures would include the use of silt fences and straw bales across drainage ways intercepted by the ROW.

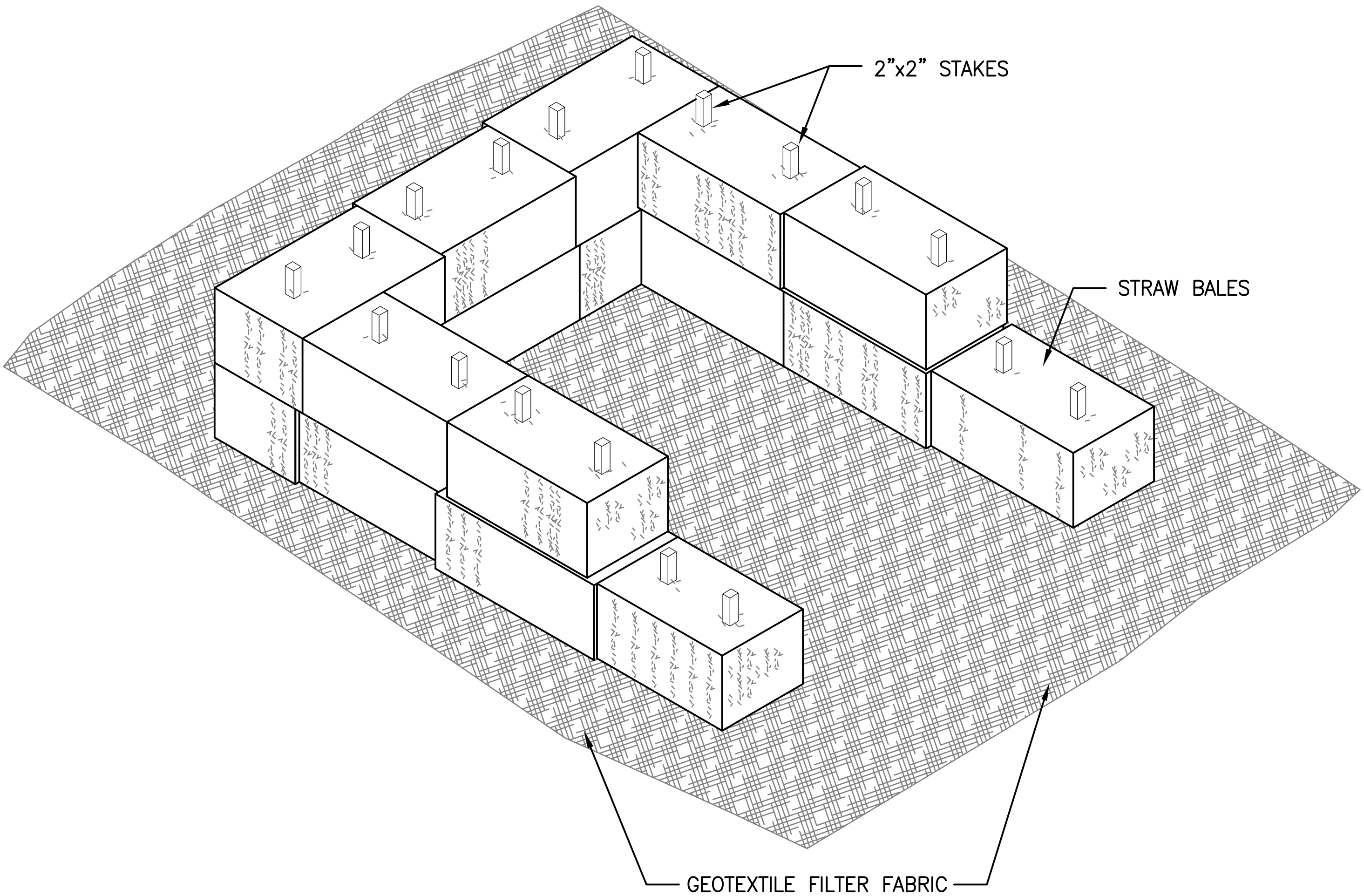
Ditching. After the working area was prepared, pipe would be hauled to and distributed along the ROW. When pipe bending was completed, as needed, trenching operations would begin. Ditches would be excavated either with a trenching machine or backhoe/trackhoe. The trenching machine, if used, can excavate a ditch of appropriate width, although width would vary with pipe diameter, soil conditions, and the type of ditcher used or setups. Gentle topography and fine-textured soils allow the use of a trenching machine while a backhoe can be used in most soils.

Ditches may be open several days, possibly up to two weeks, until welded pipe sections are lowered in and backfilling is completed. However, care would be taken to keep roads passable during this phase of construction. If there were places where the continuous pipeline trench was not interrupted by a road or pipeline crossing, earthen ramps and soft plugs might be placed in approximately one-mile intervals and/or at prominent game and livestock trails to allow escape of livestock or wildlife from the ditch. The trench would be inspected every morning for livestock or wildlife that may have fallen in during the night. The depth of the ditch would vary with the conditions encountered. The cover from the top of the pipe to ground level would be at least 36 inches, except in areas where rocks exist. Should solid rock be encountered, the minimum depth of cover would be 24 inches. In some cases, the pipeline may be buried at greater depths, such as where it passes under existing pipelines, roads, railroads, streams, or other obstacles. Additional TUAs would be required at the deeper excavated sections of the pipeline for storage of excess spoil.

In rocky terrain, a rock trenching machine may be used to minimize environmental disturbances. Backhoe hydraulic rams or blasting would assist in rock excavation where rock trenchers are ineffective. Trenches may require dewatering during rainy periods. The trenches would be dewatered through dewatering structures as shown in Figure 2.4-8 and 2.4-9 to control scouring and to prevent silt-laden water from flowing into any wetland or water body. Trench breakers, as shown in Figure 2.4-10, would be installed as needed to slow the flow of subsurface water along the trench after backfilling. Trench breakers may be constructed of materials such as sand bags or polyurethane foam. Topsoil would not to be used in trench breakers. A qualified professional would determine the need for and spacing of trench breakers. Otherwise, trench breakers would be installed at the same spacing as the upslope ends of permanent slope breakers on the surface. Trench breakers would be installed along steep slopes, at the base of slopes adjacent to water bodies and wetlands, and where needed to avoid draining of a wetland.

Stringing/Welding/Lowering-In. The ditching operation would be integrated into the process of pipe stringing, bending, aligning, welding, x-raying, coating welded joints, and lowering-in. Pipe hauling and stringing would be performed within the requested ROW and TUAs, and in a manner that minimizes interference with normal use of the land crossed. Roads would not be blocked during hauling operations on designated access roads. Parking of individual vehicles, construction equipment, and support vehicles would be confined to the ROW or TUA unless approved by a representative of the jurisdictional agency or private land owner.

Once bending, aligning, welding, x-raying, and joint coating are completed, pipe sections would be lowered into the ditch. Prior to lowering in, a detector would be used to inspect the pipe coating to detect “holidays” (imperfections). Any holidays detected in the coating would be repaired using Company-approved coatings and techniques. All construction procedures would be performed in accordance with 49 CFR Part 195.



NOTES:

1. INSTALL A STRAW BALE DEWATERING STRUCTURE WHEREVER IT IS NECESSARY AND AS DIRECTED BY THE INSPECTOR TO PREVENT THE FLOW OF HEAVILY SILT LADEN WATER INTO WATERBODIES OR WETLAND.
2. DISCHARGE SITE SHALL BE WELL VEGETATED AND THE TOPOGRAPHY OF THE SITE SUCH THAT WATER WILL FLOW AWAY FROM ANY WORK AREAS. THE AREA DOWN SLOPE FROM THE DEWATERING SITE MUST BE REASONABLY PLANE OR STABILIZED BY VEGETATION OR OTHER MEANS TO ALLOW THE FILTERED WATER TO CONTINUE AS SWEET FLOW.
3. IF BOTTOM OF STRUCTURE IS NOT LINED WITH STRAW BALES, IN AREAS OF HIGHLY ERODIBLE SOILS, LINE ENTIRE STRUCTURE WITH GEOTEXTILE FILTER FABRIC OR PLASTIC SHEETING.
4. THE DIMENSIONS OF THE STRUCTURE SHALL BE DETERMINED IN THE FIELD BASED UPON SITE CONDITIONS.
5. DISCHARGE RATES SHALL BE SUCH THAT WATER WILL NOT OVERFLOW THE TOP OF THE STRUCTURE.

ENTERPRISE

MID-AMERICA PIPELINE COMPANY, LLC.

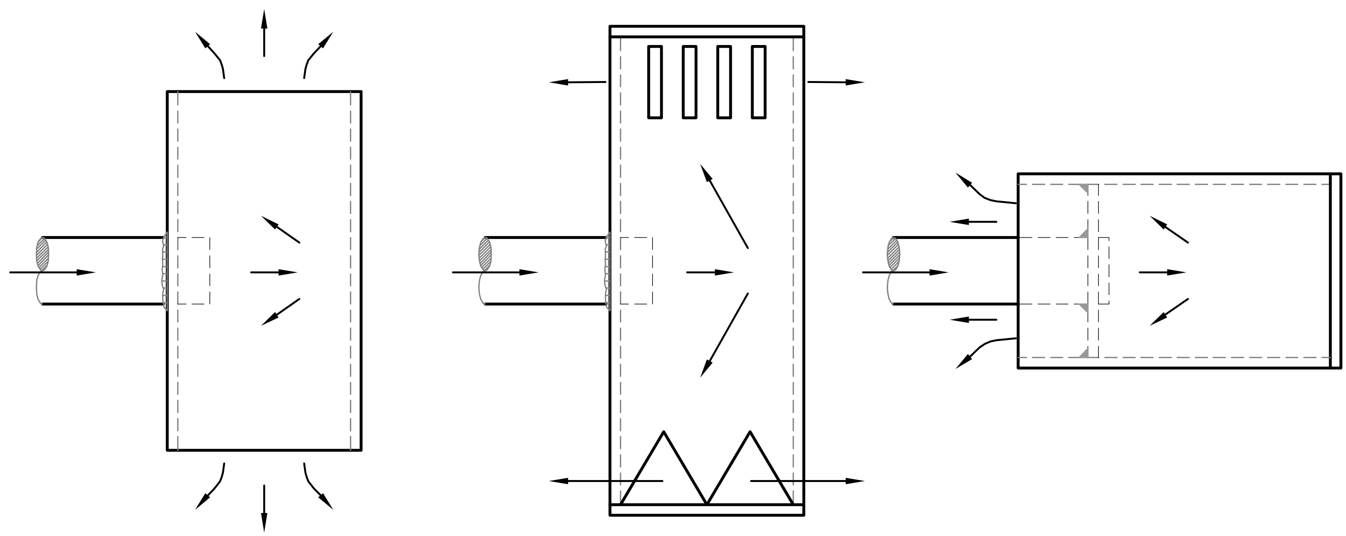
Figure 2.4-8

WESTERN EXPANSION PROJECT

STRAW BALE DEWATERING STRUCTURE FOR TEST WATER DISCHARGE

REV.	DESCRIPTION	BY DATE	CHK DATE	APPR DATE

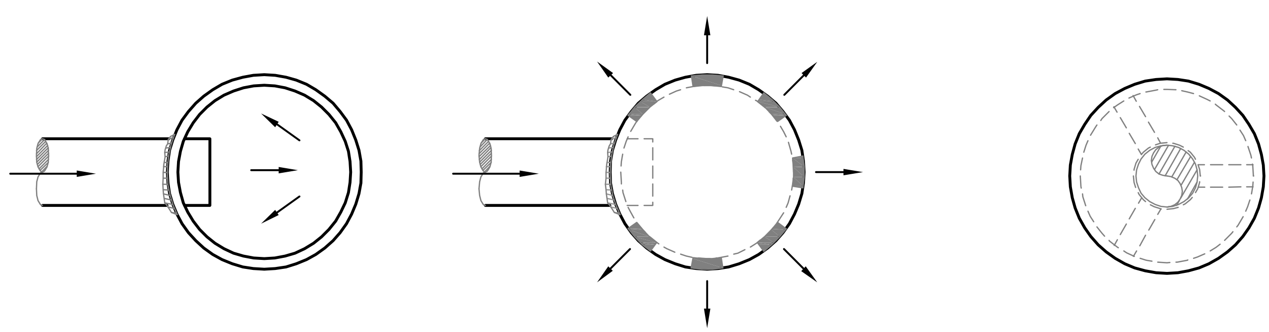
DRAWN	DATE	CHECKED	APPROVED	SCALE	DRAWING NO.
JBK	3/17/05	BO	DW		



PLAN — PIPE BODY–OPEN END

PLAN — PIPE BODY w/ STANDOFF PLATE

PLAN — PIPE BODY–PLATE END



PROFILE — BASIC SPLASH PUP

PROFILE — BASIC SPLASH PLATE

PROFILE — PLATE COMBINATION

NOTES:

1. AN ENERGY DISSIPATOR SHALL BE UTILIZED WHENEVER WATER DISCHARGE VELOCITIES MAY CAUSE EROSION.
2. THE DESIGN AND EFFECTIVENESS OF THE ENERGY DISSIPATOR IS THE RESPONSIBILITY OF THE CONSTRUCTION CONTRACTOR.
3. ENERGY DISSIPATORS ARE UTILIZED IN CONJUNCTION WITH A DEWATERING STRUCTURE.
4. GEOTEX FABRIC OR EQUIV. SHALL BE PLACED UNDERNEATH AND AROUND DISSIPATOR DEVICE TO MINIMIZE EROSION.

MID-AMERICA PIPELINE COMPANY, LLC.

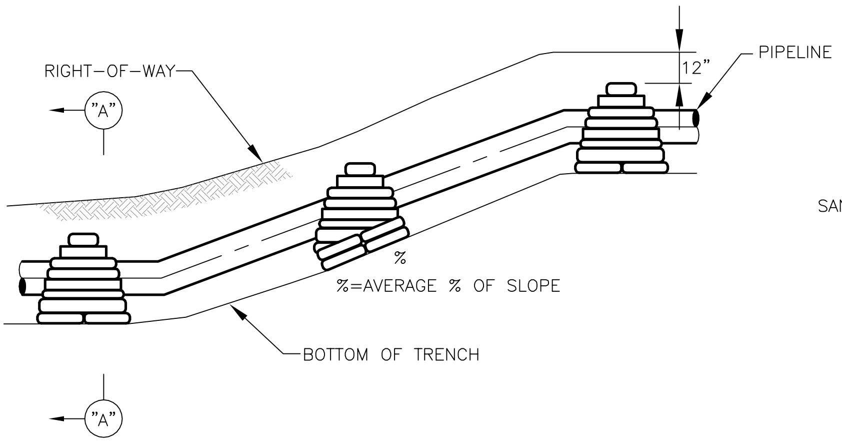
Figure 2.4-9

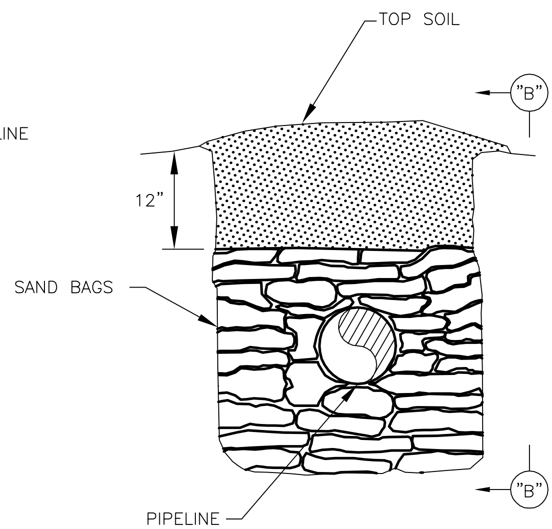
WESTERN EXPANSION PROJECT

TYPICAL ENERGY DISSIPATOR FOR TEST WATER DISCHARGE

DRAWN	DATE	CHECKED	APPROVED	SCALE	DRAWING NO.
JBK	3/17/05	BO	DW		

REV.	DESCRIPTION	BY / DATE	CHK / DATE	APPR / DATE

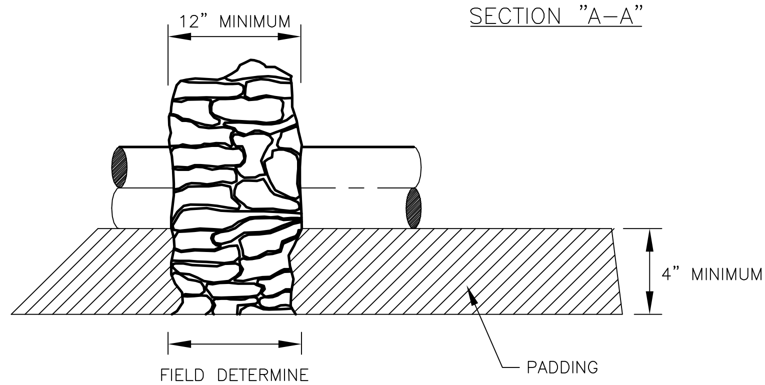




SECTION "A–A"

BREAKER SPACING

AVG. SLOPE (%)	SPACING (FT.)
<5	NONE
5–10	100–150
11–15	80–100
16–20	70–80
21–30	50–70
>30	25–50



SECTION "B–B"

NOTES:

1. BREAKERS SHALL BE INSTALLED AT SHARP CHANGES OF SLOPE (<5%) ALONG TRENCHLINE AND AT LOCATIONS WHERE THE NATURAL DRAINAGE PATTERNS, PROFILE OR BACKFILL MATERIAL WILL CAUSE THE TRENCH TO ACT AS A DRAIN.
2. BREAKER SHALL BE FORMED USING SAND BAGS, EARTH–FILLED SACKS OR SPRAYED FOAM BARRIERS.

MID-AMERICA PIPELINE COMPANY, LLC.

Figure 2.4-10

WESTERN EXPANSION PROJECT

TRENCH BREAKER DETAIL

REV.	DESCRIPTION	BY / DATE	CHK / DATE	APPR / DATE

DRAWN	DATE	CHECKED	APPROVED	SCALE	DRAWING NO.
JBK	4/30/04				

Backfilling/Cleanup. Once the pipe sections are lowered into the ditch and properly padded with rock-free subsoil, backfilling may commence. Backfilling would be completed using the spoil previously excavated from the ditch. Any topsoil previously segregated would be placed on top of subsoil or other backfill material. The entire length of pipe would generally be backfilled prior to hydrostatic testing except at tie-in locations, mainline valves, and station facilities.

The Wyoming BLM has recently requested no berm be left over the ditch. Instead, they ask that the backfilled trench line be left “rough” with 8- to 10-inch diagonal troughs throughout. In New Mexico, MAPL proposes to form a berm over the ditch (except at road crossings, in drainages, and at heavy use areas) to compensate for some settling. After backfilling, the disturbed ROW surface would be restored to its original contour. This would include moving fill material back into side hill cuts that were excavated during construction to the extent practical.

Topsoil replacement and spreading would not take place when the ground was frozen or wet. Seeding would be in accordance with landowner requirements. The Contractor would operate within the established construction ROW and TUAs for this project.

Every effort would be made to complete final cleanup of an area (including final grading and installation of permanent erosion control structures) within 30 days after backfilling the trench. If this schedule cannot be met, final cleanup must be completed as soon as possible. In no case would final cleanup be delayed beyond the end of the next recommended seeding season.

Reclamation. Erosion control and revegetation measures would be employed on federal lands as specified by the BLM and BIA. Other stabilization, rehabilitation, and revegetation measures would be conducted in accordance with the Reclamation Plan which is summarized in Appendix D-4).

Noxious Weeds. A Weed Management Plan along with a Weed Control Plan are summarized in Appendix D-2. Included are procedures and management methods for the control of noxious weed infestations that occur along the proposed segment ROWs.

Fire Control. A Fire Suppression Plan for the Project is summarized in Appendix D-5). It is based on the BLM Manual H-2801-1, Right-of-Way Plans of Development, and Grants (BLM, 1990). Fire suppression procedures would be applied to both BLM and BIA lands, unless otherwise noted.

Hydrostatic Testing. After pipeline construction is completed, the structural integrity of the pipeline would be hydrostatically tested by first filling a hydrostatic test section of the pipeline segment with water, and then employing pumps to increase the water pressure within the pipeline to a level that exceeds the maximum operating pressure for transporting natural gas liquids. Pressure testing of the pipeline and components would be conducted in accordance with DOT 195.304 and .305. These regulations require that the test pressure be maintained throughout the part of the system being tested for at least 4 continuous hours at a pressure equal to 125 percent, or more, of the maximum operating pressure. In the case of a pipeline that is not visually inspected for leakage during the test, pressure would need to be maintained for at least an additional 4 continuous hours at a pressure equal to 110 percent, or more, of the maximum operating pressure.

Hydrostatic test section lengths would be determined by taking into consideration the source and quantity of the available test water, disposal sites for the test water, the maximum elevation difference for proper testing of the pipe, and accessibility of test sites. Test sections would be chosen such that the test pressure at the highest point of each section would meet the designed pipeline MAOP, and the pressure at the low point would not exceed 95 percent of the system maximum yield strength (SMYS).

If leaks are detected, they would be repaired appropriately, and the section retested until federal Department of Transportation (DOT) requirements are met.

The Construction Contractor would obtain a hydrostatic test water discharge permit prior to the test water discharge. Prior to any discharge, hydrostatic test water will be tested and processed, as necessary, to ensure that the water meets local, State, or Federal water quality standards. Prior to discharge of hydrostatic testing water from the pipeline, an energy dissipater will be installed at the discharge point and erosion protection measures employed. Examples of an energy dissipater and haybale dewatering structure are shown in Figure 2.4-8 and 2.4-9. Permits would be obtained through the Wyoming Department of Environmental Quality, and New Mexico Oil Conservation Division in compliance with the U.S. Environmental Protection Agency (EPA) NPDES program. Discharges are typically to upland areas or surface impoundments at various locations along the route. Haybales, sandbags or other materials installed at the discharge point will be removed from the site upon completion of the hydrostatic testing. Each discharge point will be identified in NPDES permit applications.

Hydrostatic testing of new components installed as part of pump station upgrades will also be conducted. Quantities of water to be used for pump station upgrade hydrostatic testing are anticipated to be small and will be permitted and discharged in accordance with NPDES regulations in Wyoming, Utah, Colorado, and New Mexico.

Access Restoration and Control. The ROW would not provide a new vehicle access opportunity for the public. The ROW is adjacent to existing pipeline ROWs, and only authorized vehicle access is allowed on the ROW for pipeline operation and maintenance. Access is controlled primarily by locked and unlocked gates and signs denoting authorized access only. Berms or other appropriate features could be installed to deter access and use by unauthorized vehicles, including ATVs, if access issues arise. The ROW will be used by maintenance vehicles and must remain clear for authorized vehicle access. If necessary, berms or rocks would be used to limit access to the ROW from the side.

Special Construction Methods and Equipment.

Rough Terrain. Special construction methods that are typically used to work in rugged terrain may be required in several places along the route. The topsoil would be segregated and saved, and the spoil from the cut area and trench would remain on the permanent and temporary ROW. In some cases, it may be necessary to place some of the spoil from the cut areas onto the working side, and allow the construction equipment to work off the spoil. In areas of steep slopes, safety precautions would be implemented to ensure the safety of the public as well as construction personnel. It may be necessary to anchor equipment and pipe with cables to secured equipment or "dead men" to prevent the equipment or pipe from sliding down steep slopes. Some equipment may also need mechanical assistance to traverse steep slopes. Such equipment may be winched up or down the slopes.

Winter Construction. MAPL would adhere to applicable BLM field office and BIA stipulations regarding winter construction of pipelines. A summary of the Winter Construction Plan for this project is found in Appendix D-6.

Road and Railroad Crossings. Improved surface roadways including paved county roads, state and U.S. highways would be bored or horizontal directionally drilled provided geotechnical conditions are favorable. Dirt or two-track roads would be open cut. Some unimproved county roads may also be open cut with prior authorization.

Pipeline crossings of public roads and railways would be designed in accordance with 49 CFR 195, permit requirements, and MAPL specifications, except as specified herein. Road crossings would be constructed to ensure a minimum 5.5 feet of cover from the top of pipe (or pipe coating) to the underside of the traveled surface of the road and a minimum 4 feet cover as measured from the bottom of the adjacent ditches. The angle of crossing would be as close to perpendicular as practical.

Railroad crossings would be achieved by boring. The pits required to bore typical roads and railroads are typically 10 to 15 feet wide by 30 to 40 feet long, depending on site conditions. To obtain adequate cover for the pipe, drill pits may be approximately 8 to 9 feet below the road or railroad grade. Topsoil and spoil areas for the pits would be within individual TUAs as identified in Appendix C.

Rock. Excavation through rock may be required in isolated locations during construction of the pipeline looping segments. Currently, it is anticipated that limited, if any, blasting would be required for excavation through rock. An evaluation of site-specific conditions would be conducted prior to any blasting.

Waterbodies. Pipeline crossings of rivers and streams would be below ground (buried). No above ground, "spanning"-type crossings would be employed. The method selected to cross a waterbody would depend on the terrain and geotechnical conditions.

When open cut river and stream crossings are required, the pipeline would have negative buoyancy for empty pipe and would be buried to a depth such that the pipeline is not affected by anticipated scour. Pipeline buoyancy control may be achieved by applying continuous armored concrete coating, concrete anchors, or pipe sack weights, if necessary.

If the river/stream banks are breached during construction, bank protection to control erosion would be provided both during construction and following restoration.

Water crossings may be achieved by several different methods, depending on the terrain and flow conditions of the stream. Small irrigation ditches and canals may be crossed by boring under the feature.

Dry washes, gullies, and low-flowing streams may be crossed by open cutting using backhoe-type equipment where practical. Banks of the washes would be excavated to create a slope gentle enough to permit equipment to descend to the channel floor. Where steep banks are breached, the banks would be stabilized using erosion control fabric/netting or rip-rap. Flowing streams would use dams or flumes to divert the flow of water during installation of the pipeline.

Clearing of riparian vegetation will be minimized with a 15-foot vegetative buffer left on either side of stream crossings, if possible. Sediment control structures such as silt fences will be placed across the ROW at the edge of the vegetative buffer and will be temporarily removed as needed during active construction.

Additional TUAs, up to 50-feet wide on each side of the ROW and averaging 100-feet long, would be required at stream crossings. These work spaces would be located at least 50 feet from the water's edge. Soil would be stockpiled at the top of the stream banks and protected with silt fences, as necessary. After the pipe is installed, the soil would be used to restore the slopes to a stable configuration. This approach may be modified to fit specific situations, i.e., rock rip-rap or other reinforcing material may be required in large, deep washes where banks are unstable and scouring potential is high.

All vehicle and equipment refueling and maintenance as well as concrete coating activities will take place at least 100 feet from waterbodies. Exceptions will be made for stationary equipment such as pumps used for dewatering or hydrostatic testing which are placed within adequate spill containment structures. Hazardous materials, fuels, and lubricants will not be stored within 100 feet of a waterbody. Construction equipment and vehicles will be parked at least 100 feet from waterbodies at the end of the working day. A summary of the Spill Prevention Control and Countermeasures Mitigations for this project is found in Appendix D-7.

Wetlands. Prior to construction, the outer boundaries of wetlands would be marked by flagging. ROW width within the wetland crossing would be narrowed if possible and practical. For wetlands with standing water or saturated soils, equipment would be limited to that needed for construction of the wetland crossing. The ROW across the wetland would not be used as an access route unless it was the only access available. As much traffic as possible would be routed around the wetland. Foreign material would not be imported into the wetland to stabilize the working area.

If standing water or saturated soils were present, equipment would work from timber equipment support mats. Alternatively, specially-designed marsh-buggy track-hoes could be used in wetland areas without support mats. During clearing, vegetation would be cut off at ground level, leaving root systems in place. Wherever possible, 12 inches of wetland topsoil would be removed and stockpiled for replacement following pipeline installation. Drag sections of pipeline needed for each wetland crossing would be assembled and welded in an adjacent upland area, unless the wetland work space was stable. As with stream crossings, pipeline buoyancy control would be achieved by applying continuous armored concrete coating, concrete anchors, or pipe sack weights, if necessary.

TUAs, up to 50-feet wide on each side of the ROW and averaging 150-feet long, may be required in adjacent upland areas especially for assembledge and welding of pipeline drag sections.

Sediment control structures such as silt fences will be placed across the ROW at the edge of wetland areas and will be temporarily removed as needed during active construction.

All vehicle and equipment refueling and maintenance as well as concrete coating activities will take place at least 100 feet from the edges of wetlands. Exceptions will be made for stationary equipment such as pumps used for dewatering which are placed within adequate spill containment structures. Hazardous materials, fuels, and lubricants will not be stored within 100 feet of a wetland. Construction equipment and vehicles will be parked at least 100 feet from wetlands at the end of the working day.

Directional Drilling. Large rivers and major roads may be crossed by the HDD (horizontal directional drilling) method where geotechnical conditions are determined to be favorable based on testing. Directional drilling helps minimize any impacts to endangered species and important waterways. Directional drilling differs from horizontal boring. Directional drills are typically set up on the surface and drill on an angle below a feature, then curve or angle back up to the surface on the other side of the feature. A horizontal bore involves setup of a boring machine from the pipe trench, and boring horizontally under a feature such as a road or railroad. Directional drills usually involve a longer distance between entry and exit points than horizontal bores.

The directional drill site plans would be determined following geotechnical assessment and final design. Geotechnical evaluations may be required prior to starting detailed engineering. Drill depths and other specifications would be determined upon completion of this analysis.

The entry side of the directional drill would create the greatest disturbance. The TUAs for directional drills vary in size up to 300 x 300-foot area at the entry side and 50 x 1000 foot area at the drill exit site. Additional TUAs parallel to the pipeline for the length of the directional drill are needed for stringing and welding the pipe section prior to its pullback. Water would be required for the drilling mud and hydrostatic testing of the pipe before and after installation under the river or other crossing. The length of the directional drill section would be determined by the overall depth of the directional drill, height of the banks, and width of the river or other resource crossed.

HDD involves drilling a small pilot hole and then enlarging and reaming the hole to the proper diameter. The HDD rig then pulls the drill and prefabricated pipe section back out in the opposing direction from which the pilot bore entered. This procedure is called pullback. Prior to pullback, the entire pipe section would be subjected to hydrostatic testing in accordance with MAPL testing plans. This preliminary hydrostatic test does not preclude the requirement for a final hydrostatic test of the pipeline. Prior to installing the pullback section, 100 percent of its length would be inspected for holidays in the pipe coating, which would have an abrasion-resistant overlay. If any coating damage exists, it would be repaired. Inspection would be made of the portions of the pullback section that are visible after the pullback is complete. Repairs to the coating would be made if required. After the installation of the pullback section, a test of the electrical resistance to ground of the horizontally drilled pipe would be performed. Cathodic protection would be installed on the pipe if deemed necessary for corrosion control.

The directional drilling process uses drilling fluid made up primarily of water and clay. The primary purposes of this drilling fluid are to remove the cuttings from the borehole, to stabilize the borehole, and to act as a coolant and lubricant during the drilling process. The primary active clay component is bentonite, which is a naturally-occurring, nonhazardous clay product. The directional drilling operation involves the continuous flow of drilling fluid to lubricate the drill stem and drill bit, to carry away cuttings, and to assist in maintaining drill hole integrity. The fluid is pumped at a 100 to 1000 gpm rate through the center of the drill pipe to the cutters. Return flow is through the annulus created between the wall of the boring and drill pipe. The cuttings are then carried back to the entry pit, which is lined with an impervious flexible membrane. Once in the entry pit, the fluid moves into the cutting settlement pit from which it is pumped to the fluid processing equipment. Shaker screens, de-sanders, de-silters and centrifuges remove increasingly fine cuttings from the drilling fluid and the remaining fluid is re-circulated. Upon completion of the HDD process, cuttings would be properly disposed in accordance with applicable regulations.

Several actions may be taken to minimize impacts associated with directional drilling. Work areas on the entry and exit sides may be enclosed by a silt fence, hay bales, or berm to contain unplanned spills or discharges. Contingency measures for drilling fluid seepage, “frac-out” control, and cleanup is provided in a Drilling Contingency Plan which is summarized in Appendix D-7. Waste cuttings and drilling mud would be dewatered by the contractor, to the extent necessary, for approved disposal. Water from the dewatering process would be treated by the contractor to meet permit requirements, reused when possible, and disposed locally.

Cathodic Protection. The basis of the cathodic protection (CP) system, a system to effectively limit pipe corrosion, for the buried pipeline sections would be an impressed current system. The potential would be maintained below the disbondment potential for the external pipeline coating. The requirement would be for a current of 10 milliamperes per square meter of bare steel surface area. The effective bare surface area of coated steel pipe is assumed to be one percent.

Pipeline rectifier and associated ground bed sites may be located at stations or other locations where access to electrical power is available. Underground pump station piping may not be protected by the pipeline rectifier and ground bed, but may be protected through the use of sacrificial anodes supplemented, if necessary, by current from the mainline CP system. The design life of the CP system, if appropriately maintained in accordance with MAPL and DOT standards, is indefinite.

To supplement the impressed current CP system at locations where additional protection may be required, sacrificial anodes may be installed. This situation could occur at valve sites, road crossings and other pipeline crossings.

Line Markers/Aerial Markers. Line markers would usually be installed within line-of-sight, and at road crossings, rail crossings, and all river and stream crossings to identify the pipeline locations and provide emergency contact information. They would be placed in line with existing markers in order to minimize new visual impacts.

Aerial markers currently indicate the locations of adjacent pipelines and would be used to assist in identification of the new pipeline looping segments.

Hydrostatic Testing Requirements. The new pipeline looping segments would be hydrostatically tested in accordance with 49 CFR 195. A description of the testing and permitting process was provided earlier in this chapter, under 'Hydrostatic Testing'.

Radiographic Tests. Upon completion of welding and prior to coating, radiographic tests would be conducted on the pipeline system per 49 CFR 195. While CFR 195 requires a ten percent inspection rate, 100 percent of the welds would be radiographically inspected. Pipeline welds would be x-rayed to ensure structural integrity in compliance with the requirements specified at 49 CFR 195, Transportation of Hazardous Liquids or Carbon Dioxide by Pipeline: Minimum Federal Safety Standards and in accordance with industry standards and procedures.

Internal Caliper or Sizing Plate Inspection. After completion of hydrostatic testing, an internal caliper or sizing plate inspection would be conducted on the total length of each new pipeline segment to assure no structural damage has occurred during testing. Either an internal caliper or sizing plate would be run through the pipe and provide information on any pipe deformations or damage. Anomalies would be located and remediated, as appropriate, prior to placing the pipeline in service.

Pre-commissioning and Commissioning. Pre-commissioning consists of those activities that must be completed prior to commissioning of the pipeline system in a safe manner. These activities include manufacturers' recommendations and those necessary to assure that the system can be put into service and operated properly, reliably, and safely. Each piece of equipment, all instruments and control systems, all electrical systems, and all other systems must be tested. Appropriate checklists and documentation would be completed to verify pre-commissioning has been completed effectively, as required for safe introduction of NGL into the pipeline system and safe startup and operation of the pipeline system.

Upon completion of pre-commissioning, a "punch" list would be prepared to identify any outstanding work items. All punch list items that prevent safe and reliable operation during the specific stages of the commissioning period would be resolved prior to commissioning (introduction of first NGL, start-up, performance testing, and operation). The punch list would be updated and maintained until all outstanding work items were completed.

2.4.1.2 Pump Stations

Increased delivery volume of 50,000 bpd to the Hobbs Station near Hobbs, New Mexico through construction of the 12 pipeline looping segments, would also require modifications to existing pumps and drivers at the existing pump stations located along the existing MAPL NGL Pipeline System (Figure 1.1-1). The configuration of a typical pump station is presented in Figure 2.4-11. In conjunction with looping the existing pipeline system, the proposed MAPL WEP includes installation of larger capacity pumps and increased horsepower drivers at several of the pump stations. These upgrades alone could not address the increased delivery volume, rather the pump station upgrades and pipeline looping segments together would achieve the increased delivery volume. The 23 pump stations would be upgraded by increasing horsepower on existing drivers, converting to electric drivers, removing existing drivers, or installing new engine drivers. Modifications to be made at each of the 23 pump stations are detailed in Table 2.4-5.

Temporary and permanent use acreage associated with the pump station upgrades are provided in Table 2.4-6.

2.4.1.3 Project Design Refinement

Surface disturbance locations and acreages identified in previous sections are anticipated to be sufficient for the construction and operation (including maintenance) of the project and all ancillary improvements. However, due to project refinement, locations and acreages of anticipated disturbances have potential to change. This section describes procedures for assessing workspace outside areas evaluated in this EA. Analyses in this EA cover more space than would be required for the proposed facilities. For example, although the project could permanently disturb up to 633 acres, approximately 240,000 acres were surveyed for biological resources and 4,397 acres for cultural resources. The project ROW and TUAs are based on preliminary engineering. However, as the design is refined, alignments may change to increase safety, minimize environmental disturbance, and provide adequate grade on steep slopes and across deep washes. These refinements could result in slight location changes of the final alignment and the need for additional temporary work areas and staging areas.

A variance process would be used to approve these refinements. Where work is required outside the areas evaluated in this EA, additional evaluation would be performed for biological and cultural resources to ensure they are not present/impacted. Location of the workspace, date, and survey results would be documented and forwarded to the jurisdictional agency. In cases where no new state or federally protected species or cultural resources were found, work would proceed. In cases where new species or cultural resources were found, applicable agencies would provide direction prior to disturbance in that area. As-built drawings would be provided at the end of the project, and applicable adjustments made in authorizations, as needed.

2.4.2 Operation and Maintenance

2.4.2.1 Pipeline and Ancillary Surface Facilities

MAPL operates and maintains its system in a manner that provides its customers with a safe, dependable supply of natural gas liquids. Industry-proven practices are implemented in accordance with the requirements of the DOT Office of Pipeline Safety and the EPA. All pipeline facilities are under 24-hour, state-wide, one-call systems. These practices will be incorporated on the new loop sections.

	Enterprise Products Partners, LP	**Figure 2.4-11** **Typical Pump Station**
	Not to Scale	MAPL Western Expansion Project

Table 2.4-5 MAPL WEP Pump Station Upgrades

Pump Station	Land Ownership	No Change to Driver	Increase Horsepower on Existing Drivers	Convert to Electric	Remove Existing Drivers – Number of Drivers to Remain	Install New Engine Driver
Granger	BLM	X				
Pine Butte	BLM		1 (Electric)			
Tipton	Private		1 (Electric)			
Rock Springs	BLM	X				
Dinosaur	BLM		2			
Dragon	State		1			
Harley Dome	Private				2	
Thompson	BLM	X				
Moab	BLM					1
Lisbon	BLM	X				
Dove Creek	Private					1
Dolores	Private	X				
Ignacio	Private		1			
Huerfano	BLM		2			2
Lybrook	Private					1
San Luis	BLM		3			1
San Ysidro	Private		2			1
Edgewood	Private			2		1 (Electric)
Estancia	State			3		
Duran	BLM			3		
Mesa	Private		2			2
White Lakes	State		3			2
Caprock	State		3			2

Table 2.4-6 MAPL WEP Acreage Requirements for Pump Station Facilities

Facility	Ownership	Legal Description	Existing Property Acreage	Existing Fenced/ Disturbed Acreage	Temporary Use Acreage		Permanent Use Acreage	
					Inside Property Line	Outside Property Line	Inside Property Line	Outside Property Line
Granger	BLM	NW4, S8, T18N, R111W, Sweetwater Co., Wyoming	1.7	1.7	0.0	1.0	0.0	0.0
Pine Butte	BLM	NW4, S10, T16N R101W, Sweetwater Co., Wyoming	1.9	0.8	0.5	0.0	0.0	0.0
Tipton	Private	E1/2, S7, T19N, R96W, Sweetwater Co., WY	2.2	1.0	0.5	0.0	0.0	0.0
Rock Springs	BLM	NW4, S20, T16N, R105W, Sweetwater Co., Wyoming	5.7	3.7	0.4	0.8	0.0	0.0
Dinosaur	BLM	S19, T6S, R25E, Uintah Co., Utah	1.4	1.4	0.0	0.9	0.0	0.0
Dragon	State	SE4, S2, T12S, R25E, Uintah Co., UT	3.2	1.2	0.4	0.2	0.0	0.0
Harley Dome	Private	NE4, S10, T19S, R25E, Grand Co., UT	2.0	2.0	0.0	0.5	0.0	0.0
Thompson	BLM	S29, T21S, R20E, Grand Co., Utah	2.5	1.9	0.3	0.4	0.0	0.0
Moab	BLM	SW4, NW4, S12, T27S, R22E, San Juan Co., Utah	5.9	3.0	0.4	0.0	0.0	0.0
Lisbon	BLM	S29, T30S, R24E, San Juan Co., Utah	2.5	1.3	0.5	0.1	0.0	0.0
Dove Creek	Private	NE4, S9, T41N, R19W, Dolores Co., CO	3.7	2.9	0.3	0.7	0.0	0.0
Dolores	Private	SE4, S31, T37N, R14W, Montezuma Co., CO	5.8	2.7	0.4	0.0	0.0	0.0
Ignacio	Private	NE4, S2, T33N, R9W, La Plata Co., CO	3.0	2.7	0.0	0.0	0.0	0.0
Huerfano	BLM	NW4 SW4, S21, T26N, R10W San Juan Co., Utah	2.5	1.8	0.7	0.6	0.0	0.0

Facility	Ownership	Legal Description	Existing Property Acreage	Existing Fenced/ Disturbed Acreage	Temporary Use Acreage		Permanent Use Acreage	
					Inside Property Line	Outside Property Line	Inside Property Line	Outside Property Line
Lybrook	Private	NW4, S14, T23N, R7W, Rio Arriba Co., NM	1.5	0.0	0.0	0.8	0.0	0.0
San Luis	BLM	NW4 S13, T17N, R3W Sandoval Co., New Mexico	2.3	1.9	0.4	0.9	0.4	0.2
San Ysidro	Private	NW4, S19, T15N, R2E, Sandoval Co., NM	3.0	3.2	0.0	1.1	0.0	0.0
Edgewood	Private	NW4, S3, T10N, R7E, Santa Fe Co., NM	3.0	2.1	0.4	0.7	0.0	0.0
Estancia	State	NE4SE4, S27, T8N, R10E, Torrance Co., NM	3.3	3.3	0.0	0.8	0.0	0.0
Duran	BLM	SW4 S1, T2N, R16E Guadalupe Co., New Mexico	3.0	1.8	1.0	0.0	0.1	0.0
Mesa	Private	NE4, S13, T4S. R22E, Chaves Co., NM	3.1	3.1	0.0	1.2	0.0	0.0
White Lakes	State	S16, T9S, R29E, Chaves Co., NM	2.6	1.8	0.8	0.1	0.0	0.0
Caprock	State	NW4, S27, T12S, R33E, Lea Co., NM	4.3	4.3	0.0	1.2	0.0	0.0
		BLM Acreage	**29.4**	**19.3**	**4.2**	**4.7**	**0.5**	**0.2**
		Total Acreage	**70.1**	**49.6**	**7**	**12**	**0.5**	**0.2**

Access for Conducting Operation and Maintenance

Until vegetation is re-established following construction, MAPL would conduct annual inspections of the pipeline route as required by stormwater discharge permit requirements. After construction, periodic aerial patrols (26 times per year, not to exceed three week intervals) would be conducted to visually inspect for evidence of pipeline damage, nearby construction activities of landowners or other parties, erosion and wash-out areas, areas of sparse vegetation, damage to permanent erosion control devices, exposed pipe, and other potential problems that may affect the safety and operation of the pipeline. In addition, pipeline markers and signs would be maintained or replaced as necessary to ensure the pipeline location is visible from the air and ground. Patrols would be followed up with site-specific inspections to better identify potential problems and make repairs as needed. Details of post-construction monitoring for revegetation success and erosion control are found in the section which follows.

Impressed current cathodic protection would be maintained along the pipeline to prevent or minimize corrosion of the pipeline in accordance with Federal regulations. To maintain required potentials, the cathodic protection system would be monitored annually, at a minimum, depending on specific equipment and circumstances.

MAPL maintains a supply of pipe, leak-repair clamps, sleeves, etc. for emergency repairs. MAPL takes all measures necessary to protect the health and safety of all persons affected by activities performed in connection with the operation and maintenance of the pipeline. Emergency response procedures to be followed in case of leak, spill, or explosion, are detailed in Chapter 4, Section 4.3.12.3.

The permanent ROW would be maintained in a manner consistent with pre-construction conditions. Herbicides, if needed on Federal lands, would not be used without prior written approval of the BLM or BIA. Herbicides would be applied in compliance with BLM, BIA, and tribal requirements, and other applicable laws and regulations.

Following construction and revegetation, any ROW which overlaps another pipeline company’s pipeline/utility corridor would be maintained in accordance with the other company’s normal maintenance procedures.

MAPL acknowledges that lessees would be allowed to continue pre-construction land uses. Vegetation management practices may be modified in some localities in order to comply with applicable federal, state, and county requirements. At waterbodies, a 25-foot-wide riparian strip (measured from the mean high water mark) would be allowed to revert to native vegetation. However, in riparian areas as well as in wetlands, a 10-foot-wide strip centered over the pipeline may be maintained in a treeless, herbaceous state to facilitate inspection and maintenance.

Post Construction Monitoring – Vegetation and Erosion

Following construction and restoration, temporary and permanent reclamation measures will be monitored and restoration success evaluated. Monitoring is necessary to periodically evaluate recovery status of restored areas, identify the need for additional remediation, and to make a final determination regarding restoration success. Monitoring protocols and revegetation performance criteria follow. Qualitative and quantitative monitoring procedures and protocols will be used.

The main objectives of monitoring are to:

- Assess the effectiveness of temporary and permanent erosion control structures, i.e., slope breakers/water bars, to ensure the stability of the disturbed areas, and to ensure moisture runoff is controlled naturally with the erosion control structures in place, and with no accelerated erosion or wash-out areas. Monitoring will focus on qualitative visual observations of the critical areas of the highly erodible soils combined with steeper slopes, banks of stream crossings, and washes. Specific sites where remedial work may be needed will be identified. Monitoring to identify areas of new erosion or third-party damage is an element of routine aerial surveillance along the new pipeline loops and existing ROW, and will extend during the life of the project. It is anticipated that any active erosion problems, other than those caused by disturbance by other parties, would be apparent during the first two years following reclamation or after the first major storm or run-off event;

- Monitor and assess the success of the seeding efforts beginning during the first growing season after construction, but evaluating more fully in the second growing season, including an evaluation of the regeneration of desirable vegetation.
- Monitor how well the restored disturbed areas blend in with adjacent areas, including the existing ROW, in conjunction with the general revegetation;
- Monitor and assess potential invasion of targeted invasive, non-native weeds in accordance with the Weed Management Plan;
- Monitor and identify other disturbances to the ROW that may hinder reclamation success, such as excessive grazing or unauthorized off-highway vehicle use; and
- Identify where other vegetation control may be needed. Note that with the exception of invasive, non-native weed control, vegetative maintenance, including mowing of nonagricultural lands or large sapling or tree removal, is not anticipated. Absence of large brush or trees on the permanent ROW will be maintained to facilitate surveillance and inspection. All wetland areas are emergent, so regeneration of woody plants within the construction or permanent ROW, except for isolated individual plants, is not anticipated, nor is the need for selective control of saplings and trees near the pipeline within the permanent ROW.

Revegetation Performance Criteria

- Beyond evaluating the effectiveness of the reclamation effort for erosion control purposes, criteria to evaluate revegetation success are based on a number of site-specific considerations, including soil and site capabilities and form, composition and general condition of the adjacent plant communities, and general land use (most importantly, grazing practices and pre-existing populations of invasive, non-native weeds in adjacent areas). The parameters to evaluate revegetation success include composition, distribution, density and percent cover, and assigned values. Such parameters will vary based on these site conditions.

- Evaluations of revegetation success beyond basic ROW stability would begin during the second growing season. First-year evaluations would focus on initial seedling establishment and distribution, with approximately a three percent cover of desirable species distributed over at least 80 percent of the disturbed area without any accelerated erosion. A general evaluation of the ROW will be conducted by a 3rd party specialist using specific site observations at selected areas which are representative of the terrain features and seed mixtures utilized. Jurisdictional agencies will be encouraged to participate corporately in these evaluations. Ground inspections are planned during the early growing season.

- Evaluations will be conducted in successive growing seasons as plant cover increases in the ranges of 10, 20, 30, and 40 percent in the following years.

- Planting of woody plants for visual restoration or habitat restoration at stream crossings will be deemed successful where 80 percent survival and evident growth are observed.

Remedial Action and Maintenance

- The main emphasis will be to address all active erosion problems as soon as practicable and to obtain site access permits based on an evaluation of conditions against the original erosion control work.

- Additional erosion control work will be performed by applying the same basic techniques identified in the POD and based on site-specific conditions.

- Temporary erosion control structures such as straw bale sediment barriers or silt fences will be removed in the first year after construction where the sites are deemed stable and revegetation has developed.

Reseeding or replanting efforts, including supplemental mulching and livestock grazing control, will occur in agreement with the BLM and BIA, respectively, where monitoring during the second growing season determines a revegetation failure, particularly where accompanied by observed increases in water or wind erosion.

Reporting

- Observations of reclamation and revegetation success following the field inspections and sampling will be documented in summary reports to agencies, as required. Areas that require remedial action will also be identified by milepost and will include a description of additional erosion control or reclamation work that must be performed. BLM and BIA will be consulted in completing remedial plans based on site-specific conditions. A report would be submitted within three months of the identification of these conditions and the implications of corrective actions. Areas where control applications for invasive, non-native weeds were required also would be reported.

Hydrostatic Test Water

If on-site hydrostatic testing is required for operations and maintenance activities, MAPL would apply for and comply with requirements of NPDES permits. Hydrostatic testing would be conducted in accordance with applicable permits and ROW grant stipulations.

Planned Removal/Addition of Pipe for Maintenance

No removal or addition of pipe is anticipated to be required for maintenance.

Maintenance ROW Requirements

All planned maintenance would be confined to the 25 foot permanent ROW or ROW of existing parallel lines on all segments except Segment 6 where it would be confined to the 35 foot permanent ROW. MAPL would perform maintenance activities in such a manner as to avoid or minimize degradation of air, land, and water quality. While conducting operations and maintenance, MAPL would perform its activities in accordance with applicable air and water quality standards, related facility standards, and related plans of implementation, including but not limited to standards adopted pursuant to the Clean Air Act, as amended (42 USC 1857) and the Federal Water Pollution Control Act, as amended (33 USC 1321).

MAPL would take all necessary action to avoid serious and irreparable harm or damage to the environment (including but not limited to areas of vegetation or timber, fish or other wildlife populations, or their habitats, or any other natural resource). MAPL would immediately notify the appropriate agency(s) of all accidents which occur in connection with operation and maintenance activities on public lands. If maintenance involves use of power equipment that would create noise above ambient background levels, seasonal timing stipulations for raptor nesting (and possibly sage grouse) and crucial winter range for pronghorn antelope would be in effect.

MAPL would remove and properly dispose all refuse resulting from its operations and maintenance activities from all lands and waters.

No waste or byproducts would be discharged into water if they contained any substance in concentrations which would result in harm to fish and wildlife, or to human water supplies. Storage facilities for materials capable of causing water pollution, if accidentally discharged, would be located so as to prevent any spillage into water or channels leading into water that would result in harm to fish and wildlife or to human water supplies during operation and maintenance of the pipeline.

During operation and maintenance activities, care would be taken not to damage any fish, wildlife, or biotic resources in the general area of the ROW upon which persons living in the area rely on for subsistence purposes. MAPL would comply promptly with all requirements and orders of the authorized BLM and BIA offices to protect the interest of such persons.

If such accidents were to occur, contingency planning and response would be handled by an emergency response coordinator designated by MAPL.

MAPL Pipeline Safety Program

MAPL utilizes numerous safety measures to ensure that its pipelines operate in a manner that is protective of human health and the environment. Each of the measures listed below is a component of MAPL's overall pipeline safety program.

Hydrostatic testing: This test is used to ensure the integrity of the newly installed segments of pipeline. In this test, the new pipeline looping segments are filled with water and pressurized to 90 to 95 percent of the SMYS. During the test, pressure and temperature inside the pipeline are monitored and recorded to verify the system's integrity.

Radiographic Inspection: Girth welds are made to join the ends of pipe sections. Each new pipeline girth weld is radiographically inspected to ensure no defects exist. If weld defects are found, they are repaired and re-radiographed.

Supervisory control and data acquisition (SCADA): SCADA is used to remotely collect operating data from satellite communication units located along the pipeline. The data collected includes operating pressures as well as the status of all pumping equipment and remotely operated valves. This data is sent to the MAPL control center's SCADA system. SCADA collects the data 24 hours a day, providing MAPL with comprehensive information on important operating aspects of its pipeline. The SCADA system data is used to detect any changes in flow rate or pressure that might indicate a leak. The system automatically sends an alert to the controller if these changes are detected and appropriate actions are initiated to mitigate potential hazardous conditions.

Cathodic protection system: Cathodic protection is utilized to prevent external corrosion by applying a small electrical charge to the pipe, which inhibits electrochemical reactions that can cause corrosion. MAPL uses cathodic protection systems on its pipelines as a matter of standard practice to protect them from corrosion. Regular testing is conducted and compared against pre-existing conditions, industry standards, and regulatory requirements to assure satisfactory performance of the system. Existing cathodic protection will be expanded to include the new loop sections.

Smart pig: A smart pig is an electronic instrument that is cylindrical in shape that is typically pushed by the transported fluid (in this case NGL) through the pipeline. It contains sensor instrumentation that would detect and record any irregularities in the pipeline. “Pigs” were originally developed to clean and swab the inside of the pipeline, but smart pigs employ technologies capable of detecting imperfections such as internal and external corrosion, changes in wall thickness, dents, gouges, and deformities in the pipe. MAPL repairs detected irregularities to meet criteria established by engineering principles and codified in regulations and industry standards.

Depth-of-cover: Depth-of-cover refers to how deep a pipeline is buried during initial construction as measured from the surface of the ground down to the top of the pipe. Minimum depth-of-cover is established by federal pipeline regulation and varies by terrain and the anticipated use of the ROW surface at the time of construction. MAPL will meet or exceed the minimum standards during initial construction.

Valve Spacing: Valves will be installed along the pipeline system. They will be located adjacent to existing valves to the extent possible. Block valves are used to isolate segments of the pipeline or divert its flow. Check valves are used to prevent reverse flow in the pipeline. Both types of valves are used to minimize release volume in the unlikely event of an incident. Regulations require that valves are located in accessible locations, at pump stations, at storage tank areas, and at mainline locations that would minimize impact from accidental discharge, at certain takeoff points, on each side of a water crossing that is more than 100 feet wide, and on each side of a reservoir holding water for human consumption. MAPL will install valves and/or check valves at all the specified locations and at intervals of approximately every ten miles along the pipeline.

Right-of-Way Marking: Markers are used to alert the public and potential excavators to the existence of, and approximate location of, a pipeline. The NGL pipeline will be located in an

ROW corridor that includes other pipelines and utilities, all of which are marked. Above ground marker signs display a warning message, the product transported, the operating company's name, and a 24-hour emergency phone number.

Right-of-Way Monitoring: MAPL regularly inspects the pipeline routes by flying the pipeline ROW at least 26 times per year. MAPL also conducts inspections as an integral component of its regular operation and maintenance activities. In addition to MAPL monitoring, access to the ROW for long term third-party environmental monitoring will also be accommodated. Long term third-party monitoring will be conducted for five years after acceptance of the final reclamation.

"One Call" System: This is an underground facilities damage prevention program which is jointly sponsored by individual states, members of the pipeline industry, and other operators of underground facilities to alert excavators to the location of pipelines and utilities in an area before they perform digging or other excavation activities. Participation in One Call systems is required for operators of underground facilities. Outside force damage to pipelines by third parties is the leading single cause of releases. The goal of the One Call system is to prevent damage to the pipeline by third parties.

An excavator calls the One Call Center prior to excavating and provides excavation location information. The center then alerts all underground utility companies and pipeline companies operating in the affected area. A pipeline operator receiving the alert notice determines if their pipeline is in the impacted area and shows the excavator where the pipeline is located. MAPL's policy is to be on-site to watch and make sure the excavator safely uncovers the pipeline and ensure that the pipeline is back-filled properly after the excavation is completed.

Each state's One-Call system provides a toll-free number so that excavators, constructors, landowners, and the general public can contact the center with certain information about a proposed excavation site. MAPL would distribute One Call information along with other pipeline safety information to ROW landowners and residents in its areas of operation.

- For New Mexico, the One Call number is 505-260-1990 in the Albuquerque area. The remainder of New Mexico uses 1-800-321-2537.
- For Colorado, 1-800-922-1987
- For Utah, 1-800-662-4111
- For Wyoming, 1-800-348-1030

Public Education and Damage Prevention Programs: MAPL has local, qualified technicians that perform routine maintenance and community outreach to keep landowners aware of the pipelines that cross their property. MAPL conducts a comprehensive public awareness program which addresses pipeline safety issues. In addition, annual meetings are held with emergency responders and excavators to provide updated information. MAPL participates in mock drills to ensure emergency response preparedness. Emergency responders are provided with appropriate maps and other information needed for effective responses.

Safe Operating and Maintenance Procedures: MAPL is required by regulation, conscientious management and good business practices to operate and maintain its properties in such fashion as to provide the greatest degree of safety and reliability as practicable. It is in the best interests of MAPL, its employees, and the general public that procedures are in place, employees are properly trained and equipped to insure the integrity of the system is not jeopardized, the serviceable life of the system is not impaired, and the system functions at minimal levels of risk to all parties.

MAPL maintains a policy manual with written procedures detailing how all functions of operation and maintenance, both routine and emergency, are to be conducted. This manual contains all pertinent safety precautions, training requirements and operator qualification processes. All personnel working on the system are routinely tested to assure appropriate knowledge and skill for each task required to be performed.

The policy manual establishes frequencies for inspections of instruments, valves, pressure control and relief devices, and cathodic protection systems as well as all other elements of the system integral to its safe and reliable operation.

Pipeline Integrity Management Program

MAPL operates approximately 8,500 miles of pipelines in the United States. The Rocky Mountain segment of the Mid-America pipeline is 2,548 miles long and transports mixed NGLs produced from more than 20 natural gas processing plants in Wyoming, Utah, Colorado, and New Mexico to processing facilities in the Midwest and Gulf Coast. These pipelines transport hazardous liquids and are governed by federal regulation, specifically Title 49 CFR 195.

MAPL has developed a written Integrity Management Program (IMP) that addresses the risks on each segment of pipeline and meets or exceeds requirements specified by the Department of Transportation – Office of Pipeline Safety contained in 49 CFR 195. The IMP lays out the goals for a comprehensive program that maintains the integrity of the pipeline system. The program is customized to support MAPL's system, and requires continual evaluation to accommodate changes in pipeline operation, changes in the environment in which the system operates, new operating data, and the results of inspections. As specified in 49 CFR 195.452(f), the elements of the IMP include, at a minimum:

- A baseline assessment plan that addresses the risks for pipelines. In the Placitas area and in other communities, previous baseline assessments have been conducted through the use of internal inspection tools capable of detecting corrosion and deformation anomalies including dents, gouges, and grooves. Consistent with applicable regulations, all assessments are scheduled based on the relative risk of pipeline looping segments which is determined in accord with standard models and practices and guidance from state and federal regulations.

- A process for identifying which pipeline looping segments could affect a high consequence area (HCA). The pipelines in several areas, including the Placitas community, have been identified as pipelines that could affect an HCA as defined by federal regulations. The program requires consideration be given to pressure and flow rates as well as to the different types of products (e.g., NGLs) and their characteristics to determine the effect, if any, on an

HCA by aerial dispersion or by pooling and running along the ground. Maps showing the locations of HCAs and areas where pipelines could affect an HCA are distributed to MAPL emergency response personnel. HCAs are treated as Immediate Response Areas pursuant to specific training and guidance contained in MAPL's Operating and Maintenance Procedures Manual.

- An analysis that integrates all available information about the integrity of the entire pipeline and the consequences of a failure. The relative risk of all the pipelines that MAPL operates is determined utilizing industry standard relative risk models. The risk ranking of all MAPL operated pipelines is consistent with industry norms and meets or exceeds the requirements of state and federal regulations.

- Criteria for remedial actions to address issues raised by the assessment methods and information analysis. MAPL's standards for remedial actions meet or exceed the requirements of 49 CFR 195.452, and industry standards such as ASME B31.4 and API Standard 1160, "Managing System Integrity for Hazardous Liquid Pipelines."

- A continual process of assessment and evaluation to maintain a pipeline's integrity. MAPL's processes for continual assessment and evaluation consistently meet or exceed the requirements of state and federal regulations including "smart pig" runs at intervals not exceeding five years.

- Identification of preventive and mitigative measures to protect high consequence areas. MAPL's processes for identification of preventive and mitigative measures to protect HCAs are designed to enhance public safety and environmental protection and are, in all cases, consistent with or in excess of the requirements of state and federal regulations.

- Methods to measure the program's effectiveness. MAPL's processes are designed to assure the continuing integrity, safety and operational security of its pipeline system. Regular measurements of the program's effectiveness are conducted to that end and are at a minimum consistent with the requirements of all applicable regulations and industry practices.

- A process for review of integrity assessment results and information analysis by persons qualified to evaluate the results and information. MAPL's review process is conducted by highly skilled professionals wholly qualified in all respects to conduct and analyze the results of integrity assessments.

In accordance with MAPL's IMPs and 49 CFR 195, MAPL has conducted extensive testing of its pipeline system including, for example, three segments in the Placitas area in 2001, 2003 and 2005. These segments have been internally inspected and remediation completed. All the remaining sections are scheduled for baseline assessments before March 31, 2008, as required by state and federal regulations.

2.4.2.2 Pump Stations

MAPL will maintain the facilities as required by the ROW grant for the MAPL WEP. Maintenance of the facilities includes soil stabilization and reseeding of lands disturbed by modifications to the existing pump stations. All improvements or upgrades to the stations authorized by the BLM/BIA are kept in serviceable condition using best standard operating procedures and in keeping with state requirements.

2.5 ABANDONMENT

When the pipeline, surface facilities, and pump stations reach the end of their useful life, MAPL would contact the BLM, BIA, states, tribes, and private landowners and seek their participation in developing an abandonment plan. This plan would include removal of all surface facilities, including pump station equipment, and rendering the pipeline and remaining facilities totally safe by purging the pipeline, if permitted to remain in the ground, with a gas such as nitrogen to remove contaminants. It is anticipated the pipe would be left buried in the ground to avoid additional soil disturbance, however, that will be addressed in the abandonment plan.

2.6 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

The following alternatives were considered, but eliminated due to anticipated greater adverse environmental impacts and lack of contribution to meeting the purpose and need for the project.

2.6.1 Construction and Operation of New Large Diameter Pipeline

Implementation of this alternative would require the construction of a large diameter (16 to 20 inch) pipeline between Rock Springs, Wyoming area and Hobbs, New Mexico parallel to existing pipeline/utility corridors in place of the 12 proposed pipeline looping segments. This alternative would not involve the addition of pump stations from the proposed Project or the addition of horsepower at the existing pump stations. The large diameter pipeline would be constructed parallel to existing pipelines with portions being rerouted around any areas sensitive to humans or the environment. After the large diameter pipeline is constructed, one or more of the existing MAPL pipelines would be taken out of service and removed and the areas restored as dictated by jurisdictional agencies and the public. It is anticipated that this pipeline would transport existing NGL liquids and also provide for long-term growth of transportation demands for the forseeable future.

The proposed pipeline looping segments would be shorter in total length (202 miles) than a new continuous pipeline between the Rock Springs, Wyoming area and Hobbs, New Mexico (approximately 800 miles). In addition, the shorter pipeline looping segments are generally away from sensitive areas. A full pipeline replacement would make avoidance of these areas difficult. Construction and operation of new, large-diameter pipeline would result in greater total disturbance to both reclaimed lands in the area of overlap between the existing pipeline/utility ROW and the proposed new pipeline construction ROW, and previously undisturbed lands along the entire length of the proposed pipeline. In addition, numbers and extent of TUAs and associated disturbance for special construction situations such as roads and required utilities to support the operations would be greater than disturbance associated with the Proposed Action. The existing, established pipeline/utility corridor would remain a pipeline corridor even after the NGL pipelines replaced by this alternative were removed because there are other non-NGL pipelines and utilities in the existing corridor. Lastly, existing pipelines are properly designed and maintained in accordance with all regulatory standards, and their replacement would do little to offset the associated environmental consequences. Furthermore, the reliability of the existing multi-pipeline system would be negatively impacted.

The combination of the factors described above eliminated this alternative from further analysis.

2.6.2 Add Horsepower at Existing Pump Stations

This alternative would involve the addition of pump capacity (horsepower) at existing pump stations located along the existing pipeline system to accommodate the proposed increase in WEP delivery volumes for NGL and does not include new pipeline looping segments. Without looping the existing pipeline (the Proposed Action) or constructing a new large-diameter pipeline, outlet pressures generated by the increased horsepower for the volumes needed would exceed the MAOP of the pipeline downstream of the pump station(s). To avoid excessive operating pressures, existing downstream pipe would need to be replaced with new thicker-walled pipe, and additional aboveground facilities to regulate pressure would need to be installed. Should pressures exceed safety criteria, the pipeline would be shut down and reliability for NGL delivery would be decreased to unacceptable levels under this alternative. Increased environmental impacts and operational reliability issues resulted in the elimination of this alternative. This alternative does not satisfy the project’s need.

2.6.3 Build and Operate Additional Pump Stations

Selection of this alternative would require the construction and operation of 12 additional pump stations spaced along the existing pipeline system between Wamsutter, Wyoming and Hobbs, New Mexico in lieu of looping the existing system (Proposed Action), constructing a new pipeline, or adding horsepower to existing pump stations. The addition of these 12 new surface facilities would increase the amount of short-term and long-term surface and noise disturbance from installation and operation of pumps and ancillary piping and facilities. The increased number of gas-fired pump stations would also result in increased emissions of polluting gases and particulates from the WEP in comparison with the Proposed Action. Use of electric-driven pumps in place of gas-fired engines/pumps would reduce the noise disturbance factor. However, the increased surface disturbance and associated impacts to the environment would remain. In addition, both gas-fired and electric-driven pump stations would decrease the reliability of the system compared to pipeline looping (Proposed Action) due the necessity of taking pump facilities off-line for maintenance and repairs. Electric-driven pump stations would also require the construction of additional power lines that would result in associated additional impacts to the environment and a reduction in reliability due to the susceptibility of power lines to adverse effects from factors such as demand of other customers, equipment maintenance, and weather. Also, in many areas the electric power needed is not available and there would be a potential need for more or expanded power plants. Increased environmental impacts and decreased reliability in comparison to the Proposed Action were the reasons to eliminate this alternative and its variations from further consideration.

3.0 AFFECTED ENVIRONMENT

3.1 INTRODUCTION

The purpose of this chapter is to fully describe the condition of environmental resources potentially affected by the Proposed Action or an alternative as discussed in Chapter 2. It includes all resources known to be present in the areas to be affected by the proposed Project. The main focus of this chapter is the identification and description of those resources likely to be affected by construction and operation of the proposed pipeline looping segments. Proposed disturbance to lands from the upgrade of the existing pump stations is limited. Therefore, discussion of the environmental setting of the existing pump stations is also limited in this EA. Air quality and noise conditions are those resources most likely to be affected by construction and operation of the existing pump stations.

The size of the affected area surrounding each looping segment for a resource will likely differ greatly among resources. Resources which may be present in the vicinity of the proposed pipeline looping segments, but would not be affected by the Proposed Action or an alternative, are discussed briefly to indicate the rationale for their elimination from environmental analysis. These resources will not be discussed further in this EA.

Climate

The Proposed Project crosses portions of four states in a generally northwest to southeast direction. Elevation and topography are the major factors that influence the climate in all four states. Arid and semi-arid climate is typical. Portions of the proposed pipeline route in Wyoming cross high basin terrain resulting in conditions that are normally on the dry side and relatively cool. Southwestern Wyoming has cold winters followed by mild springs and warm summers. Eastern Utah exhibits moderately cold winter weather and summers that are dry and hot. Southwestern Colorado displays climatic conditions similar to those in eastern Utah, however, conditions are moister and cooler than those farther west. In both areas, elevation differences effect major variations in local weather patterns. The northwestern portion of the proposed route in New Mexico experiences weather conditions similar to those in Colorado, whereas the southeastern portion is located in desert climate with low precipitation. Winters in this area are usually mild.

Topography and Soils

Although the Proposed Project would cross several physiographic provinces, topographic relief is generally low to moderate with limited areas of steeper slopes. Areas of the Wyoming Basin, Colorado Plateau, Basin and Range, and Great Plains physiographic provinces comprise portions of the proposed ROW. Elevations of most of the proposed ROW exceed 6,000 feet above sea level, where the route crosses elevated basins and plateau topography. Southern portions of the Proposed Project, located within the Great Plains Province, occur at elevations below 5,000 feet. Underlying geological formations are diverse in both age and lithology.

Twenty-five soil associations, formed from a variety of sources, have been located along the proposed ROW. Soils are principally well drained in both Wyoming and New Mexico portions of the Proposed Project. Almost all Wyoming soils are moderately deep to deep, while deep soils predominate in New Mexico. Portions of the ROW would cross soils subject to high water and wind erosion potential and all soils would exhibit significant revegetation challenges.

Biota

Six general vegetation types have been identified along the proposed pipeline route: sagebrush steppe, pinyon/juniper woodland, sand shrub/grassland, desert grassland north, desert grassland south, and Rio Grande floodplain. Wyoming portions of the Proposed Project are almost entirely composed of sagebrush steppe, with areas of desert grassland north type being much less common. New Mexico exhibits a considerable contrast, and displays a northwest to southeast progression from sagebrush steppe dominance only in Segment 8 through pinyon/juniper woodlands and sand shrub/grasslands to complete desert grassland south cover at the southeastern terminus at Segment 13.

Antelope, mule deer, and elk herds are present in the vicinity of the Project in southwestern Wyoming. Antelope crucial winter range would be crossed by the proposed ROW. Other large animals include a wild horse herd which overlaps part of the proposed route. The same big game species are found in New Mexico, in addition to black bear, mountain lion, and white-tailed deer.

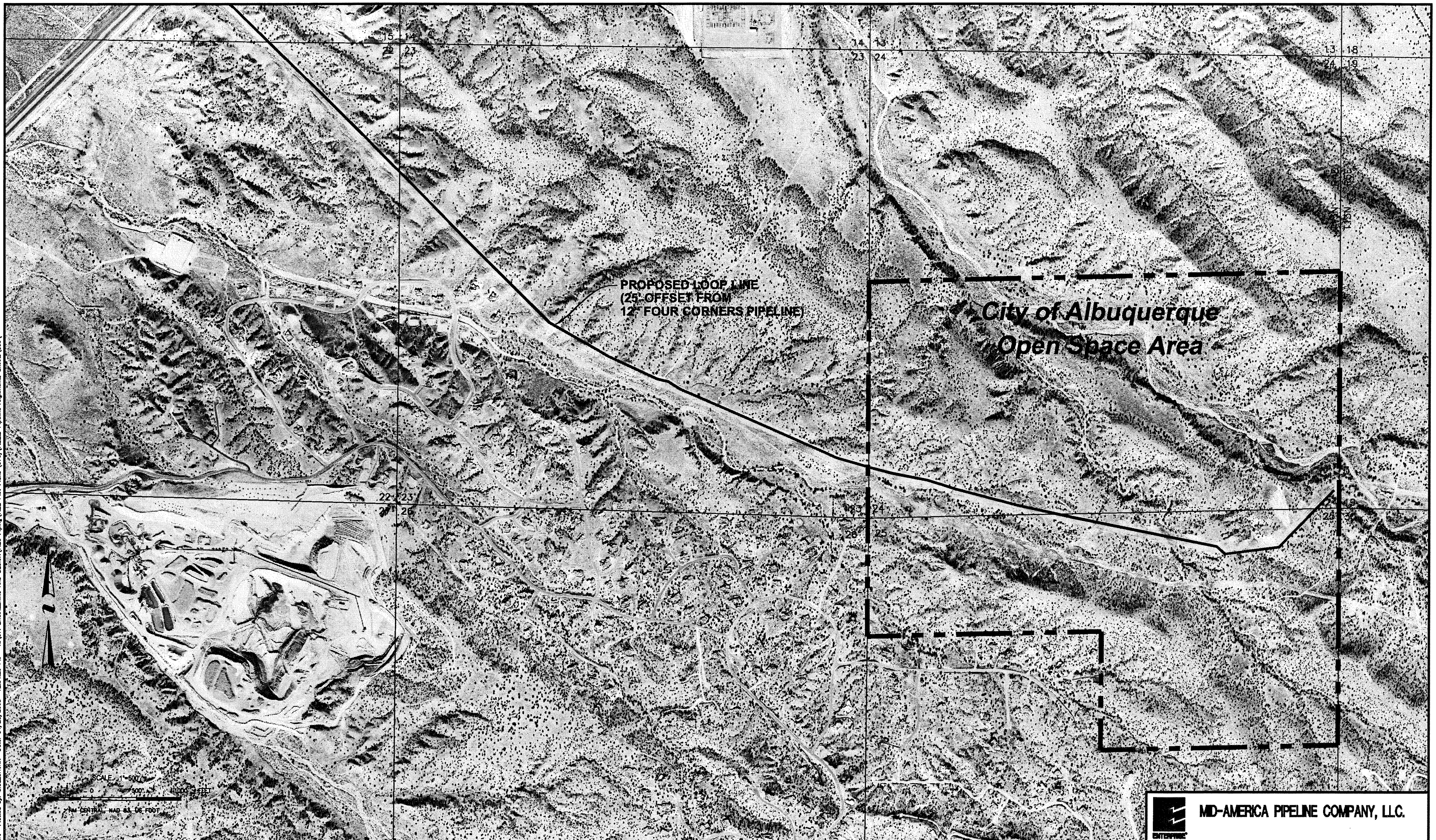
Many raptor species are known to nest in the general vicinity of the Proposed Project and may be found near existing pump station locations in Utah and Colorado. A number of passerines and neotropical migrants, some of which are sensitive species, have ranges encompassing the entire Project area. Various small mammal species, foxes, prairie dogs, and coyotes can be found over the Project area as well. Aquatic and amphibious animals would be principally restricted to perennial streams, the Blacks Fork River and Rio Grande, and their immediate vicinity.

Land Use

Livestock grazing and wildlife habitat are the predominant land uses along most of the proposed ROW. Oil and gas development is common in the Wyoming portion of the proposed Project, and in the northwestern and southeastern portions of New Mexico. Other mineral resource development is limited to trona mining in Wyoming and sand and gravel quarrying in central New Mexico. Residential areas are largely avoided by the Project, with the exception of Placitas, New Mexico where the project proximity to residences is shown on Figure 3.1-1 (A wall size map of the Placitas area is located in the Placitas Community Library). No commercial or industrial areas would be affected. In Wyoming, 48 percent of the land crossed is privately owned, 47 percent is Federal (BLM) land, and 5 percent is state land. In New Mexico, 55 percent of the land crossed is private, 26 percent are native lands administered by the BIA, 12 percent is BLM land, and 7 percent is state land.

3.1.1 Critical Elements of the Human Environment

Implementation of the Proposed Action could potentially affect certain critical elements of the human environment, as defined in the BLM Handbook H-1790-1 (NEPA Handbook; BLM, 1988), Appendix 5, as amended. These elements must, at a minimum, be considered in all EAs developed by the BLM. The status of the critical elements for the Proposed Action is indicated in Table 3.1-1.



A WALL SIZE MAP OF THE PLACITAS AREA IS LOCATED IN THE PLACITAS COMMUNITY LIBRARY

DRAWING NO.	TITLE	REV.	DESCRIPTION	BY / DATE	CHK / DATE	APPR / DATE

MID-AMERICA PIPELINE COMPANY, LLC.

FIGURE 3.1–1
WESTERN EXPANSION PROJECT
PLACITAS RESIDENTIAL AREA &
CITY OF ALBUQUERQUE OPEN SPACE AREA
SANDOVAL COUNTY, NEW MEXICO

DRAWN	DATE	CHECKED	APPROVED	SCALE	DRAWING NO.
C. Cleghorn	4/20/05	B. OLSEN	B. OLSEN	1"=500'	

Drawing: EA FIGURE 3.1–1.DWG Plotted by: C.CLEGHORN Date: 04/20/2005 12:31:25 PM K:\07. ENGINEERING AND DESIGN\7.20 Piping\7.22 Plot Plans (978)\7.22.2 Pipeline Alignments Sheets\S09\

Table 3.1-1 Critical Elements of the Human Environment for the MAPL WEP

Element	Present? (Yes or No)	Impacted? (Yes or No)	Discussed in EA
Air Quality	Yes	Yes	X
Areas of Critical Environmental Concern (ACEC)	Yes	Yes, mitigated	X
Cultural Resources	Yes	Yes, mitigated	X
Environmental Justice	Yes	No	X
Farm Lands (Prime or Unique)	Yes	Yes, temporarily	X
Floodplains	Yes	Yes, temporarily	X
Invasive, Non-Native Species	Yes	Yes, mitigated	X
Migratory Birds	Yes	Yes, mitigated	X
Native American Religious Concerns	Yes	Yes, mitigated	X
Threatened or Endangered Species	Yes	Yes, mitigated	X
Wastes, Hazardous or Solid	Yes	Yes, mitigated	X
Water Quality Drinking/Ground	Yes	Yes, mitigated	X
Wetlands/Riparian Zones	Yes	Yes, mitigated	X
Wild and Scenic Rivers	No	No	X
Wilderness	No	No	X

Source: BLM, 2003c

If the resource or value is not present or is not affected by the Proposed Action, this will be documented as a negative declaration. These items will not be discussed further in this EA. In addition to the critical elements, this EA discusses the current status and potential environmental effects from the Project in the areas of geology, minerals, and paleontology, climate and air quality, soils, water resources, vegetation and invasive weeds, range resources, wildlife and special status species, recreation, visual resources, cultural resources, socioeconomics, transportation, health and safety, and noise.

3.2 GENERAL SETTING

3.2.1 Climate, Air Quality, and Noise

3.2.1.1 Climate

The climate in New Mexico, southwestern Colorado, eastern Utah and southwestern Wyoming is warm during the summers and moderately cold to cold during the winter. Temperatures are generally warmest in June and July and coldest in January. Elevation and topography are the major factors that influence the climate in all four states.

Southwestern Wyoming

Wyoming has the second highest, average elevation of all states in the United States, and because of that elevation, conditions are normally on the dry side and relatively cool. Southwestern Wyoming has cold winters followed by mild springs and warm summers.

Winters in southwestern Wyoming are cold with average daily maximum temperatures in the high 20s. January is the coldest month. Summer average daily maximum temperatures in the southwestern portion of Wyoming are in the low 80s.

Some areas of the Wyoming receive only five inches of rain, while the Teton Range can receive 60 inches or more per year. The average annual precipitation received in southwestern Wyoming is approximately nine inches per year. Snow falls frequently from November through May and at lower elevations is light to moderate. Over the drier southwest portion of Wyoming, annual snow amounts vary from 45 to 55 inches.

Eastern Utah

Eastern Utah's climate is determined and influenced by a number of factors including latitude, elevation, and the mountain ranges. There are definite variations in temperature with altitude and latitude. Naturally, the mountains and the elevated valleys have the cooler climates.

Winter weather in eastern Utah is moderately cold with average daily maximum temperatures ranging from the low 30s in the north to low 40s in the south. Temperatures below 0^{o} F during winter and early spring are uncommon in eastern Utah, and prolonged periods of extremely cold weather are also rare. This is primarily due to the mountains east and north of the State, which act as a barrier to intensely cold continental Artic air masses. Summer average daily maximum temperatures over eastern Utah are in the mid to high 90s.

Precipitation varies greatly across Utah, from an average of less than five inches annually over the Great Salt Lake Desert (west of Great Salt Lake), to more than 40 inches in some parts of the Wasatch Mountains. The eastern portion of Utah receives less than ten inches of precipitation per year.

Southwestern Colorado

Southwestern Colorado's topography is slightly less extreme with lower elevations and combinations of canyons and plateaus. Elevation and topography remain dominant controls of local climates, but precipitation gets progressively less and temperature progressively warmer approaching the Utah border.

Southwestern Colorado winter weather is cold with average daily maximum temperatures in the mid 30s. Temperatures can drop below 0° F in all areas of Colorado, but the valleys of southwest Colorado receive abundant sunshine and the winter climate is not harsh. Summer afternoon temperatures can exceed 100° F several times each summer at elevations below 5,500 feet, but it only takes a short drive to higher elevations to find cooler air. Temperatures only rarely drop below -10° F.

Precipitation in southwestern Colorado is more evenly distributed throughout the year than in the eastern plains. In southwestern Colorado and near the Utah border, June is the driest month and late summer through early autumn is the wettest time of year. Precipitation averages from 8 to 14 inches per year. Annual snowfall ranges from 30 to 45 inches per year.

New Mexico

New Mexico is well known for its arid climate. Mean annual temperatures range from 64° F in the extreme southeast to 40° F or lower in high mountains and valleys of the north. Elevation is the major factor in determining the temperature of any location within the state. During the summer months, individual daytime temperatures quite often exceed 100° F at elevations below 5,000 feet. However the average monthly maximum temperatures during July, the warmest month, range from slightly above 90° F at lower elevations to the upper 70s at high elevations. The average range between daily high and low temperatures is from 25° to 35° F.

In January, the coldest month, average daytime temperatures range from the middle 50s (°F) in the southern and central valleys to the middle 30s in the higher elevations of the north. Temperatures below freezing are common in all sections of New Mexico during the winter. Subzero temperatures are rare in New Mexico except in the mountains.

New Mexico's average annual precipitation ranges from less than 10 inches over much of the southern desert and the Rio Grande and San Juan Valleys to more than 20 inches at higher elevations. A wide variation in annual totals is characteristic of arid and semiarid climates.

3.2.1.2 Air Quality

Air quality is good throughout the project area counties of New Mexico, Colorado, Utah, and Wyoming listed in Table 3.2-1. These counties have ambient air quality that does not exceed any of the National Ambient Air Quality Standards (NAAQS) for criteria pollutants and are considered areas of attainment. Air quality in these counties tends to be good due to the lack of major industrial development and the dispersed and relatively small human population.

Table 3.2-1 Ambient Air Quality Status for the MAPL WEP

State	County	Ambient Air Quality Status
New Mexico	Lea	Attainment[1]
	Chaves	Attainment[1]
	De Baca	Attainment[1]
	Torrance	Attainment[1]
	Bernalillo	Attainment[1]
	Santa Fe	Attainment[1]
	Sandoval	Attainment[1]
	San Juan	Attainment[1]
Colorado	La Plata	Attainment[2]
	Montezuma	Attainment[2]
	Dolores	Attainment[2]
Utah	San Juan	Attainment[3]
	Grand	Attainment[3]
	Uintah	Attainment[3]
Wyoming	Sweetwater	Attainment[4]
	Uinta	Attainment[4]

[1] New Mexico Environment Department, Air Quality Bureau, 2004
[2] Colorado Department of Environmental Quality, Air Quality Division, 2004
[3] Utah Department of Environmental Quality, Division of Air Quality, 2004
[4] Wyoming Department of Environmental Quality, Air Quality, 2004

The Clean Air Act (CAA) in New Mexico is administered by the Air Quality Bureau (AQB), in Colorado by the Colorado Department of Public Health and Environment (CDPHE) Air Quality Division, in Utah by the Utah Department of Environmental Quality (UDEQ) Division of Air Quality, and in Wyoming by the Wyoming Department of Environmental Quality (WDEQ), Air Quality Division (WDAQ). National and State Ambient Air Quality Standards (AAQS) set the absolute upper limits for criteria air pollutant concentrations to which the public has access. The purpose of these standards is to allow an adequate margin of safety for the protection of public health and welfare from adverse effects resulting from pollutants in the ambient air. Ambient air quality in a given location is characterized by comparing the concentration of criteria pollutants in the atmosphere to the ambient air quality standards. Table 3.2-2 lists the NAAQS and the state ambient air quality standards for the following air pollutants: particulate matter of 10 or 2.5 microns in diameter or less (PM_{10} and $PM_{2.5}$), nitrogen dioxide (NO_2), sulfur oxides (SO_X), carbon monoxide (CO), and ozone.

The Environmental Protection Agency (EPA) maintains a repository of ambient air quality monitoring data that has been collected from various monitoring locations throughout the United States (EPA, 2004). Potential criteria air pollutants that could be generated from the project include NO_x, $PM_{10,}$ and CO. Table 3.2-3 summarizes the maximum ambient air concentrations observed during 2004 (as of November) in each of the project area counties. Review of the maximum values detected during 2004, indicates that none of the ambient air quality standards have been exceeded.

Areas where criteria pollutants are measured below the limits are called “attainment” areas. Prevention of Significant Deterioration (PSD) regulations limit emissions of pollutants from new sources in attainment areas, known as Class II PSD areas. Class II PSD areas allow additional, well-controlled industrial growth through the incremental addition of some area-specific pollutants. In order to meet or maintain NAAQS, the states have established limits on the quantity, rate, or concentration of emissions of air pollutants from industrial sources. Emissions of criteria air pollutants, hazardous air pollutants, and air toxics are regulated by the states with permits regulating individual emissions sources from construction and/or operations activities within the state. A geographic area that meets or exceeds the limit for an ambient particular pollutant is called a “non-attainment” area. As listed in Table 3.2-1 above, all the counties that could be impacted by the project are attainment areas.

The PSD title of the CAA is an important authority for protecting the resources of parks and other environmentally sensitive areas. One of its express purposes is “to preserve, protect, and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic, or historic value.” PSD addresses resource protection through the establishment of ceilings on additional amounts of air pollution that may be emitted and still preserve air quality.

Table 3.2-2 National and State Ambient Air Quality Standards

Pollutant	Period	NAAQS ($\mu g/m^3$)	New Mexico ($\mu g/m^3$)	Colorado ($\mu g/m^3$)	Utah ($\mu g/m^3$)	Wyoming ($\mu g/m^3$)
NO_2	24-Hour Annual Arithmetic Mean	-- 100 (0.053 ppm)	 0.100 ppm 0.05 ppm	-- 100	-- 100 (0.053 ppm)	-- 100 (0.053 ppm)
CO	1-Hour Maximum[1] 8-Hour Maximum[1]	40,000 (35 ppm) 10,000 (9 ppm)	 13.1 ppm 8.7 ppm	40,000 10,000	40,000 (35 ppm) 10,000 (9 ppm)	40,000 (35 ppm) 10,000 (9 ppm)
PM_{10}	24-Hour Maximum[1] Annual Arithmetic Mean[2] 7-Day Average 30-Day Average Annual Geometric Mean	150 50 -- -- --	150 -- 110 90 60	150 50 -- -- --	150 50	150 50 -- -- --
$PM_{2.5}$	24-Hour Maximum[4] Annual Arithmetic Mean[3]	65 15			65 15	65 15
SO_x	3-Hour Maximum[1] 24-hour Maximum[1] Annual Arithmetic Mean	1,300 (0.5 ppm) 365 (0.14 ppm) 80 (0.03 ppm)	-- 0.1 ppm 0.02 ppm	700	1,300 (0.5 ppm) 365 (0.14 ppm) 80 (0.03 ppm)	1,300 (0.5 ppm) 260 (0.10 ppm) 60 (0.02 ppm)
O_3	1-Hour Maximum[6] 8-Hour Maximum[5]	0.12 ppm 0.08 ppm	--	235	0.12 ppm 0.08 ppm	0.12 ppm 0.08 ppm

$\mu g/m^3$ = micrograms of pollutant per cubic meter of ambient air
ppm = parts per million
ppb = parts per billion
[1] Not to be exceeded more than once per year.
[2] To attain this standard, the expected annual arithmetic mean PM_{10} concentration at each monitor within an area must not exceed 50 $\mu g/m^3$.
[3] To attain this standard, the 3-year average of the annual arithmetic mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 $\mu g/m^3$.
[4] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 65 $\mu g/m^3$.
[5] To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
[6] (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is < = 1.
(b) The 1-hour NAAQS will no longer apply to an area one year after the effective date of the designation of that area for the 8-hour ozone NAAQS. The effective designation date for most areas is June 15, 2004. [40 CFR 50.9; see Federal Register of April 30, 2004 (69 FR 23996).]

Table 3.2-3 Maximum Ambient Air Concentrations (Year 2004), MAPL WEP

State	County	EPA AIRDATA Station ID	Criteria Pollutant Maximum Value (µg/m³)		
			PM_{10}	NO_x	CO
New Mexico	Lea	3502500078110201	28	ND	ND
	Chaves	3500500058110201	24	ND	ND
	DeBaca		ND	ND	ND
	Torrance		ND	ND	ND
	Bernalillo	3500100298110203 3500100194210101	674 (32 Mean)	ND	3.7 ppm
	Santa Fe	3504900208110201 3504900194210101	14	ND	2.5 ppm
	Sandoval	3504300018110201 3504310034260201 3504310034210101	20	0.05 ppm	2.1 ppm
	Rio Arriba		ND	ND	ND
	San Juan	3504500068110201 3504500094260201	26	0.046 ppm	ND
Colorado	La Plata	0806700098110201 0806770034260201	50 (18.6 Mean)	0.047 ppm	ND
	Montezuma		ND	ND	ND
	Dolores		ND	ND	ND
Utah	San Juan		ND	ND	ND
	Grand		ND	ND	ND
	Uintah	4904770228110201	8	ND	ND
Wyoming	Sweetwater	5603708688110202	147 (22.3 Mean)	ND	ND
	Uinta	ND	ND	ND	ND

(EPA, 2004)
ND – No Data

Air quality related values such as visibility and acid deposition are regulated by Regional Haze Regulations and are monitored by the BLM and the states. Visibility is degraded by the presence of fine particulates in the air. Materials produced from combustion processes or secondary formation in the atmosphere by photochemical processes tend to make up the majority of $PM_{2.5}$ pollutants. The CAA does not explicitly define the qualities that comprise air quality related values (EPA, 1990). States take steps, however, to maintain visibility in areas deemed of national importance and designated by Section 162(a) of the CAA as Class I PSD areas. Class I areas include federal lands such as national parks, national wilderness areas, and national monuments. The nearest Class I areas to the proposed pipeline looping segment loops and existing pump stations are listed in Table 3.2-4.

Table 3.2-4 Class I PSD Areas, MAPL WEP

State	Project Area County	Class I Area	Distance from Project to Class I Area
New Mexico	Lea	Carlsbad Caverns NP	>90 miles SW
	Chaves	Salt Creek Wilderness Area	>40 miles S
	DeBaca	--	
	Torrance	White Mountain Wilderness	>50 miles SW
	Bernalillo	--	
	Santa Fe	Pecos Wilderness Bandelier National Park	>60 miles NE >50 miles NE
	Sandoval	San Pedro Parks Wilderness	>25 miles E
	San Juan	--	
Colorado	La Plata	Mesa Verde National Park Weminuche Wilderness	>40 miles W >25 miles NE
	Montezuma	--	
	Dolores	--	
Utah	San Juan	Canyonlands National Park	>20 miles W
	Grand	Arches National Park	>10 miles N
	Uintah	--	
Wyoming	Sweetwater	--	
	Uinta	--	

The New Source Review process determines and regulates sources that would cause adverse effects to these Class I PSD areas. Facilities that have a potential to emit more than 250 tons per year of any regulated pollutant (major source) are required to obtain a PSD permit which, depending on its location with respect to nearby Class I areas, may include performing a visibility analysis. None of the existing pump station modifications proposed for horsepower increases would be considered a major source or approach this threshold.

3.2.1.3 Sound Quality

Noise is defined as unwanted or annoying sound that is typically associated with human activities and that interferes with or disrupts normal activities. Sound and noise are measured as sound pressure levels in units of decibels (dB). Response to noise varies according to its type, its perceived importance, its appropriateness in the setting and time of day, and the sensitivity of the individual receptor. Human hearing is simulated by measurements in the A-weighting (dBA) network, which de-emphasizes lower frequency sounds to simulate the response of the human ear. Some typical sound levels from common noise sources are presented in Table 3.2-5.

Table 3.2-5 Sound Levels Associated With Noise Environments and Field Operations

Noise Source	Scale of A-weighted Sound Level (dBA)	Human Judgment of Noise Loudness (relative to a reference loudness of to dB*)
Typical construction site at 50 feet	85	*approximately 15 times as loud
Diesel truck, 40 mph at 50 feet	75	*approximately 8 times as loud
Light traffic at 50 feet	56	*approximately 2 times as loud
Rural area daytime	45+	Reference loudness
Rural area at night	35+	Quiet - * ½ as loud
Human voice whisper at 5 feet	20	Very quiet

* These values are logarithmic measurements (i.e. every 10-dBA increase is perceived by the human ear as approximately twice the previous noise level. Therefore, a rural area during the day is about twice as loud to the human ear as a rural area at night). Source: Compiled from EPA, 1974 and EPA, 1971.

+ Corrected for high winds.

The Inverse Square Law of Noise Propagation states that sound level intensity decreases by approximately 6 dBA with every doubling of the distance from the source. Further reduction occurs when sound energy travels far enough to be appreciably reduced by absorptions (Harris, 1991).

Environmental noise regulations and guidelines for outdoor, neighborhood and/or community noise levels have not been promulgated by the EPA. The EPA provides guideline noise levels in relation to anticipated noise/human activity disturbance impacts from industrial construction and operations, below which the general public would be protected from activity interference and annoyance. Outdoor locations “in which quiet is a basis for use” are assigned a maximum noise level of 55 dBA. Laws or regulations for acceptable noise limits have not been established at the state level by New Mexico, Colorado, Utah or Wyoming. Local city ordinances and codes have been established by some cities such as Albuquerque, New Mexico but are only applicable to activities that occur within the city limits. Based on a review of available city and county ordinances and codes, no applicable noise limits were identified for the project area.

The primary noise sources in the vicinity of the proposed pipeline and existing pump stations are the turbines and equipment at the pump stations, wind noise, occasional traffic noise where the pipeline route crosses rural roads, and highway noise where the route crosses Interstate Highway 25 north of Bernalillo, New Mexico.

Current noise levels at the existing pump stations were estimated based on the turbines that have approved permits, electric motors present on site, and manufacturer information. Table 3.2-6 lists the estimated noise levels for each pump station at 50 feet from the sources, and at one-half and one mile from the facility. The calculated noise levels are higher than actual noise levels collected at Edgewood, Estancia, and Duran during April 2004. Based on this comparison the calculated noise levels are conservative.

Table 3.2-6 Estimated Pump Station Noise Levels, MAPL WEP

Existing Pump Station	Current Permitted Turbines and Electric Motors	Noise at Pump Station 50 ft from Source* (dBA)	Noise at ½ Mile from Source (dBA)	Noise at 1 Mile from Source (dBA)
Caprock	3 - T1302	84.8	50.8	46.1
White Lakes	4 - T1302	86.0	52.0	47.0
Mesa	3 – T1402	84.8	50.8	46.1
Duran	5 – T1302	(81.4) 87.0	52.9	47.7
Estancia	4 – T1402	(70.3) 86.0	52.0	47.0
Edgewood	3 – T1302	(69.2) 84.8	50.8	46.1
San Ysidro	3 - T1302 1 – T1402	86.0	52.0	47.0
San Luis	5 – T1302	87.0	52.9	47.7
Lybrook	3 – T1602	86.1	52.0	47.0
Huerfano	4 – T1302	86.0	52.0	47.0
Ignacio	1 – T1302	80.0	47.0	43.6
Dolores	3 – T1302	84.8	50.8	46.1
Dove Creek	1 – T1302	80.0	47.0	43.6
Lisbon	3 – T1302	84.8	50.8	46.1
Moab	2 – T1302	83.0	49.3	45.0
Thompson	3 – T1302	84.8	50.8	46.1
Harley Dome	3 – T1302	84.8	50.8	46.1
Dragon	3 – T1302	84.8	50.8	46.1
Dinosaur	2 – T1302	83.0	49.3	45.0
Rock Springs	4 - T1302	86.0	52.0	47.0
Granger	1 – T1602 1 – T1302	83.7	49.9	45.4
Pine Butte	500 hp Electric	61.4	41.6	41.4
Tipton	400 hp Electric	61.4	41.6	41.4

*Actual noise level readings are shown in ( ) and were taken on April 7, 2004.

The noise from the existing pump stations were calculated and potential noise levels at set distances from the pump stations (one-half and 1 mile) were estimated using the Inverse Square Law of Noise Propagation (Harris, 1991):

$L_2 = L_1 - 20 \, Log_{10} (R_2/R_1)$,

where:
L_2 = predicted noise at a specified distance, R_2, from the pump station and
L_1 = source noise measured at a distance R_1 near the turbines/electric motors.
(Note atmospheric absorption was not included in this equation.)

The noise level day-night (L_{dn}) from the existing pump station was then calculated at specified distances from the stations and incorporated existing background noise levels of 35 dBA. The calculations assume that the equipment will be operated 24 hours per day at full load. The total L_{dn} at one-half and 1 mile from the pump stations was calculated using the following formula (Harris, 1991):

Total $L_{dn} = 10 \log_{10} (10L_{ex}/10 + 10L_{ps}/10 + \ldots)$
where:
L_{ex} is the existing L_{dn} at ½ and 1 mile from the existing pump station (for rural areas this is estimated to be 35 dBA), and
L_{ps} is the L_{dn} contribution of the existing pump station noise (turbines with silencers and enclosures, electric motors).

3.2.2 Geological Resources

3.2.2.1 Geology

General Physiography and Geology

The 12 pipeline looping segments of the MAPL Project are located within a variety of Western landscapes. They cross one physiographic province in Wyoming and three in New Mexico (Table 3.2-7). Relief within the segments is low to moderate with only limited areas of steep slopes. The segments primarily cross areas of thick, unconsolidated Quaternary deposits and near-surface, Tertiary sedimentary bedrock. Older near-surface formations are encountered in portions of Segments 5 and 9 (Cretaceous sedimentary rock), Segments 10 through 12 (Permian sedimentary rock), and Segment 10 (Pre-Cambrian igneous rock).

Geologic Hazards

Faults and earthquakes: In Wyoming, Segments 1, 2, 4, and 6 do not cross any fault zones (Greer et al., 1987a and 1987b). Segment 3 crosses one fault zone in Sections 16, 17, 18, 19, T20N, R93W (King et al., 1987) and another in Sec. 35, T20N, R95W (Greer et al., 1987b). Segment 5 crosses a fault zone in Sec. 15, T16N, R104W (Greer et al., 1987b). None of these faults are reported to be active.

The USGS has estimated that a 4.2 to 4.5 magnitude earthquake might occur somewhere in Wyoming’s Green River Basin every 62 years (BLM, 1999). One of the largest historic earthquakes in southwestern Wyoming occurred in 1995 with an epicenter near Segment 1. This event was associated with the collapse of a large section of the Solvay Minerals trona mine. This Intensity V earthquake measured 5.3 on the Richter scale (Case et al., 2002a).

For Sweetwater and Uinta counties, it is estimated that there is a 10 percent chance of an Intensity V earthquake (Modified Mercali Scale) occurring once during a 50 year period (Case et al., 2002a and 2002b). There is a 2 percent chance of an Intensity VI event occurring during this period in Segment 1 and a 2 percent chance of an Intensity VII event occurring in Segments 2 through 6.

Current earthquake probability maps suggest that the worst case scenario for possible future earthquakes in the vicinity of the proposed pipeline looping segments in Wyoming could result in damage comparable to an Intensity VII earthquake (Case et al., 2002a and 2002b). This intensity corresponds to negligible damage to buildings of good design and construction.

Table 3.2-7 Physiography and Geology of Lands Affected by the Proposed MAPL WEP

Segments	Physiographic Province and Section	Local Area Physiography	Elevation Range; Relief (ft.)	Geologic Formations (age)	Associated Geologic Hazards
1 and 2	Wyoming Basin	Bridger Basin and Green River Basin	6130-6940; 810	- Alluvium and colluvium (Holocene and Pleistocene) - Dune sand and loess (Holocene and Pleistocene) - Bridger formation (Eocene) - Green River formation (Eocene)	- flooding - wind erosion
3 and 4	Wyoming Basin	Great Divide Basin	6690-7010; 320	- Playa lake and other lacustrine deposits (Holocene and Pleistocene) - Green River formation (Eocene) - Wasatch formation (Eocene to upper Paleocene)	
5	Wyoming Basin	Rock Springs Uplift	6660-7240; 580	- Alluvium and colluvium (Holocene and Pleistocene) - Rock Springs formation (upper Cretaceous) - Blair formation (upper Cretaceous) - Baxter shale (upper Cretaceous)	- flooding
6	Wyoming Basin	Rock Springs Uplift and Green River Basin	7300-8130; 830	- Bishop conglomerate (Oligocene) - Green River formation (Eocene) - Wasatch formation (Eocene to upper Paleocene)	- landslides
8	Colorado Plateau – Navajo	San Juan Basin	6820-7240; 420	- San Jose formation (Eocene) - Nacimiento formation (Paleocene)	
9	Basin and Range – Mexican Highlands	Rio Grande Rift – Jemez valley	5070-5540; 470	- Alluvium (Holocene to upper Pleistocene) - Santa Fe group (middle Pleistocene to upper Oligocene)	- flooding
10	Basin and Range – Sacramento; Great Plains – Pecos Valley	Estancia valley and Pedernal Hills; Encino Basin	6095-6610; 515	- Alluvium (Holocene to upper Pleistocene) - Lacustrine and playa deposits (Holocene) - Piedmont alluvial deposits (Holocene to lower Pleistocene) - Glorietta sandstone (Permian) - Yeso and San Andres formations (Permian) - Paleoproterozoic granitic plutonic rocks (pre-Cambrian) - Paleoproterozoic metasedimentary rocks (pre-Cambrian)	- karst issues
11 and 12	Great Plains – Pecos Valley	Pecos Plains	3725-4890; 1165	- Older alluvial deposits of upland plains and piedmont areas (middle to lower Pleistocene) - Artesian group (Permian) - San Andres formation (Permian)	- karst issues
13	Great Plains – Southern High Plains	Llano Estacado	4200-4270; 70	- Ogallala formation (lower Pliocene to middle Miocene)	

Sources: Fenneman, 1931; Hawley and Love, 1981; Hunt, 1967; Love and Christiansen, 1985; McLemore, 1984; NMBG&MR, 2003; Roberts, 1989

In New Mexico, Segments 8, 11, 12, and 13 do not cross any fault zones. All of Segment 9 is in a fault zone. Segment 9 crosses several faults in the Rio Grande rift which date from the late Pliocene to late Quaternary. Two inactive faults are crossed by Segment 10 in the Pedernal Hills in Sections 23 and 26, T7N, R11E and in Sec. 8, T6N, R12E (Callender, 1979 and NMBG&MR, 2003).

Seismic activity in New Mexico is concentrated along the Rio Grande rift, a major continental rift extending from north of Taos to south of Las Cruces. While the overwhelming majority of Quaternary faults in New Mexico occur within the boundaries of the rift, earthquakes are absent over much of its extent. Most New Mexican earthquakes with magnitudes of 4.5 or greater during the period 1869-1998 have occurred in the section of the rift between Albuquerque and Socorro which is at least 30 miles south of the proposed Project. A majority of these have been associated with the Socorro fracture zone (Sanford et al., 2002).

In general, seismic hazards for New Mexico are moderate to low. The highest seismic hazard in New Mexico for the MAPL Project would be in Segment 9 which lies within the Rio Grande Rift. In this area the maximum peak ground acceleration has been calculated to be approximately 0.08g which generates Modified Mercali Intensity VI effects (Lin and Sanford, 2000).

Landslides: The Geological Survey of Wyoming has mapped a landslide area which is crossed by Segment 6 on the southwest slope of Miller Mountain between Aerial Marker (AM) 855.6 and 855.9 (Case and Murray, 1990). The segment would cross the toe of a slide area which includes earth flows, debris-laden earth flows, bedrock slumps, and a debris slump. In addition, side slopes of 10-20 percent would be crossed by the proposed pipeline looping segment. Bedrock in this area is the Oligocene-age Bishop conglomerate.

Along Segment 5 (Sec. 14, T16N, R104W), a small multiple debris flow has been mapped on the slope north of pipeline corridor (Ford and Larsen, 1989). The proposed pipeline route does not appear to cross the slide area. No other landslide areas have been mapped along the Wyoming segments of the pipeline (Case and Larsen, 1991 and Case et al., 1991).

Within New Mexico, nearly all of the proposed segments lie within an area defined as “low landslide incidence – less than 1.5 percent of area involved” (Godt, 1997). The exception is the north end of Segment 8 which lies within an area defined as “moderate susceptibility, low incidence”. A review of the Lybrook Quadrangle topographic map (1:24,000) shows potential minor landslide areas between AMs 367 and 369 of Segment 8.

Soil liquefaction occurs when unconsolidated deposits composed primarily of water-saturated sands and silts lose their internal strength and behave as viscous fluids (Case, 1986a). Liquefaction is sometimes associated with earthquakes. When seismic waves pass through saturated materials, the pore pressures may be raised because of compaction and liquefaction occurs. A map of liquefaction-prone areas in Wyoming indicates that none are crossed by the proposed pipeline corridors (Case 1986c). In New Mexico, the potential for soil liquefaction associated with earthquakes is low in areas crossed by the proposed pipeline corridors. Horizontal ground accelerations from predicted maximum intensity earthquakes are not expected to be severe enough for liquefaction to occur (BLM, 1995). With the exception of the Rio Grande valley, saturated surficial materials are infrequently encountered within the New Mexico segments.

Karst topography: These landscapes are characterized by irregular topography with sinks, underground streams, springs, and caves that were formed by subsurface dissolution of limestone and dolomite. Areas of karst terrain are susceptible to ground subsidence, sinkhole collapse, groundwater contamination, and unpredictable water supply (BLM, 2003a).

In Wyoming, none of the geologic formations crossed by the proposed pipeline looping segments exhibit karst characteristics (Love and Christiansen, 1985).

In New Mexico, solution of Permian-age evaporite and carbonate rocks has produced large subsidence basins in the Pecos Plains. At present, the dominant solution-subsidence process is associated with both deep and shallow dissolution of gypsum and various sodium and potash salts. Several large collapse depressions formed during the 20th Century in this area (Hawley and Love, 1981). Segments 10 and 11 cross through areas underlain by two Permian-age geologic formations which have karst characteristics (Table 3.2-8). Both formations (the San Andres and Yeso formations) contain limestone, dolomite, and gypsum beds. The Fourmile Draw member of the San Andres formation is known to exhibit numerous surficial sinkholes to the southwest of the corridor (Kelly, 1971). Segment 11 crosses the Fourmile Draw member just northwest of the existing Mesa pump station for several miles. A significant sinkhole, Devil's Well, is located just off the ROW in section 12, T3S, R21E. Other sinkholes (some with ponds) occur nearby in this area where the Fourmile Draw member is present.

Table 3.2-8 Karst Formations Crossed by MAPL WEP Pipeline Looping Segments

Segment	Approximate aerial markers	Formation
10	188.6 – 191.0	Yeso
10	194.1 – 196.3	Yeso
10	222.0 – 223.3	San Andres
11	127.5 – 128.0	San Andres
11	130.5 – 136.7	San Andres
11	137.9 – 140.0	San Andres

Source: NMBG&MR, 2003

During 2004 biological surveys for the MAPL WEP, a few sinkholes were observed approximately one-quarter mile from the pipeline corridor but not along the pipeline centerline itself.

Abandoned underground mines: Two mined-out areas are located in the vicinity of Segment 6 in Wyoming (Case, 1986b). The first area is located in T15N, R105W. It has known subsidence but appears to be located approximately one mile east of the pipeline corridor. The second area is located in T14N, R105W. It has no known subsidence and appears to be located approximately one mile west of the corridor. An examination of the 1:24,000 scale topographic maps for these areas indicates that neither mine was a large operation. Thus, it is unlikely that underground mine-associated subsidence would impact the pipeline in these areas. There are no other known mined-out areas near the pipeline corridors in Wyoming.

No abandoned underground coal mines are located in the vicinity of the proposed pipeline looping segments in New Mexico (BLM, 1995 and Anderson, 1980). The pipeline looping segments do not pass through any other mineral mining districts in New Mexico (Williams and McAllister, 1979).

3.2.2.2 Mineral Resources

The proposed MAPL WEP pipeline looping segments cross mineral resource areas in both Wyoming and New Mexico (Table 3.2-9). In addition, they cross close to several active mineral resource extraction operations.

Oil and Gas

Segments 1 through 4 in Wyoming cross oil and gas reserve areas of the Bridger, Green River, and Great Divide basins (DeBruin, 2002) (Table 3.2-9). Segment 5 crosses oil and gas reserves of the Rock Springs uplift. Segments 1, 3, and 5 are located within active gas fields. In New Mexico, Segment 8 crosses oil and gas reserves of the San Juan basin (Williams and McAllister, 1979). The northern 2 miles of Segment 8 are located in an active oil and gas field (Huffman, 1989). Segments 12 and 13 cross Permian basin oil and gas reserves which are being actively exploited.

Authorized oil and gas leases are crossed by proposed ROWs of nine of the 12 proposed segments (BLM and USFS, 2004) (Table 3.2-9). Although these leases are authorized and active, they are not necessarily being actively exploited at the present time. Table 3.2-9 also shows that active oil and gas wells are located within 500 feet of the ROW in four of the six Wyoming segments and in two of the six New Mexico segments (WO&GCC, 2004 and NMEM&NR Dept., 2004).

High grade oil shale deposits of the Green River Formation are located beneath Segments 1 and 2 (University of Wyoming, 2004d). There is currently no oil shale mining activity in Wyoming and there are no foreseeable plans to develop this resource.

Coal Bed Methane

All six proposed Wyoming pipeline looping segments cross coal bed methane resources (DeBruin et al., 2001) (Table 3.2-9). In addition, Segment 8 in New Mexico is located within an area of coal bed methane reserves (Huffman, 1989). CBM is being developed in southwest Wyoming but not near the project location. Currently, there is no coal bed methane extraction in the vicinity of Segment 8 in New Mexico. It is anticipated that these resources will be developed sometime in the future.

Coal

Segments 1, 2, 4 and 6 in Wyoming cross subbituminous coal reserves which are located too deep beneath the surface to be economically extracted at present (University of Wyoming 2004b). Segment 3 crosses strippable subbituminous coal in the Cherokee and Red Desert fields from Creston to Wamsutter. There are several underground mines in this area but not near the proposed ROW. The east end of Segment 5 crosses an area of near-surface bituminous and subbituminous coal which has not been mined.

In New Mexico, Segment 8 crosses Fruitland formation coal deposits of the San Juan basin. These coal beds are relatively thin, however, along the Segment 8 corridor (4 to 12 feet) (Fassett, 1989) and are unlikely to be mined.

Other Minerals

The world's largest deposit of trona, a sodium carbonate used in glassmaking and chemical production (Wyoming Rails, 2001), is found in western Sweetwater County, Wyoming (University of Wyoming, 2004e). The east end of Segment 1 and west half of Segment 2 are within the high yield zone (Table 3.2-9). Underground trona mines near Segments 1 and 2 are currently active (University of Wyoming, 2004f).

Other mineral deposits crossed by the ROWs in Wyoming include a high-grade CO_2 resource in Segment 1 (University of Wyoming, 2004a), a clay deposit in Segment 2 south of Peru (Harris et al., 1985), and a high grade helium resource area in Segment 4 (University of Wyoming, 2004c). Segment 5 is located just south of the Aspen Mountain silicified zone (Hausel et al., 1994), but there is no active or proposed gold mining in the vicinity of the ROW.

In New Mexico, the north end of Segment 8 is located approximately 18 miles east of the center of the Kimbeto T.P. uranium cluster (Finch and McLemore, 1989).

No other metallic or non-metallic mineral deposits have been identified in the vicinity of the pipeline looping segments in Wyoming or New Mexico.

Sand and Gravel

The proposed pipeline looping segments in Wyoming cross several gravel resource areas (Root et al., 1973) (Table 3.2-9). Segment 2 crosses gravel deposits in the Blacks Fork River valley between AM 29.5 and 30.0. A gravel resource area is crossed by Segment 4 in Patrick Draw near Bitter Creek from AM 44.5 to 45. Segment 5 crosses a gravel resource area in the Salt Wells Creek valley from AM 17.7 to 17.9. A large gravel resource area is crossed by Segment 6 on Miller Mountain from AM 857 to 869.7. No sand and gravel pits are located in the vicinity of Segments 1 through 5. An examination of USGS topographic maps reveals that Segment 6 is located near gravel pits at AM 862.0 and 866.5.

Table 3.2-9 Mineral Resources Crossed by MAPL WEP Pipeline Looping Segments

Segment	Oil and Gas Fields	Authorized Oil and Gas Leases	Oil and Gas Wells < 500 ft from ROW[1]	Coal Bed Methane	Coal Fields	Other Mineral Deposits	Sand and Gravel Resources	Sand and Gravel Pits near ROW
Wyoming								
1	Bruff gas field; Green River oil shale	6	9	CBM beds >5000 ft. deep	Subbituminous coal deposits – too deep to mine	CO_2 trona	-	0
2	Green River oil shale	1	0	CBM beds >5000 ft. deep	Subbituminous coal deposits – too deep to mine	clay trona	Blacks Fork valley (gravel): AM 29.5 – 29.7	0
3	Echo Springs, Tierney North, Frewen, and Wamsutter gas fields	7	15	CBM beds >5000 ft. deep	Strippable subbituminous coal in Cherokee and Red Desert fields	-	-	0
4	Table Rock gas field and Patrick Draw oil field	1	3	CBM beds >5000 ft. deep	Subbituminous coal deposits – too deep to mine	helium	-	0
5	Baxter Basin South Gas Field	7	1	CBM beds >5000 ft. deep	Near-surface bituminous and subbituminous deposits.	gold (north of segment)	gravel: AM 44.5 – 45.0	0
6	-	9	0	CBM beds <5000 ft. deep	Subbituminous coal deposits – too deep to strip	-	gravel: AM 857-869.7	2
New Mexico								
8	San Juan Basin	19	5	potential CBM beds present	Strippable coals are too thin to mine.	uranium		0
9	-	0	0	-	-	gypsum	sand and gravel: Jemez and Rio Grande valleys	2
10	-	0	0	-	-	-	sand and gravel: various alluvial valleys	0
11	-	0	0	-	-	-	-	0
12	Permian Basin	14	8	-	-	-	-	0
13	Hightower oil field	1	0	-	-	-	sand: AM 46.8 – 51.1	0

Sources: BLM and USFS, 2004; Connel et al., 2000; DeBruin, 2002, DeBruin et al., 2001; Fassett, 1989; Finch and McLemore, 1989; Harris et al., 1985; Hausel, W.D. 1987; Huffman, A. C., Jr. 1989; Hunt, C.B., 1977; Root et al., 1973; Roswell Geol. Soc., 1988; NMEM and NR Dept., 2004; University of Wyoming, 2004 a through e; Williams and McAllister, 1979; Woodward and Ruetschilling, 1976; WO&GCC, 2004;

[1]Distance estimated using ¼ ¼ section location of wells in Wyoming. Well locations in New Mexico are based on precise distances from section lines.

In New Mexico, Segment 9 crosses alluvial sand and gravel deposits in Jemez River valley (Woodward and Ruetschilling, 1976) and the Rio Grande valley (Connel et al., 2000). Segment 9 crosses immediately south of a large sand and gravel quarry in the Rio Grande valley between Interstate 25 and the Algodones Canal (AM 279.8 to 280.0). At the San Ysidro Station, the end of Segment 9 (AM 299.3) is immediately northeast of a small sand and gravel operation. Segment 10 crosses sand and gravel resources in several alluvial valleys including Red Canyon and McGilivray draws. Segment 13 crosses thin sand on caliche of the Ogallala Formation, a shallow source of aggregate (Hunt, 1977b). There are no sand and gravel quarries near Segments 10 or 13.

3.2.2.3 Paleontological Resources

The route of the proposed pipeline crosses bedrock of highly variable lithology, age, and potential for recovery of significant vertebrate fossils. BLM uses a tripartite ranking system to classify the potential of areas to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils (BLM, 1998):

- <u>Condition 1</u> - Areas that are known to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils.
- <u>Condition 2</u> - Areas with exposures of geological units or settings that have high potential to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. The presence of geologic units from which such fossils have been recovered elsewhere may require further assessment of these same units where they are exposed in the area of consideration.
- <u>Condition 3</u> - Areas that are very unlikely to produce vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils based on their surficial geology, igneous or metamorphic rocks, extremely young alluvium, colluvium, or eolian deposits or the presence of deep soils.

Areas containing Condition 1 or Condition 2 strata may trigger formal analysis during NEPA compliance.

In Wyoming, important fossiliferous strata crossed by the proposed Project include the Eocene Bridger and Green River formations, lacustrine units which are noted for recovery of well preserved fossil fish from some areas. The Laney Member of the Green River Formation is known for vertebrate fossil localities (Grande, 1984). Bedrock is generally a dark grey, shaley limestone. Fish bones are ivory white to buff white. Two localities near Segment 2 feature excellent fish skeletons. Herring (*Knightia)* and trout perch *(Erismatopterus)* are the most common. Uncommon or rare species at these sites include catfish *(Astephus)* and sucker *(Amyzon).*

Three localities have been identified in the Granger, Wyoming area that are actively excavated for vertebrate fossils by the University of California Museum of Paleontology. The majority of the fossils are in Eocene lacustrine and associated strata. The fossils observed in these strata are also present throughout the Green River Formation in the Bridger and Green River Basins. All of the excavation sites in the proposed pipeline vicinity are located approximately 10 to 30 miles north of Granger (the northwestern terminus of the proposed pipeline, Segment 1) and will not be affected by pipeline construction and related activities. The site 10 miles north of Granger is probably in the Bridger Formation (Welder, 1968).

During November 2004, a paleontological survey of the proposed pipeline ROW in Wyoming was conducted at the request of the BLM by Erathem Vanir Geological Consultants of Pocatello, Idaho. The survey consisted of both vehicular and pedestrian examination of local stratigraphy. The survey focused on an analysis of potential for recovery of scientifically important fossils during construction. No such materials were observed during the survey or during previous surveys of nearby pipeline ROWs by the Principal Investigator. A report of the survey, including mitigation and data recovery recommendations, has been included as Appendix E to this EA (Erathem Vanir Geological, 2004).

New Mexico portions of the proposed pipeline route cross rock units of greater age and lithologic variability than those of the Wyoming segments. However; Condition 1 formations are crossed by all proposed Project Segments except for Segment 12. A list of the Condition 1 formations crossed by the MAPL WEP and approximate aerial markers of the crossings is provided in Appendix E – Paleontological Report and Summary Table.

As a result of extensive previous disturbance along the proposed pipeline ROW in New Mexico, BLM has not required a pedestrian survey of the paleontological potential of the proposed Project. BLM has proposed a mitigation plan (Hester, 2004) that is summarized in Appendix D-8. A summary of the geological formations crossed by the proposed pipeline route and their potential for yielding scientifically important fossils is indicated in Table 3.2-10.

Table 3.2-10 Paleontological Potential of Geologic Formations, MAPL WEP

Geologic Unit	Geologic Age	Fossil Resources	Paleontologic Potential	Pipeline Looping Segments
Wyoming				
alluvial sediments (including alluvium and colluvium)	Holocene	none	Condition 3	1,2,3,4,5,6
eolian sediments	Holocene (less than 2,000 ybp)	none	Condition 3	1,2,3,4,5,6
playa lake and lake margin deposits	Holocene (to 7,000 ybp)	none known	Condition 3	1,2,3,4,5,6
Bridger Fm.	middle Eocene	vertebrates, invertebrates, plants, trace fossils	Condition 1	1,2
Green River Fm. Laney Shale Member	middle Eocene	vertebrates, invertebrates, trace fossils	Condition 1	2
Green River Fm. Luman Tongue	middle Eocene	vertebrates, invertebrates, trace fossil	Condition 1	3,4
Wasatch Fm.	early Eocene	vertebrates,	Condition 1	3,6

Geologic Unit	Geologic Age	Fossil Resources	Paleontologic Potential	Pipeline Looping Segments
Main body		invertebrates, plants, trace fossils		
Fort Union Fm.	Paleocene to earliest Eocene	vertebrates, invertebrate, plants	Condition 3	6
Blair Fm.	Late Cretaceous	invertebrates, trace fossils	Condition 2	5
Baxter Shale	Late Cretaceous	invertebrates, trace fossils	Condition 2	5
New Mexico				
alluvial, lacustrine, playa, and piedmont deposits	Holocene to Pleistocene	mammals	Condition 1	9,10
alluvial and piedmont deposits	middle to lower Pleistocene	mammals	Condition 1	10
Santa Fe Group.	middle Pleistocene to upper Oligocene	mammals	Condition 1	9
Ogallala Fm.	lower Pliocene to middle Miocene	mammals	Condition 1	13
San Jose Fm.	Eocene	mammals	Condition 1	8
Nacimiento Fm.	Paleocene	variable mammals and reptile fossils	Condition 1	8
San Andres Fm.	Permian	invertebrates	Condition 2	11
Glorieta Fm.	Permian	invertebrates	Condition 2	10
Yeso Fm.	Permian	invertebrates	Condition 2	10
Artesia Group	Permian	invertebrates	Condition 3	11, 12
granites and meta-sedimentary rocks	Precambrian	none	Condition 3	10

Sources: Erathem Vanir Geological, 2004; Liebed, 2004; BLM 1995; BLM, 2003a; Hester, 2004.

3.2.3 Soils

3.2.3.1 General Description

Soils within the proposed pipeline looping segments and existing pump station sites have formed within a variety of natural environments. Table 3.2-11 lists 25 soil associations that are crossed by proposed MAPL WEP pipeline looping segments (nine in Wyoming and 16 in New Mexico) (NRCS, 2004c and 2004d). Each association is comprised of soil series which occur in similar soil-forming environments.

Along the Wyoming segments, soils have formed primarily in residuum, slopewash, and colluvium with smaller areas of alluvium, eolian deposits, landslide deposits, and playa deposits

(Case et al., 1998). Areas of bedrock outcrop are found within Segments 5 and 6. Parent materials are Tertiary basin sedimentary bedrock in all corridors except Segment 5 (Love and Christiansen, 1985). In this latter segment, parent materials are Cretaceous sedimentary bedrock of the Rock Springs Uplift.

Along the New Mexico segments, soils have formed primarily in residuum and alluvial fan deposits as well as alluvium (northwestern segments), playa deposits (central and southeastern segments), eolian deposits (Segment 13), and colluvium (Segment 8) (Hunt 1977a, 1977b, and 1978). Areas of bedrock outcrop are found in Segment 8. Parent materials are predominantly Tertiary sedimentary bedrock in the northwestern segments (NMBG&MR, 2003). In the central and southeastern segments, Permian sedimentary bedrock and thick, unconsolidated Quaternary alluvial and eolian deposits are the predominant soil parent materials.

Soils are predominantly well-drained within both the Wyoming and New Mexico segments. There are also minor areas of somewhat excessively drained, excessively drained, and somewhat poorly drained soils in some segments of both states. Within the Wyoming segments, nearly all soils are moderately deep (20 to 40 inches to bedrock) to deep (more than 40 inches to bedrock). Deep soils predominate within the New Mexico segments although some areas of shallow (less than 20 inches to bedrock) or moderately deep soils are also present.

Soils with a shallow depth to bedrock (less than 20 inches) may have insufficient topsoil of suitable quality for revegetation. In addition, both shallow and moderately deep soils (20 to 40 inches depth to bedrock) may require blasting during trenching operations.

Nearly all the soil associations crossed by the proposed pipeline looping segments are characterized by soil series with severe or very severe limitations (such as susceptibility to water or wind erosion, excess water/poor drainage, soil limitations within the rooting zone, temperature limitations, and lack of moisture) that make them generally unsuited to cultivation of crops or pasture plants unless irrigated (NRCS, 2004b). An exception is Segment 13, where roughly half of the soils can support some crops or pasture plants with careful management. Limited areas of prime farmland soils (when irrigated) (NRCS, 2004b) are crossed by the Segments 9 and 10. These areas are discussed in Section 3.2.7.1.

3.2.3.2 Erosion

A minority of Wyoming and New Mexico corridor areas have soils with severe or very severe water erosion hazards (Table 3.2-11). Most water erosion problems are found in steeply sloping areas (slopes greater than 15 percent) but even some gently to moderately sloping areas may experience water erosion problems especially when stripped of their protective vegetation cover during construction. In general, the central and southeastern New Mexico segments have lower water erosion hazards because of their setting in relatively flat to gently sloping topography.

High or very high wind erosion hazards are associated with a few soils in the corridors of both states. Topsoil with a large percentage of fine sand is especially susceptible to wind erosion when the protective layer of vegetation is removed by construction activities.

3.2.3.3 Biological Soil Crusts

In arid and semi-arid regions, where vegetative cover is generally sparse, open spaces can support biological soil crusts. Also known as cryptogamic, microbiotic, cryptobiotic, and microphytic crusts, these crusts are highly specialized communities of cyanobacteria, green algae, mosses, lichens, microfungi, and other bacteria. Formed by these living organisms and their by-products, they create a surface crust of soil particles bound together by organic materials. Ecological functions contributed by biological soil crusts include soil stability and erosion control, nitrogen fixation, nutrient contributions to plants, soil-plant-water relations, infiltration, seedling germination, and plant growth (Belnap et al., 2001).

Biological soil crusts have not been recognized in southwestern Wyoming (Jelden, 2004). They exist in New Mexico rangelands although data on specific locales is lacking (Scheffe, 2004). They have been reported by the public in the Placitas area of Segment 9.

3.2.3.4 Existing Soil Contamination

Nearly all pipeline looping segment rights-of-way are located in rural areas where little industrial activity takes place. Thus, large-scale soil contamination by hazardous materials or hydrocarbons would not be expected. During biological surveys of the segment ROWs in spring and summer 2004, no evidence of surficial soil contamination was observed.

3.2.4 Water Resources

3.2.4.1 Surface Water Resources

Two major drainage basins are crossed by the proposed route: the Blacks Fork (HUC 14040107) and Rio Grande Basins (HUC 13020203) (USGS, 1985). Because the climate of lands affected by the proposed Project is arid to semiarid, surface water is limited. Nearly all channel crossings traversed by the MAPL WEP segments are intermittent or ephemeral arroyos or washes that primarily carry water during storm events or snowmelt periods.

Segment 2 crosses the Blacks Fork River drainage in Wyoming. The Blacks Fork River is a tributary to the Green River and has a designated use classification of Class 2AB, meaning that the waters are protected for drinking water, game and non-game fish, fish consumption, other aquatic life, recreation, wildlife, agriculture, industry, and scenic value. The reach of the river that the proposed pipeline crosses is included on the Wyoming Section 303(d) 2004 list of impaired waters. From its confluence with the Hams Fork River upstream to a point above the Smiths Fork, the Blacks Fork River is on the 303(d) list for impairment of contact recreation uses due to exceedences for fecal coliform bacteria. The source of contamination is unknown at this time (WDEQ, 2004).

Table 3.2-11 Characteristics of Soil Associations Crossed by MAPL WEP Pipeline Looping Segments

Major Land Resource Area	Association name	Segments	Drainage	Water Erosion Hazard	Wind Erosion Hazard	Depth to Bedrock
- WYOMING -						
Northern Intermountain Desertic Basins	Chrisman-Shellcreek-Dines	3	moderately well drained (a minority of soils well drained)	Severe or very severe for a majority of soils		
Central Intermountain Desertic Basins, Mountains, and Plateaus	Delphill-Blazon-Langspring	2, 6	well drained	Severe to very severe for majority of soils		<40” for most soils
Central Intermountain Desertic Basins, Mountains, and Plateaus	Huguston-Teagulf-Wint	2, 3, 4 ,5	well drained (a few soils somewhat excessively drained)	Severe or very severe for a minority of soils		<40” for most soils
Central Intermountain Desertic Basins, Mountains, and Plateaus	Forelle-Vonason-Farson	3	well drained		High for a few soils	<40” for a few soils
Central Intermountain Desertic Basins, Mountains, and Plateaus	Dines-Fluvents-Chrisman	2, 5	well drained (minority of soils moderately well to somewhat poorly drained)	Severe for a minority of soils	Very high for a few soils	
Central Intermountain Desertic Basins, Mountains, and Plateaus	Haterton-Kandaly-Westvaco	1	well drained (minority of soils somewhat excessively drained)	Severe or very severe for a minority of soils	Very high for a minority of soils	<40” for about ½ of soils
Central Intermountain Desertic Basins, Mountains, and Plateaus	Kandaly-Teagulf-Huguston	4	well drained (minority of soils somewhat excessively drained)		Very high for a minority of soils	<40” for a minority of soils
Wasatch and Uinta Mountains	Uinta-Miracle-Chittum	6	well drained	Severe for a minority of soils		<40” for about ½ of soils
Wasatch and Uinta Mountains	Teemat-Teeler-Roxal	6	well drained (a few soils somewhat poorly drained)	Severe for a minority of soils		
- NEW MEXICO -						
New Mexico and Arizona Plateaus and Mesas	Rock outcrop-Travessila-Weska	8	well drained	Severe or very severe for a majority of soils		<20” for most soils
New Mexico and Arizona Plateaus and Mesas	Pinavetes-Rock outcrop-San Mateo	9	excessively drained (minority of soils well drained)		High for a majority of soils	<20” for a minority of soils
San Juan River Valley Mesas and Plateaus	Doakum-Betonnie	8	well drained			
San Juan River Valley Mesas and Plateaus	Blancot-Councelor-Tsosie	8	well drained	Severe for a few soils		

Major Land Resource Area	Association name	Segments	Drainage	Water Erosion Hazard	Wind Erosion Hazard	Depth to Bedrock
Southern Desertic Basins, Plains and Mountains	Sheppard-Grieta	9	some what excessively to excessively drained (minority well drained)		High for a majority of soils	
Southern Desertic Basins, Plains and Mountains	Gilco-Vintas-Aga	9	well drained (a few soils somewhat poorly drained)			
Southern Desertic Basins, Plains and Mountains	Hollomex-Reeves-Milner	12	well drained	Severe for a few soils		
Pecos-Canadian Plains and Valleys	Sedillo-Placitas-Zia	9	well drained	Severe or very severe for about ½ of soils		<35” for a minority of soils
Pecos-Canadian Plains and Valleys	Willard-Karde-Manzano	10	well drained	Severe or very severe for a minority of soils		
Pecos-Canadian Plains and Valleys	Clovis-Rock outcrop-Otero	10	well drained (minority of soils somewhat excessively drained)			<20” for a few soils
Pecos-Canadian Plains and Valleys	Tapia-Dean-Harvey	10	well drained	Severe for a few soils		
Pecos-Canadian Plains and Valleys	La Fonda-Alicia-Rock outcrop	10	well drained (a few soils somewhat excessively drained)	Severe for a few soils		<20” for a few soils
Pecos-Canadian Plains and Valleys	Poquita-Tucumcari-Regnier	11	well drained	Severe for a few soils		<20” for a few soils
Pecos-Canadian Plains and Valleys	Holloman-Reeves-Poquita	11	well drained	Severe for a minority of soils		<40” for a majority of soils
Pecos-Canadian Plains and Valleys	Pastura-Darvey-Deama	11	well drained			<20” for a few soils
Southern High Plains	Kimbrough-Lea-Stegall	13	well drained	Severe or very severe for a minority of soils		
Southern High Plains	Lea-Kimbrough-Stegall	13	well drained	Severe or very severe for a minority of soils		

Major Land Resource Areas: The NRCS has divided the 48 contiguous states into 185 geographically associated land resources units or soil-forming environments which it has designated Major Land Resource Areas (NRCS. 2004a).

Explanation of modifiers:

“most” soils: more than approximately 80% of association

“majority” of soils: more than approximately 50% of association

“minority” of soils: less than approximately 50% of association

“a few” soils: less than approximately 20% of association

The major drainage basin crossed by the Project pipeline looping segments in New Mexico is the Rio Grande basin. Segment 9 crosses this perennial stream north of Bernalillo, NM. Water use designations for the portion of the Rio Grande crossed by the proposed pipeline looping segment include limited warm-water fishery, wildlife habitat, irrigation, livestock watering, and secondary contact (NMWQCC, 2001). The area upstream of the proposed pipeline crossing is included on the New Mexico Section 303(d) 2002-2004 list of impaired waters. From the Alameda Bridge to the Santa Ana Pueblo boundary, the Rio Grande is on the 303(d) list for impairment of secondary contact and irrigation uses due to exceedences for fecal coliform bacteria. The source of contamination is thought to be urban runoff or municipal point sources. The total maximum daily load (TMDL) calculations were completed in 2000 (NMEDSWQB, 2004).

The City of Albuquerque Public Works Department is constructing a system that would withdraw water from the Rio Grande for drinking water purposes. A new water diversion facility north of the Paseo del Norte Bridge will be constructed 13.3 miles downstream of the proposed Rio Grande crossing in Segment 9. The city proposes to divert approximately 94,000 acre-feet of water per year at a near constant rate of 130 cubic feet per second (cfs). The facility will consist of an adjustable-height (from 0 to 3.5 feet) inflatable dam to be constructed 2,500 feet north of the Paseo del Norte Bridge. This diversion will be designed so that water will only be directed when the flow in the River exceeds 135 cfs. (NMSEO, 2004) The diversion system is expected to be in operation by late 2006.

Segment 9 also crosses the Bernalillo Drain, Albuquerque Main Canal, and the Algodones Canal on the southeast side of the Rio Grande. Segment 9 would also parallel the Jemez River on the Santa Ana and Zia Pueblos but does not cross the river. The eastern terminus of Segment 9 is near Las Huertas Creek. This creek is an intermittent drainage with a large upstream watershed. The proposed Project parallels Las Huertas Creek but does not cross it. Upper reaches of the creek (upstream of the proposed Project) have been proposed for designation as a Wild and Scenic River by the Southwest Wild and Scenic River Campaign (SWSRC, 2001). However, the portion of the creek near the proposed Project has been characterized as “degraded” by a local hydrologist due to “…a century of poor land management, including recent heavy flash floods caused by new housing developments upstream…” (The Quivara Coalition, 2002).

Historic daily flows of perennial water bodies potentially affected by the proposed Project are presented in Table 3.2-12. Other surface water resources affected by the pipeline include intermittent and ephemeral streams and arroyos that flow only after storm events or snowmelt. Locations of those intermittent and ephemeral streams may be found on topographic maps of the project provided in Appendix C.

Table 3.2-12 Historical Flows of Perennial Streams Crossed by the Proposed MAPL WEP Pipeline Looping Segments

Pipeline Looping Segment	Stream or River	USGS Gauging Station	Date Range	Discharge (cfs)			
				Low (10th Percentile	Median	Average	High (90th Percentile)
2	Blacks Fork River	Blacks Fork Near Little America, WY, USGS09224700	9/30/83 – 9/30/03	10	110	265.7	700
Adjacent to Segment 9	Jemez River	Jemez River Below Jemez Canyon Dam, NM, USGS08329000	1/28/83 – 5/22/01	0.9	23	74	194
9	Rio Grande	Rio Grande at Albuquerque, NM, USGS08220000	9/30/82 – 9/30/02	420.5	910	1470.3	3590
9	Rio Grande	Rio Grande at Alameda, NM, USGS 08329928	3/1/89 – 9/30/95	366	924	1586	4250

Source: USGS, 2004

3.2.4.2 Groundwater

The 12 MAPL WEP proposed pipeline looping segments cross four physiographic provinces from the north to the south: the Wyoming Basin, the Colorado Plateau, the Basin and Range and the Great Plains. This diversity of geology and land forms results in significant differences in the availability and quality of groundwater resources (USGS, 1985). The principal groundwater aquifers crossed by the proposed Project pipeline looping segments are identified in Table 3.2-13.

Recharge to groundwater along the proposed route occurs through precipitation infiltration, surface water loss, and irrigation return flow. Precipitation ranges from less than eight inches to 20 inches per year with the greatest quantity of precipitation occurring in southeast New Mexico. Most streamflow and recharge to the groundwater system along the proposed segment ROWs come from snowmelt during the spring and from thunderstorms during the summer (USGS, 1985).

Table 3.2-13 Aquifers Crossed by the Proposed MAPL WEP Pipeline Looping Segments

Segment	State	Length (miles)	Structural Basin or Aquifer (Approximate Percentage)						
			Quarternary Sand Deposits	Lower Tertiary Aquifers	Upper Cretaceous				
1	WY	5.4	100%						
2	WY	18.3	25%	75%					
3	WY	23.1		100%					
4	WY	8.5		100%					
5	WY	9.8		50%	50%				
6	WY	18.6		100%					

Segment	State	Length (miles)	San Juan	Rio Grande	Estancia	Upper Pecos	Fort Sumner	Roswell	Lea County
8	NM	20.1	98%	2%					
9	NM	22.6		100%					
10	NM	34.7			45%	10%	45%		
11	NM	18.7					20%	80%	
12	NM	18.1					85%	15%	
13	NM	4.4							100%

Sources: NMSEO, 2004; Wyoming Water Resources Center, 2004; USGS, 1996
Note: where multiple aquifers are present, shallowest is listed

Wyoming

The major aquifer system underlying the six proposed pipeline looping segments in Wyoming is the Upper Colorado River Basin System. Within this system are Quaternary sand deposits, Lower Tertiary sandstones with some coal beds, and Upper Cretaceous sandstones with some claystone, siltstones, and coal beds (USGS, 1996).

Unconsolidated-deposit aquifers in sediments of Quaternary age are the most productive aquifers in the region (USGS, 1996). In southwest Wyoming these aquifers are alluvial and permeability is variable. Average yields of wells completed in these aquifers range from 1 to 1000 gallons per minute (gpm). Static depth to the water table ranges from 0 to 50 feet. These aquifers are not widely used as water sources in the vicinity of the Project.

Lower Tertiary aquifers consist mostly of semi-consolidated sandstone beds of Oligocene to Paleocene age. The water yielding sandstones are interbedded with shale, mudstone, siltstone, lignite, and coal. The lower Tertiary aquifers contain freshwater over a large area of the region and are important sources of water supply even though they are not highly permeable. Yields range from 1 to 50 gpm and well depths range from 300 to 900 feet (USGS, 1996).

The upper Cretaceous aquifers extend over large areas of southwest Wyoming but only contain fresh water where they crop out and for short distances down dip. In this area, the principle water yielding zone is the Lance Formation. The permeability of the upper Cretaceous aquifers is somewhat variable, but not as great as that of the aquifers in younger rocks. Well yields range from 5 to 50 gpm with some wells yielding 1000 gpm near within the Green River basin. Wells that obtain water from the upper Cretaceous are generally less than 800 feet deep.

New Mexico

In New Mexico, the six proposed pipeline looping segments would cross several major groundwater aquifer systems. The San Juan, Roswell Basin, and Estancia aquifer systems are consolidated bedrock aquifers, while the Rio Grande and High Plains aquifers are composed of unconsolidated sediments of Tertiary, Cretaceous, or older periods. The Upper Pecos River and Lea County aquifers are alluvial. Near surface aquifers also are present in alluvial deposits of the Rio Grande Basin and the Roswell Basin. However, these shallow aquifers are part of deeper or more extensive aquifers. The Estancia Basin, Fort Sumner and Lea County are minor local aquifers crossed by the proposed route.

The San Juan Structural Basin (crossed by Segment 8) is a northwest-trending, asymmetric structural depression at the eastern edge of the Colorado Plateau. It is located in Arizona, Utah, Colorado, and New Mexico. The San Juan Structural Basin includes major aquifers in Quaternary valley-fill structures and Tertiary, Cretaceous, Jurassic, and Triassic aged sandstones.

The aquifers in the San Juan Structural Basin are considered confined and artesian because of the regional geologic structure and confinement by overlying mudstones, clays, and other structures that have relatively lower hydraulic conductivity. The eight major aquifers within this basin that contain retrievable groundwater of acceptable quality are identified as the San Jose Formation, the Animas and Nacimiento Formations, the Ojo Alamo Sandstone, the Menefee Formation, the Point Lookout Sandstone, the Gallup Sandstone, the Dakota Sandstone, and the Morrison Formation. Flow rates range from 0.15 to 645 gpm, and water quality of these aquifers is highly variable. The Gallup and Ojo Alamo Sandstone aquifers have the best potential of supplying groundwater (SJWC, 2003).

The Rio Grande aquifer system (crossed by Segments 8 and 9) is the principal aquifer in southern Colorado, central New Mexico, and western Texas. This system is composed of a network of hydraulically interconnected aquifers in basin-fill deposits located along the Rio Grande and nearby valleys. The deposits generally consist of unconsolidated gravel, sand, silt, and clay, or partly consolidated sedimentary or volcanic materials. The system consists of both confined and unconfined conditions (USGS, 1995). Wells within the Rio Grande Aquifer system range from 49 feet in depth to 2200 feet, with depth to the water table ranging from 3 to 760 feet. Well yield is also highly variable (NMSEO, 2004).

The Upper Pecos River aquifer (crossed by Segment 10) consists of thick and extensive alluvial deposits of Cenozoic age. Water in the alluvium is generally unconfined. However, confined conditions prevail in local areas where a clay-confining unit is present. Under natural conditions, groundwater generally moves from recharge areas near the margins of the alluvium toward the Pecos River. Recharge to the alluvium is by direct precipitation, infiltration from intermittent streamflow, return irrigation water, and subsurface flow from older formations. Groundwater in the alluvial aquifer is used principally for irrigation (USGS, 1996).

The Estancia Basin (crossed by Segment 10) is a topographically closed basin in central New Mexico. In the area of the proposed pipeline, the Precambrian basement is overlain by limestone, sandstone, and shale of the Pennsylvanian Madera Group (USGS, 1995).

The Fort Sumner aquifer (crossed by Segments 10, 11, and 12) is a locally significant sandstone and shale aquifer. Depth to water ranges from 18 to 700 feet.

The Roswell Basin aquifer system (crossed by Segments 11 and 12) consists of an underlying carbonate-rock aquifer and a hydraulically connected, overlying alluvial aquifer. It is an important aquifer within a roughly 740 square mile area, primarily along the western side of the Pecos River. Large volumes of groundwater are withdrawn from the alluvial and underlying carbonate-rock aquifers of this system. Well yield is variable ranging from 5 to 2000 gpm (USGS, 1995).

The Lea County alluvial aquifer (crossed by Segment 13) represents the northernmost extension of thick alluvial water-bearing deposits, common to Winkler, Ward, Loving, and Reeves counties in Texas. In Lea County, New Mexico, the alluvial aquifer is unconfined. Even at locations where it is thin, the alluvial aquifer is capable of producing adequate supplies of water for livestock and domestic uses. Depth to water ranges from 50 to 100 feet (NMSEO, 2004).

3.2.4.3 Wetlands

A combination of National Wetland Inventory (NWI) maps, aerial photographs, and field verification was used to determine the presence of wetlands. Wetlands crossed by the proposed pipeline looping segments are typically located along perennial and intermittent drainages. All proposed pipeline looping segments and existing pump stations were field surveyed for wetlands. In Wyoming, two small wetlands were identified by field personnel along Segment 5 in Section 15, T16N, R104W and in Section 19, T16N, R103W. Three small wetlands were identified Segment 6: two in Section 31, T14N, R104W and one in Section 19, T14N, R105W. There were also wetlands identified at the Blacks Fork River crossing in Section 14, T18N, R109W. Areas along ephemeral drainages were generally observed to be dry and lack wetland characteristics. In New Mexico, one small wetland was identified along Segment 13 in Section 6, T13S, R34E. Wetlands are discussed in terms of vegetation in more detail in Section 3.2.5.1 Native Vegetation, Riparian and Wetland Vegetation section.

3.2.4.4 Floodplains

Segment 2 will cross the Blacks Fork River 100-year floodplain in Section 14, T18N, R109W between approximately AM 29.5 and 29.7 in Wyoming (HUD, 1978). The river would be crossed by HDD if geotechnical conditions permit. Use of HDD would avoid construction in the floodplain.

In New Mexico, Segment 9 does not cross the 100-year floodplains of Arroyo Piedra Parado or Jemez River based on floodplain mapping on private land in the San Ysidro area (FEMA, 1996a). Floodplains are not mapped within the Zia or Santa Ana pueblos which are crossed by Segment 9 in the Jemez River valley. An examination of USGS 1:24,000-scale topographic maps reveals that the proposed pipeline probably does not cross the Jemez River floodplain within either pueblo.

Below the Jemez Canyon Dam in Section 8, T13N, R4E, Segment 8 crosses the 100-year floodplain of the dam overflow channel (FEMA, 1996b). The floodplain starts at approximately AM 282.0 and continues east across the Rio Grande. East of Section 8 (T13N, R4E), however, the 100-year floodplain is not mapped because it is within the boundary of the Santa Ana Pueblo. FEMA designates this land as an “area in which flood hazards are undetermined” (Zone D).

Although a portion of the Rio Grande floodplain will be crossed by directional drilling, conventional construction will be used between AM 280.7 and 282.0 (northwest of the river crossing) which appears to be in a floodplain area. The Rio Grande floodplain is the only wide floodplain crossed by the proposed pipeline looping segments. Some of the riparian areas in the vicinity of the Project in New Mexico no longer support native cottonwoods and willows. Invasive species such as Russian olive and saltcedar dominate (BLM, 2003b). A well-developed riparian community consisting of cottonwood, willow, and saltcedar is present at the proposed Rio Grande crossing location.

The pipeline avoids floodplains on the southeast side of the Rio Grande crossing. At the southeast end of Segment 9, the proposed receiver facility is located just outside the 100-year floodplain of Las Huertas Creek (FEMA, 1996c).

No other 100-year floodplains mapped in association with the National Flood Insurance Program are crossed by the proposed pipeline looping segments. However, flash flood hazards may be associated with a number of other intermittent and ephemeral streams crossed by the proposed pipeline looping segments. These especially include, but are not limited to, the following:

- Telephone Canyon: Segment 2, AM 19.6-19.9
- Circle Creek: Segment 5, AM 9.2-13.3
- Salt Wells Creek: Segment 5, AM 17.8
- Sage Creek: Segment 6, AM 854.2
- Red Canyon Draw: Segment 10, AM 222.0
- McGillivray Draw: Segment 10, AM 215.3
- unnamed drainage along rail line: Segment 10, AM 199.8
- Huggins Draw: Segment 12, AM 114.6

3.2.5 Vegetation and Invasive, Non-Native Weeds

3.2.5.1 Native Vegetation

The proposed pipeline ROW and associated existing pump stations would cross a number of vegetation communities. Table 3.2-14 describes, by segment and existing pump station, the dominant vegetation types observed during the 2004 field surveys. Specific community types are discussed below in detail.

Table 3.2-14 Dominant Vegetation Cover Type by MAPL WEP Pipeline Looping Segment and Existing Pump Station

Segment/ Pump Station	County/State	Dominant Vegetation Cover Type
1 Granger	Uinta, Sweetwater, WY	Wyoming big sagebrush, rabbitbrush, greasewood, prickly pear, western wheatgrass, needle-and-thread grass, crested wheatgrass.
2	Sweetwater, WY	Wyoming big sagebrush, rabbitbrush, fourwing saltbush, greasewood, prickly pear, western wheatgrass, needle-and-thread grass, crested wheatgrass.
3 Tipton	Sweetwater, WY	Wyoming big sagebrush, rabbitbrush, greasewood, prickly pear, western wheatgrass, needle-and-thread grass, crested wheatgrass.
4	Sweetwater, WY	Wyoming big sagebrush, rabbitbrush, greasewood, prickly pear, western wheatgrass, needle-and-thread grass, crested wheatgrass, alkali sacaton.
5 Pine Butte	Sweetwater, WY	Wyoming big sagebrush, rabbitbrush, greasewood, prickly pear, western wheatgrass, needle-and-thread grass, crested wheatgrass.
6 Rock Springs	Sweetwater, WY	Wyoming big sagebrush, rabbitbrush, greasewood, prickly pear, western wheatgrass, needle-and-thread grass, crested wheatgrass.

Segment/ Pump Station	County/State	Dominant Vegetation Cover Type
Dinosaur Dragon	Uintah, UT	Greasewood, big sagebrush, rabbitbrush, galleta grass, Indian rice grass.
Harley Dome	Grand, UT	Pinyon/juniper, snakeweed, grama grass,
Thompson	Grand, UT	Mixed bunch grass, rabbitbrush, saltcedar
Moab Lisbon	San Juan, UT	Pinyon/juniper, fourwing saltbush, big sagebrush, greasewood, Indian ricegrass, thickspike wheatgrass.
Dove Creek	Dolores, CO	Agricultural lands
Dolores	Montezuma, CO	Pinyon/juniper, big sagebrush, gambel oak, crested wheatgrass, brome, foxtail barley, intermediate wheatgrass
Ignacio	LaPlata, CO	Pinyon/juniper, big sagebrush, rabbitbrush, Indian ricegrass, wheatgrasses
Huerfano	San Juan, NM	Big sagebrush, Indian ricegrass, cheatgrass
Lybrook	Rio Arriba, NM	Pinyon/juniper, big sagebrush, rabbitbrush, crested wheatgrass, western wheatgrass
8 9 San Luis San Ysidro	Sandoval, NM	Pinyon/juniper, big sagebrush, rabbitbrush, fourwing saltbush, needle-and-thread grass, Indian ricegrass, foxtail barley, prickly pear cactus, cholla, wholly plantain, yucca, red threeawn, galleta, sideoats grama,
Edgewood	Santa Fe, NM	Cholla, galleta, wholly plantain
10 Estancia	Torrance, NM	Yucca, fourwing saltbush, cholla, broombush, juniper, rabbitbrush, grama grass, red threeawn, sandsage.
Duran	Guadalupe, NM	Rabbitbrush, cholla, juniper, yucca, red threeawn, needle-and-thread grass, grama grass.
11	DeBaca, NM	Yucca, cholla, prickly pear, galleta, mesquite, grama grass, red threeawn, needle-and-thread grass
12 Mesa White Lakes	Chaves, NM	Mesquite, yucca, prickly pear, cholla, sand dropseed, galleta
13 Caprock	Lea, NM	Cholla, hedgehog cactus, galleta

Sagebrush-Steppe: The dominant vegetation community along the Wyoming portions of the proposed pipeline route (Segments 1 through 6 and the existing Granger, Tipton, Rock Springs, and Pine Butte pump stations) is sagebrush-steppe. This community is typical of the Green River and Great Divide Basins. Precipitation in this area averages 8-10 inches per year. Dominant species include Wyoming big sagebrush (*Artemisia tridentata wyomingensis*), basin big sagebrush (*Artemisia tridentata tridentata*), Gardner saltbush (*Atriplex gardneri*), greasewood (*Sarcobatus vermiculatus*), and cushion plant communities (Knight, 1994). The understory includes western wheatgrass (*Agropyron smithii*), needle-and-thread grass (*Stipa comata*), Sandberg blue grass (*Poa secunda*), prickly pear cactus (*Opuntia spp*), scarlet globemallow (*Sphaeralcea coccin*), and rabbitbrush (*Chrysothamnus spp*). These species are adapted to aridic soils and require little water. Species composition varies depending on soil type, salinity, exposure, and moisture levels. Many of the same understory plant species associated with sagebrush-steppe are the dominant species within the grassland communities described below.

Pinyon/Juniper: Pinyon/Juniper communities are represented along portions of the proposed ROW in Segments 5 and 6 in Wyoming; the existing Harley Dome and Moab pump stations in

Utah; the existing Dolores and Ignacio pump stations in Colorado; and Segments 8, 9, and 10 in New Mexico. Soils are typically sands, loamy sands and clays. Precipitation is typically 10-15 inches per year. Dominant species of this vegetation community are; pinyon pine (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), one-seed juniper (*Juniperus monosperma*), big sagebrush (*Artemisia tridentata*), rabbitbrush (*Chrysothamnus spp*), Indian ricegrass (*Achnatherum hymenoides*), needle-and-thread grass (*Stipa comata*), Galleta (*Hilaria jamesii*), and sideoats grama (*Bouteloua curtipendula*).

Sand Shrub Grasslands: This vegetation type can be found along portions of Segments 9, 10, 11, and 12 in New Mexico. Soils associated with this community are well drained sands and silty sands with annual precipitation typically less than 13 inches per year. Dominant plant species for this cover type are fourwing saltbush (*Atriplex canescens*), big sagebrush (*Artemisia tridentata*), mesquite (*Prosopis spp*), rabbitbrush (*Chrysothamnus spp*), broom snakeweed (*Gutierrezia sarothrae*), greasewood (*Sarcobatus vermiculatus*), winterfat (*Ceratoides lanata*), staghorn cholla (*Opuntia versicolor*), yucca (*Yucca spp*) with a mixed grass understory of Indian ricegrass (*Achnatherum hymenoides*), needle-and-thread grass (*Stipa comata*), and Galleta (*Hilaria jamesii*).

Desert Grassland North: Synonymous with plains and Great Basin grasslands, this vegetation type is represented along portions of Segments 1 through 6 in Wyoming, in the vicinity of the existing pump stations in Utah, and along portions of Segments 8 through 12 in New Mexico. Soils vary greatly within this vegetation community, but are generally well drained sands and loamy sands. Precipitation is less than 12 inches per year. Dominant species include western wheatgrass (*Agropyron smithii*), thickspike wheatgrass (*Agropyron macrourus*), Indian ricegrass (*Achnatherum hymenoides*), needle-and-thread grass (*Stipa comata*), Galleta (*Hilaria jamesii*), red threeawn (*Aristida purpurea*), with sparse cover a low shrubs such as big sagebrush, mesquite, cholla, and yucca.

Desert Grassland South: Also called Semidesert Grassland, this cover type is represented in Segment 13 in New Mexico. Soils associated with this community are well drained sands and silty sands with annual precipitation typically less than 13 inches per year. Common species include; blue grama (*Bouteloua gracilis*), black grama (*Bouteloua eriopoda*), galleta (*Hilaria jamesii*), tobosa (*Pleuraphis mutica*), sideoats grama (*Bouteloua curtipendula*), sand dropseed (*Sporobolus cryptandrus*), and red threeawn (*Aristida purpurea*), with scattered stands and individuals of cholla, prickly pear, and yucca.

Reclaimed Grasslands: This vegetative community is represented by portions of reclaimed ROWs that are adjacent to and overlapping the proposed pipeline ROWs along the segments and at existing pump station sites in Wyoming, Utah, Colorado, and New Mexico. The previously disturbed portions of the existing multi-pipeline corridor include species that have been planted for reclamation. Soil type and relative revegetation success are variable. Reclaimed grasslands include western wheatgrass (*Agropyron smithii*), crested wheatgrass (*Agropyron cristatum*) and thickspike wheatgrass (*Agropyron macrourus*), Indian ricegrass (*Achnatherum hymenoides*), fourwing saltbush (*Atriplex canescens*), Sandberg bluegrass (*Poa secunda*), and winterfat (*Ceratoides lanata*) among others. With the exception of crested wheatgrass, these species and others like rabbitbrush are common in native grasslands of this region.

Riparian and Wetland Vegetation Resources

Riparian habitat is a highly valued vegetation community found along or around streams, lakes, ponds and other open water (both perennial and ephemeral). This unique habitat is crucial to many fish and other aquatic species in adjacent aquatic habitats and terrestrial wildlife species. Riparian vegetation helps maintain high water tables, stabilize pond and stream banks, create high quality fish/aquatic and wildlife habitats, prevent or reduce flooding, and maintain or improve water quality.

Many small seasonal (intermittent) and ephemeral streams and washes which support riparian communities would be crossed by the proposed pipeline. These communities support a variety of plant species, some of which are Plains cottonwood (*Populus sargentii*), Narrowleaf cottonwood (*Populus angustifolia*), Russian olive (*Elaeagnus angustifolia*), Saltcedar (*Tamarix spp*), Seep willow (*Baccharis glutinosa*), Coyote willow (*Salix exigua*), rushes (*Juncus spp*), sedges (*Carex spp*), and Inland saltgrass (*Distichlis spicata*). Two rivers will be crossed by the pipeline route: the Blacks Fork in Segment 2 in Sweetwater County, Wyoming, and the Rio Grande in Segment 9 in Sandoval County, New Mexico. Shrub species such as saltcedar are found at the Blacks Fork River crossing, while a mature riparian community exists at the Rio Grande crossing. Both of these proposed crossings would be completed by HDD, if geotechnical conditions permit.

Wetlands are lands where at least periodic inundation or saturation with water (either from the surface or subsurface) is the dominant factor determining the nature of soil development and the types of plant and animal communities living there. These include the entire zones associated with streams, lakes, ponds, springs, canals, seeps, wet meadows, and some aspen stands. They comprise less than one percent of the public land acreage crossed by the ROW.

Wetland identification and mapping along the proposed pipeline looping segments indicates that wetlands are limited in extent along the pipeline looping segment rights-of-way (ROWs). The wetlands identified during field investigations are provided in Table 3.2-15, and were identified by location in Section 3.2.4.3. Wetlands were identified at the following locations: one wetland crossed by Segment 1 (Sweetwater County, WY), two wetlands crossed by Segment 5 (Sweetwater County, WY), and three wetlands crossed by Segment 6 (Sweetwater County, WY). These wetlands are dominated by Inland saltgrass (*Distichlis spicata*), Foxtail barley (*Hordeum jubatum*), rushes (*Juncus spp*), spikerush (*Eleocharis spp*), and sedges (*Carex spp*) with small patches of shrubby riparian vegetation interspersed. Herbaceous wetland vegetation consisting of spikerush (*Eleocharis spp*) and rushes (*Juncus spp*) is present along Segment 13 (Lea County, NM) in a wet swale.

Table 3.2-15 Wetlands Crossed by the Proposed Pipeline Looping Segments

County/State	Segment	Site ID	Length of Crossing (ft)	Approximate Aerial Marker
Sweetwater, Wyoming	1	Wetland 01	160	46.5
Sweetwater, Wyoming	5	Wetland 01	300	8
Sweetwater, Wyoming	5	Wetland 02	120	11

Sweetwater, Wyoming	6	Wetland 01	10	854
Sweetwater, Wyoming	6	Wetland 02	10	854
Sweetwater, Wyoming	6	Wetland 03	25	855
Lea, New Mexico	13	Wetland 01	200	47

3.2.5.2 Invasive, Non-Native Weeds

Invasive, non-native weeds are plants designated by a federal, state, tribal, or county government as "noxious", i.e., injurious to public health, agriculture, recreation, wildlife, or property. They are plants that are competitive, persistent, pernicious, and often non-native. Invasive species are plants introduced into an environment with no natural enemies, such as insects or other plants, to limit their reproduction and spread. They frequently dominate native vegetation if left unchecked.

Based on field surveys, invasive, non-native weed establishment along the proposed pipeline looping segments and at existing pump station sites is generally limited to existing pipeline ROWs, roadsides, well pads and other previously disturbed areas. The most common weed observed within or near the proposed pipeline looping segments in Wyoming is halogeton (*Halogeton glomeratus*) with others such as Canada thistle (*Cirsium arvense*) and saltcedar (*Tamarix spp*) present in wetter areas. In Utah, pump stations are the only facilities associated with proposed Project activities. Major weed infestations were not identified during the 2004 field survey. In Colorado, there are three existing pump stations associated with the Project. Two of these, Dolores pump station in Montezuma County and Ignacio pump station in LaPlata County have large infestations of invasive, non-native weeds (designated as "noxious" weeds) adjacent to the facilities and along portions of the existing ROW approaching the pump stations. Some of the weed species identified at these existing pump stations include knapweed (*Centaurea spp*), Canada thistle (*Cirsium arvense*), musk thistle (*Carduus nutans*), jointed goat grass (*Aegilops cylindrical*), and scotch thistle (*Onopordum acanthiom*). In New Mexico, no major weed infestations were noted during the 2004 survey. A survey for designated noxious weeds will be conducted, however, along each of the proposed segments prior to the start of construction. Table 3.2-16 lists designated noxious weeds of concern identified for each state that may be affected by project activities.

Table 3.2-16 Designated Noxious Weed Species of Concern for the MAPL WEP

Scientific Name	Common Name	WY	NM	UT	CO
Acroptilon repens	Russian knapweed	X	X	X	X
Aegilops cylindrica	Jointed goatgrass		X		
Agroyron repens	Quackgrass	X		X	
Alhagi maurorum	Camelthorn		X		
Anthemis spp	Chamomile				X
Arctium minus	Common burdock	X			
Asclepias verticillata	Whorled milkweed				X

Scientific Name	Common Name	WY	NM	UT	CO
Asphodelus fistulosus	Onionweed		X		
Carduus acanthoides	Plumeless thistle	X			
Cardaria draba	Whitetop	X	X	X	X
Carduus nutans	Musk thistle	X	X	X	X
Centaurea biebersteinii	Spotted knapweed		X		X
Centaurea calcitrapa	Red starthistle		X		
Centaurea diffusa	Diffuse knapweed	X	X	X	X
Centaurea maculosa	Spotted knapweed	X		X	
Centaurea melitensis	Maltese starthistle		X		
Centaurea solstitialis	Yellow starthistle		X	X	X
Centaurea squarrosa	Squarrose knapweed			X	
Chrysanthemum leucanthemum	Ox-eye daisy	X			X
Cicuta douglasii	Western water hemlock				X
Cirsium arvense	Canada thistle	X	X	X	X
Cirsium vulgare	Bull thistle		X		
Conium maculatum	Poison hemlock		X		
Convolvulus arvensis	Field bindweed	X	X	X	X
Cynodon dactyon	Bermudagrass			X	
Dipsacus follonum	Fuller’s teasel		X		
Drymaria arenarioides	Sandwort drymary		X		
Elaeagnus angustifolia	Russian olive		X		
Euphorbia esula	Leafy spurge	X	X	X	X
Franseria discolor	Skeletonleaf bursage	X			
Halogeton glomeratus	Halogeton		X		
Hieracium cynoglossoides	Houndstongue				X
Hydrilla verticillata	Hydrilla		X		
Hypericum perforatum	Common St. Johnswort	X			
Huoscyamus niger	Black henbane		X		X
Isatis tinctoria	Dyer’s woad	X	X	X	X
Iva axillaris	Povertyweed				X
Lepidium latifolium	Broad leaved pepperweed	X	X	X	
Linaria dalmatica	Dalmation toadflax	X	X		X
Linaria vulagaris	Yellow toadflax	X	X		X
Lythrum salicaria	Purple loosestrife	X	X	X	
Myriophylum spicatum	Spike watermilfoil		X		
Onopordum acanthiom	Scotch thistle	X	X	X	
Peganum harmala	African rue		X		
Potentilla recta	Sulfur cinquefoil				X
Rumex crispus	Curly dock				X
Sonchus arvensis	Perennial sowthistle	X			
Sorhgum halepense	Perennial sorghum			X	
Taeniatherum caput-medusae	Medusahead			X	
Tamarix aphylla	Athel tamarisk		X		
Tamarix parviflora	Smallflower tamarisk		X		
Tamarix ramossisima	Saltcedar	X	X		
Tanacetum vulgare	Common tansy	X			
Ulmus pumila	Siberian elm		X		

Sources: Colorado Weed Management Association, 2004; U.S. Geological Survey and Northern Arizona University, 1999; Utah BLM Partners Against Noxious Weeds, 2004; Wyoming Weed and Pest Council, 2004.

3.2.6 Wildlife and Fisheries

3.2.6.1 Terrestrial Wildlife

Big Game Species

Wyoming

The Wyoming Game and Fish Department (WGF) manages three big game species in the vicinity of the proposed pipeline looping segments. Pronghorn *(Antilocapra americana)*, mule deer *(Odocoileus hemionus)*, and elk *(Cervis elaphus)* are managed in major herd units. Herd units represent geographic ranges which are typically several hundred thousand to several million acres in area and contain several hundred to tens of thousands of individual animals. The herd unit areas containing the proposed pipeline looping segments comprise a total area of more than five million acres.

Four pronghorn herds units, Carter Lease, Uinta-Cedar Mountain, Bitter Creek, and South Rock Springs, are crossed by pipeline looping segments of the proposed MAPL WEP. Total estimated population from 2002 field studies for the four herds is approximately 35,000 individuals. On lands administered by the BLM Rawlins Field Office (FO), the herd unit for pronghorn antelope north of I-80 is Red Desert (Herd Unit #615) which has an estimated population from 2003 field studies of 13,400 individuals. Segments 1, 2, 3, and 5 cross portions of antelope critical range (i.e., seasonal or range components which have been documented as the determining factor in the population's ability to maintain itself at or above the population objective) (WGF, 2002).

Five mule deer herd units, Wyoming Range, Uinta, Steamboat, Baggs, and South Rock Springs, are crossed by segments of the proposed Project. Total estimated 2002 population for these five herds is approximately 80,500 individuals. On lands administered by the BLM Rawlins FO, the Chain Lakes (Herd Unit #650) mule deer unit is also impacted by the proposed Project, with an estimated 2003 population of 400 individuals. Mule deer critical range is not crossed by any of the proposed Project segments.

Four elk herd units, West Green River, Steamboat, Petition, and South Rock Springs, are crossed by segments of the proposed Project. Total estimated population for the four herds is approximately 6,500 individuals. On lands administered by the BLM Rawlins FO, the Shamrock (Herd Unit #643) is an additional Elk Unit impacted by the project with an estimated 2003 population of 150 individuals. Elk critical range is not affected by the proposed Project segments (WGF, 2003).

Utah and Colorado

The same species found in the Wyoming portion of the Project are also present in western Colorado and eastern Utah. Elk and mule deer range include pump station sites in Colorado but these facilities are not located within any defined critical range (CDOW, 2003). Several existing pump stations in Utah are contained within seasonal mule deer, elk, and/or pronghorn range, but critical range for these species has not been identified in these areas (UDWR, 2003).

New Mexico

Big game species occurring in the vicinity of the proposed pipeline looping segments in New Mexico include mule deer, white-tailed deer *(Odocoileus virginianus*), pronghorn antelope, elk, Barbary sheep *(Ammotragus lervia)*, black bear *(Ursus americanus)*, mountain lion *(Puma concolor)*, and wild turkey *(Meleagris gallopavo)* (BLM, 1995). Digital mapping of big game ranges obtained from the University of New Mexico (2003) has identified approximately three miles of big game summer and winter range at the north end of Segment 8. No migration corridors or calving areas have been identified within the proposed segments.

Small, scattered elk populations are known to occur in the general vicinities of Segments 8 and 9 in association with pinyon-juniper woodlands (BLM, 1995).

Mule deer herds in the vicinity of the proposed Project segments are associated with habitat along the Rio Grande (Segment 9) and Pecos River (southeast of Segment 12), although small herds may occasionally move to nearby desert grasslands for forage. Isolated mule deer populations may also be found in the same habitats as those frequented by elk, and in western Sandoval County (Segment 8). Segment 12 is located adjacent to the Pecos River Mule Deer Management Area, which is also managed for white-tailed deer and pronghorn (BLM, 1995).

Small, resident white-tailed deer herds near the proposed pipeline ROW are restricted to riparian habitat adjacent to the Pecos River near Segment 12, but important white-tailed deer range does not occur along the proposed route. Pronghorn antelope may be found in sagebrush scrub/grassland, semi-desert grassland, and oak scrub environments along the route. Occupied antelope range has been identified in western Sandoval County (Segment 8) and eastern Torrance County (Segment 10), and the species may also be found along the Pecos River (near Segment 12). Black bear, mountain lion, and wild turkey may traverse pinyon-juniper and juniper woodlands in the vicinity of Placitas, NM (Segment 9), but the area is not considered important habitat for these species (BLM, 1995).

The Macho Wildlife Habitat Management Area encompasses approximately 10 miles of the northeastern portion of Segment 11. Pronghorn are the primary management species in this area (BLM, 1995).

Raptors

Wyoming

Many raptor species are known to occur in the general vicinity of the proposed pipeline looping segments in Wyoming and could nest along the ROW within appropriate habitat. These species include golden eagle *(Aquila chrysaetos)*, red-tailed hawk *(Buteo jamaicensis)*, ferruginous hawk *(Buteo regalis)*, great horned owl *(Bubo virginianus)*, bald eagle *(Haliaeetus leucocephalus)*, Swainson's hawk *(Buteo swainsoni)*, northern harrier *(Circus cyaneus)*, prairie falcon *(Falco mexicanus)*, American kestrel *(Falco sparverius)*, merlin *(Falco columbarius)*, and osprey *(Pandion haliaetus)*. Sharp-shinned hawk *(Accipiter striatus)*, Cooper's hawk *(Accipiter cooperi)*, northern goshawk *(Accipiter gentilis)*, burrowing owl *(Athene cunicularia)*, and long-eared owl *(Asio otus)* may also be present in the area during the summer months. Birds that may winter in the area include golden eagle, red-tailed hawk, rough-legged hawk *(Buteo Lagopus)* and great horned owl, as well as other less common species (Call, 1978).

Between April 25 and July 30, 2004, wildlife and wildlife habitat surveys were conducted along each of the proposed segments. Searches for raptor nests were conducted within one mile of either the proposed centerline or pump station. In Wyoming, 25 possible or active raptor nests were observed. Nests were noted near all segments but Segment 4. Five active nests were observed. Surveys for federally listed species were conducted at each of the four existing Wyoming pump stations planned for upgrades. No raptor nests were observed within one mile of these stations.

Utah and Colorado

Surveys for federally listed species were conducted at each of the three existing Colorado and six existing Utah pump stations planned for upgrades. In Colorado, one apparently inactive raptor nest was observed within one-half mile of the Dove Creek pump station in Dolores County. In Utah, no raptor nests were observed within one-half mile of the existing pump stations.

New Mexico

Most of the raptor species known from Wyoming may also be found along the proposed pipeline route in New Mexico and could nest in appropriate habitat near the proposed segments. New Mexican raptor species not typically found in the vicinity of the proposed Wyoming segments include the peregrine falcon *(Falco peregrinus)*, aplomado falcon *(Falco femoralis)*, Mexican spotted owl *(Strix occidentalis)*, and Harris' hawk *(Parabuteo unicinctus)*. Project wildlife and habitat surveys in New Mexico located 63 possible or active raptor nests, including six burrowing owl nests. Eleven of the nests were observed to be active. Surveys were also conducted at each of the 10 existing New Mexico pump stations scheduled for upgrades. One unoccupied raptor nest was observed within one-half mile of the existing White Lakes pump station in Chaves County. Two inactive raptor nests and an active burrowing owl nest were observed within one-half mile of the existing Mesa pump station in Chaves County.

Additional information about many raptor species is provided in Section 3.2.6.3, in subsections which discuss Federally listed species and BLM and Tribal sensitive species.

Other Terrestrial Wildlife Species

Many other animal species occupy the habitats crossed by the proposed pipeline project segments. Bird species include a variety of passerines and neotropical migrants, in addition to raptors. These birds are integral to natural communities and act as environmental indicators of ecosystem health.

Common non-raptor bird species seasonally present or resident in southwestern Wyoming include greater sage-grouse *(Centrocercus urophasianus)*, horned lark *(Eremophila alpestris)*, common raven *(Corvus corax)*, western meadowlark *(Sturnella neglecta)*, western kingbird *(Tyrannus verticalis*, mourning dove *(Zenaida macroura)*, sage thrasher *(Oreoscoptes montanus)*, and sage sparrow *(Amphispiza belli)* (BLM, 1987). The sage grouse, sage thrasher, and sage sparrow are BLM WY Sensitive Species. In New Mexico, common bird species include bobwhite quail *(Colinus virginianus)*, scaled quail *(Callipepla squamata)*, ring-necked pheasant *(Phasianus colchicus)*, and mourning dove. Habitat for the lesser prairie chicken *(Tympanuchus pallidicintus)* is restricted to the Mescalero Sands area, northwest of Segment 13. Wetlands associated with the Rio Grande (Segment 9) and karst playa lakes in southeastern New Mexico provide habitat for nesting, wintering, and migratory waterfowl. Seasonal use of playas by waterfowl typically occurs from November through April when water is present (BLM, 1995).

Small mammal species found in the vicinity of the proposed Project in Wyoming include white-tailed prairie dog *(Cynomys leucurus)*, jackrabbit *(Lepus spp.)*, cottontail rabbit *(Sylvilagus spp.)*, coyote *(Canis latrans)*, Richardson's ground squirrel *(Spermophilus richardsonii)*, thirteen-lined ground squirrel *(Spermophilus tridecemlineatus*, badger *(Taxidea taxus)*, and various mice and bats (BLM, 1987; Whitaker, 1992). Areas of sagebrush growth over four feet in height along drainages serve as wildlife corridors for ground-dwelling animals, providing shelter from predators and thermal cover for wintering wildlife. In New Mexico, small mammal species include desert cottontail, black-tailed jackrabbit *(Lepus californicus)*, striped skunk *(Memphitis memphitis)*, red squirrel *(Tamiasciurus hudsonicus)*, Albert's squirrel *(Sciurus alberti)*, beaver *(Castor canadensis)*, muskrat *(ondatra zibethicus)*, nutria *(Myocastor coypus)*, bobcat *(Lynx rufus)*, coyote, fox *(Canis spp.)*, raccoon *(Procyon lotor)*, ringtail *(Carnivora procyonidae)*, badger, and certain weasel species (BLM, 1995). Many small mammal species provide important prey for raptors. Prairie dog colonies were identified within several segments in Wyoming and within one segment in New Mexico.

Wild Horses

Segments 4 and 6 occupy the northern and western extremities, respectively, of the BLM Salt Wells Wild Horse Herd Management Area (HMA). Segment 5 crosses the western portion of this HMA in Wyoming. The HMA encompasses 1.2 million acres, of which approximately 60 percent is BLM surface ownership. Topography consists of gently rolling hills, some small streams, and occasional high ridges. Vegetation is predominantly sagebrush and grassland. The area supports elk, deer, and antelope populations and is grazed by both cattle and sheep in the summer and predominantly by cattle in the winter.

Since the 1971 passage of the Wild Free-Roaming Horse and Burro Act (Public Law 92-195), the BLM has been responsible for management of wild horses as part of the natural system multiple-use concept. The appropriate management level for this HMA is 365 horses. The herd is represented by diverse color varieties. Adult horses range from 14 to 15.5 hands in height (one hand equals four inches) and weigh between 750 and 1,100 pounds. Studies indicate the herd exhibits good health (BLM, 2004b).

Wild horse herds are not found in the vicinity of the proposed Project in New Mexico, Colorado, or Utah (BLM, 1995; BLM, 2004c).

3.2.6.2 Aquatic Resources

Perennial streams crossed or affected by the Project are limited to the Blacks Fork River in Wyoming and the Rio Grande in New Mexico. These are both limited warmwater fisheries (WGF, 1991; NMWQCC, 2001).

Fish

The Blacks Fork River, which is crossed by the proposed pipeline (Segment 2) in Sweetwater County, Wyoming, is a Class 2AB game fishery. Channel catfish *(Ictalurus punctatus)* is the only game species known to be present. Other game species are not known to occur near the proposed crossing location of the river (BLM, 2004d). The Rio Grande, which is crossed by the proposed pipeline (Segment 9) in Sandoval County, New Mexico, is also considered a game fishery. The stretch of the river crossed by the proposed pipeline is known to support channel catfish, numerous minnows, white bass *(Morone chrysops)*, suckers, and may also support special status fish species. Threatened, endangered, and sensitive fish species are identified and addressed in Appendix F.

Amphibians

Amphibious species which are present in the vicinity of the proposed Project segments may include frog, toad, and salamander species. Habitat for these animals includes wet areas such as floodplains, wetlands, marshes, and riverbanks. These habitats are uncommon along the proposed route and amphibian species are encountered infrequently. Habitat for amphibian species is primarily limited to the Blacks Fork River and the Rio Grande as these are the only perennial waterbodies crossed by the proposed route.

3.2.6.3 Threatened, Endangered, and Sensitive Species

The USFWS identifies and lists species considered to be threatened or endangered (TES), and those species proposed for listing as threatened or endangered. Potential effects to federally-listed species must be considered in planning for all projects which involve federal, state, or local public land or other government actions. The USFWS has identified 45 federally-listed TES and candidate species that could possibly occur in the counties crossed by the proposed Project segments. In addition to federally listed species, species considered sensitive by BLM, state wildlife agencies, or tribal governments potentially occurring within areas crossed by the proposed segments were analyzed for this EA. These species are identified with range and habitat information and potential for occurrence along the proposed segments in Appendix G.

Federally Listed Species

A Biological Assessment (BA) has been prepared for this project, in accordance with section 7(c) of the Endangered Species Act, to determine the potential for impacts to federally listed species. The BA focused on the 45 federal TES species identified as potentially occurring in counties crossed by the proposed pipeline looping segments. Data sources included federal, state, and tribal agencies, the Biota Information System of New Mexico (BISON-M) (NMGFD, 2004), and field surveys conducted during spring and summer 2004. Detailed species descriptions pertaining to life history, status, distribution, and biological opinion are present in the BA.

Field surveys were conducted to determine presence of suitable habitat for TES species along the proposed segments. Additional clearance surveys for species for which suitable habitat was observed are planned to take place prior to construction. The following baseline descriptions are limited to those species that have been identified as being potentially present or impacted by the proposed Project. Listed species are identified in Appendix F and descriptions of their status, range, habitat, and potential for occurrence are included.

Of the 45 TES species identified as potentially occurring in the vicinity of the proposed pipeline looping segments, seven have been identified as being present or having suitable habitat on or near one or more of the proposed segments. These species are the black-footed ferret *(Mustela nigripes)*, bald eagle, interior least tern *(Sterna antillarum)*, southwestern willow flycatcher

(Epidonax traillii), yellow-billed cuckoo *(Coccyzus americanus)*, lesser prairie chicken, and the Rio Grande silvery minnow *(Hybognathus amarus)*.

Suitable habitat for the black-footed ferret has been defined as a minimum of 80 acres of black-tailed prairie dog *(Cynomys ludovicianus)* colonies or 200 acres of white-tailed prairie dog colonies. Suitable habitat for this species was identified along proposed segments in both Wyoming and New Mexico. One black-tailed prairie dog colony was identified within Segment 12 near the existing Mesa Pump Station in Chaves County, New Mexico. While this colony is large enough to be considered suitable habitat for the species, black-footed ferrets are considered extirpated from the state (NMGFD, 2004). Habitat for the species is also present along Segments 1, 2, 3, and 4 in Wyoming. These segments cross large, low density white-tailed prairie dog colonies. While these prairie dog complexes are not known to support populations of wild ferrets, they occur in parts of Wyoming which have not received a block clearance for the species from the USFWS (2004). Thus, ferret clearance surveys will be conducted prior to construction.

Federally listed birds with potential habitat in the project area include the bald eagle, southwestern willow flycatcher, yellow-billed cuckoo, and interior least tern.

Throughout the project area, bald eagles may be present as migrants or wintering birds. While no known nesting sites have been identified within the project area, potential nesting habitat is limited to riparian habitat along the Rio Grande. Riparian areas and wetlands are primary habitat for winter roost areas and during migration. Bald eagles tend to nest and roost in mature cottonwoods, for which habitat may be present along the Rio Grande. The proposed Rio Grande crossing location is vegetated with mature cottonwood trees, shrubby willows in the understory, and saltcedar. No bald eagle nests were observed within 1 mile of the Rio Grande crossing during field surveys in 2004, and there are no known winter roost areas in the vicinity. Surveys of this area will be conducted prior to construction to identify whether there are active bald eagle nests within 1 mile of the crossing.

The southwestern willow flycatcher and yellow billed cuckoo typically occur in riparian habitat. The southwestern willow flycatcher subspecies breeds primarily in New Mexico, Arizona, and Southern California. Most records in New Mexico are from the Rio Grande Valley and westward with the largest colony on the Gila River. Nesting habitat includes shrubs and trees in willow thickets. The yellow billed cuckoo tends to inhabit open woodlands, streamside willows and alder groves throughout Wyoming and New Mexico. There is potential habitat for the southwestern willow flycatcher in riparian areas in New Mexico, and potential for the yellow billed cuckoo in riparian areas throughout Wyoming and New Mexico. No suitable habitat for either species was observed to be present in the project area in Wyoming during habitat surveys in 2004. In New Mexico, these species may occupy suitable habitat along the Rio Grande. Neither species was observed during field surveys in 2004, and MAPL intends to use HDD to cross the Rio Grande. Clearance surveys will be conducted for these species if construction is planned within areas of suitable habitat prior to the September migration period.

Habitat for the interior least tern includes sandy sites that are relatively free of vegetation, such as sandbars in rivers. It is a summer resident in other parts of New Mexico and in eastern

Wyoming, but the subspecies is not known to occur within the project area. The only potential habitat for the interior least tern exists at the Blacks Fork River and Rio Grande, both of which would be avoided by HDD technology.

One endangered fish species was identified as potentially occurring near the proposed route. The Rio Grande silvery minnow may be present within the stretch of the Rio Grande crossed by the proposed pipeline. This species is known to occur within the river between the Santo Domingo Pueblo and Socorro.

The four Colorado fish species; Bonytail chub, humpback chub, razorback sucker, and the Colorado pikeminnow; may exist downstream of the project segments in Wyoming. Water withdrawals from the Blacks Fork River, if used for hydrostatic testing and dust control would have negligible affects on the four fish species considering most of the water would be returned to the hydrologic system through surface discharges and infiltration to shallow groundwater after testing. Consultation with the FWS would be conducted to assess water depletions associated with the withdrawls, if the Black Fork is used. The volume of water anticipated to be used for hydrostatic testing was provided in Table 2.4-4, at 5.93 acre-feet for the entire project. Of this, 2.3 acre-feet would be used in Wyoming, and 3.6 acre-feet used in New Mexico. The volume of water to be used for dust control is discussed in Section 2.4.4.1, and ranges from 0.52 to 2.1 acre-feet of water for the entire project.

Lesser prairie chickens may be present along the proposed pipeline ROW in Chaves County, New Mexico. This species is sensitive to disturbance during the breeding season at lek locations. Leks may be present on or near the existing pipeline ROW. These sites are typically located on elevated, open areas, where visibility is good and calls can be heard from a great distance. Lek locations are usually abandoned by June. Surveys for the species will be conducted if construction activities are planned near known lek locations prior to July. The Roswell Field Office is developing an RMP amendment identifying areas for habitat management for the lesser prairie chicken. Preliminary maps identifying lesser prairie chicken habitat are in areas outside the proposed pipeline looping segments (BLM, 2004e).

Sensitive Species

Impacts to sensitive species were considered in the analysis for this Project. Sensitive species lists maintained by the BLM, Navajo Tribe, Wyoming Natural Diversity Database, State of New Mexico, and USFWS were consulted to determine presence of sensitive species and potential impacts. These species are identified in Appendix F with their status, range and habitat descriptions and potential for occurrence. Species that were determined to have potential for occurrence within or near the project ROW are discussed in the following section. In addition to the 45 federally listed species, 142 sensitive species and species of special concern were evaluated for potential impacts as a result of this Project. Of the 142 species evaluated, 37 are either present or have suitable habitat along the proposed ROW. The 37 species identified as potentially affected by the project include 12 mammals, 13 birds, one reptile, two fish, and eight plants.

Mammals

Sensitive mammal species that may occur within or near the project include the swift fox *(Vulpes velox)*, black-tailed prairie dog, white-tailed prairie dog, spotted bat *(Euderma maculatum)*, Idaho pocket gopher *(Thomomys idahoensis)*, Wyoming pocket gopher *(Thomomys clusius)*, pygmy rabbit *(Brachylagus idahoensis)*,western small-footed myotis *(Myotis ciliolabrum)*, long-eared myotis *(Myotis evotis)*, occult little brown bat *(Myotis lucifugus)*, fringed myotis *(Myotis thysanodes)*, cave myotis *(Myotis velifer)*, Yuma myotis *(Myotis yumanensis)*, Townsend's big eared bat *(Plecotus townsendii)*, and big free-tailed bat *(Nyctinomops macrotis)*.

Black-tailed and white-tailed prairie dogs are known to occur along some of the proposed pipeline looping segments. These species have been identified in Segment 10 (black-tailed) in Chaves County, New Mexico and in Segments 1-4 (white-tailed) in Uinta and Sweetwater counties, Wyoming. More detailed information regarding locations of these species along the proposed segments is presented in Appendix F.

Nine sensitive bat species were identified as having suitable habitat along the proposed segments. These species utilize a wide variety of habitats. Several bat species roost in pinyon-juniper woodlands as well as shrub and grassland communities. While these habitat types occur throughout most of the proposed segments, no roost sites have been identified within the proposed ROWs. Typical roost sites include caves, mines, crevices, abandoned buildings, and other man-made structures. Facilities in the vicinity of the proposed ROWs may support sensitive bat species. Specific habitat requirements and known ranges for sensitive bat species are presented in Appendix F.

The Idaho pocket gopher and the Wyoming pocket gopher are listed as sensitive mammal species by the Rock Springs and Kemmerer field offices of the Wyoming BLM. The Idaho pocket gopher exploits a very broad range of habitats and potentially occurs within Segments 1, 2, 4, 5, and 6 although it has not been identified in these areas. This gopher is known to inhabit shallow, stony soils (BLM, 2002). The Wyoming pocket gopher populations occur in south central Wyoming on dry ridge tops in loose gravelly soils. Segments 3 and 4 would be the most likely habitat for the gophers' occurrence within the project area.

Birds

Sensitive bird species that are known to occur or have suitable habitat within or near the proposed Project ROWs include the greater sage-grouse, mountain plover *(Charadrius montanus)*, black tern *(Childonias niger)*, sage thrasher, loggerhead shrike *(Lanius ludovicianus)*, Brewer's sparrow *(Spizella brewer)*, sage sparrow, and several raptor species. Raptors that may be present and are considered sensitive species include the osprey, golden eagle, ferruginous hawk, Swainson's hawk, flammulated owl *(Otus flammeolus)*, and burrowing owl.

Sage grouse may be present along all of the proposed Wyoming segments. Grouse leks within two miles of the proposed ROWs were identified by BLM and have been analyzed for potential impacts. Construction within two miles of lek locations would be avoided during the breeding season (March 1 through June 15) if surveys determine the leks are active. No leks are located within the proposed ROWs or in other areas proposed for disturbance. Sage-grouse are not known to occur in the vicinity of the proposed Project segments in New Mexico. The species is considered extirpated from the state (Connelly et al., 2004).

Mountain plover habitat is present along portions of the proposed segment ROWs. Habitat for this species includes previously disturbed ground. This migratory bird is known to occur in both Wyoming and New Mexico. Breeding season is typically from March 15 through July 15. Construction in mountain plover habitat would be conducted after July 15 or after clearance surveys are conducted in mountain plover habitat.

Black tern habitat is typically characterized as riparian areas, marsh and open water. This seasonal resident may be present throughout the Rio Grande Valley (including the Segment 9 crossing area) from March through May (NMGFD, 2004). The species has not been identified in other locations along the proposed segments, and suitable habitat is not present.

Sage thrashers, sage sparrows, and Brewer’s sparrow typically inhabit basin prairie shrub and mountain foothill shrub communities. These habitats are common along some of the proposed segments. These species are known to breed and winter extensively in North America and are likely to be present along the proposed segments at various locations throughout the year (BLM, 2002).

Loggerhead shrikes are widespread summer residents throughout New Mexico and Wyoming. The species nests and breeds along roadsides and the edges of shrub communities. They prefer shrubs and trees with thorns which they use to impale their prey. Nesting habitat is not present along the proposed pipeline looping segments in Wyoming and is very limited in New Mexico (BLM, 2002). They prefer shrubs and trees with thorns as places to stash and feed on prey but will nest in habitats adjacent to the pipeline ROW. This species should be considered as a potential sensitive species impacted by the ROW.

Many sensitive raptor species are known to occur along or near the proposed segments. Most of these species are migrants that may be present for nesting or wintering depending on the species’ home range. Raptor surveys were conducted in 2004 to determine baseline conditions for these species. Surveys would be conducted in all segments prior to construction to identify locations of nesting birds.

Reptiles

Sensitive reptilian species that may occur or have suitable habitat along the proposed segments include the Texas horned lizard and the desert kingsnake *(Lampropeltis getula)*. These species exploit a wide variety of habitats that occur throughout New Mexico. Habitat for the Texas horned lizard *(Phrynosoma cornutum)* ranges from grassland to open deserts. Individuals present in the Rio Grande Valley are likely escaped pets (NMGFD, 2004). Habitat for the desert kingsnake includes grassland, riparian, and mesquite-dominated bajada. These habitats are present along much of the proposed route.

Fish

Sensitive fish species have been identified as potentially occurring in the Rio Grande near the proposed Project (NMGFD, 2004). These species include the flathead chub *(Platygobio gracilis)* and the Rio Grande sucker *(Catostomus plebeius)*. No other populations of sensitive fish or perennial waters are crossed by the proposed segments with the exception of the Blacks Fork River in Wyoming in which no sensitive fish species are reportedly present (NMGFD, 2004).

Plants

Eight sensitive plant species have been identified as potentially occurring along the proposed segments. These include Nelson's milkvetch *(Astragalus nelsonianus)*, Cedar Rim thistle *(Cirsium aridum)*, Ownbey's thistle *(Cirsium ownbeyi)*, Wyoming tansymustard *(Descurainia torulosa)*, Gibben's beardtongue (*Penstemon gibbensii*), and Green River greenthread *(Thelesperma caespitosum)*. These species are known to occur near the proposed Wyoming segments within the boundaries of BLM Rock Springs, Rawlins and Kemmerer Field Offices. The gramma grass cactus *(Sclerocactus papyracanthus)*, dwarf milkweed *(Asclepias uncialis)*, and gypsum Townsend's aster *(Townsendia gypsophila)* have been identified as having suitable habitat within Sandoval, McKinley, and Torrance Counties. These plants are discussed in Appendix F. Information provided in Appendix G includes common and scientific names, habitat and range information, status, and potential for occurrence.

3.2.7 Land Use, Transportation, Special Designated Areas, and Recreation

3.2.7.1 Land Use

Land Ownership and Use

The proposed pipeline looping segments would be located in two counties in Wyoming and six in New Mexico. Total length of land crossed is approximately 202 miles (84.4 miles in Wyoming and 117.1 miles in New Mexico). In Wyoming 48 percent of the land crossed is privately owned, 47 percent is federal (BLM) land, and 5 percent is state land. In New Mexico, 55 percent of the land crossed is in private hands, 26 percent is native land administered by the BIA, 12 percent is BLM-administered federal land, and 7 percent is state land. Table 1.1-1 shows the breakdown of land ownership by segment. Construction of the 12 segments would result in 1221.2 acres of disturbance but only half of this acreage would be part of the permanent ROW.

All 12 segments parallel and overlap existing pipeline ROW. Livestock grazing and wildlife habitat are the predominant land uses along most of the pipeline ROW in each segment. In addition, oil and gas field activities co-exist with grazing and wildlife habitat in land adjacent to portions of four of the Wyoming segments and two of the New Mexico segments. There are no commercial or industrial areas in the vicinity of the pipeline looping segments. There are only five small residential areas in the vicinity of the pipeline looping segments. Segment 9 passes close to the residential community of Placitas, New Mexico.

Rangeland and Agriculture

Cattle grazing is practiced along most of the proposed segment ROWs. The only cropland encountered by the proposed pipeline is along Segment 9 on the east side of the Rio Grande crossing. This irrigated land is located between AM 280.0 and 280.4.

Mineral Development

As discussed in Section 2.2.2, a number of mineral resource areas are crossed by the proposed pipeline looping segments. The east end of Segment 1 and west half of Segment 2 are located within a high yield trona zone. Underground trona mines near Segments 1 and 2 are currently active (University of Wyoming, 2004f). Segment 9 crosses immediately south of a large sand and gravel quarry in the Rio Grande valley between Interstate 25 and the Algodones Canal (AM 279.8 to 280.0). There are no other active mining operations in the vicinity of the proposed pipeline looping segments.

Residential, Park, and Open Space Areas

Table 3.2-17 shows residential areas located in the vicinity of the proposed segment ROWs. Red Desert and Table Rock, Wyoming are small settlements located next to Interstate Highway 80. The South Baxter, Wyoming residential buildings appear to be vacant. The Lybrook residential area is located immediately south of the Lybrook gas processing plant in New Mexico. The residential area near Zia Pueblo in New Mexico is a small cluster of houses inhabited by Native Americans. The Placitas residential neighborhood includes several houses south and east of the proposed pipeline looping segment 9.

A City of Albuquerque Open Space Area is crossed by Segment 9 in sections 24 and 25, T13N, R4E, near Placitas, NM. The relative location is shown on Figure 3.1-1. No other parks or open space are crossed by the proposed pipeline looping segments.

3.2.7.2 Transportation

Table 3.2-18 shows roads and railroads that would be crossed by construction of the proposed pipeline looping segments. The most significant crossings are Wyoming highways 530 and 430 in Segments 2 and 5, Interstate Highway 25 in Segment 9, US Highway 550 (a four-lane highway) in Segments 8 and 9, and the Burlington-Northern and Santa Fe Railroad 2-track line in Segment 10. Out of a total of 73 transportation line crossings, the majority are improved local and county roads. The 16 listed 2-track and dirt roads which will be crossed are used regularly by the public or by private landowners. Other 2-track and dirt roads will be crossed but they are lightly used and not maintained.

Table 3.2-17 Residential Areas Located within 1000 Feet of Proposed MAPL WEP Pipeline Looping Segment ROW

Segment	Aerial Marker	Community name	Distance of closest buildings from ROW
Wyoming			
1		none	
2		none	
3	67.7	Red Desert	600 feet south
4	53.3	Table Rock	1000 feet north
5	8.1	South Baxter (historic buildings – appear vacant)	600 feet northeast
6		none	
New Mexico			
8	369.0	Lybrook	200 feet west
9	295.4	Zia Pueblo	500 feet northeast
9	277.9 – 278.1	Placitas	400 feet south
9	276.8	Placitas	1000 feet southeast
9	276.7	Placitas	500 feet east
10		none	
11		none	
12		none	
13		none	

Table 3.2-18 Highway, Road, and Railroad Crossings for the MAPL WEP

Segment	Interstate highway	US/state highway	County/ local road	2-track/ dirt road	Railroad
Wyoming					
1	0	0	10	0	0
2	0	1	3	2	1
3	0	0	11	3	0

4	0	0	0	1	0
5	0	1	6	0	0
6	0	0	3	1	0
WY totals	0	2	33	7	1
New Mexico					
8	0	1	4	3	0
9	1	1	2	2	0
10	0	2	1	1	1
11	0	1	4	2	0
12	0	0	3	1	0
13	0	0	0	0	0
NM totals	1	5	14	9	1
Project totals	1	7	47	16	2

3.2.7.3 ACECs/SDAs, Trails, and Recreation

The BLM manages a variety of resources including Areas of Critical Environmental Concern (ACECs), Special Management Areas (SMAs), Research Natural Areas, Historic and National Scenic Trails, and Recreation Areas. This section describes those designated areas in the vicinity of the proposed Project. Special Designated Area (SDA) is a term used to identify future potential ACECs, Research Natural Areas, Special Management Areas, and others.

Areas of Critical Environmental Concern

The MAPL WEP is within 0.25 mile of the Roswell Cave Complex ACEC, managed by the Roswell Field Office. Crystal Caverns-Devil's Well, Coachwhip Cave and Martin-Antelope Gyp Cave are some of the more prominent caves within the nearly 15,000 acre Roswell ACEC. The Crystal Caverns Cave system is one of the longest and deepest gypsum caves in the United States. Recreational uses in this BLM-administered area include caving and rock-hounding. Due to the sensitive nature of the resource, maps of the ACEC boundaries were not available. The Roswell Field Office reviewed the location of the project relative to the ACEC and indicated the project was 0.25 miles from the system (BLM, 2005). All lands within the ACEC are designated exclusion areas for major rights of way. Additional ACECs are discussed below in the paleontological resource ACECs.

Paleontologic ACECs/SMAs

The northern end of Segment 8, near the Lybrook Pump Station, crosses the Lybrook Fossil Area, managed by the Farmington Field Office. The crossing is approximately 1,200 feet in length. The crossing is in an area of Class I paleontologic resources.

The southern end of Segment 8 is adjacent to, but at least 600 feet from, the boundary of the Torreon Fossil Fauna ACEC/SMA, protected for its paleontologic resources. Unique and irreplaceable fossil resources are found within this SMA. The ACEC is located within the boundaries of the Albuquerque Field Office and the Farmington Field Office. All these areas are managed by the Albuquerque Field Office. The project does not cross the boundary.

Wilderness Study Areas/Research Natural Areas

No wilderness study areas (WSAs) or Research Natural Areas (RNAs) are crossed by the proposed segments. The Ojito WSA/ACEC west of Segment 9 contains Condition 1 paleontological formations and is home to a large diversity of wildlife species. Neither it nor any other WSA or RNA would be affected by the proposed Project or proposed upgrades to the existing pump stations.

Historic Trails/National Scenic Trails

In Wyoming, portions of eight historic roads or trails are within or adjacent to the pipeline ROW or associated facilities. The history of these trails is more fully discussed in the Cultural Resources Section 3.2.9.2. These trails or roads are the Emigrant/Oregon/Mormon Trail, located north of Segment 1; the Overland Trail, located in Segment 2; the Cherokee Trail crossed in Segment 6; and the Lincoln Highway crossed by Segments 1, 2, 3 and 4. Historic roads in the area include the Bryan-Brown's Park Freight Road, the Rock Springs-Brown's Park Road, the Rock Springs-Vernal Freight Road, and the Rock Springs-Hiawatha Road.

The BLM Kemmerer Field Office is developing a management plan for the Oregon Trail and the major cutoffs that traverse the Kemmerer Resource Area. The cultural aspects, recreation opportunities, and management prescriptions will be identified in the plan to ensure that values of the historic trail are protected.

The Continental Divide National Scenic Trail, a trans-continental hiking trail, crosses southern Wyoming near Rawlins, approximately 33 miles east of Segment 3. The Continental Divide National Scenic Trail also follows the Continental Divide through Colorado into northwest New Mexico. The trail is located near the existing San Luis existing pump station, between Segments 8 and 9. According to the Continental Divide National Scenic Trail Comprehensive Plan, prepared by the Forest Service, BLM, and National Park Service, the trail is proposed to extend from Canada to Mexico.

Segment 9 is located in the vicinity of the 1870s Wagon Road Trail in Sandoval County, southwest of San Ysidro near White Mesa. The 1870s Wagon Road Trail was the main route linking Santa Fe with Fort Wingate until the early 1900s and was used for both supplies and troops. The trail was also used extensively as a wagon freight road and for passenger coaches.

Recreation Areas

The MAPL WEP will cross through public lands within or adjacent to existing pipeline ROWs. The majority of the proposed pipeline looping segments do not cross any designated BLM-administered recreational areas. SDAs are used to identify future potential ACECs, Research Natural Areas, Special Management Areas, and others.

Special Recreation Management Areas

Special Recreation Management Area (SRMA) is an official designation given to BLM lands that are heavily used for recreational purposes and require special management to ensure protection of identified recreation values. The BLM places management emphasis on enhancing recreation opportunities in SRMAs and focuses management on areas with high recreation values or areas where there are conflicts between recreation and other uses.

No SRMAs are traversed by a proposed pipeline looping segment. However, two proposed segments are located near an SRMA. Segment 2 in Wyoming is located approximately 1½ miles southwest of the Green River, and land adjacent to the river is designated an SRMA. The Segment 2 crossing of the Blacks Fork River is located in an area designated as medium level recreation potential by the Kemmerer District BLM RMP (BLM, 1986).

The Little Mountain Recreational Use Area is a BLM-administered area that is managed to assure continuing value for recreational opportunities. It is located approximately four miles west of the southern portion of Segment 6. Segment 6 is near roads under consideration for Back County Byway Designation.

In New Mexico, Angel Peak SRMA is located approximately 35 miles southeast of Farmington, New Mexico, about 3 miles northwest of the existing Huerfano pump station. Badlands such as those found in the Angel Peak SRMA offer an unusual scenic opportunity with the occurrence of spires, “hoodoos”, and other unusual rock formations. There are various developed facilities and recreation opportunities within the Angel Peak SRMA.

The proposed route crosses two perennial streams that have limited potential to support recreational fisheries. The portions of the Rio Grande in New Mexico and the Blacks Fork River in Wyoming crossed by Segments 9 and 2 are designated warm water fisheries.

Developed Recreational Facilities

Developed recreation facilities are improvements constructed for the purpose of recreation and may include but are not limited to bicycle paths, ski runs, swimming pools, golf courses, campgrounds, and trails.

Mountain bike trail opportunities are being explored, specifically in the Little Mountain-Firehole Canyon-Flaming Gorge area in Wyoming. In New Mexico, developed recreational facilities within four miles of the proposed segments include Jemez Canyon Dam and Lake. The U.S. Bureau of Reclamation administers Jemez Canyon Dam and Lake, approximately one mile north of Segment 9. The Jemez Canyon Dam was breached in recent years due to silting, and the lake was drained. The dam and former lake are located approximately six miles north of Bernalillo, NM and include a picnic area and hiking trails.

There are no developed recreational facilities crossed by any of the proposed pipeline looping segments.

Off-Highway Vehicle Use

Off-highway vehicle (OHV) use is dispersed throughout the public lands crossed by the proposed pipeline looping segments of the MAPL WEP. The public lands crossed by the pipeline looping segments are available to OHV use but limitations under a “limited” OHV/ORV area designation may apply, such as those on Segments 8 and 9 within the Rio Puerco Field Offices where vehicles are limited to existing roads and trails. OHV closures and limitations typically do not apply to BLM-permitted uses that require off-road travel. Construction and maintenance of the proposed pipeline looping segments would be one such permitted use.

OHV use is limited to existing roads and trails for all BLM-administered lands crossed by the proposed pipeline looping segments within the Green River Resource Area near the town of Green River. The Kemmerer Resource Area limits OHV use to existing roads and trails except for emergencies, maintenance, and other necessary tasks. OHV use is also limited to existing roads and trails in the Rio Puerco Field Office.

Dispersed Recreational Uses

Dispersed, undeveloped recreation is the predominant type of outdoor recreation in areas crossed by and near the proposed pipeline looping segments and existing pump stations. Dispersed recreation uses not described above that occur in the vicinity of the proposed Project pipeline looping segments include hunting, river rafting, caving, fishing, sightseeing, nature photography, primitive camping, biking, cross-country hiking, and rock hounding. These activities occur on BLM, BIA, tribal, state, and private lands. Hunting occurs on most public, tribal, and private lands in the vicinity of the proposed Project segments. Typical game species include elk, deer, pronghorn, sage grouse, and waterfowl. The majority of hunting occurs during the fall big-game season (September through mid-December). Other activities occur year-round in some locations, but most have seasonal restrictions, such as river rafting, fishing, camping, and cross-country hiking.

3.2.8 Visual Resources

Visual Resource Management

The proposed pipeline looping segments and existing pump stations are located within several landscape-types in both New Mexico and Wyoming. Significant landforms dominating the visual character of the proposed Project segments are the western plateau and the east-central high plains in New Mexico and the plains of the Wyoming Basin in southwestern Wyoming.

The Wyoming Basin and the plains of southeastern New Mexico are characterized by rolling hills, sinuous streams, and rangeland with minor areas of cultivated fields. The vegetation in southwestern Wyoming is predominantly sagebrush with areas of cottonwoods along major drainages. Grasslands are the dominant vegetation in the New Mexico plains with a sparse cover of cactus, yucca, and brush. The visual landscape in southeast New Mexico is characterized by playas and sinkholes.

The western plateau in New Mexico is dominated by rolling to rugged hills, incised drainages, hogbacks, cuestas, and flat top mesas. The vegetation within the western plateau is regionally sparse and dominated by sagebrush and conifer woodlands.

The proposed segments follow an existing ROW that has already altered the visual landscape, creating stark textual contrast and horizontal line forms within the natural environment. The existing ROW differs in vegetation and colors relative to the surrounding natural environment. The natural landscape has also been modified in the area by human development of transportation and energy transmission infrastructure, small communities, ranches, and other man-made structures near the segment ROWs.

The objectives of the BLM Visual Resource Management (VRM) system are to minimize the visual impacts of surface disturbing activities and to maintain scenic values for the future. There are four different classes used to assign value to the visual landscape. Class I indicates that the existing character of the landscape is to be preserved while allowing a very low level of change to its character which must not attract attention. Class II calls for retaining the existing character of the landscape while allowing a low level of change to its character. Class III partially retains the existing character of the landscape and while allowing a moderate level of change to its character. Class IV allows activities that require major modifications to the existing character of the landscape.

Ninety-nine percent of the proposed pipeline looping segments lie within VRM Class III and Class IV areas. No segment will cross any Class I areas and only one VRM Class II area in Wyoming will be crossed. Segment 6 in Wyoming lies just outside (to the west-northwest) of the Greater Red Creek ACEC (VRM Class I). The south end of Segment 6 (south of Sage Creek) lies within the VRM Class II area located just outside this ACEC between AM 851.3 and 853.5. Segment 9 is located just east of a VRM Class II area in New Mexico, the Ojito WSA/ACEC.

3.2.9 Cultural Resources

3.2.9.1 Prehistoric Cultural Overview

The region of the American West crossed by the proposed Project has been continuously inhabited by indigenous peoples beginning at least 12,000 years before the present (B.P.). The proposed Project would cross portions of the Green River and Great Divide basins in southwest Wyoming and the San Juan Basin, Rio Grande watershed, and Pecos River watershed in New Mexico. In addition, upgraded pump stations supporting the Project are located in the Uinta and Paradox basins near the border between Utah and Colorado. Each of these areas has experienced a distinct cultural history. A summary chronology of the prehistory of the proposed Project area is indicated in Table 3.2-19.

Paleoindian

In southwestern Wyoming, the oldest period for which there is archaeological evidence is the Paleoindian, beginning ca. 12,000 years B.P. and ending around 8500 B.P. The Paleoindian Era represents the first advance of humans onto the North American continent. This is the transition period from the periglacial conditions of the Wisconsin-age ice advance during the terminal Pleistocene to the warmer and drier climatic conditions of the Holocene. A savanna-like environment with higher precipitation than occurs today was prevalent in southwest Wyoming. Paleoindian sites are rare, however, isolated surface finds of Paleoindian projectile points are not uncommon and suggest that site preservation may be a major factor affecting the number of known sites (Pastor et al., 2004).

The lithic technology of the Paleoindian period is distinctive for its meticulous workmanship, especially projectile points. Projectile points are usually lanceolate, some with distinctive shoulders or fluting, and stemmed, basally-ground hafting elements. Notching is not present. Paleoindian tool assemblages often contain a high percentage of gravers, spurred end-scrapers, and burination, especially on broken projectile point fragments (Frison, 1978).

Table 3.2-19 Prehistoric Chronology, Mid-America Pipeline Western Expansion Project Area

Era	Southwest Wyoming [1]	Northwest and West Central Colorado [2]	Southwest Colorado [3]	San Juan Basin [4]	Middle Rio Grande / Jemez [5]	Middle Pecos [6]	Dates (BP)
	Tradition / Period / Phase	Tradition / Period / Phase	Tradition / Period / Phase	Tradition / Period / Phase	Tradition / Period / Phase	Tradition / Period / Phase	
							14,000
		Clovis and Goshen Traditions					
		Folsom Tradition		Clovis	Clovis	Clovis	12,000
Paleoindian	Paleoindian	Foothill-Mountain Tradition	Paleoindian	Folsom	Folsom	Folsom	10,000
				Plano Early Archaic	Plano	Plano	8000
	Early Archaic	Great Divide Phase	Pioneer Period				
				Jay	Jay		6000
				Mid Arch. Bajada	Bajada		
Archaic	Late Archaic	Opal Phase	Settlement Period	Archaic			
				Late Archaic San Jose	San Jose	Archaic	
		Pine Spring Phase	Transitional Period	Armijo	Armijo		4000
		Deadman Wash Phase	Terminal Period	En Medio	Rio Rancho		2000
	Pre hist.	Gateway and Aspen Traditions	Basketmaker II		Alameda		
Formative	Late	Uinta	Fremont Tradition	Basketmaker III	Basketmaker III	Early Developmental	18 Mile	
			Anasazi	Pueblo I-III	Pueblo I, II, and III	Late Developmental	Mesita Negra, McKenzie	
		Firehole		Ute - Navajo		Coalition & Classic		
Protohistoric	Protohistoric	Protohistoric Phases		Dinetah Gobernador Cabezon		Post McKenzie / Neoarchaic	Present

Sources: (1) Thompson and Pastor, 1995 (2) Reed and Metcalf, 1999 (3) Lipe *et al*, 1999 (4) Vivian, 1990 (5) Cordell, 1979 (6) Leslie, 1979

The subsistence and settlement patterns of the Paleoindian period are poorly understood. Some researchers (Kelly and Todd, 1988; Eckerle and Hobey, 1993) postulate that early Paleoindian groups practiced a forager strategy, with little investment in place, and no food storage.

Conversely, other researchers maintain that a big game forager adaptation was never a major portion of the subsistence base, and instead, a more collector-oriented pattern was practiced which continuing essentially unchanged into the Archaic period.

Within western Colorado and eastern Utah, the Paleoindian era began around 13,500 years B.P. and lasted until approximately 8,400 years B.P. The climate was cool and moist with alpine glaciation occurring at higher elevations. A general warming trend is evident by approximately 9,500 years B.P (Reed and Metcalf, 1999). Early Paleioindian lithic technology features laceolate projectile points similar to Wyoming examples. Identified cultures include Clovis, Goshen, and Folsom traditions in Colorado, and Clovis, Folsom, and Plano in southeastern Utah. Highly mobile groups engaged in hunting megafauna, including mammoth and extinct forms of bison (Kelly and Todd, 1988). The latter part of the Paleoindian Era is best described by the Foothill-Mountain tradition in which inhabitants of foothills and mountain ecological zones employed subsistence strategies distinct from those of bison-hunting Plains groups (Frison, 1992). Bison were hunted, but a wider variety of game animals and plants was exploited. Local groups practiced foraging and were highly mobile (Pitblado, 1999).

Paleoindian sites within New Mexico date from approximately 12,000 years B.P. to approximately 7,500 years B.P. New Mexico contains the type sites for the Sandia, Clovis, and Folsom Paleoindian assemblages. The population consisted of mobile hunters and gatherers distinguished on the basis of occupation dates and projectile point styles. As is typical of related peoples to the north, the New Mexican Paoleoindian population engaged in megafauna hunting, with characteristic projectile points found in conjunction with mammoth and now-extinct bison kill sites. There is also evidence of plant utilization. In the area of the proposed Project, groups identified include the (progressively recent) Clovis, Folsom, and Plano cultures (Bradley et al., 1995; BLM, 2003a).

Archaic

Settlement and subsistence practices in southwest Wyoming remained largely unchanged from the end of the Paleoindian period through the Archaic and continued until at least the introduction of the horse, or even until Historic Contact. A period of reduced precipitation and warmer temperatures, commonly termed the Altithermal, commenced ca. 8,500 years B.P and lasted until approximately 6,400 years B.P. Post-Altithermal climate alternated between cool-moist and warm-dry, but never as moist as Paleoindain times nor as dry as the Altithermal period (Reed and Metcalf, 1999). The environmental change at the end of the Paleoindian period led to a pattern of broad spectrum resource exploitation that is reflected in the diverse subsistence and settlement practices of the Archaic period. The Archaic is divided into the Early and the Late periods and subdivided into the Great Divide and Opal and the Pine Spring and Deadman Wash phases, respectively (Pastor et al., 2004).

Projectile point types remain the major chronological indicator. The large, stemmed lanceolate projectiles of the Paleoindian period were replaced with smaller side- and corner-notched atlatl dart points. Indications from ground stone and macrofloral and pollen data suggest increasing use of vegetable resources. Faunal assemblages from Archaic components reflect increased procurement of small animals. Housepits were developed during this period and became a major characteristic of the Opal Phase of the Early Archaic (Thompson and Pastor, 1995).

Early Archaic projectile points include both side-notched and stemmed specimens. Seeds were relatively unimportant in the diet (Smith, 1988), but ground stone implements occur more frequently than during the preceding Paleoindian period.

Late Archaic period sites yield stemmed, indented-base projectiles, attributed to the McKean Technocomplex on the Plains, and large corner-notched points usually termed Elko. The Late Archaic was distinguished by a decreased reliance on plant foods and a corresponding increase in large animal use (Creasman, 1987). The climate improved from the xeric conditions typical of the Early Archaic Altithermal to more mesic conditions. Bison remains in archaeological contexts become more common in the Green River Basin due to improved forage. Large-scale seed processing, common to the subsequent Late Prehistoric period, does not appear to have occurred with any consistency.

Archaic sites are dated between about 8,400 years B.P. and 2,400 years B.P. in western Colorado and eastern Utah. Within the northern Colorado River Basin, analyses of archaeological data have resulted in the identification of four, successively recent periods: Pioneer, Settlement, Transitional, and Terminal. Subsistence practices are broadly similar to those of contemporaneous groups farther north. Early experiments in growth of corn have been noted in some areas in the Late Archaic. Archaic populations appear to have used a central foraging strategy with seasonal/elevational migration patterns. The end of the Archaic is marked in Colorado by the onset of bow and arrow use, replacing the atlatl (Reed and Metcalf, 1999).

New Mexico Archaic sites have been dated between about 7,500 years B.P. and about 1,600 years B.P. In central and northwestern New Mexico, the Early Archaic has been subdivided into successively younger Jay and Bajada periods, ending approximately 5,000 years B.P. The Middle Archaic is comprised of the San Jose period, ending approximately 3,800 years B.P. The Late Archaic has been subdivided into an earlier Armijo period and later En Medio period, ending approximately 1,600 years B.P., in northwestern New Mexico (Vivian, 1990). In central New Mexico, the Late Archaic has been subdivided into the Armijo, Rio Rancho, and Alameda periods, with the Archaic extending until approximately 1,500 years B.P. (Cordell, 1979).

In New Mexico, archaic groups exploited a generally arid environment. Populations were highly mobile in acquiring often widely dispersed food sources. Similar to semi-contemporaneous groups to the north, New Mexican Archaic bands began to rely more upon wild plant food and smaller game than in previous times. Cultivated crops began to appear in the latest Archaic sites across New Mexico. As in Colorado, a base camp/specialty camp foraging strategy was employed with seasonal mobility (BLM, 2003a).

Formative/Late Prehistoric

In southwestern Wyoming, the Late Prehistoric period began with the introduction of the bow and arrow and pottery, approximately 2,000 years B.P., and ended approximately 300 years ago when European trade goods began to reach the area (Pastor et al., 2004). The period has been subdivided into an earlier Uinta Phase that was succeeded by the Firehole Phase around A.D. 650 (Metcalf, 1987). Projectile points became smaller as a function of their adaptation to the bow. Rose Spring points are common finds from the early portion of the period and were replaced by small, side- and tri-notched points during the later portion of the period. Pottery makes an appearance in the archaeological record starting around A.D. 650 (Creasman et al., 1990).

The Late Prehistoric period may have seen the highest human population of any period in southwest Wyoming prehistory (Thompson and Pastor, 1995). Subsistence patterns were broadly similar to the Late Archaic Period, except that intensive seed processing appeared (Smith, 1988). Studies of pollen and plant macrofossil evidence suggest that a wide variety of plant foods were being utilized (Smith, 1988). A wide variety of animals were being exploited as well, including big game such as antelope and bison (Lubinski, 2000).

The Formative Era (Late Prehistoric) appears to have begun approximately 400 years earlier in western Colorado and eastern Utah than in Wyoming. This is the time when a horticultural subsistence base became established in parts of the area, with hunting and foraging economies occurring in higher elevations and mountains. On the Colorado Plateau, Basketmaker II culture represents the beginning of the Late Prehistoric, existing until around A.D. 500. These people constituted an early stage of the Anasazi cultural sequence, which ultimately led to modern Pueblo Indians. The period is marked by increasing agriculture, expansion of pithouse construction, and technological advances in tool manufacturing (Matson, 1999). Climatic conditions were warmer and moister than previously or subsequently. Several horticultural traditions, including the Anasazi, Fremont, and Gateway, have been identified. They are characterized and distinguished by large habitation structures, high quality pottery, and distinctive rock art styles. The Aspen Tradition refers to a non-horticultural foraging group which is equivalent to the Wyoming Uinta Phase (Reed and Metcalf, 1999).

The Late Prehistoric onset is progressively later from northwest to southeast in New Mexico, between approximately 1,600 and 1,400 years B.P. This period is marked by an increase in cultivation of food crops, population growth, and expansion of permanent aboveground and belowground habitation structures in northwestern and central New Mexico. Pottery, cloth, baskets, and other implements are characteristic. Chronologically, the period is divided into the Basketmaker III and Pueblo I through IV phases in the central and northern portions of New Mexico. By A.D. 1500, a large ancestral Pueblo Indian population inhabited numerous villages distributed along the Rio Grande from present day Taos to Socorro New Mexico, with other large settlements in the Galisteo, Santa Fe and upper Pecos river basins, and in the Acoma, Zuni, and Hopi regions to the west (Cordell, 1979; Stuart and Gauthier 1981; Gerow, 2004).

In south-central and southeastern New Mexico similar developments are reflected by the Mesilla, Dona Ana and El Paso phases of the Jornada Mogollon culture area, with subregional correlates (Stuart and Gauthier, 1981). While the latest El Paso phase villages in the Rio Grande valley persisted until the A.D. 1400s, sedentary horticulturalist settlement in the Pecos valley and environs declined by A.D. 1300, and local populations seemed to have shifted to a more nomadic bison hunting economy (Sebastian and Larralde 1989; Gerow, 2004).

Protohistoric

The Protohistoric is generally considered a transitional period extending from the time immediately prior to contact with Europeans through the initial contact phase. It ends at the time of full contact with Europeans and Euro-Americans. Onset of the Protohistoric occurred at different times in different areas. According to Thompson and Pastor (1995), the Protohistoric period began in western Wyoming 250-300 years ago with the first European trade goods to reach the area, and ended around A.D. 1800 with the entry of Euro-Americans associated with the Rocky Mountain fur trade. Archaeological ethnic affiliations to modern Indian groups can be assigned with moderate certainty. The Green River Basin was the heart of Shoshone territory during this period, but occasional forays by other groups, such as the Crow and Ute, into the area were also common.

The most profound influence on native cultures during this time was the introduction of the horse in the early 1700s, primarily from Spanish settlements in Texas and New Mexico (Ewers, 1955; Secoy, 1953). Hunting, especially for bison, became more efficient, with a consequent increase in average group size and changes in social organization. Material culture became easier to transport with the horse, and sites of this period often contain very diverse assemblages including metal knives, points, glass beads, copper, and other evidence of Euro-American influence (Pastor et al., 2004).

Reed and Metcalf (1999) have defined a pre-contact Canalla Protohistoric phase and a post-contact Antero phase for western Colorado and eastern Utah. The Canalla phase is characterized by the entrance of Numic groups such as the Utes into the area, possibly around 1100 A.D. Desert side-notched and Cottonwood projectile points are diagnostic and ceramics include Uncompahgre brown ware. Local bands appear to have been multi-family groups which dispersed and aggregated seasonally in response to food resources. Use of the horse is characteristic of the Antero phase.

In the Rio Grande valley of New Mexico, a large ancestral Pueblo occupation consisted of both large and small villages of permanent houses. The ancestral Pueblos engaged in horticulture, raised domesticated turkeys, and hunted and gathered extensively and traded with plains nomads for bison products (Cordell, 1979). Earliest evidence of Navajo populations arriving in New Mexico dates from A.D. 1400, but their population was apparently not large until the late A.D. 1500s, when Spanish chroniclers identified a number of different Navajo and Apache bands speaking Athapaskan languages. The Navajo and Apache adopted horticulture from the ancestral Pueblos, but engaged in a mixed horticultural and hunter-gatherer lifestyle characterized by considerable mobility in comparison to their Pueblo neighbors (Gerow, 2004).

In extreme southeastern New Mexico, the small pockets of agriculturalists who had previously occupied the Canadian and Pecos valleys had been replaced by (or had adaptively changed into) nomadic hunter gatherers by the A.D. 1300s. By A.D. 1500 many of these groups were engaged in an active trade relationship with Pueblo villagers in the upper Pecos, Galisteo, and Rio Grande regions, bartering bison hides and dried meat for Pueblo ceramic vessels, woven goods, and agricultural products (Sebastian and Larralde, 1989).

Significant economic transitions for all regions of New Mexico took place with the arrival of Spanish exploratory armies and colonists beginning with Coronado's expedition in A.D. 1540, the year generally used to demark the beginning of the historical era in the area. The introduction of horses, sheep, goats, cattle, and cultigens such as wheat were to have a profound effect upon the economies of Pueblo, Navajo and Apache cultures. Similarly the forcible imposition of the *encomienda* labor tribute system and the new Christian religion upon the sedentary Pueblo villagers resulted in dramatic changes of regional settlement and technologies (Gerow, 2004).

3.2.9.2 Historic Cultural Overview

Wyoming, with large basins exhibiting generally flat topography in contrast to the Colorado mountains to the south, offered a natural route across the Rocky Mountain West. The Green River Basin represents an important source for cultural resource information relating to the Euro-American westward expansion. Mountainous areas surrounding the basin were centers for the fur trade of the early 19th century and the basin was the location of the rendezvous meetings of the fur-trading "mountain men." Numerous historic trails, including the Oregon (1841-1848), Cherokee (1849), and Overland (1862-1864) trails, were used by the pioneer emigrants to cross the region. Railroad construction, mining activities, and oil and gas development are other historic themes present in the basin. The Union Pacific Railroad, part of the first transcontinental railroad, crossed Wyoming (1867-1868) near portions of the current route of Interstate 80 (Massey, 1992). The nation's first transcontinental highway, the Lincoln Highway, crossed Wyoming near the current route of Interstate 80 (1913), (Lin, 2000). Several historic local roads were part of regional transportation networks such as the Bryan-Brown’s Park Freight Road, the Rock Springs-Brown’s Park Road, the Rock Springs-Vernal Freight Road, and the Rock Springs-Hiawatha Road. Military outposts representative of conflict with the indigenous native population were focal points of the westward movement. Historic structures in the vicinity of the proposed Project are commonly associated with ranching and mining activities.

The Colorado-Utah border area represented one of the last areas of the western United States to be settled. The region is characterized by semi-arid and arid canyonlands making access difficult, such that the Colorado Western Slope was not developed for 30 to 40 years after settlement along the Front Range. The earliest European incursions into the area were by Spanish explorers moving north from Mexico, including the Juan de Rivera and Dominguez-Escalante expeditions in the late 18th century. Further exploration awaited the Louisiana Purchase in 1803 and the cession of Spanish lands to the Republic of Mexico and resulted from the arrival of the fur trade into western Colorado. Discovery of gold along the Front Range of Colorado resulted in a mining boom across much of the state, including the San Juan Mountains in southwestern Colorado. A result of the boom was expansion of railroads into the Colorado mountains, traces of which remain to the present. Coal mining began in western Colorado in 1881. Oil shale development began in 1888, but never developed into a mature industry (Hoefer et al., 2002) Oil and gas development has been important in the Paradox and Piceance basins (Reed and Metcalf, 1999).

First contact between native peoples and Spanish colonizers may be used to define the onset of the Protohistoric in New Mexico in 1540 AD with the entry of the Coronado expedition from Mexico. Coronado documented contacts with Zuni and Acoma pueblos and with pueblos in the Rio Grande valley. Subsequent exploratory ventures were made into the New Mexico region during the late 1500s, but the first successful Spanish colony was not established until 1598 (Gerow, 2004). Extensive conflict between the Spanish and all local native peoples is a principal feature of this period. Nomadic groups, such as the Navajo and Apache, suffered minor incursions initially, whereas sedentary groups such as the Pueblo were heavily affected. The

Spanish colonization took the form of creating *encomiendas* for privileged Spanish families by granting the rights to labor, agricultural products, and goods produced by Pueblo Indians. The Pueblo inhabitants were subject as well to a tax of labor by the Catholic Church, to construct missions in all major towns, and to support the priests and friars who accompanied the Spanish settlers and administrators.

Occupation of pueblos by the Spanish, coupled with a series of devastating droughts and attacks by nomadic Athapaskan parties in the 1660s and 1670s, led to the Pueblo Revolt of 1680 (BLM, 2003a). The Spanish colonists' political and economic ties with Mexico City became increasingly tenuous during the 18th Century, and by 1821 when Mexico declared independence from Spain, New Mexico was a virtually land-locked self-sufficient colony with little economic ties to its parent country to the south. Trade relations with the eastern United States were opened through the Santa Fe Trail in 1820 which resulted in an ever increasing stream of Eastern merchants, settlers and fur traders (Gerow, 2004).

Cession of New Mexico to the United States following the Mexican-American war of 1845 resulted in conflicts between a new set of immigrants and native peoples. The U.S. Army established forts for use in military operations against local Indians. Ultimately, reservations were established for Navajo, Apache, and Pueblo tribes. The late 1800s saw expansion of a frontier ranching and farming economy and expansion of rail transportation into the territory by 1880 (BLM, 2003a). With the railroad and amendments to the Homestead Act in 1877, successive waves of immigrants flooded into portions of the New Mexico Territory, settling vast areas of new public lands and leaving a footprint of homesteads, small ranches, towns, and a network of roads and trails. Coal mining began as early as 1861 and continues in the northwestern portion of the state (Hoffman, 1999). Oil and gas development has been important in both the northwestern and southeastern portions of New Mexico, and mineral exploration and development has played an important economic role in settlement throughout the region.

3.2.9.3 Cultural Resource Inventories

Protection of Cultural Resources on Public Lands

A large number of federal laws and implementing regulations pertain to the evaluation and protection of significant cultural resource properties and preservation of cultural values. Several of these require consultations with local Native American tribes when dealing with applicable antiquities. Among the most significant of these laws and regulations are:

- Antiquities Act of 1906, as amended (16 U.S.C. 431-433).
- Preservation of American Antiquities (43 CFR 3).
- National Historic Preservation Act of 1966, Section 106, as amended, (NHPA) (16 U.S.C. 470, Executive Order 13007).
- National Register of Historic Places (NRHP) (36 CFR 60).
- National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321-4361, 40 CFR 1500-1508).
- Protection and Enhancement of the Cultural Environment, 1971 (Executive Order 11593).
- Federal Land Policy and Management Act of 1976 (FLPMA) (43 U.S.C. 1701 *et seq.*).

- American Indian Religious Freedom Act Amendments of 1978, as amended (AIRFA) (42 U.S.C. 1996, 43 CFR 7).
- Archeological Resources Protection Act of 1979, as amended (ARPA) (16 U.S.C. 470aa-470ll).
- Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) (25 U.S.C. 3001, 43 CFR 10).

Management of cultural resources within the Project Area is determined by policy directives contained in those BLM Resource Management Plans applying to field offices affected by the proposed Project, as indicated in Section 1.4.1. The BLM may make land use decisions that would limit access or require modifications to the Proposed Action. A factor in these decisions would be potential effects on Native American cultural values as protected by many of the laws and regulations listed above. Many natural features of the American West continue to be regarded as places of spiritual and cultural significance to Native Americans.

Cultural Inventories

RMC Consultants of Lakewood, Colorado conducted Class I and Class III inventories of six segments of the proposed pipeline and four existing pump stations proposed for upgrades in Wyoming. The Class I inventory revealed 74 previously discovered sites located within the proposed Project's Area of Potential Effect (APE), including all areas of temporary and permanent disturbance and a buffer area beyond disturbed areas. Class III inventory field surveys and testing were conducted between June 25 and October 1, 2004. The survey method consisted of three archaeologists walking a 200-foot wide corridor. The corridor began at the existing MAPL pipeline and extended 175 feet beyond the proposed pipeline centerline. In total, the Class III inventory located 191 sites, of which 17 were multi-component (prehistoric and historic elements). The survey located an additional 40 isolated finds. Of the sites located, 50 were recommended as being eligible for listing with the NRHP (Hoefer and Barclay, 2004).

RMC Consultants also conducted Class I inventory file searches for the three existing Colorado pump stations and the six existing Utah pump stations proposed for upgrades. The Class I inventories showed that Class III surveys had been completed for each of the existing pump stations, therefore Class III surveys were not required to be completed in 2004. No previously recorded cultural sites were located within the property boundaries of the existing pump stations (Hoefer, 2004a; Hoefer, 2004b).

The Office of Contract Archaeology of the University of New Mexico in Albuquerque conducted Class I and Class III inventories of six segments of the proposed pipeline and ten existing pump stations proposed for upgrades in New Mexico. The Class I inventory revealed 100 previously discovered sites located within the proposed Project's APE. Class III inventory field surveys were conducted in five phases between April 27 and June 28, 2004. The survey method consisted of four archaeologists conducting a pedestrian survey over a 150 ft. wide survey corridor. The corridor extended from the existing ROW disturbance including the proposed ROW, a 50 foot temporary use area (TUA) corridor, and a 50 foot buffer beyond all proposed TUAs. In total, the Class III inventory located 136 sites, including 12 multi-component sites. The surveys re-located 91 of the previously identified sites and discovered 45 new cultural sites. Documentation of some previously identified sites was updated. The surveys also located 311 isolated finds which were fully analyzed in the field. Of the sites located, 101 were recommended as being eligible for listing with the NRHP (Gerow, 2004).

Cultural resource inventories remain to be completed on approximately one mile of Segment 3 and six miles of Segment 4 in Wyoming and six miles on Segment 10 in New Mexico pending landowner approval. Class III inventories will be completed on these segments once approval is granted. Cultural resources encountered will be documented and included in report addenda to be submitted for further review.

3.2.10 Native American Concerns

Archaeological sites and certain landscape features may be important to Native American religious beliefs and cultural concerns. Native American Traditional Cultural Properties (TCPs) may be determined eligible for listing with the NRHP as a result of their continuing importance to existing communities. NEPA, Section 106 of NHPA, NAGPRA, and AIRFA have various directives requiring consultation with designated representatives of federally-recognized Native American tribes. As part of the NEPA scoping process for the Proposed Action, scoping notices describing the Project and its potential effects were sent to leaders of various interested, recognized tribes. At this time, only one response, from the Southern Ute tribe, which indicated no objections to the proposed Project.

Native American consultations for the project segments in Wyoming is expected to include a series of Native American tribes, including the Eastern Shoshone, the Shoshone-Bannock, the Northern Arapaho and the Northern Ute Tribes. In New Mexico, the proposed segments cross lands administered by the Navajo Nation and the Pueblos of Zia and Santa Ana who will be involved in consultation for all phases of the project.

In New Mexico, an ethnographic study along the proposed route of Segment 8 was conducted, which included interviews of 18 individuals in local Navajo communities. No potential Traditional Cultural Properties were identified along the route. In one case an informant provided a recommendation for treatment of a historic site adjacent to the proposed route. The Pueblo of Zia has identified sites along the pipeline corridor which are of concern, many of which are known from construction of previous pipelines. The Pueblo of Santa Ana may also have concerns related to sites along the pipeline corridor. The BLM will conduct direct consultations for all phases of the project with these Native American tribes. (Further discussion is provided in Chapter 4).

3.2.11 Social and Economic Conditions

The pipeline looping portion of the proposed Project would cross a relatively low density populated portion of southwestern Wyoming located generally within the Green River Basin. Project development would be almost completely limited to Sweetwater County, with a small portion crossing into Uinta County. Six counties across New Mexico (Chaves, De Baca, Lea, Rio Arriba, Sandoval, and Torrance) would be affected. Socioeconomic effects on McKinley County (0.2 percent of the new pipeline construction) have been ignored for this analysis. Portions of the Project within Colorado and Utah would be limited to upgrades to nine existing pump stations. There would also be upgrades to three existing pump stations in New Mexico counties not experiencing new pipeline construction. Because the magnitude of effects to socioeconomic conditions from these upgrades would be minor, they have been considered in lesser detail than effects associated with pipeline construction.

3.2.11.1 Population, Employment, and Income

Population Demographics

The Project would cross lands which are sparsely populated compared to national population density (79.6 persons/square mile), with county population densities as low as 1.0 persons/square mile (De Baca County, New Mexico) and none higher than 24.2 persons/square mile (Sandoval County, New Mexico). Population growth rates have generally trailed national rates (16.9 percent change, 1990 to 2000), with the exceptions of Sandoval and Torrance counties, New Mexico. Sweetwater County, Wyoming, and Lea and De Baca counties, New Mexico, have experienced population declines between 1990 and 2000. Population size of the largest municipalities in affected counties emphasizes the rural nature of the Project Area (U.S. Census Bureau, 2004a; U.S. Census Bureau, 2004b; NMDED, 2004a; WDAI, 2004). A summary of population data and trends is illustrated in Table 3.2-20.

Economy and Employment

Portions of Wyoming and New Mexico potentially affected by the proposed Project exhibit higher rates of home ownership and a lower reliance on multi-unit housing than the national averages (U.S. Census Bureau, 2004b). Median household income and per capita income levels are generally lower than national figures. Unemployment rates for 2003 are lower than the national average for Wyoming and exceed the national average for most of the affected counties in New Mexico (U.S. Department of Labor, 2004). A summary of economic statistics is presented in Table 3.2-21.

Employment and earnings data are broadly similar for the Project area. Sweetwater County, Wyoming and Lea County, New Mexico have significant contributions from oil and gas development and mining. De Baca, Rio Arriba, and Torrance counties, New Mexico exhibit high levels of contributions from government services to their economies. Employment information by industry classification is indicated in Table 3.2-22.

Earnings and the percentage of earnings by industry are provided in Tables 3.2-23 and 3.2-24.

Table 3.2-20 Population Data and Trends for Proposed MAPL WEP, Wyoming and New Mexico

County or Municipality	Population 1990	Population 2000	Percent Change	Area (Sq. Mi.)	Population Density (2000) (Persons/Sq. Mi.)
United States	248,709,873	290,809,777	16.9		79.6
Wyoming	453,589	493,782	8.1	97,100	4.7
Sweetwater County	38,823	37,613	-3.2	10,425	3.7
Green River	12,711	11,808	-7.6		
Rock Springs	19,050	18,708	-1.8		

County or Municipality	Population 1990	Population 2000	Percent Change	Area (Sq. Mi.)	Population Density (2000) (Persons/Sq. Mi.)
Uinta County	18,705	19,742	5.3	2,082	9.0
Evanston	10,904	11,507	5.2		
New Mexico	1,515,069	1,819,046	16.7	121,356	12.5
Chaves County	57,849	61,382	5.8	6,071	9.5
Roswell	44,480	45,293	1.8		
De Baca County	2,252	2,240	-0.5	2,325	1.0
Lea County	55,765	55,511	-0.5	4,393	12.7
Hobbs	29,445	28,657	-2.7		
Rio Arriba County	34,365	41,190	16.6	5,858	5.9
Sandoval County	63,319	89,908	29.6	3,709	17.1
Espanola	9,295	9,688	4.1		
Rio Rancho	32,551	51,765	37.1		
Torrance County	10,285	16,911	39.2	3,345	3.1

Sources: U.S. Census Bureau, 2004a and 2004b; NMDED, 2004a; WDAI, 2004.

Table 3.2-21 Economic Data, 2000, for Proposed MAPL WEP, Wyoming and New Mexico

State and County	Households	Home Ownership Rate (%)	Multi-Unit Housing (%)	Median Household Income (1999)	Per Capita Income (1999)	Unemployment Rate (%) (2003 Ave.)
United States		66.2	26.4	41,994	21,587	6.0
Wyoming	193,608	70.0	15.2	37,892	19,134	4.4
Sweetwater	14,105	75.1	15.0	46,537	19,575	4.3
Uinta	6,823	75.3	15.8	44,544	16,994	5.8
New Mexico	677,971	70.0	15.3	34,133	17,261	6.4
Chaves	25,948	70.9	10.6	28,513	14,990	8.6
De Baca	922	78.0	4.4	25,441	14,065	8.7
Lea	19,699	72.6	8.4	29,799	14,184	4.8
Rio Arriba	15,044	81.6	2.1	29,429	14,263	7.7
Sandoval	31,411	83.6	7.1	44,949	19,174	6.5
Torrance	6,024	83.9	1.5	30,446	14,134	5.2

Sources: U.S. Census Bureau, 2004b; U.S. Department of Labor, 2004

3.2.11.2 Public Finance and Revenue

The State of Wyoming is unusual in that it levies neither a state personal income tax nor a corporate income tax. Wyoming collects a statewide 4.0 percent sales and use tax, less than the national average of 5.0 percent (Tax Foundation, 2004). Local sales tax options increase rates to 5.0 percent in Uinta County (Uinta County, 2003) and 5.5 percent in Sweetwater County (SWEDA, 2004).

Wyoming collects property tax at state and county levels. Over half of the assessed value for property tax purposes is derived from mineral production (54.4 percent), with lesser amounts coming from non-residential property (23.4 percent) and residential property (22.2 percent). Countywide property tax levies were 12.351 mils for Sweetwater County and 12.908 mils for Uinta County. Mandatory school levies of at least 43.0 mils levied at state, county, and district levels are additional, as are levies for special districts. Total rates for both counties are 66 to 75 mils, depending upon the location within each county (Wyoming Taxpayers Association, 2003).

The State of New Mexico levies a gross receipts tax on money received by businesses from four types of transactions. The tax is similar to a sales tax and has a statewide base rate of five percent. Counties and municipalities may enact local option gross receipts taxes above the base rate. Total gross receipts rates for counties in the Project Area range from 5.375 percent (Lea County) to 6.0 percent (Sandoval County) (NMDTR, 2004a). Corporate income tax rates increase with increasing amounts of the federal corporate tax, from 4.8 percent to 7.5 percent of net income from business within the state (NMDED, 2004b).

Property tax in New Mexico is determined by county appraisal, except for certain types of property extending across county boundaries. In these instances, appraisal is by the Department of Taxation and Revenue. Taxes are imposed on 33.3 percent of the assessed value, which is typically between 80 and 100 percent of market value. Statewide rates are 26 mills for residential property and 29 mills for non-residential property (NMDED, 2004b). In tax year 2003, approximately 56.9 percent of state property taxes were collected from residential property, 33.5 percent from non-residential property, and 9.6 percent from mineral development (NMDTR, 2004b).

3.2.11.3 Environmental Justice

Federal actions are required by Executive Order 12898 (February 11, 1994) to avoid disproportionate adverse environmental effects and risks to minority and low-income communities. Minority populations are defined by the Council on Environmental Quality as areas in which defined minority groups exceed 50 percent of the population or in which the minority population in the affected area is meaningfully greater than in the general population or other appropriate unit of geographic analysis (CEQ, 1997, pg. 25). A summary of Project area poverty and ethnicity data is indicated in Tables 3.2-25 and 3.2-26.

Both Wyoming as a whole and the affected counties have higher proportions of non-Hispanic white population and lower poverty levels than the national averages. Percentages of the population speaking languages other than English at home are lower than for the United States as a whole. In contrast, New Mexico as a whole and all of the affected counties have significantly higher Hispanic populations levels than the national average. Native American population levels in the State of New Mexico and all but one of the affected counties are higher than national averages. Poverty levels are higher than the national average in all affected counties except Rio Arriba. Languages other than English are spoken at levels significantly higher than the national average in homes in New Mexico as a whole and in all of the affected counties. National minorities do not constitute a majority in any Project county except Rio Arriba (Hispanic).

Table 3.2-22 Employment by Industry (2000) for Counties Affected by the Proposed MAPL WEP, Wyoming and New Mexico

Industry	Sweetwater, WY	Uinta, WY	Chaves, NM	De Baca, NM	Lea, NM	Rio Arriba, NM	Sandoval, NM	Torrance, NM
Total Employment	24,249	11,379	28,017	1,039	28,469	15,537	32,379	5,146
Total Farm	201	412	1,561	313	855	1,059	411	621
Total Non-Farm	24,048	10,967	26,456	726	27,614	14,478	31,968	4,525
Total Private Sector	19,760	8,804	21,534	480	23,876	9,821	26,710	3,351
Agricultural Services, Forestry, Fishing	187	121	643	D	236	192	308	D
Mining (including Oil and Gas)	3,736	D	1,094	L	5,410	78	110	L
Construction	1,497	864	1,351	68	1,578	953	2,531	305
Manufacturing	1,648	462	2,342	34	490	648	D	96
Transportation / Utilities	1,781	675	926	D	1,423	528	2,306	313
Wholesale Trade	614	203	995	D	1,281	209	D	120
Retail Trade	4,420	2,203	5,608	160	4,642	2,484	5,368	966
Finance, Insurance, Real Estate	1,130	526	1,642	29	1,408	576	2,172	D
Services	4,747	D	6,933	110	7,408	4,153	6,719	1,239
Total Government (including Schools)	4,288	2,163	4,922	246	3,738	4,657	5,258	1,174

D - Not shown to avoid disclosure of confidential information, but included in totals

L - Less than 10 jobs, but included in totals

Source: U.S. Department of Commerce, 2004

Table 3.2-23 Earnings* by Industry (2000) for Counties Affected by the Proposed MAPL WEP, Wyoming and New Mexico

Industry	Sweetwater, WY	Uinta, WY	Chaves, NM	De Baca, NM	Lea, NM	Rio Arriba, NM	Sandoval, NM	Torrance, NM
Total Employment Income	952,896	301,013	771,469	20,955	817,593	332,348	1,209,339	100,747
Total Farm	305	-140	99,656	3,442	27,421	-543	1,516	5,605
Total Non-Farm	952,591	301,153	97,914	17,513	790,172	332,891	1,207,823	95,142
Total Private Sector	813,637	236,718	505,714	10,172	672,217	188,870	1,035,357	54,172
Agricultural Services, Forestry, Fishing	1,390	1,227	15,794	D	4,755	2,134	3,022	D
Mining (including Oil and Gas)	318,679	D	52,409	159	219,428	2,481	3,621	801
Construction	56,715	34,146	37,133	1,445	44,244	17,344	96,571	4,507
Manufacturing	115,381	14,416	84,608	571	15,113	16,522	D	2,464
Transportation / Utilities	100,301	34,613	32,085	D	77,592	19,915	84,080	11,538
Wholesale Trade	21,856	6,912	27,180	D	45,737	3,665	D	1,974
Retail Trade	67,451	29,888	87,355	2,451	73,575	44,549	81,636	12,785
Finance, Insurance, Real Estate	26,455	8,344	27,508	562	28,197	7,399	43,438	D
Services	105,409	D	141,642	1,454	163,576	74,861	132,769	16,999
Total Government (including Schools)	138,954	64,435	166,099	7,341	117,955	144,021	172,466	40,970

Source: U.S. Department of Commerce, 2004

*Thousands of Dollars

D - Not shown to avoid disclosure of confidential information, but included in totals

L - Less than 10 jobs, but included in totals

Table 3.2-24 Percentage Earnings by Industry (2000) for Counties Affected by the Proposed MAPL WEP, Wyoming and New Mexico

Industry	Sweetwater, WY	Uinta, WY	Chaves, NM	De Baca, NM	Lea, NM	Rio Arriba, NM	Sandoval, NM	Torrance, NM
Total Employment Income	952,896	301,013	771,469	20,955	817,593	332,348	1,209,339	100,747
Total Farm	0.0%	0.0%	12.9%	16.4%	3.4%	-0.2%	0.1%	5.6%
Total Non-Farm	100.0%	100.0%	12.7%	83.6%	96.6%	100.2%	99.9%	94.4%
Total Private Sector	85.4%	78.6%	65.6%	48.5%	82.2%	56.8%	85.6%	53.8%
Agricultural Services, Forestry, Fishing	0.1%	0.4%	2.0%	NA	0.6%	0.6%	0.2%	NA
Mining (including Oil and Gas)	33.4%	NA	6.8%	0.8%	26.8%	0.7%	0.3%	0.8%
Construction	6.0%	11.3%	4.8%	6.9%	5.4%	5.2%	8.0%	4.5%
Manufacturing	12.1%	4.8%	11.0%	2.7%	1.8%	5.0%	NA	2.4%
Transportation / Utilities	10.5%	11.5%	4.2%	NA	9.5%	6.0%	7.0%	11.5%
Wholesale Trade	2.3%	2.3%	3.5%	NA	5.6%	1.1%	NA	2.0%
Retail Trade	7.1%	9.9%	11.3%	11.7%	9.0%	13.4%	6.8%	12.7%
Finance, Insurance, Real Estate	2.8%	2.8%	3.6%	2.7%	3.4%	2.2%	3.6%	NA
Services	11.1%	NA	18.4%	6.9%	20.0%	22.5%	11.0%	16.9%
Total Government (including Schools)	14.6%	21.4%	21.5%	35.0%	14.4%	43.3%	14.3%	40.7%

Source: U.S. Department of Commerce, 2004

Total Employment Income in Thousands of Dollars

NA - Data Unavailable

Nine communities are located within 2.5 miles of the proposed Project in New Mexico and Wyoming, as indicated in Table 3.2-26. In Wyoming, these communities exhibit dominantly white, non-Hispanic ethnicity and median household incomes near or above the Wyoming statewide average. In New Mexico, the communities of Zia Pueblo, San Ysidro, and Bernalillo, all located in Sandoval County, have national minorities (Hispanic and Native American) as majority components of their populations. Three of the affected communities; San Ysidro, Bernalillo, and Encino; have lower household median incomes than the New Mexico average.

3.2.12 Public Health and Safety

This section summarizes the procedures MAPL would follow during construction of the WEP to manage hazardous and non-hazardous waste and materials during pipeline construction. A section on pipeline safety is also provided in response to public input received during project scoping. The MAPL WEP pipeline loop segments would be constructed from new steel, and would loop existing lines. The pipeline safety section provides statistics and background on pipeline safety for pipelines and provides background on MAPL's operating history.

3.2.12.1 Hazardous Waste and Materials

An investigation of whether the proposed route would directly cross or cross near any EPA-identified hazardous waste sites was conducted by reviewing the EPA Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List. The CERCLIS List identifies sites that are currently being considered for inclusion on the national list of Superfund sites administered by the EPA under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The route would not intercept any identified hazardous waste sites.

Although NGLs are exempt from CERCLA requirements, MAPL is required to maintain Material Safety Data Sheets (MSDSs) for NGLs. Current pipeline operations require very limited amounts of additional substances that require MSDS documentation. One or more barrels of turbine oil or methanol may be stored at each pump station. In addition, ten gallons or less of additional compounds are typically stored and used at pump stations including lubricants, mineral spirits, mastic, methanol, and other miscellaneous products.

3.2.12.2 Non-hazardous Waste

Small amounts of solid waste are generated at the pump stations. These solid wastes are placed in containers and disposed of in a permitted solid waste landfill.

Table 3.2-25 Poverty and Ethnicity Indicators (2000) for Counties Affected by the Proposed MAPL WEP, Wyoming and New Mexico (Percent of Total Population)

Poverty and Ethnicity Indicators	United States	Wyoming	Sweetwater WY	Uinta WY	New Mexico	Chaves NM	De Baca NM	Lea NM	Rio Arriba NM	Sandoval NM	Torrance NM
Ethnicity											
White	75.1	92.1	91.6	94.3	66.8	72.0	84.0	67.1	56.6	65.1	73.9
Black or African American	12.3	0.8	0.7	0.1	1.9	2.0	Z	4.4	0.3	1.7	1.7
American Indian and Alaskan Native	0.9	2.3	1.0	0.9	9.5	1.1	0.9	1.0	13.9	16.3	2.1
Asian	3.6	0.6	0.6	0.3	1.1	0.5	0.2	0.4	0.1	1.0	0.3
Native Hawaiian or other Pacific Islander	0.1	0.1	Z	0.1	0.1	0.1	0.0	Z	0.1	0.1	0.1
Persons Reporting Two or More Ethnic Groups	2.4	1.8	2.4	1.5	3.6	3.1	2.2	3.3	3.3	3.5	4.0
Hispanic or Latino	12.5	6.4	9.4	5.3	42.1	43.8	35.3	39.6	72.9	29.4	37.2
White, not of Hispanic or Latino Origin	69.1	88.9	86.9	92.2	44.7	52.1	62.8	54.0	13.6	50.3	57.2
Language Other than English Spoken at Home	17.9	6.4	7.5	5.6	36.5	33.4	31.1	32.8	65.9	31.8	26.2
Poverty											
All Ages, Below Poverty Level	12.4	10.4	7.7	9.9	17.3	21.3	20.6	18.2	18.3	11.8	22.5

Z - Value greater than zero, but less than half unit of measure shown
Source: U.S. Census Bureau, 2004a, 2004b

Table 3.2-26 Poverty and Ethnicity Indicators (2000) Communities Within 2.5 Miles of Proposed MAPL WEP, Wyoming and New Mexico

Poverty and Ethnicity Indicators	Wyoming	Granger*	Green River	Wamsutter	New Mexico	Zia Pueblo	San Ysidro	Santa Ana Pueblo	Bernalillo	Placitas	Encino*
Population	493,782	146	11,808	261	1,819,046	646	238	479	6,611	3,452	94
Ethnicity											
White	92.1%	91.6%	NA	NA	66.8%	NA	NA	NA	NA	NA	73.9%
Black or African American	0.8%	0.7%	NA	NA	1.9%	0.0%	0.8%	NA	0.7%	0.7%	1.7%
American Indian and Alaskan Native	2.3%	1.0%	1.8%	3.1%	9.5%	100.0%	9.7%	97.9%	4.6%	2.2%	2.1%
Asian	0.6%	0.6%	NA	NA	1.1%	0.0%	NA	NA	NA	NA	0.3%
Native Hawaiian or other Pacific Islander	0.1%	Z	NA	NA	0.1%	0.0%	NA	NA	NA	NA	0.1%
Persons Reporting Two or More Ethnic Groups	1.8%	2.4%	1.6%	2.3%	3.6%	0.0%	7.1%	0.6%	3.6%	3.5%	4.0%
Hispanic or Latino	6.4%	9.4%	10.2%	13.0%	42.1%	0.0%	71.8%	2.5%	74.8%	20.2%	37.2%
White, not of Hispanic or Latino Origin	88.9%	86.9%	87.2%	83.9%	44.7%	0.0%	18.9%	NA	20.1%	74.3%	57.2%
Language Other than English Spoken at Home	6.4%	7.5%	NA	NA	36.5%	NA	NA	NA	NA	NA	26.2%
Poverty											
Median Household Income (1999)	37,892	46,537	53,164	35,625	34,133	34,583	30,521	45,179	30,864	60,597	30,446
All Ages, Below Poverty Level	10.4%	7.7%	NA	NA	17.3%	15.0%	10.6%	4.1%	NA	2.6%	22.5%

* Ethnographic data unavailable, county data substituted

Z - Value greater than zero, but less than half unit of measure shown
Source: U.S. Census Bureau 2004a, 2004b; BLM, 2003a; City-Data.com, 2004

3.2.12.3 Pipeline Safety

This section explains the factors that contribute to pipeline safety, the causes of pipeline and other pipeline system accidents, and the historic pipeline leak and spill incident rates that are used to calculate public health and safety risks. These statistics were developed to assess impacts to various resources. This section also provides risk statistics for other methods of transportation, allowing a comparison between transportation methods.

Several factors influence pipeline safety. The positive influence of Federal regulations is anticipated to continue to enhance the safety of operation of pipelines.

3.2.12.3.1 Evolution of Pipe Materials, Fabrication Methods, and Industry Regulations

The following discussion of pipeline design and regulations provides background for the subsequent evaluation of incident rates related to pipeline age.

Pipelines began transporting crude oil in the late 1800s. The performance of early pipelines was frequently quite poor due to low quality materials, low quality control, ineffective joints between pipe segments, poor corrosion control and a general lack of applied technology. Over time, materials quality dramatically improved, high quality joining techniques evolved, construction techniques were enhanced and sound operation and maintenance procedures developed. Simultaneously, industry standards and state and federal regulations also evolved, resulting in measurable improvement in the safety and reliability of pipeline construction and operation.

There have been numerous and substantial technological advances in pipe materials, design, industry standards, and federal regulations governing petroleum product pipelines. Pipe materials, corrosion protection, and methods to test the pipeline's integrity have evolved since the late 1950s. Manufacturers introduced new steels with higher minimum yield strengths and improved resistance to defects and rapid crack propagation. The high frequency ERW pipe manufacturing process, for example, has replaced the low frequency ERW process, reducing longitudinal seam defects. New pipeline coatings such as fusion bonded epoxy have become industry standards and have substantially reduced external corrosion control requirements, thereby extending the safe and reliable service life of the pipe. Aboveground survey techniques were developed and refined to ensure that proper levels of cathodic protection of the pipeline are achieved. National standards also were adopted for testing and inspection of girth weld seams and welder and welding procedure qualifications. Internal inspection tools ("smart pigs") have been introduced as non-destructive methods to detect deformities, metal loss, and cracks in pipelines. The detection capabilities of these tools have continually increased. The latest internal inspection tools are capable of discriminating between interior and exterior defects.

In 1970, federal safety regulations for hazardous liquid pipelines were enacted (49 CFR Part 195). These regulations govern the design, construction, and operation of hazardous liquid pipelines. Other federal regulations control other aspects of pipeline operation, such as 49 CFR Parts 190 (Pipeline Safety Programs; OPS Authority); 193 (Emergency Response Plans), 198 (State One-Call Damage Prevention Systems), and 199 (Drug and Alcohol Testing). Recent enactment of the Integrity Management Rule for High Consequence Areas (49 CFR Part

195.452) expanded federal requirements for pipeline operators. This regulation requires operators to systematically and periodically evaluate the design and operation of their pipeline, assess various risks to the pipeline, and to prioritize pipe repair operations to reduce risk to the public and the environment.

In 2001, the initial Integrity Management Rule for hazardous liquid pipelines became applicable to operators with more than 500 miles of pipeline. A rule change effective February 15, 2002, made the rule applicable to owners of all hazardous liquid pipelines. The goals of the rule were to: accelerate assessment of lines in High Consequence Areas (HCAs); improve operator integrity management systems; improve government role in reviewing integrity plans and programs; and increase public assurance in pipeline safety. Hazardous liquid pipeline operators were required to develop a written Integrity Management Program and to perform periodic integrity assessments (i.e. continual integrity evaluation and assessment) on line segments that could affect HCAs at intervals not to exceed 5 years (OPS, 2005).

3.2.12.3.2 Causes of Accidents

The OPS categorizes the causes of pipeline accidents into seven categories: third-party/outside forces, internal and external corrosion, incorrect operation malfunction of control/relief equipment, failed weld, failed pipe, or “other” causes. From 1986 to 2002, the three leading causes of pipeline accidents were given in percentages as third-party/outside force (29 percent), corrosion (21 percent), and “other” (27 percent). The remaining OPS-designated categories (failed weld, incorrect operation, failed pipe, and malfunction of control/relief equipment) accounted for the remaining 23 percent of petroleum product pipeline failures. Third-party/outside force, corrosion, and “other” categories also were the leading categories for damage based on property damage (in dollars), amount of product released per spill, number of injuries, and number of fatalities (BLM, 2003a).

Third-party excavation damage is responsible for the majority of outside force damage to transmission petroleum product pipelines and has been responsible for more than 95 percent of the injuries associated with pipeline accidents. Third-party/outside force damage is much more likely to result in catastrophic failures resulting in large releases, compared to corrosion-caused accidents (NTSB, 1996).

In recognition of the risk of accidents and their causes, bound by a significant battery of state and federal law and regulation, sound engineering practices and principals as well as conscientious management, pipeline operators have developed comprehensive procedures, training and employee qualification programs designed specifically to address and mitigate against the occurrence of unsafe conditions. Extensive application of training and procedures to prevent operator error, corrosion, mechanical failure and third party encounters is now standard operating practice. Federal regulations governing hazardous liquid pipelines have been enacted establishing standards for such programs and imposing stringent reporting requirements as well as testing requirements for qualifying pipeline facility operators.

3.2.12.3.3 Baseline Transportation Accident Rates

The majority of petroleum products within the U.S. are transported by pipelines. According to the Association of Pipe Lines (AOPL), 57 percent of petroleum and petroleum products were transported by pipelines, 38 percent by water carriers, 3 percent by motor carriers (e.g., tanker trucks), and 2 percent by railroads. Every year, over 12.9 billion barrels of petroleum and petroleum products are transported by interstate pipelines (AOPL, 2000).

Pipelines operate more safely than other transportation modes as indicated by the number of pipeline accidents per year as compared to other modes of transportation (Table 3.2-27). AOPL reports that trucking of petroleum is 87 times more likely to result in human fatalities than by pipeline. Similarly, trucking results in fires and/or explosions about 35 times more frequently than for pipelines transporting petroleum (AOPL, 2004).

Table 3.2-27 Relative Risk* of Petroleum Transportation Methods as Compared to Pipelines

Transportation Method	Death	Fire/Explosion	Injury
Truck	87.3	34.7	2.3
Rail	2.7	8.6	0.1
Barge	0.2	4	3.6
Tank Ship	4	1.2	3.1
Pipeline	1	1	1

*Relative rates are calculated based on incidents per ton miles for each transportation mode (AOPL, 2004).

Nonetheless, inherent hazards are associated with transporting petroleum products by pipeline. These hazards are a function of the probability of an accident and the magnitude of its effects on the environment and human health.

3.2.12.3.4 Hazardous Liquid Pipeline Accident Rates

With the emergence of new pipeline technologies and stricter federal regulations designed to reduce hazards, historical data should overestimate future risk. Nevertheless, the use of historical data provides a quantitative if not qualitative, estimate of the likelihood of future pipeline failure and its potential causes. The estimates provided in the text that follows are probabilities, not precise or actual values. The probabilities presented are the number of events likely to occur on average; given the current state of the art, the actual number of events is quite likely to be less than the values presented.

Office of Pipeline Safety Database

Data from the OPS database (OPS, 2004) were analyzed to evaluate historical trends in accident rates for petroleum product transmission pipelines in order to estimate the likelihood of future pipeline failure and its probable consequences. Information specific to hazardous liquid pipeline operators from 1986 to 2004 is available on this database.

Analysis of OPS incident data indicated that the number of accidents for hazardous liquid pipelines declined during the 1980s and 1990s as shown in Table 3.2-28. The average number of incidents per year for hazardous liquid pipelines in the U.S. has declined from a maximum of 245 incidents in 1994 to 115 incidents through November 30, 2004 (OPS, 2004) These trends indicate that hazardous liquid pipelines are operating more safely now than in the past.

The type of commodity being transported was also evaluated with respect to accidents. Crude oil accounted for nearly 41 percent of the accidents in 2004, followed by gasoline (13.9 percent) and diesel (3.5 percent). NGL accounted for less than 1 percent of the accidents.

Table 3.2-28 OPS Hazardous Liquid Pipeline Operators Accident Summary Statistics by Year (1/1/1986 – 11/30/2004)

Year	Number of Accidents	Fatalities	Injuries
1986	210	4	32
1987	237	3	20
1988	193	2	19
1989	163	3	38
1990	180	3	7
1991	216	0	9
1992	212	5	38
1993	229	0	10
1994	245	1	7
1995	188	3	11
1996	194	5	13
1997	171	0	5
1998	153	2	6
1999	167	4	20
2000	146	1	4
2001	130	0	10
2002	146	1	0
2003	128	0	5
2004	115	0	10
Totals	3,414	37	264

3.2.12.3.5 MAPL Integrity Test

While historical probabilities may be suggestive of future performance, other assessment methods can much more reliably evaluate the current condition of the pipeline. These methods include internal inspection, hydrostatic testing, and direct examination techniques.

MAPL WEP has committed to assess pipeline integrity by conducting a pre-operational hydrostatic test of each new segment to ensure structural integrity prior to operation. In addition, regularly scheduled integrity assessments, are conducted to assure the continued safe operating condition of the pipeline. These, as well as stringent operating and maintenance procedural requirements that meet or exceed all state and federal requirements, are measures that ensure public protection. These practices provide assurance that the integrity of the pipe would be sufficient to safely transport petroleum products.

3.2.12.3.6 Natural Hazards

This section documents naturally occurring hazards (seismicity, landslides, flooding, channel incision) that could compromise pipeline safety either in the short or long term by damaging the pipeline or ancillary facilities, or exposing the pipe at the surface to potential third-party damage.

Seismicity and Faults

Seismic activity in the project area is described in Sections 3.2.2.1 and 4.3.2.1. Earthquake hazards to the proposed pipeline are expected to be minimal even for the largest intensity earthquake predicted for the areas where the new segments are to be constructed. The probability of impacts to public health and safety as a result of seismic events and faults is low.

Landslides

Landslide areas are described in Sections 3.2.2.1 and 4.3.2.1. Special construction techniques may be required in landslide and unstable slope areas to prevent construction-induced slope failures and protect the long-term integrity of the pipe. Risk to public health as a result of landslide failure events is low.

Karst

Karst terrain is discussed in Sections 3.2.2.1 and 4.3.2.1. Areas of karst terrain are susceptible to ground subsidence, sinkhole collapse, groundwater contamination, and unpredictable water supply. While the implications for pipeline safety through sudden collapse and pipeline breakage in areas of karst terrain are considerably higher than other areas of the project, the pipeline-operating history demonstrates no catastrophic events.

The implications for pipeline safety are potential sudden subsidence events that could damage or break the pipeline. Because of the very slow rates of cave formation by groundwater solution of the underlying limestone, the risks of sudden subsidence at the surface are very low.

Flooding and Incised Channels

MAPL has identified work sites along the existing pipeline where the pipe has been exposed and would be buried to a greater depth to avoid eventual exposure or subsequent damage. Periodic inspections would also identify areas with erosion hazards, and measures would be taken to mitigate exposed lines. Based on these additional engineering measures the risk to public health from pipeline exposure is low.

Wind Erosion

Soils with a large percentage of fine sand are especially susceptible to wind erosion when the protective layer of vegetation is removed by construction activities. As a result, thin sandy topsoils can be lost and blowouts to greater soil depths can occur, exposing buried pipe.

This hazard will be mitigated where necessary by use of appropriate erosion control measures such as snow fences, gravel mulches, and geofabric mulches. Any sections of new or existing pipe exposed by wind erosion will be noted during regularly scheduled inspections and will be reburied as soon as possible.

3.2.12.3.7 Environmentally Sensitive Resources Along the MAPL Route

An inventory of residences within 300 feet and public assembly places within 500 feet of the existing pipeline and proposed new pipeline extensions was completed. The distances between the nearest residences or public assembly places also were estimated for the pump stations and the terminals. Only one residence is within 300 feet of the MAPL WEP centerline and it is located in the Lybrook community south of the existing Lybrook Pump Station. Noise impacts from proposed upgrades at the Lybrook Pump Station were calculated and found to result in a negligible increase in noise, approximately 1.4 dbA. No schools or community centers are located within 500 feet of the pipeline.

4.0 ENVIRONMENTAL CONSEQUENCES

Chapter 4 is an analysis of the environmental consequences of implementing the MAPL WEP and the No Action Alternative. Critical elements of the human environment which are listed in Table 3.1-1 are evaluated in Chapter 4 with the exception of Wild and Scenic Rivers and Wilderness. These resources are not crossed by the proposed project and would not be affected by it. Therefore, they were dropped from further analysis in this chapter.

4.1 MITIGATION MEASURES

MAPL will incorporate standard and selective mitigation measures, and has committed to their implementation. A detailed description of mitigation measures is provided in the mitigation summaries in Appendix D. In addition to the Appendix D information, specific measures are listed by resource in Table 4.1-1. Mitigation typically involves one or more of the following:

- Avoiding the impacts by not taking a certain action or part of an action;
- Minimizing impacts by limiting the degree of magnitude of the action and its implementation;
- Rectifying impacts by repairing, rehabilitating, or restoring the affected environment;
- Reducing the impact; and/or
- Compensating for the impact by replacing or providing substitute resources or environments.

As part of the Project Description, certain measures to protect the environment will be considered standard practice for the entire Project. Where warranted on a case by case basis, mitigation beyond these standard measures will be employed on a selective basis to reduce adverse impacts to an acceptable or lesser level. Standard and selective mitigation measures are summarized in Table 4.1-1. Mitigation measures described in this EA will be incorporated into the Project Plan of Development.

Table 4.1-1 Mitigation Measures

Air Quality	
Air-1	All construction activities would be conducted in compliance with state and local requirements for construction-related fugitive dust. At the request of residents or the BLM, unsurfaced roads that pass within 500 feet of dwellings that generate excessive dust will either be watered, covered with a BLM-approved chemical binder, or other dust control method satisfactory to the BLM. Chemical binders will not be used on any lands under BIA jurisdiction.
Air-2	All requirements of those entities having jurisdiction over air quality matters will be adhered to and any necessary permits for construction activities would be obtained.
Air-3	Traffic controls may be implemented including decreased speed limits with appropriate enforcement, other traffic calming methods, to minimize fugitive dust. Disturbed areas would be revegetated as soon as possible after construction of a given pipeline segment is completed.

Geologic Hazards	
GH-1	If surface subsidence or collapse occurs during construction, work would stop immediately. Equipment would be removed from the area, if possible, and the pipe would be inspected for damage. New collapse structures would be fenced to keep out people, animals, and equipment; and the proposed pipeline looping segment would be re-routed.
GH-2	Special construction techniques would be used in potential landslide and unstable slope areas to prevent construction-induced slope failures and protect the long-term integrity of the pipe.
Paleontologic Resources	
P-1	Wyoming - A qualified paleontologist will monitor excavation on all ground disturbing activity on all BLM lands crossing Class I Formations in Wyoming (mileposts are provided on Summary Table in Appendix E). A qualified paleontologist will spot check excavation on all BLM lands crossing Class II formations.
P-2	New Mexico - A qualified paleontologist will monitor excavation on all ground disturbing activity on all BLM lands crossing Class I Formations (includes the Lybrook Fossil Area in Segment 8, the remainder of BLM land in Segment 8 and a portion of Segment 9).
P-3	Paleontologic monitoring and mitigation procedures are described in the Paleontology Resources Mitigation Summary in Appendix D-9.
Soils	
S-1	Soil erosion caused by water would be mitigated by erosion control measures described in the Storm Water Pollution Prevention Plan (SWPPP) Mitigation Summary in Appendix D-3.
S-2	Areas where wind erodes soil and exposes the pipe will be mitigated by the use of snow fences, gravel mulches, and geofabric mulches. Sections of pipe loop segments exposed by wind erosion would also be reburied.
S-3	Shallow soils would be mitigated by moving any excess topsoil from adjacent areas within the ROW into thin topsoil areas subject to landowner concurrence. Other measures which may be used include use of soil amendments or seed mixes developed specifically for shallow, rocky soils.
S-4	These measures would include use of both temporary erosion control during construction and permanent post-construction erosion control. Measures would include use and regular maintenance of silt fences, slope breakers, mulch, and geotextile fabric, where appropriate.
S-5	MAPL would stress the importance of keeping equipment and vehicles on the ROW at all times, especially in biological soil crust areas. MAPL would commit to reclaiming disturbed areas of biological crust within one year to aid in prevention of organism death.
S-6	SWPPP mitigation would include use and regular maintenance of silt fences, slope breakers, mulch, and geotextile fabric immediately following ROW clearing and grading continuing until adequate vegetation is successfully restored. Time between ROW clearing and the completion of ROW restoration would minimized.
S-7	Compacted soils would be loosened by harrowing or disking before reseeding.

S-8	Mitigation/reduction of potential impacts to biological soil crusts would be accomplished by minimizing the area of construction disturbance; educating construction crews in identification of this type of soil; ensuring personnel and vehicles remain on the ROW; specifically avoiding undisturbed off-ROW areas where biological soil crusts are present; and reclaim disturbed areas of biological crust within one year to aid in prevention of organism death.
S-9	Mitigation of possible accidental releases of fuel, lubricants, solvents and other hazardous materials, including a possible fuel tanker spill or a ruptured vehicle fuel tank would be accomplished according to the best management practices described in the Spill Prevention, Control and Countermeasures Plan (SPCC) Mitigation Summary in Appendix D-3.
Surface Water	
SW-1	Surface water of the Blacks Fork River, Circle Creek, Algodones Canal and the Rio Grande will be mitigated by use of Horizontal Directional Drill technology if geotechnically feasible. Mitigation for the potential release of drilling mud from these drills is provided in the Drilling Contingency Plan Mitigation Summary in Appendix D-8.
SW-2	All equipment staging areas shall be located at least 50 feet from all water courses and wetland areas. Refueling of construction equipment shall take place at least 100 feet from stream banks as provided in the SPCC Mitigation Summary in Appendix D-7.
SW-3	MAPL will adhere to the mitigation measures described in the SWPPP and SPCC plans summarized in Appendix D.
SW-4	All construction and maintenance activities shall be conducted in a manner that would minimize disturbance to vegetation, drainage channels and intermittent drainages.
SW-5	Intermittent streams may be crossed by HDD techniques in highly erosive areas to minimize impacts. For intermittently flowing stream channels, sediment control measures provided in the SWPPP summarized in Appendix D-3 would be applied downstream from the crossing to prevent dispersal of sediment.
SW-6	Mitigation of potential for pipeline failure due to excess pressure would be minimized by engineering design and pump discharge setpoints to prevent overpressure from occurring. Operating pipelines would be monitored through periodic leakage surveys and patrols, as required by 49 CFR 195.705 and 706. Valves would be placed in close proximity to all perennial water bodies and to canals/drains crossed by the proposed pipeline segments. In the event of a pipe failure, these valves would be closed to minimize the leakage and allow for repair of the pipe. Additionally, regulators would be used on the downhill side of major changes in elevation.
Ground Water	
GW-1	Potential impacts of NGLs migrating, if a rupture occurs, would be mitigated by the nature of NGLs which result in the evaporation of most, if not all, of the liquids on the surface of the ground or in the vadose zone above the water table.
GW-2	Mitigation of potential spills of fuel, oils, and solvents during pipeline/facility

	construction would be with adherence to the SPCC Plan summarized in Appendix D-7.
Wetlands	
W-1	Mitigation measures for crossing wetlands could include, but are not limited to, such measures as reducing the width of the ROW and TUA through wetlands and using matting to protect wetland soils from construction equipment.
W-2	Potential impacts to riparian vegetation/wetlands at the Blacks Fork River and Rio Grande would be minimized by the use of HDD techniques, if feasible.
Floodplains	
F-1	Potential impacts to active floodplains would be mitigated by not placing permanent ancillary facilities on them.
Vegetation	
V-1	Surface restoration will be conducted as required by the BLM and BIA. Mitigation measures for vegetation are summarized in the Reclamation Plan Mitigation Measures Summary in Appendix D-4.
Invasive Species	
IS-1	Invasive species and noxious weeds will be mitigated in accordance with procedures summarized in the Appendix D-2, Weed Management Plan Mitigation Summary.
IS-2	MAPL plans to conduct a pre-construction weed inventory for all segments and pump stations associated with the proposed project activities. MAPL would ensure that excavation and grading equipment is cleaned prior to entry into work areas.
IS-3	Mitigation as described in the Weed Management Plan Summary in Appendix D-2 includes pre-construction weed mapping; preventative measures to be implemented; treatment methods; and monitoring.
Wildlife	
WL-1	Big Game: Kemmerer Field Office: Construction, drilling and other activities potentially disruptive to wintering wildlife are prohibited during the period of November 15 to April 15 for the protection of big game (deer and pronghorn) winter habitat. Rock Springs and Rawlins Field Offices: Construction, drilling and other activities potentially disruptive to wintering wildlife are prohibited during the period of November 15 to April 30 for the protection of big game winter habitat.
WL-2	Sage Grouse: Surveys will be conducted during the survey period of March 1 to June 30 to determine whether sage grouse breeding and nesting habitat (leks) and individuals are present. If active leks are observed, surface disturbance within 2 miles of the lek will be avoided from March 15 to July 15.
WL-3	Raptors: Raptor surveys would be conducted prior to construction during the raptor

	survey period (February 1 to August 1) in order to identify occupied nesting territories in areas where there is a potential for nesting raptors. Construction, within a half-mile from nesting raptors and 1 mile from active bald eagle and ferruginous hawk nesting areas, would be avoided from February 1 to July 31 (in Wyoming, and March 1 until August 1 in New Mexico) or until chicks have fledged.
WL-4	Mountain Plover: Surveys will be conducted prior to construction in order to identify occupied mountain plover habitat. If present, construction would be avoided during the breeding/nesting period of April 10 to July 10 or until the young have fledged.
WL-5	Prairie dog towns that meet the size criteria and have not been previously block-cleared will be cleared for the presence of black-footed ferrets.
WL-6	Potential impacts to big game and big game habitat are partially mitigated by the project following an existing pipeline corridor; not constructing new roads; and construction timing restrictions during times crucial to the animals.
WL-7	Prior to construction, a survey would be conducted to identify new raptor nests.
WL-8	Some of the potential impacts of construction to other wildlife species would be mitigated by constructing outside the breeding season.
WL-9	Potential impacts to wild horses in the Salt Wells WHMA would be mitigated by not permitting construction activities would not take place during the winter and early spring months (critical winter and foaling times); and avoiding water resources.
WL-10	Potential impacts to fish would be mitigated by directional drilling major rivers; implementing the SPCC Plan Mitigation Measures (summarized in Appendix D-7) to mitigate potential spills; and discharging hydrostatic test water into upland areas drained by ephemeral or intermittent streams not containing fish and in accordance to permit requirements.
WL-11	Potential impacts to amphibious species are mitigated by directionally drilling major rivers and streams.
WL-12	Impacts to sensitive species were identified as potentially occurring or having suitable habitat along the proposed route would be minimized by avoiding sensitive areas; constructing outside of sensitive seasons; following existing disturbance corridors, and conducting clearance surveys to avoid direct impacts.
WL-13	Mitigation efforts to protect the desert Kingsnake would include educating project personnel of the potential presence of a protected species and avoiding unnecessary killing of the species.
WL-14	Mitigation of potential impacts to fish would be provided by using HDD technology to cross rivers.
WL-16	Mitigation for sensitive plant species includes conducting field surveys; reducing ROW width; erecting temporary fencing to protect individuals; and by periodically monitoring plants during construction. Individuals identified within the ROW that are unavoidable would be excavated and transplanted to suitable habitat adjacent to the ROW.

Land Use	
LU-1	Mitigation of impacts on natural or man-made barriers to livestock movement would be mitigated by replacement of fences to at least the same condition as before construction, repair of some fences and construction of new fences where needed. Vegetation would be restored.
LU-2	Potential traffic delays caused by pipeline construction crossing on major arteries would be mitigated by boring or directional drilling under the road-ways.
LU-3	Potential impact to paleontologic resources would be mitigated by monitoring excavations and implementing procedures in the Paleontologic Resources Mitigation summarized in Appendix D-9.
LU-4	Potential delays to river-rafters would be avoided by crossing the Blacks Fork River and the Rio Grande by directional drilling.
LU-5	Potential disturbance of sensitive cave resources in the Crystal Caverns area would be mitigated by requiring construction activities to remain within the existing (original)ROW to the maximum extent practical.
Visual Resources	
VR-1	Disturbance of rangeland and agricultural areas would be returned to their natural visual characteristics by the implementation of the Reclamation Plan Mitigations summarized in Appendix D-4. Visual quality changes would be mitigated by blending colors and texture with adjacent natural areas through successful revegetation. Areas where rock outcrops are removed would be mitigated by reshaping the surface to conform to the existing contours
VR-2	Visual impacts are also mitigated for the relatively few number of viewers by the nature and location of the project, i.e., locating new segments beside existing pipelines; crossing relatively few areas with high or unique visual character; and applying water to areas prone to high dust emissions to locally reduce dust in the air.
Cultural Resources	
CR-1	The project will be surveyed for cultural resources prior to construction. Mitigation measures would apply to cultural sites recommended as being eligible for listing with the NRHP. After completion of the cultural resource inventory reports, a treatment and mitigation plan will be formulated as prescribed in the Programmatic Agreements developed for the project. Where eligible sites have been located, the proposed Project will avoid impacts or mitigating measures including data recovery methods will be employed.
CR-2	A Monitoring and Discovery plan will be developed for the pipeline segments in New Mexico and Wyoming in consultation under the Programmatic Agreements. It defines stipulations and procedures for project construction to reduce or eliminate these potential impacts. Mitigation includes directing construction crews to avoid artifact collection; placing construction barriers for site protection; and notifying supervisors of the discovery of cultural features or artifacts.
CR-3	The mitigation measure for potential impacts to the Overland Trail is to avoid it by rerouting to the south or into the disturbed pipeline corridor.

Socio-economics	
Se-1	Mitigation of potential economic impacts to the Navajo Nation would be provided by compliance with applicable requirements of the Navajo Preference in Employment Act and the Navajo Business Preference Act.
Se-2	Mitigation would also be in the form of opportunities for construction employment.
Se-3	Impacts to communities and infrastructure would be mitigated by receipts from sales and use taxes in Wyoming and gross receipts taxes in New Mexico. Increased revenues would result from construction of the project.
Hazardous/Non-hazardous Waste	
H/N-1	Spills of hazardous waste materials would be mitigated by implementation of the SPCC Plan Mitigation Measures, summarized in Appendix D-7.
H/N-2	Mitigation of non-hazardous waste, including all debris, empty containers, and other materials would be removal and proper disposal of those items and implementing the SPCC Plan Mitigation Measures, summarized in Appendix D-7.
Pipeline Safety	
PS-1	Potential impacts to public health and safety by the project would be mitigated by implementation of, and adherence to federal safety regulations for hazardous liquid pipelines (49 CFR Part 195) which govern design, construction, and operation of hazardous liquid pipelines. Other mitigating federal regulations during other aspects of pipeline operation are 49 CFR Parts 190 (Pipeline Safety Programs; OPS Authority); 193 (Emergency Response Plans), 198 (State One-Call Damage Prevention Systems), and 199 (Drug and Alcohol Testing). Additional mitigation is provided by the recent enactment of the Integrity Management Rule for High Consequence Areas (49 CFR Part 195.452) which expanded Federal requirements for pipeline operators.
PS-2	Other mitigation is assessing pipeline integrity by conducting pre-operational hydrostatic tests of each new pipeline to ensure structural integrity prior to operation and to conduct regularly scheduled integrity assessments to assure the continued safe operating conditions. Stringent operating and maintenance procedural requirements that meet or exceed all state and Federal requirements are measures that contribute to public safety will be employed. There will be community outreach and public education programs to keep local landowners and the general public informed of the location of pipelines and potential associated hazards.
PS-3	To mitigate a release from a rupture, a rate of pressure drop alarm would be activated at the pipeline control center in Houston causing an examination of the live pressure trend and determination as to whether the pressure drop is due to a rupture. Confirmation of a rupture would require an immediate shut down of the pipeline (valve travel time is about 1.5 minutes), and an emergency response plan would be implemented immediately.

4.2 NO ACTION ALTERNATIVE

Under the no action alternative, the purpose and need of the project would not be fulfilled. Implementation of the No Action alternative would avoid approximately 2,029 acres of surface disturbance that would have occurred under the proposed Project, and short- and long-term impacts to resources identified for the proposed Project would not occur. The natural and human resources within ROWs and TUAs associated with the Project would not be directly affected nor would indirect effects occur to resources adjacent to or near Project locations. Potential tax revenues and increased payroll receipts for counties crossed by or supporting Project facilities would not be provided. Additional economic consequences of a No Action alternative selection would be:

- Delays in moving produced NGLs to market,
- Potential reduction in competition among NGLs suppliers because of transportation system constraints, and
- More expensive transportation alternatives would likely be employed resulting in higher costs being passed on to the consumer.

The inherent cost effectiveness of a pipeline to transport NGLs compared to other means such as trucking or rail indicates that an alternative pipeline project would likely be developed resulting in the displacement of surface disturbance and construction-related impacts to another pipeline route in the Rocky Mountain states.

4.3 PROPOSED ACTION

4.3.1 Air Quality and Noise

4.3.1.1 Air Quality

Pump Stations

Fugitive dust emissions and impacts to air quality are expected to be minimal. The project includes modification of 23 pump stations along the pipeline route, to include the addition of new turbines, up-rates of existing turbines, and replacement of existing electric motors with larger horsepower motors. As an independent project not affecting the capacity of the system, two of the existing turbines at two of the stations (Edgewood and Estancia) have been replaced with electric motors. Edgewood and Estancia replacements are complete and the existing turbine at Duran will be replaced with an electric motor by the third quarter of 2005. The calculated annual emissions of nitrogen oxide (NO_x) and carbon monoxide (CO) for each of the modified pump stations are summarized in Table 4.3-1. Table 4.3-1 also provides the existing emissions for each pump station and the anticipated increase or decrease of emissions if the proposed modifications are made. Four pump stations are not anticipated to have any increase or decrease in emissions. These pump stations are the Rock Springs, Lisbon, Dolores, and Granger.

Table 4.3-1 Estimated Annual Emissions from Pump Stations Following Proposed Modifications

Pump Station Turbine/Motor	Emission Factor (grams/second)* NO$_x$	Emission Factor (grams/second)* CO	Yearly Hours of Operation	Annual Emissions (tons/year) NO$_x$	Annual Emissions (tons/year) CO
Pine Butte					
600 HP Electric Motor	N/A	N/A	8760	None	None
	Proposed Pump Station Emissions			**0**	**0**
	Existing Pump Station Emissions			**0**	**0**
	Increase/Decrease over Existing			**0**	**0**
Tipton					
600 HP Electric Motor	N/A	N/A	8760	None	None
	Proposed Pump Station Emissions			**0**	**0**
	Existing Pump Station Emissions			**0**	**0**
	Increase/Decrease over Existing			**0**	**0**
Dinosaur					
Solar Saturn T1602	0.743	0.904	8760	25.8	31.4
Solar Saturn T1602	0.743	0.904	8760	25.8	31.4
	Proposed Pump Station Emissions			**51.6**	**62.8**
	Existing Pump Station Emissions			**86.65**	**77.5**
	Increase/Decrease over Existing			**-35.05**	**-14.7**
Dragon					
Solar Saturn T1300	0.586	0.945	8760	20.4	32.8
Solar Saturn T1300	0.586	0.945	8760	20.4	32.8
Solar Saturn T1602	0.734	0.894	8760	25.5	31.1
	Proposed Pump Station Emissions			**66.3**	**96.7**
	Existing Pump Station Emissions			**61.11**	**98.55**
	Increase/Decrease over Existing			**5.19**	**-1.85**
Harley Dome					
Solar Saturn T1300	0.983	2.314	8760	34.2	80.4
Solar Saturn T1302	0.991	0.402	8760	34.5	14.0
	Proposed Pump Station Emissions			**68.7**	**74.4**
	Existing Pump Station Emissions			**18.96**	**80.37**
	Increase/Decrease over Existing			**49.74**	**-5.97**
Thompson					
Solar Saturn T1302	0.982	0.399	8760	34.1	13.9
Solar Saturn T1302	0.982	0.399	8760	34.1	13.9
Solar Saturn T1302	0.982	0.399	8760	34.1	13.9
	Proposed Pump Station Emissions			**102.3**	**41.7**
	Existing Pump Station Emissions			**59.13**	**85.41**
	Increase/Decrease over Existing			**43.17**	**-43.71**
Moab					
Solar Saturn T1300	0.955	0.774	8760	33.2	26.9
Solar Saturn T1302	0.984	0.400	8760	34.2	13.9
Solar Saturn T1302	0.984	0.400	8760	34.2	13.9
	Proposed Pump Station Emissions			**101.6**	**54.7**
	Existing Pump Station Emissions			**87.03**	**77.82**
	Increase/Decrease over Existing			**14.57**	**-23.12**
Dove Creek					
Solar Saturn T1300	0.472	0.953	8760	16.4	33.1
Solar Saturn T1302	0.918	0.373	8760	31.9	13.0
	Proposed Pump Station Emissions			**48.3**	**46.1`**

Pump Station Turbine/Motor	Emission Factor (grams/second)*		Yearly Hours of Operation	Annual Emissions (tons/year)	
	NO_x	CO		NO_x	CO
	Existing Pump Station Emissions			**16.4**	**33.1**
	Increase/Decrease over Existing			**31.9**	**13.0**
Ignacio					
Solar Saturn T1602	0.7094	0.8644	8760	24.7	30.0
	Proposed Pump Station Emissions			**24.7**	**30.0**
	Existing Pump Station Emissions			**16.4**	**31.1**
	Increase/Decrease over Existing			**8.3**	**-1.1**
Huerfano					
Solar Saturn T1300	0.5178	0.8198	8760	18	28.5
Solar Saturn T1300	0.5178	0.8198	8760	18	28.5
Solar Saturn T1602	0.7106	0.8656	8760	24.7	30.08
Solar Saturn T1602	0.7106	0.8656	8760	24.7	30.08
Solar Saturn T1602	0.7106	0.8656	8760	24.7	30.08
Solar Saturn T1602	0.7106	0.8656	8760	24.7	30.08
	Proposed Pump Station Emissions			**134.8**	**177.32**
	Existing Pump Station Emissions			**72**	**114**
	Increase/Decrease over Existing			**62.8**	**63.32**
Lybrook					
Solar Saturn T1602	0.6943	0.8455	8760	24.2	29.4
Solar Saturn T1600	0.6674	0.5034	8760	23.2	17.5
Solar Saturn T1600	0.6674	0.5034	8760	23.2	17.5
Solar Saturn T1600	0.6674	0.5034	8760	23.2	17.5
	Proposed Pump Station Emissions			**93.8**	**81.9**
	Existing Pump Station Emissions			**69.63**	**52.56**
	Increase/Decrease over Existing			**24.17**	**29.34**
San Luis					
Solar Saturn T1300	0.5667	0.8716	8760	19.7	30.3
Solar Saturn T1300	0.5667	0.8716	8760	19.7	30.3
Solar Saturn T1602	0.7119	0.8669	8760	24.74	30.1
Solar Saturn T1602	0.7119	0.8669	8760	24.74	30.1
Solar Saturn T1602	0.7119	0.8669	8760	24.74	30.1
Solar Saturn T1602	0.7119	0.8669	8760	24.74	30.1
	Proposed Pump Station Emissions			**138.4**	**181.0**
	Existing Pump Station Emissions			**98.5**	**151.5**
	Increase/Decrease over Existing			**39.9**	**29.5**
San Ysidro					
Solar Saturn T1602	0.7396	0.9009	8760	25.7	31.3
Solar Saturn T1400	0.63	0.9464	8760	21.9	32.9
Solar Saturn T1602	0.7396	0.9009	8760	25.7	31.3
Solar Saturn T1602	0.7396	0.9009	8760	25.7	31.3
Solar Saturn T1602	0.7396	0.9009	8760	25.7	31.3
	Proposed Pump Station Emissions			**124.7**	**158.1**
	Existing Pump Station Emissions			**87.6**	**131.6**
	Increase/Decrease over Existing			**37.1**	**26.5**
Edgewood **					
TECO Elec Motor 1250	N/A	N/A	8760	None	None
TECO Elec Motor 1250	N/A	N/A	8760	None	None
TECO Elec Motor 1250	N/A	N/A	8760	None	None
	Proposed Pump Station Emissions			**0**	**0**
	Existing Pump Station Emissions			**65.7**	**98.6**

Pump Station Turbine/Motor	Emission Factor (grams/second)*		Yearly Hours of Operation	Annual Emissions (tons/year)	
	NO_x	CO		NO_x	CO
	Increase/Decrease over Existing			**-65.7**	**-98.6**
Estancia **					
Solar Saturn T1400	0.63	0.9464	8760	21.9	32.9
TECO Elec Motor 1250	N/A	N/A	8760	None	None
TECO Elec Motor 1250	N/A	N/A	8760	None	None
TECO Elec Motor 1250	N/A	N/A	8760	None	None
	Proposed Pump Station Emissions			**21.9**	**21.9**
	Existing Pump Station Emissions			**87.6**	**131.6**
	Increase/Decrease over Existing			**-65.7**	**-109.7**
Duran **					
Solar Saturn T1300	0.63	0.9464	8760	21.9	32.9
TECO Elec Motor 1250	N/A	N/A	8760	None	None
TECO Elec Motor 1250	N/A	N/A	8760	None	None
TECO Elec Motor 1250	N/A	N/A	8760	None	None
	Proposed Pump Station Emissions			**21.9**	**21.9**
	Existing Pump Station Emissions			**109.5**	**164.3**
	Increase/Decrease over Existing			**-87.6**	**-142.4**
Mesa					
Solar Saturn T1602	0.7661	0.9337	8760	26.6	32.4
Solar Saturn T1602	0.7661	0.9337	8760	26.6	32.4
Solar Saturn T1402	0.63	0.9464	8760	21.9	32.9
Solar Saturn T1602	0.7661	0.9337	8760	26.6	32.4
Solar Saturn T1602	0.7661	0.9337	8760	26.6	32.4
	Proposed Pump Station Emissions			**128.3**	**162.5**
	Existing Pump Station Emissions			**65.7**	**98.7**
	Increase/Decrease over Existing			**62.6**	**63.8**
White Lakes					
Solar Saturn T1602	0.7837	0.9551	8760	27.3	33.2
Solar Saturn T1602	0.7837	0.9551	8760	27.3	33.2
Solar Saturn T1602	0.7837	0.9551	8760	27.3	33.2
Solar Saturn T1602	0.7837	0.9551	8760	27.3	33.2
Solar Saturn T1602	0.7837	0.9551	8760	27.3	33.2
	Proposed Pump Station Emissions			**136.5**	**166.0**
	Existing Pump Station Emissions			**72**	**94.8**
	Increase/Decrease over Existing			**64.5**	**71.2**
Caprock					
Solar Saturn T1602	0.7729	0.9406	8760	26.8	32.7
Solar Saturn T1602	0.7729	0.9406	8760	26.8	32.7
Solar Saturn T1602	0.7729	0,9406	8760	26.8	32.7
Solar Saturn T1602	0.7729	0,9406	8760	26.8	32.7
Solar Saturn T1602	0.7729	0,9406	8760	26.8	32.7
	Proposed Pump Station Emissions			**134**	**163.5**
	Existing Pump Station Emissions			**54**	**71.1**
	Increase/Decrease over Existing			**80**	**92.4**

** Emission factors for the new turbines are based on data provided by the manufacturer for the maximum rate emissions at 0° F (the worst cast scenario). Emission rates for the existing turbines were taken from the permit.*

*** Three of the existing turbines at these pump stations are being converted to electric motors under another project, therefore, the annual emissions will decrease.*

As indicated in Table 4.3-1, emissions of nitrogen oxides and carbon monoxide will decrease at the Duran, Estancia, and Edgewood pump stations. Three of the turbines at these three pump stations are being replaced with TECO Westinghouse electric motors eliminating combustion emissions. This replacement is independent of the proposed WEP Project and is expected to be completed prior to commencement of WEP Project construction. The Tipton and Pine Butte pump stations will remain electric and, therefore, will not emit any combustion related pollutants. The nitrogen oxide and carbon monoxide emissions from the remaining 15 pump stations will increase due to the addition of new turbines and up-rates of existing drivers. The impacts to ambient air quality associated with the modified pump station sources were evaluated by models. Based on the state, size of the source, and permit application requirements, an ISC3 or SCREEN3 model was utilized to evaluate the potential impacts.

Ambient impact analyses for NO_2 were conducted to evaluate facility emission impacts at the Huerfano, Caprock, Lybrook, Mesa, San Luis, San Ysidro, and White Lakes pump stations. The ISC3 Model incorporated USGS 7.5-minute digital evaluation models and Golden Software's Surfer program to produce the receptor grid. Existing source information and meteorological data were obtained from the New Mexico Environment Department, Air Quality Bureau. All NO_2 modeling results were adjusted by a factor of 0.75 to account for partial conversion of NO to NO_2 for the federal annual standard and by a factor of 0.4 for the New Mexico 24-hour state standard as set forth by the ambient ratio method (ARM). No NO_2 background value was added to ARM-corrected values, as the ambient air increment is the limiting case. The maximum 24-hour and annual NO_2 predicted concentrations within the facilities' radius of impact are listed in Table 4.3-2a. This table also provides the maximum 24-hour and annual NO_2 predicted concentrations for all sources around the pump station facilities. Ambient concentrations of CO were anticipated to be well below National and State ambient air quality standards, therefore, no direct CO modeling was conducted. Source-specific CO ambient concentrations were estimated by correcting the 24-hour source-specific NO_x modeling results. The 1-hour and 8-hour calculated CO concentrations are also provided in Table 4.3-2a.

Table 4.3-2a ISC3 Modeling Results Summary

Pump Station Facility	NO_2 - 24 –Hour			NO_2 – Annual			Facility-Only CO Impacts*	
	All Sources Conc. (μg/m^3)	Facility Only Conc. (μg/m^3)	Radius of Impact	All Sources Conc. (μg/m^3)	Facility Only Conc. (μg/m^3)	Radius of Impact	1-Hr	8-Hr
Huerfano	95.78	14.88	5.2	56.54	7.31	16.2	113.46	79.42
Lybrook **	**488.68**	18.20	3.7	**160.26**	5.68	4.6	167.31	117.12
San Luis	103.22	103	2.5	16.50	16.03	2.2	818.35	572.84
San Ysidro	28.49	28.11	5.0	9.53	9.18	6.1	222.54	155.78
Mesa	15.20	15.20	15.0	1.1	2.88	2.26	118.87	83.21
White Lakes	26.23	25.72	2.0	5.50	4.50	2.7	195.90	137.13
Caprock	20.83	17.91	1.8	5.87	2.41	3.2	91.86	64.30

** All CO impacts are less than National and State ambient air quality standards.*
***Bold indicates that concentration exceeds the ambient standard. "Facility Only" impacts are less than National and State ambient air quality standards.*

Based on the ISC3 modeling results summarized in Table 4.3-2a, NO_2 concentrations comply with ambient air quality standards with one exception. The predicted NO_2 concentrations for all sources around the Lybrook facility indicated an elevated 24-hour and Annual NO_2 concentrations of 488.68 µg/m^3 and 160.26 µg/m^3, respectively. The model results also demonstrate that the Lybrook facility contributes very little to these predicted elevated concentrations. The calculated CO impacts are also less than ambient air quality standards. Emissions from the Huerfano, Caprock, Lybrook, Mesa, San Luis, San Ysidro, and White Lakes pump stations will comply with National and State ambient air quality standards.

Emissions of NO_x and CO at the Dinosaur, Dragon Harley Dome, Moab, Thompson, Dove Creek, and Ignacio pump stations were modeled to determine if they could cause or contribute to exceedances of the ambient standards. The SCREEN3 (EPA, 1996) was used to predict maximum NO_2 and CO concentrations at each of the pump stations. All NO_2 modeling results were adjusted by a factor of 0.75 to account for partial conversion of NO to NO_2 as set forth by the ARM. Table 4.3-2b contains the SCREEN3 modeling results.

Table 4.3-2b SCREEN3 Modeling Results Summary

Pump Station Facility	Max NO_2 Concentration (µg/m^3)	Distance from Facility (m)	Radius of Impact (m)	Max 1-Hr CO Concentration (µg/m^3)	Max 8-Hr CO Concentration (µg/m^3)	Distance from Facility (m)
Dinosaur	4.16	192	1250	84.35	59.05	192
Dragon	6.93	411	2000	170.38	119.26	411
Harley Dome	6.99	150	2000	171.25	119.88	150
Moab	24.55	194	>10,000	158.18	110.72	194
Thompson	9.77	175	>10,000	244.72	171.30	761
Dove Creek	5.2	150	2000	84.48	59.14	150
Ignacio	2.13	175	487	43.16	30.21	175

Actual ambient NO_2 and CO concentrations in the affected counties were not available as monitoring has not been conducted. Based on the SCREEN3 modeling results indicated in Table 4.3-2b, however, the total ambient concentrations are anticipated to be below the annual NO_2 national and state ambient air quality standards of 100 µg/m^3. The SCREEN3 model results shown in Table 4.3-2b also include the maximum allowable impacts for CO (1-hour and 8-hour). These values are well below the ambient air quality standards of 40,000 µg/m^3 (1-hour) and 10,000 µg/m^3 (8-hour). Emissions from the Dinosaur, Dragon Harley Dome, Moab, Thompson, Dove Creek, and Ignacio pump stations will comply with national and state ambient air quality standards.

Thirty foot stack heights from ground elevation were used in the models for existing turbines. For the new turbines, 20 foot stack heights were used. Other modeling parameters such as source strength, temperature, velocity, and stack diameter were based on manufacturer data sheets and permits for the existing turbines. The turbines modeled by the SCREEN3 method assumed 20-foot stack heights.

Pipeline Segments

The anticipated air impacts associated with pipeline construction will result from vehicle and heavy equipment/construction equipment exhaust emissions and elevated levels of particulates associated with construction activities. Increases in levels of fugitive dust will be temporary at any location. The construction site will be temporally and spatially changing as trenching and pipe installation take place along the route. Elevated fugitive dust levels and exhaust emissions at any particular location are expected to be relatively brief as the duration of construction in Wyoming is three months and four months in New Mexico. Construction activities in Colorado and Utah associated with pump station modifications are anticipated to be brief in duration.

Elevated fugitive dust emissions will result from increased vehicle travel on the non-paved gravel and dirt roads used to access the pipeline route and pump stations and from pipeline construction activities and will be mitigated with dust suppression. The local fugitive dust emissions generated from pipeline construction and increased traffic will be temporary and generally limited to daylight hours. Construction activities are not expected to lead to exceedances of any particulate air quality standards.

4.3.1.1.1 Visibility

No impacts to visibility are anticipated. No accidental emissions affecting visibility are expected to be associated with routine pipeline operation because the pipeline will be buried.

The Class I areas near the project were identified in Table 3.2-4 and included several national parks and wilderness areas. The potential emission sources, including construction activities and pump stations will not be major sources, eliminating the need to conduct a Class I visibility or other impact analysis.

4.3.1.2 Sound Quality

Pump Stations

Modification of the 23 stations will include addition of new turbines, up-rates of exiting turbines, and replacement of existing electric motors with larger horsepower motors. In addition, as noted in Section 4.3.1.1, three existing turbines at three of the stations (Edgewood, Estancia, and Duran) are currently being replaced with electric motors. Edgewood and Estancia are complete and Duran will be complete by 3rd quarter. This turbine replacement is an independent project not affecting the capacity of the system and is expected to be completed prior to the start of MAPL WEP construction. Some of these modifications will result in a decrease in noise levels, while others may increase noise levels. Table 4.3-3 lists the calculated noise levels for the existing turbine or electric motor configurations and the proposed configurations once the pump stations are modified. Noise level estimates for each of the pump stations were performed to quantify the noise level increases or decreases associated with the pump station modifications. Noise data was provided by the turbine and electric motor manufacturers. The noise level calculations include losses due to inlet and exhaust silencers and corrections associated with exhaust stacks. All noise calculations were corrected to the A-weighted octave band for human receptors.

Based on the calculated noise levels for each of the pump stations, the increases and decreases are generally small and are anticipated to be imperceptible. The calculated noise levels are also higher than actual noise levels collected at Edgewood, Estancia, and Duran during April 2004. Based on this comparison, the calculated noise levels are conservatively high. Noise levels at the modified pump stations will meet EPA's guideline of 55 dBA for outdoor locations "in which quiet is a basis for use" at one-half mile from the pump station. Although all the pump stations will meet this EPA guideline at a distance of one-half mile, it may not be applicable to all of the pump stations. The 55 dBA guideline was developed for outdoor locations "in which quiet is the basis for use". Therefore, the guideline may not be applicable to pump stations adjacent to highways or located in industrial settings. Generally, there are no residents or noise receptors in the vicinity of the pump stations. The closest receptor to the pump stations, a residence located approximately 300 feet from the Lybrook Pump Station, may experience an increase of 1.4 dbA as a result of the modifications, a negligible increase in noise level. Based the minimal noise increases and conservative nature of the noise calculations, noise impacts from the pump station modifications are not anticipated.

Pipeline

Another source of noise impacts will result from the heavy equipment and increased traffic associated with constructing the pipeline. Noise impacts during the construction phase will be temporary at any one location. The construction site will be temporally and spatially changing as trenching and installation take place along the route. Elevated noise levels at any particular location are expected to be relatively brief as the construction duration for the Wyoming portion of the pipeline is anticipated to take three months and for the New Mexico portion, four months. Based on an average noise level of 85 dBA measured at 50 feet from a typical construction site, the expected noise level will not impact any known receptors with the exception of the construction crew. OSHA noise regulations and guidelines will protect workers from adverse impacts resulting from exposure to noise originating from machinery, equipment, and tools. Therefore, no noise impacts are expected to result from pipeline construction activities.

Pipeline construction would cause truck traffic to increase slightly. Noise emanating from truck traffic, 56 to 75 dBA, is considerably less than noise generated by construction activities at 85 dBA. Truck traffic will be variable and transient. Occasionally, there will be additional traffic associated with pipeline operation and maintenance. However, this small incremental increase in traffic is not expected to be noticeable.

Most researchers agree that noise can affect an animal's physiology and behavior especially if it becomes a chronic stress (Radle, n.d.). However, the temporary increase in noise associated with pipeline construction is not expected to be significant to wildlife (Bowles, 1995).

Table 4.3-3 Existing and Planned Pump Station Noise Levels

Pump Station/ Distance	Existing Pump Station Noise *(dBA)	Modified Pump Station Noise (dBA)	Increase/Decrease over Existing **(dBA)
Granger			
At pump station 50ft from source	83.7	83.7	0.0
½ mile from pump station	49.9	49.9	0.0

Pump Station/ Distance	Existing Pump Station Noise *(dBA)	Modified Pump Station Noise (dBA)	Increase/Decrease over Existing **(dBA)
1 mile from pump station	45.4	45.4	0.0
Tipton			
At pump station 50ft from source	61.4	61.4	0.0
½ mile from pump station	41.6	41.6	0.0
1 mile from pump station	41.4	41.4	0.0
Pine Butte			
At pump station 50ft from source	61.4	61.4	0.0
½ mile from pump station	41.6	41.6	0.0
1 mile from pump station	41.4	41.4	0.0
Rock Springs			
At pump station 50ft from source	86.0	86.0	0.0
½ mile from pump station	52.0	52.0	0.0
1 mile from pump station	47.0	47.0	0.0
Dinosaur			
At pump station 50ft from source	83.0	84.3	1.3
½ mile from pump station	49.3	50.4	1.1
1 mile from pump station	45.0	45.8	0.8
Dragon			
At pump station 50ft from source	84.8	85.2	0.5
½ mile from pump station	50.8	51.3	0.4
1 mile from pump station	46.1	46.4	0.3
Harley Dome* **			
At pump station 50ft from source	84.8	83.0	-1.8
½ mile from pump station	50.8	49.3	-1.5
1 mile from pump station	46.1	45.0	-1.1
Thompson			
At pump station 50ft from source	84.8	84.8	0.0
½ mile from pump station	50.8	50.8	0.0
1 mile from pump station	46.1	46.1	0.0
Moab			
At pump station 50ft from source	83.0	85.0	2.0
½ mile from pump station	49.3	51.1	1.7
1 mile from pump station	45.0	46.3	1.2
Lisbon			
At pump station 50ft from source	84.8	84.8	0.0
½ mile from pump station	50.8	50.8	0.0
1 mile from pump station	46.1	46.1	0.0
Dove Creek			
At pump station 50ft from source	80.0	83.4	3.4
½ mile from pump station	47.0	49.6	2.7
1 mile from pump station	43.6	45.2	1.6
Dolores			
At pump station 50ft from source	84.8	84.8	0.0
½ mile from pump station	50.8	50.8	0.0
1 mile from pump station	46.1	46.1	0.0
Ignacio			
At pump station 50ft from source	80.0	81.3	1.3
½ mile from pump station	47.0	47.9	1.0
1 mile from pump station	43.6	44.1	0.6
Huerfano			
At pump station 50ft from source	86.0	89.1	3.1

Pump Station/ Distance	Existing Pump Station Noise *(dBA)	Modified Pump Station Noise (dBA)	Increase/Decrease over Existing **(dBA)
½ mile from pump station	52.0	54.9	2.9
1 mile from pump station	47.0	49.4	2.5
Lybrook			
At pump station 50ft from source	86.1	87.5	1.4
300 feet from pump station	70.5	71.9	1.4
½ mile from pump station	52.0	53.3	1.3
1 mile from pump station	47.0	48.1	1.1
San Luis			
At pump station 50ft from source	87.0	88.8	1.8
½ mile from pump station	52.9	54.6	1.7
1 mile from pump station	47.7	49.2	1.5
San Ysidro			
At pump station 50ft from source	86.0	88.2	2.2
½ mile from pump station	52.0	54.0	2.0
1 mile from pump station	47.0	48.7	1.7
Edgewood			
At pump station 50ft from source	(69.2) 84.8	80.2	-4.6
½ mile from pump station	50.8	47.1	-3.8
1 mile from pump station	46.1	43.6	-2.5
Estancia			
At pump station 50ft from source	(70.3) 86.0	80.2	-5.8
½ mile from pump station	52.0	47.1	-4.9
1 mile from pump station	47.0	43.6	-3.3
Duran			
At pump station 50ft from source	(81.4) 87.0	80.2	-6.8
½ mile from pump station	52.9	47.1	-5.8
1 mile from pump station	47.7	43.6	-4.0
Mesa			
At pump station 50ft from source	84.8	88.4	3.6
½ mile from pump station	50.8	54.2	3.3
1 mile from pump station	46.1	48.8	2.7
White Lakes			
At pump station 50ft from source	86.0	89.1	3.1
½ mile from pump station	52.0	54.9	2.9
1 mile from pump station	47.0	49.4	2.5
Caprock			
At pump station 50ft from source	84.8	88.6	3.8
½ mile from pump station	50.8	54.4	3.5
1 mile from pump station	46.1	49	2.9

** Actual noise level readings are shown in ( ) and were taken on April 7, 2004.*

*** Negative numbers indicate a decrease in noise levels.*

****Harley Dome noise levels decrease because the site is currently permitted for three T1302 engines even though there is only one engine installed. Therefore, the calculations were based on three engines. The Modified Pump Station Noise was calculated for the two T1302s which will be used at the modified site.*

4.3.2 Geological Resources

4.3.2.1 Geological Hazards

Direct and indirect effects related to geological hazards from implementation of the proposed Project are likely to be those natural conditions and events that would affect the pipeline and pump stations. There is less likelihood that the Project would have an effect on geological hazard conditions. However, the Project could increase the potential for a hazardous event such as a landslide or sinkhole development resulting from rock and/or soil excavations or surface activity by heavy equipment in a high risk area.

Earthquake activity

The areas where the pipeline segments are located are predicted to experience seismic events no greater than Intensity VI or VII. Pipeline damage can result from earthquake-related seismic wave propagation. For an Intensity VII earthquake, less than 0.0001 repairs per 1,000 feet are predicted for steel pipe with arc-welded joints (O'Rourke and Liu, 1999). As a result, earthquake hazards for the proposed pipeline are expected to be minimal even for the largest intensity earthquake predicted for the areas where the new segments are to be constructed.

Landslide areas

Segment 6 crosses a landslide area for 0.3 miles on the southwest slope of Miller Mountain (between AM 855.6 and 855.9). The proposed line through this area parallels existing pipelines which reportedly have experienced no problems with slope instability. However, the proposed line would be located 25 feet east and upslope of the most easterly line in the corridor and would, therefore, cut into more of the slide toes. There is a potential for instability on the 10-20 percent side slopes which would be crossed by the pipeline. This instability could be aggravated by heavy precipitation and/or a seismic event. Minor unstable slope areas are found in Segment 8, approximately two miles south of Lybrook, New Mexico (between AM 367 and 369). Special construction techniques would be required in landslide and unstable slope areas to prevent construction-induced slope failures and protect the long-term integrity of the pipe.

Karst terrain

Segments 10 and 11 in New Mexico cross areas underlain by the Permian-age San Andres and Yeso formations which have karst characteristics that sometimes result in surficial collapse features (sinkholes). These features result from collapse of surficial materials into underlying cave passages within limestone and gypsum bedrock. Table 4.3-4 shows the acreages of permanent ROW and linear temporary use areas (TUAa) potentially affected by karst bedrock conditions. A total of 133.6 acres of the 75-foot-wide ROW and linear TUAs is subject to potential karst problems.

No sinkholes are present within the existing pipeline corridor to be shared by the proposed segments although they were observed approximately ¼ mile from the corridor during 2004 field surveys. The potential for heavy equipment and pipe to trigger a collapse in karst terrain requires mitigation in the event that karst-related problems are encountered during construction.

If surface subsidence or collapse occurs during construction, work would stop immediately. Equipment would be removed from the area, if possible, and the pipe would be inspected for damage. Possible site-specific mitigation measures include fencing of new collapse structures to keep out people, animals, and equipment; and re-routing the proposed pipeline.

Table 4.3-4 Areas of MAPL WEP ROW Potentially Affected by Karst Conditions

Segment	Approximate aerial markers	Acres of ROW crossing mapped karst terrain
10	188.6 – 191.0	21.8
10	194.1 – 196.3	20.0
10	222.0 – 223.3	11.8
11	127.5 – 128.0	4.5
11	130.5 – 136.7	56.4
11	137.9 – 140.0	19.1

4.3.2.2 Mineral Resources

Disruption of oil and gas operations

Six of the 12 proposed pipeline segments would cross active oil and gas fields. The new pipeline would likely not interfere with existing operations since it parallels an existing pipeline corridor. Pipeline construction could temporarily disrupt access to well sites by oil and gas field service vehicles. MAPL would stay in communication with operators to ensure that any disruption is minimal and short-term. The new pipeline segments are not expected to interfere with future oil and gas operations because of flexibility in locating well pads and supporting infrastructure.

Disruption of coal resource development

The proposed segments would not interfere with active surface or underground coal mines as none are located in the immediate vicinity. Although coal resources are located beneath portions of seven of the pipeline segments, most reserves in these areas are too deep to mine economically for the foreseeable future. As with conventional gas wells, there is flexibility in locating coal bed methane wells to exploit the large reserves beneath the Wyoming segments and Segment 8 in New Mexico. Thus, the proposed pipeline would not preclude future coal bed methane extraction along the pipeline segments.

Disruption of sand and gravel extraction

Segment 9 of the pipeline would be constructed immediately south of a large alluvial sand and gravel extraction facility in the Rio Grande Valley (AM 279.8 – 280.0). Construction and operation of the new pipeline would not interfere with operations at the facility, and access to it would be maintained during construction. Sand and gravel resource areas are crossed by six of the 12 proposed pipeline segments. Because the segments would parallel and overlap existing pipeline rights-of-way, there would be no significant impact on future development of these resources. Sand and gravel extraction is already precluded from the area immediately adjacent to the existing pipeline corridor and proposed ROW for the MAPL WEP pipeline segments.

Disruption of other mineral mining activities

Although trona is actively mined in the vicinity of Segments 1 and 2, construction and operation of these segments would not interfere with present or projected operations. There is flexibility in locating surface facilities, and mining takes place well below the pipeline trench depth. There are other mineral resources present in some of the pipeline segment areas. These resources are not currently mined in the vicinity of the segment corridors, however, and there are no current plans to exploit them in these areas.

4.3.2.3 Paleontological Resources

The proposed Project would cross approximately 55.1 miles of Condition 1 formations in Wyoming and approximately 65.5 miles in New Mexico. Pedestrian surveys of the proposed ROW in Wyoming and of pipeline ROWs in the vicinity have not identified fossils of scientific importance. However, there is the possibility that trench excavation which disturbed bedrock could result in the discovery of such remains. Assuming a trench width of 5 feet, approximately 33 acres of Condition 1 formations would be potentially affected by trenching in Wyoming and approximately 40 acres in New Mexico. MAPL would comply with recommended monitoring and data recovery plans on BLM land (surface ownership) as indicated in Summary of Paleontology Resources Mitigation Measures (Appendix D-9).

In New Mexico, BLM has not required pedestrian surveys to evaluate paleontologic potential. BLM would require monitoring of construction activities on all BLM lands in the Condition 1 Nacimento and San Jose Formations (all BLM lands on Segment 8, including the Lybrook Fossil Area) and the last portion of Segment 9 which crosses a small portion of BLM land where Condition 1 Santa Fe Group occurs. Although Segment 13 crosses Condition 1 Ogallala, no BLM surface-owned land is crossed by the segment (Appendix E Summary Table). Paleontological monitoring and data recovery requirements over most of Segment 9 would be the responsibility of tribal governments and the BIA, and MAPL would comply with their requirements. A table of Condition 1 formations crossed by the Project has been included in Appendix E.

By complying with monitoring and data recovery plans, loss of scientifically important paleontological information is not anticipated.

4.3.3 Soils

Key issues related to potential impacts on soils from implementation of the proposed Project are potential accelerated erosion and soil loss, shallow soils and depth to bedrock, limited revegetation potential, and disturbance of biological soil crusts.

4.3.3.1 Accelerated Erosion

Soils with severe or very severe water erosion hazard potential, if disturbed, are identified by milepost and soils association/mapping unit in Table 4.3-5. Up to 875.3 acres of soils with this constraint would be exposed during construction. Construction of buried pipelines can lead to some acceleration of soil erosion and associated soil loss due to the removal of the protective layer of vegetation Precipitation and runoff water can then more easily dislodge and entrain soil particles. Water runs off the surface more rapidly without vegetation impeding its flow. Increased flow velocity enables water to carry more soil sediment in suspension.

Surface rills and gullies more easily form in bare, disturbed soil. As a result, topsoil is lost and stream sedimentation results. Water erosion is typically accelerated by steeper slopes, low permeability soils, and surface disturbance by cattle, conditions which are present in portions of the proposed pipeline segments. Water erosion can continue to be a problem even after the completion of construction and ROW reclamation until new vegetation is successfully established. This process can take several years in some of the arid areas where proposed pipeline construction would occur.

Accelerated water erosion would be mitigated by erosion control measures described in the SWPPP (summarized in Appendix D-3) and the BLM/BIA construction guidelines. These measures would include use of both temporary erosion control during construction and permanent post-construction erosion control. Measures would include use and regular maintenance of silt fences, slope breakers, mulch, and geotextile fabric, where appropriate. Water erosion control would commence immediately following ROW clearing and grading and would continue until adequate vegetation is successfully restored. Erosion would also be reduced by minimizing the time between ROW clearing and the completion of ROW restoration.

Table 4.3-5 also lists aerial marker intervals for soil associations comprised of some soils with high or very high wind erosion hazards. Up to 261.5 acres of soils with this constraint would be exposed during construction. Pipeline construction may accelerate wind erosion particularly in areas of disturbed fine sandy soils. When vegetation is removed from the ROW during construction, wind can more easily dislodge fine sands. Sand dunes which were stabilized by vegetation can become active and migrate. As a result, thin, sandy topsoils can be lost and blowouts to greater soil depths can occur exposing buried pipe. Wind erosion is aggravated where areas surrounding the ROW have little vegetation to act as a windbreak, a condition which exists along lengthy portions of the proposed pipeline segments.

The methods for water erosion control described above also mitigate wind erosion. Additional measures which target wind erosion would be used where needed. These include snow fences, gravel mulches, and geofabric mulches. Any sections of existing or new pipe exposed by wind erosion would also be reburied.

4.3.3.2 Shallow Soils

Table 4.3-5 lists aerial marker intervals for associations comprised of some soils with less than 40 inches depth to bedrock. Up to 729 acres of soils with this constraint would be cleared during construction. There are potential environmental and construction issues related to shallow soils. First, trenching may encounter bedrock in areas of shallow soils. Assuming a 5-foot-wide trench, up to 74 acres of shallow depth to bedrock could be encountered by trenching. Blasting is not anticipated to be required but may be necessary in some of these areas. Most of the relatively soft sedimentary bedrock which will likely be encountered would be excavated with large tracked backhoes (track-hoes or excavators) or special trenchers without blasting. Whether bedrock is removed by blasting or excavation, paleontological resources may be encountered.

Table 4.3-5 Limitations/Constraints to Post-Construction Stabilization and Revegetation Posed by Soils Crossed by MAPL WEP Pipeline Segments

	Severe or very severe water erosion hazard[1]	% of segment length	Possible acreage affected		High or very high wind erosion hazard[1]	% of segment length	Possible acreage affected		Shallow or moderately deep soils[1]	% of segment length	Possible acreage affected	
			Temp. Use Area	Perm. ROW			Temp. Use Area	Perm. ROW			Temp. Use Area	Perm. ROW
Wyoming												
Segment 1	0.0 – 5.4	100	32.7	16.4	0.0 – 5.4	100	32.7	16.4	0.0 – 5.4	100	32.7	16.4
Segment 2	0.0 – 18.3	100	111.1	55.6	12.3 – 13.1	4	4.4	2.2	0.0 – 12.3 13.1 – 18.3	96	106.7	53.3
Segment 3	0.0 – 7.0 8.0 – 11.7	52	72.9	36.5	7.0 – 8.0 13.0 – 23.1	48	67.3	33.7	0.0 – 5.0	22	30.8	15.4
Segment 4	0.0 – 6.8	80	41.2	20.6	0.0 – 1.5 3.0 – 8.5	82	42.2	21.1	1.5 – 3.0 6.8 – 8.5	38	19.6	9.8
Segment 5	0.0 – 9.9	100	59.5	29.7	9.1 – 9.8	7	4.2	2.1	0.0 – 9.1	73	43.4	21.7
Segment 6	0.0 – 18.6	100	112.8	79.0	none	0	0	0	1.6 – 18.6	91	102.6	71.9
New Mexico												
Segment 8	0.0 – 9.9 10.8 – 12.9	60	73.0	36.5	none	0	0	0	12.9 – 20.1	36	43.8	21.9
Segment 9	0.0 – 3.4	15	20.5	10.3	4.3 – 22.6	81	110.7	55.4	0.0 – 3.4 4.9 – 22.6	93	127.1	63.6
Segment 10	0.0 – 16.0 31.5 – 34.6	55	115.6	57.8	none	0	0	0	5.8 – 7.7 16.1 – 31.5 32.5 – 33.2	52	109.3	54.6
Segment 11	0.0 – 17.0	91	102.8	51.4	none	0	0	0	0.0 – 18.7	100	113.0	56.5
Segment 12	0.4 – 18.0	98	106.8	53.4	none	0	0	0	none	0	0	0
Segment 13	0.0 – 4.3	100	26.4	13.2	none	0	0	0	none	0	0	0
Total miles	**143.1**	**71**	**875.3**	**460.4**	**43.0**	**21**	**261.5**	**130.9**	**122.2**	**60**	**729.0**	**385.1**

[1]Aerial marker intervals represent soil associations comprised of some soil series with this constraint. In most cases, not all soils within the association have this constraint. Therefore, the "possible acreage affected" assumes that the entire soil association shares a constraint which is normally not the case (see Table 3.2-11).

Mitigation measures for paleontological resources are explained in Section 4.3.2.3 and the paleontological resources mitigation/monitoring plan summarized in Appendix D-9.

Shallow soil areas may present challenges to revegetation because the available topsoil may be thin and/or rocky. This problem would be mitigated by moving any excess topsoil from adjacent areas within the ROW into thin topsoil areas subject to landowner concurrence. Other measures which may be used include use of soil amendments or seed mixes developed specifically for shallow, rocky soils. A summary these proposed mitigation measures are summarized in Appendix D-4.

4.3.3.3 Limitations to Revegetation

Most soils crossed by the proposed Wyoming and New Mexico pipeline segments would present challenges to successful revegetation. Limiting factors include susceptibility to accelerated erosion, shallowness of the rooting zone, stoniness, low moisture-holding capacity, low fertility, high salinity, and a combination of high temperatures and low moisture. Revegetation of soils in floodplains may be hampered by periodic flooding, poor soil drainage, and a high water table. The existing low fertility of project area soils will likely be degraded further during construction by some unavoidable mixing of subsoil with topsoil and erosion of stockpiled topsoil. During and following ROW reclamation, re-spread topsoil may become compacted by equipment and precipitation before vegetation is reestablished.

Successful revegetation of disturbed portions of the ROWs would require careful selection and proper seeding with drought-resistant plant species which are compatible with local soil conditions and careful management (including erosion control). Stockpiled and re-spread topsoil would need to be protected by regularly maintained erosion control measures. Any compacted soils would need to be loosened by harrowing or disking. Even careful and diligent use of revegetation BMPs would not likely result in success in a single growing season. It may take five years or more for vegetation to become fully re-established in all areas.

4.3.3.4 Biological Soil Crusts

Clearing and grading may damage or destroy biological soil crusts. Wind-rowing the topsoil into linear stockpiles on the construction ROW would likely result in some level of damage to the crusts including crushing, breakage, overturning, and burying by the topsoil stock piles. Following topsoil replacement as part of post construction reclamation, crust reestablishment and recovery to pre-disturbance conditions would be a slow process, particularly for mosses and lichens. Recovery can begin immediately following construction but may require as much as 50 years to re-establish original thickness and up to 250 years to recover the moss and lichen component.

The degree of impact on biological soil crusts would be reduced by educating construction crews in their identification, ensuring that personnel and vehicles stay on the ROW and avoid undisturbed off-ROW areas where biological soil crusts are present. In addition, minimizing the area of construction disturbance through such areas will also reduce the area affected. MAPL would stress the importance of keeping equipment and vehicles on the ROW at all times, especially in biological soil crust areas. MAPL would commit to reclaiming disturbed areas of biological crust within one year to aid in prevention of organism death.

4.3.3.5 Soil Contamination

During construction, accidental releases of fuel, lubricants, solvents, and other hazardous materials may impact soil quality. With the unlikely exception of a fuel tanker spill or a ruptured vehicle fuel tank, most releases are expected to be relatively small, localized, easily contained, and amenable to thorough clean-up. MAPL will follow the best management practices described in their SPCC Plan (summarized in Appendix D-7) to avoid releases and minimize their impact on soil quality.

During the operation phase, a pipeline rupture could result in soil contamination by NGL. A large percentage of the release would immediately vaporize, however, and escape to the atmosphere with little contact with or absorption by soil. Any residual liquid hydrocarbons could spread over the soil surface and infiltrate depending on nature of the NGL, soil characteristics, and weather conditions. This phenomenon is explained in greater detail in the Surface Water Quality section, immediately following this section. MAPL would assume responsibility for all spill-related soil remediation should an unlikely release of NGL occur from the MAPL WEP line.

4.3.4 Water Resources

4.3.4.1 Surface Water

Quality

The proponent has committed to horizontally directional drill the Blacks Fork River and the Rio Grande using HDD techniques if conditions permit. Since this technique would be used, increased sedimentation and flow alteration typical of open trenched river crossings would not occur. In addition to directionally drilling these two rivers, segment crossings of the Bernalillo Drain, the Albuquerque Main Canal, and the Algodones Canal would also be completed using HDD. Furthermore, intermittent streams may be crossed using HDD to prevent damage in highly erosive areas. The remaining crossings would consist of intermittently flowing stream channels that would be crossed by open cut. In the event that intermittent channels contain flowing water, sediment control measures would be applied downstream of the crossing to prevent sediment from being transported outside the permanent ROW and TUAs or construction would wait until channel flows abate. Sediment would be prevented from reaching stream channels through the use of erosion control measures outlined in the SWPPP summarized in Appendix D-3. Fuels and lubricants would be stored in accordance with the Equipment Storage, Cleaning, and Maintenance Practices provided in MAPL's SPCC Plan summarized in Appendix D-7.

In the unlikely event of an HDD failure, drilling mud (bentonite) could come into contact with water in the Blacks Fork or the Rio Grande. Bentonite is a naturally occurring, non-hazardous, cohesive water absorbing clay material, and would resist suspension when exposed to flowing water. Local, increased turbidity would occur in the event of drilling mud exiting the substrate, but would be a short-term (less than 1 day) event because drilling would immediately stop if a drilling mud extrusion were observed or was assumed to have occurred because of a sudden loss of fluid pressure. The Drilling Contingency Plan (summarized in Appendix D-8) details the steps that would be taken in the event of an HDD failure.

There is a risk that an HDD failure at the Rio Grande crossing would impact the new Albuquerque Drinking Water Project (ADWP). The diversion dam for the ADWP is scheduled for construction in spring 2005, but the first drinking water is not scheduled to be diverted until late 2006 (Wilson, 2004). The current pipeline project schedule calls for the construction of Segment 9 in late 2005 or early 2006. Given this timing difference, it is unlikely that the pipeline would impact this project. If the HDD across the Rio Grande is delayed until late 2006, an emergency action plan will be in place.

Accidental releases or leaks from the pipeline could impact surface water quality by introducing hydrocarbons into soil materials followed by surface runoff or directly into surface waters. The principal risks from pipeline operations include excessive pressure and physical damage from flooding/scouring, soil erosion, corrosion, and accidental puncture. The potential for pipeline failure due to excess pressure would be minimized by engineering design controls. Operating pipelines would be monitored through periodic leakage surveys and patrols, as required by 49 CFR 195.705 and 706, to anticipate and correct problems before failures occur.

Although highly unlikely, the pipeline could leak or rupture under the Blacks Fork River or Rio Grande during pipeline operation. If such a release occurred, the majority of the product (ethane, butane, and propane fractions) would vaporize immediately and escape to the atmosphere with little contact or absorption by water. This volatilization would occur because the boiling points of these components are below freezing. They are in the liquid phase in the pipeline because of the pressure under which they have been placed. The small percentage (2-4 percent) of pentane and hexane fractions would not volatilize as rapidly, because they are lighter than and insoluble in water and would rise rapidly to the surface and volatilize relatively quickly. None of these compounds would have the opportunity to mix to any great degree with ground or surface water (BLM, 1995). Section 4.3.4.2 presents a more complete discussion of the chemical and physical properties of the natural gas liquids.

Valves would be placed in close proximity to perennial water bodies and to canals/drains crossed by the proposed pipeline segments. In the event of a pipe failure, these valves would be closed to minimize the leakage and allow for repair of the pipe. Table 4.3-6 summarizes the water bodies and the location and type of the valves nearest them.

In the event that the pipeline would require repairs within the flowing section of a river channel, there would be a short-term (minimum of several days) increase in suspended sediment as the result of flow diversion, and excavation of the affected pipe section.

During pipeline/facility construction, there is also the potential for spills of fuel, oils, and solvents. These spills would be localized and compliance with measures identified in the Project’s SPCC Plan (summarized in Appendix D-7) would minimize the occurrence and impacts of these spills.

Table 4.3-6 Valves Protecting Waterbodies Crossed by HDD for the MAPL WEP

Segment	Water Crossing	Perennial, Intermittent or Controlled	Type of Valve Upstream of Water Crossing	Distance to Upstream Valve (miles)	Type of Valve Downstream of Water Crossing	Distance to Downstream Valve (miles)
1	Unnamed tributary to Blacks Fork River	Intermittent	Mainline above ground	0.19	Mainline above ground	0.06
2	Blacks Fork River	Perennial	Mainline above ground	0.55	Mainline above ground	0.59
5	Circle Creek	Intermittent	Mainline above ground	4.9	Mainline above ground	4.81
5	Salt Wells Creek	Intermittent	Mainline above ground	0.15	Mainline above ground	0.06
9	Rio Grande	Perennial	Mainline above ground	2.8	Mainline above ground	1.0
9	Bernalillo Drain	Controlled	Mainline above ground	2.8	Mainline above ground	1.0
9	Albuquerque Main Canal	Controlled	Mainline above ground valve and check valve	3.2	Mainline above ground valve and check valve	0.6
9	Algodones Canal	Controlled	Mainline above ground valve and check valve	3.2	Mainline above ground valve and check valve	0.6

Quantity

Soil disturbance caused by construction would not alter or reduce the recharge area to springs because soil infiltration characteristics would not be changed.

For dust control and hydrostatic testing of the pipeline and facilities, approximately 8 to 25 acre-feet of water would be withdrawn from permitted sources and would be discharged in accordance with permit requirements. Ground water for this purpose would be withdrawn from permitted sources (anticipated to be municipal supplies and irrigation wells). All necessary permits would be obtained for the withdrawal and discharge of hydrostatic test water. These would include State Engineer and NPDES permits. Table 4.3-7 summarizes the water uses, possible sources, and potential discharge locations. This table provides the minimum and maximum volume of water to be used based on whether there is reuse of hydrostatic test water in multiple sections within a segment. MAPL plans to test the pipeline by segment, “pushing” and reusing test water within a segment whenever possible in order to substantially reduce total consumption, reflected by the minimum volume.

Table 4.3-7. Water Use for Dust Control and Hydrostatic Testing for the MAPL WEP

Segment	Min/Maximum Volume (Acre-feet)	Possible Water Source	Fill Location	Discharge Location
All (dust control)	1.53 (estimated)	Same as hydrostatic testing water source for each segment	N/A	ROW and unpaved access roads
All (above ground facility testing)	0.05 (assumes 48 facilities at 350 gallons per facility)	Same as hydrostatic testing water source for each segment on construction, other sources for maintenance	Above Ground Facilities	Surface discharge through dewatering structure or trucked for disposal
1	0.37/0.37	Permitted sources such as a municipality or private supplier	Granger Station	Discharge through dewatering structure at Opal meter site
2	0.42/1.27	Permitted sources such as a municipality or private supplier	Far east end, closest to the town of Green River	Discharge through dewatering structure at tie-in
3	0.28/1.01	Permitted sources such as a municipality or private supplier	Tipton Station	Discharge through dewatering structure at tie-in at Wamsutter junction
4	0.37/0.37	Permitted sources such as a municipality or private supplier	West tie-in location	Discharge through dewatering structure at east tie-in site
5	0.15/0.43	Permitted sources such as a municipality or private supplier	West tie-in location - MLV site	Discharge through dewatering structure at east tie-in site
6	0.71/2.90	Permitted sources such as a municipality or private supplier	Rock Springs Station	Discharge through dewatering structure at south tie-in site
8	0.93/3.14	Permitted sources such as a municipality or private supplier	Lybrook Station	Discharge through dewatering structure at the valve site at the south end.
9	0.96/3.51	Permitted sources such as a municipality or private supplier	San Ysidro station	Discharge through dewatering structure; dewater to crop area between I-25 and Rio Grande.
10	0.92/5.41	Permitted sources such as a municipality or private supplier	Estancia Station	Discharge through dewatering structure at valve site tie-in at south end
11	1.39/2.91	Permitted sources such as a municipality or private supplier	Mesa Station	Discharge through dewatering structure at north tie-in valve site
12	0.87/2.81	Permitted sources such as a municipality or private supplier	Mesa Station	Discharge through dewatering structure at south tie-in valve site
13	0.67/0.67	Permitted sources such as a municipality or private supplier	South Tie-in Valve site	Discharge through dewatering structure at Caprock Station

Segment	Min/Maximum Volume (Acre-feet)	Possible Water Source	Fill Location	Discharge Location
Total Volume	8.02/24.79			

4.3.4.2 Groundwater

Quality

Multiple groundwater aquifers underlie the proposed pipeline system. Vulnerability of these aquifers is a function of the depth to groundwater and the permeability of the overlying soils. Because of the interconnections between karst and groundwater systems, areas where aquifers are located in karst terrain also represent vulnerable groundwater sources.

While routine operation of the pipeline would not affect groundwater, an accidental release of hydrocarbons from a pipeline segment could migrate through the overlying surface materials and enter the groundwater. Only those compounds that do not readily volatilize at atmospheric pressure (2-4 percent of the potential release) would be left to migrate. If a release were to occur, MAPL would be responsible for monitoring groundwater to ensure that contaminants did not reach receptors.

In the unlikely event of a release, groundwater wells (non-industrial or mineral/gas exploration) within one mile of the pipeline would be potential receptors. These wells are listed in Table 4.3-8. A quantitative assessment of the potential for contamination of these or other groundwater sources follows.

NGLs, those hydrocarbons separated from methane (the primary constituent of natural gas), consist primarily of straight-chain alkanes containing two or more carbon atoms, as well as isobutane and isopentane. The majority of the NGLs are lighter alkanes, from ethane through pentane. Longer-chain hydrocarbons comprise 2-4 percent of the total volume of the NGLs proposed for transport.

As discussed in Section 4.3.4.1, the lighter hydrocarbons (ethane, butane. propane and pentane) are highly volatile and exist as liquids in the pipeline only because of the high pressures inside the pipe. In the event of a release, there would be little opportunity for these hydrocarbons to move downward through the unsaturated upper soil (vadose zone) to the water table, because they would be expected to evaporate at the surface or in the upper portion of the vadose zone prior to reaching the water table.

Table 4.3-8 Domestic Irrigation and Stock Water Wells within One Mile of the Proposed MAPL WEP Pipeline Segments

Segment	Permit Number	Well Type[1]	Legal Location	Priority Date (WY) / Date Completed (NM)	Well Depth	Static Water Depth
3	P38913W	DOM	Section 6, T19N-R95W	6/28/1977	87	40
3	P43515W	DOM	Section 6, T19N-R95W	5/24/1978	100	40

Segment	Permit Number	Well Type[1]	Legal Location	Priority Date (WY) / Date Completed (NM)	Well Depth	Static Water Depth
3	P49641W	DOM	Section 6, T19N-R95W	8/27/1979	100	60
3	P39016W	DOM	Section 6, T19N-R95W	6/20/1977	120	87
3	P65306W	DOM	Section 6, T19N-R95W	8/16/1983	120	45
3	P70476W	DOM	Section 6, T19N-R95W	6/13/1985	135	60
3	P60980W	DOM	Section 1, T19N-R96W	4/16/1982	148	45
3	P56977W	DOM	Section 1, T19N-R96W	6/2/1981	150	45
3	P82536W	STO	Section 36, T20N-R96W	5/24/1990	196	84
3	P34809W	DOM	Section 2, T19N-R97W	8/19/1976	220	70
3	P7545P	STO	Section 22, T20N-R94W	3/23/1963	240	180
3	P50389W	STO	Section 23, T20N-R93W	10/22/1979	250	50
3	P26024W	IRR, DOM	Section 1, T19N-R95W	2/27/1974	300	100
3	P59218W	STO	Section 33, T20N-R94W	1/5/1982	360	55
3	P7543P	STO	Section 33, T20N-R95W	12/31/1929	380	30
3	P9626W	DOM	Section 18, T19N-R96W	7/1/1971	380	35
3	P102711W	STO	Section 22, T20N-R94W	5/16/1996	400	50
3	P15644W	STO	Section 30, T20N-R94W	8/28/1972	400	80
3	P6209W	DOM	Section 5, T19N-R95W	7/29/1970	400	60
3	P15643W	STO	Section 35, T20N-R95W	8/28/1972	400	210
3	P35724W	STO	Section 24, T20N-R94W	12/17/1976	500	100
3	P32764W	STO	Section 17, T19N-R96W	4/2/1976	500	280
3	P59057W	STO	Section 2, T19N-R96W	9/24/1981	500	65
3	P80506W	DOM	Section 2, T19N-R96W	8/17/1989	500	65
3	P84603W	DOM, STO	Section 2, T19N-R96W	3/12/1991	500	75
3	P63763W	STO	Section 15, T19N-R96W	3/3/1983	580	130
3	P63761W	STO	Section 13, T20N-R93W	3/3/1983	620	460
3	P51482W	STO, DOM	Section 6, T19N-R95W	3/11/1980	875	40
3	P17024P	DOM	Section 34, T20N-R94W	10/24/1958	1045	94
3	P695W	IND, IRR, MIS, DOM	Section 34, T20N-R94W	3/28/1961	1046	12
4	P50387W	STO	Section 19, T19N-R97W	10/22/1979	200	80
4	P9630W	DOM	Section 19, T19N-R97W	7/1/1971	270	70
4	P74517W	STO	Section 33, T19N-R98W	4/23/1987	340	90
9	RG 59518	DOM	Section 33, T15N-R02E	5/10/1994	49	3
9	RG 57664	DOM	Section 19, T15N-R02E	8/15/1993	75	50
9	RG 63116	DOM	Section 30, T15N-R02E	9/22/1995	160	8
9	RG 00077	STK	Section 3, T13N-R03E	3/7/1957	183	140
9	RG 59589	DOM	Section 19, T15N-R02E	6/22/1994	200	37
9	RG 51529	DOM	Section 30, T13N-R05E	10/12/1989	200	128
9	RG 70478	DOM	Section 19, T13N-R05E	10/1/1998	315	235
9	RG 63228	DOM	Section 3, T13N-R03E	11/3/1995	380	170
9	RG 47847	DOM	Section 19, T15N-R02E	7/15/1987	480	80
9	RG 67202	DOM	Section 33, T14N-R03E	4/14/1997	500	320
9	RG 62868	DOM	Section 30, T13N-R05E	9/9/1995	540	380

Segment	Permit Number	Well Type[1]	Legal Location	Priority Date (WY) / Date Completed (NM)	Well Depth	Static Water Depth
10	E 01760	DOM	Section 26, T07N-R11E	11/3/1970	189	109
10	E 00436	STK	Section 21, T07N-R11E	4/10/1952	445	200
11	FS 00461	STK	Section 2, T04S-R22E	12/31/1939	50	35
11	FS 00462	STK	Section 2, T04S-R22E	12/31/1939	60	50
11	FS 00830	STK	Section 1, T04S-R22E	6/21/1995	800	700
12	FS 01135	STK	Section 21, T05S-R24E	3/1/2000	40	18
12	FS 00557	STK	Section 22, T05S-R24E	6/8/1978	411	380
12	FS 00610	STK	Section 36, T05S-R24E	12/31/1972	520	490
13	L 03338	DOM	Section 34, T12S-R33E	11/20/1956	138	90

[1] DOM = Domestic, STO or STK = Stock, IRR = Irrigation, IND = Industrial, MIS = Miscellaneous

The longer-chain hydrocarbons that make up a small portion of the natural gas liquids are also volatile, although less so than the shorter-chain hydrocarbons. As is the case with the lighter hydrocarbons, a portion of the heavier hydrocarbons would evaporate at the surface and in the vadose zone. Because these hydrocarbons have limited solubility in water, any un-evaporated hydrocarbons that reached the water table would form a layer of hydrocarbons on the top of the groundwater. A portion of the floating hydrocarbons would then dissolve into the groundwater (maximum solubility for most of these compounds is in the low part per million range), and the remainder would continue to evaporate into the vadose zone. The extent to which groundwater might be contaminated with these longer-chain hydrocarbons is, therefore, subject to a number of variables, including the volume of hydrocarbons released, the surface temperature, the porosity and permeability of the soils and bedrock, and the depth to the water table.

The toxicity of those hydrocarbons present in NGLs is considerably less than for hydrocarbons that comprise refined petroleum products (e.g. gasoline, diesel, and aviation fuels). Refined petroleum products, while consisting predominantly of alkanes, also have significant amounts of aromatic compounds, such as benzene, ethylbenzene, toluene, and xylenes. These aromatic compounds are known toxins and carcinogens, and limits on their concentration in drinking water have been established. Straight-chain hydrocarbons, such as those found in small concentrations in NGLs, are much less toxic and are not regulated under the Safe Drinking Water Act (EPA, 2004).

In summary, a release from an NGL pipeline would result in the evaporation of most, if not all, of the liquids on the surface of the ground or in the vadose zone above the water table. Under certain conditions it would be possible for a very small portion of the release to reach the water table. Because of their slight solubility in water, contamination from NGLs would be limited to a few parts-per-million. These concentrations will be further reduced by diffusion and natural attenuation further reducing the risk to potential receptors.

There is also the potential for spills of fuel, oils, and solvents during pipeline/facility construction that could enter into shallow groundwater sources. These spills would be localized and adherence to the project SPCC Plan (summarized in Appendix D-7) would minimize the occurrence and impacts of these spills.

Quantity

Most of the aquifers along the route are deep (depth to the water table more than 50 feet). Therefore, construction, operation, and maintenance of the proposed pipeline segments would not be expected to affect groundwater quantity.

A portion of the hydrostatic test water may be withdrawn from permitted groundwater sources in Wyoming and New Mexico with the rest coming from existing permitted surface water sources (Table 2.4-4). Approximately 4.9 acre-feet (1.6 million gallons) of groundwater would be used for hydrostatic testing. This groundwater withdrawn would represent less than 1 percent of the daily withdrawal from most of these sources.

4.3.4.3 Wetlands

Impacts to riparian vegetation and wetlands would be minimized by the use of mitigating measures. Measures would be taken to minimize impacts to those wetlands that would be crossed. These could include, but are not limited to, such measures as reducing the width of the construction ROW through wetlands and using matting to protect wetland soils from construction equipment.

4.3.4.4 Floodplains

Conventional construction will be used to cross approximately 1.3 miles of the 100-year floodplain northwest of the Rio Grande crossing. Thus, approximately 11.8 acres of the floodplain would be temporarily disturbed by construction. Other floodplains of major drainages would be crossed by directional drilling which would avoid surface disturbance. No floodplain alteration activities (dredging, filling, or diversions) would take place, and no permanent facilities would be constructed on the active floodplains of the major drainages to be crossed by the proposed Project (Blacks Fork River and Rio Grande). As a consequence, no long-term changes to stream channels, stream banks, and overflow areas would occur as the result of construction and operation of this pipeline.

4.3.5 Vegetation and Invasive, Non-Native Weeds

4.3.5.1 General Impacts

Impacts to vegetation would include the removal and crushing of vegetation resulting from clearing and construction activities. Clearing activities include tree cutting and shrub clearing from the permanent ROW and linear TUA prior to initiation of construction. The proposed permanent ROW for the project is 25 feet, which has all been reclaimed after previous pipelines or utilities were constructed. It is estimated that all of the permanent ROW has been previously reclaimed, or approximately 633 acres. The 50-foot wide TUA is generally not previously disturbed or reclaimed. Table 4.3-9 shows the percentage of this previously non-disturbed vegetation by cover type for each segment. Approximately 1,221 acres of previously non-disturbed lands would be cleared and graded as linear TUAs during pipeline construction as well as an additional 121 acres of other TUAs. Pipe storage yards would result in disturbance to an additional 35 acres, 13.5 of which were previously disturbed and revegetated, and 21.5 of industrial use that is generally non-vegetated. For the entire pipeline construction project, clearing and construction activities would remove or crush approximately 1,975 acres of vegetation.

Table 4.3-9 Percent of Previously Non-Disturbed Vegetation Cover Type

Segment	Percent Vegetation Cover Type					
	Sagebrush Steppe	Pinyon/ Juniper	Sand Shrub/ Grassland	Desert Grassland North	Desert Grassland South	Rio Grande Floodplain
1	95			5		
2	95			5		
3	95			5		
4	95			5		
5	85	10		5		
6	90	10		5		
8	70	30				
9		80	15			5
10		15	85			
11			100			
12			100			
13					100	

Short-term impacts to vegetation include the reduction in forage productivity and increased soil erosion rates due to reduced vegetation cover. Reclamation would be completed for all disturbed areas after pipeline construction activities are completed, therefore, approximately 1,975 acres of disturbed land would be reclaimed excluding wetlands, surface water areas (Rio Grande and Blacks Fork River), roads, and other barren areas. Specific information regarding reclamation measures is provided in the Reclamation Plan summarized in Appendix D-4. One to three years after the completion of reclamation, vegetative cover in the reclaimed areas would primarily consist of planted and weedy species. It is also anticipated that approximately three to five years after reclamation, vegetative cover in reclaimed areas would primarily consist of desirable species (i.e. plant species in the reclamation seed mixtures). Reclaimed grassland (previously disturbed areas from other pipeline projects) comprised of grass species such as western wheatgrass (*Agropyron smithii*), crested wheatgrass (*Agropyron cristatum*), thickspike wheatgrass (*Agropyron macrourus*), and Indian ricegrass (*Achnatherum hymenoides*) accounts for 36 percent of the cover type in the proposed project area. Reclamation success would depend upon several variables including soil preparation, season of seed application, and precipitation amounts after seed application. The majority of forage productivity for herbaceous species lost during construction activities would be recovered approximately five years after reclamation. Impacts to vegetation affecting forage value and visual resources would be negligible because of dust control measures implemented during construction activities. Dust control delivered via water trucks combined with occasional rain events and winds, would minimize any detrimental affects to vegetation caused by dust.

Longer-term impacts to vegetation include the loss of woody species such as juniper, pinyon pine, and shrub species during clearing activities. The re-establishment of these species is slower and dependent on precipitation and weather patterns, but can range from 5 to 20 years. These species will become re-established in time over areas not kept free of them, such as the permanent ROW. It is assumed that over a distance of approximately 202 miles, clearing of previously non-disturbed native vegetation would be restricted to approximately 50 feet on all segments except for Segment 6 where the wider linear TUA means that 60 feet would be cleared. Native trees and shrubs (of sagebrush steppe and pinyon/juniper vegetative communities) would be cleared from approximately 749 acres of TUAs. Tree and shrub species would be allowed to become reestablished in the 50-foot-wide linear TUA after construction. Shrubs would not become reestablished within the temporary easement for approximately 5 to 15 years after construction. For Segments 1 through 6 in Wyoming and Segment 8 in New Mexico, sagebrush steppe composed of shrub species such as Wyoming big sagebrush (*Artemisia tridentata wyomingensis*), basin big sagebrush (*Artemisia tridentata tridentata*), Gardner saltbush (*Atriplex gardneri*), and greasewood (*Sarcobatus vermiculatus*), accounts for approximately 29.5 percent of the cover type that would be affected by the proposed activities. Sand shrub grassland, consisting of fourwing saltbush (*Atriplex canescens*), big sagebrush (*Artemisia tridentata*), and mesquite (*Prosopis spp*) in Segments 9-12 in New Mexico accounts for approximately 21.5 percent of the cover type. Juniper and pinyon trees would not recover fully for approximately 25 to 50 years. Pinyon/juniper woodland identified in Segments 5 and 6 in Wyoming, and Segments 8, 9, and 10 in New Mexico are comprised principally of three tree species: pinyon pine (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), and one-seed juniper (*Juniperus monosperma*). Pinyon/juniper woodland accounts for approximately 10 percent of the non-disturbed cover type for lands crossed by the proposed Project. Table 4.3-10 summarizes the acres of vegetation community type that would be disturbed by construction activities.

To summarize, short-term impacts to vegetation include the reduction in forage productivity and increased soil erosion rates due to reduced vegetative cover. If disturbed areas have been successfully reclaimed, the majority of forage productivity lost during construction activities would be recovered approximately five years after reclamation. Longer-term impacts to vegetation include the loss of woody species during clearing activities. Trees and shrubs present on approximately 749 acres of the proposed ROW include pinyon, juniper, big sagebrush, mesquite, greasewood, and some cacti.

4.3.5.2 Invasive, Non-Native Weeds

MAPL plans to conduct a pre-construction inventory of invasive, non-native weeds (designated as “noxious”) for all segments and pump stations associated with the proposed Project activities. MAPL would ensure that excavation and grading equipment is cleaned prior to entry into work areas and would conduct annual monitoring and control of remaining weed infestations. Although it is anticipated that these measures would limit the spread of existing weed populations, it is unlikely that these measures would completely eliminate the proliferation of these weed populations. Over the long term, it is expected that some invasive, non-native weed species would continue to spread within previously disturbed areas due to grazing, seed dispersion by livestock, and the overall competitive advantages of weeds over native species.

Appendix D-2 summarizes the Weed Management Plan Summary including the pre-construction weed mapping efforts, preventative measures to be implemented, treatment methods, and monitoring and record keeping for the proposed Project.

4.3.6 Wildlife and Fisheries

Possible impacts to big game or other wildlife species resulting from construction or operation of the proposed Project are described in this section.

4.3.6.1 Terrestrial Wildlife

Big Game Animals

Pipeline construction activities would temporarily displace big game animals from active construction areas and would result in the short-term loss of forage of 1,975 acres, as discussed in Section 4.3.5.1 and 4.3.7.1. The proposed Project would be constructed within an existing disturbance corridor. Combined with the narrow, linear nature of the disturbance, the loss of forage should be minimal, but this would depend upon the success of reclamation efforts. If the disturbed area does not completely recover to native forage, and non-native weed species invade, then potentially the forage loss over the long-term could be moderate in scale. Following completion of initial reclamation and departure of work crews from the area, big game animals would return to the area. The proposed Project would be constructed within an existing disturbance corridor. Because the proposed Project follows an existing pipeline corridor, no new roads will be built and, therefore, no additional acreage would be accessible due to Project activities.

Impacts to pronghorn crucial winter range may result from construction of the proposed pipeline. Identified areas of affected critical range are restricted to Pronghorn habitat in Wyoming portions of the proposed route. Portions of the pipeline ROW occurring within antelope crucial winter range will be subject to timing restrictions so as not to negatively impact the wintering animals. Construction activities during the winter can cause stress and habitat avoidance from the noise and activity. A summary of critical habitat disturbance is indicated in Table 4.3-11. In addition to areas of direct effect, approximately one mile of Segment 6 is located within one mile of elk crucial winter/yearlong range.

Although short-term disturbance of critical habitat would amount to 430.3 acres, this would represent a proportionally small area compared to the total acres of pronghorn antelope crucial winter range. Project impacts to big game species are expected to be proportional to the level of disturbance.

Upgrades of existing pump station in Colorado and Utah would occur within very small areas of previous disturbance. No pump stations are located within identified critical habitat. Project impacts to big game species from pump station upgrades are not anticipated.

Table 4.3-10 Affected Vegetation Types and Acreages for the Proposed MAPL WEP

Segment	State	Length (miles)	Temporary Use Area	Disturbed Area	Total Disturbance	Acres of Affected Vegetation Type							
			Clearing of Previously Non-Disturbed Vegetation (Acres)	Clearing of Previously Disturbed Vegetation (Acres)	Clearing for all Construction Activity (Acres)	Sagebrush Steppe	Pinyon Juniper	Sand Shrub/ Grassland	Desert Grassland North	Desert Grassland South	Rio Grande Floodplain	Reclaimed Grassland Previously Disturbed	Total Acres Disturb ed
1	Wyoming	5.40	31.1	18.0	49.1	29.5	0.0	0.0	1.6	0.0	0.0	18.0	49.1
2	Wyoming	18.33	105.5	61.1	166.6	100.3	0.0	0.0	5.3	0.0	0.0	61.1	166.6
3	Wyoming	23.14	133.2	77.1	210.4	126.6	0.0	0.0	6.7	0.0	0.0	77.1	210.4
4	Wyoming	8.49	48.9	28.3	77.2	46.4	0.0	0.0	2.4	0.0	0.0	28.3	77.2
5	Wyoming	9.81	56.5	32.7	89.2	48.0	5.6	0.0	2.8	0.0	0.0	32.7	89.2
6	Wyoming*	18.62	129.8	62.1	191.8	116.8	13.0	0.0	0.0	0.0	0.0	62.1	191.8
8	New Mexico	20.08	115.6	66.9	182.5	80.9	34.7	0.0	0.0	0.0	0.0	66.9	182.5
9	New Mexico	22.56	129.9	75.2	205.1	0.0	103.9	19.5	0.0	0.0	6.5	75.2	205.1
10	New Mexico	34.68	199.7	115.6	315.3	0.0	30.0	169.7	0.0	0.0	0.0	115.6	315.3
11	New Mexico	18.64	107.3	62.1	169.5	0.0	0.0	107.3	0.0	0.0	0.0	62.1	169.5
12	New Mexico	17.99	103.6	60.0	163.5	0.0	0.0	103.6	0.0	0.0	0.0	60.0	163.5
13	New Mexico	4.35	25.0	14.5	39.5	0.0	0.0	0.0	0.0	25.0	0.0	14.5	39.5
Total		202.09	1186.1	673.6	1859.8	548.5	187.2	400.1	18.8	25.0	6.5	673.6	1859.8
					Percent	29.5%	10.1%	21.5%	1.0%	1.3%	0.3%	36.2%	100.00%

* = Segment 6 has Perm ROW of 35 ft, and Temporary Use Area of 50 ft for total width of 85 ft.

Table 4.3-11 Wyoming Big Game Critical Habitat Disturbance for the Proposed MAPL WEP

Segment	Type	Start AM	End AM	Short-Term Disturbance (Acres)	WGF Herd Unit	Herd Unit Critical Range Area (Acres)
1	Pronghorn CRUSWR	45.4	46.4	12.1	419	24,194
2	Pronghorn CRUWYL	23.7	35.0	136.9	411	204,444
3	Pronghorn CRUWYL	60.3	69.6	112.7	414	212,212
3	Pronghorn CRUWYL	71.8	83.4	140.7	414	212,212
5	Pronghorn CRUWYL	15.6	17.9	27.9	412	127,157
TOTAL				430.3		568,007
Project Percentage of Pronghorn Crucial Winter Range				0.08%		

Source: Wyoming Game and Fish Department, 2002 and 2003
CRUSWR - Crucial severe winter relief range, typically used substantially only in very severe winters
CRUWYL - Crucial year long range which exhibits high winter influx of animals from other areas

Raptors

Impacts to nesting raptors are not anticipated. MAPL would comply with BLM or tribal-mandated protective measures. Raptor surveys would be conducted prior to construction during the raptor survey period (February 1 to August 1) in order to identify occupied nesting territories in areas where there is a potential for nesting raptors. Construction, within a half-mile from nesting raptors and 1 mile from active bald eagle and ferruginous hawk nesting areas, would be avoided from February 1 to July 31 (in Wyoming, and March 1 until August 1 in New Mexico) or until chicks have fledged.

Other Terrestrial Wildlife Species

Impacts to other terrestrial wildlife species would be somewhat dependent on the mobility of affected species. Bird species and mobile mammals such as coyote and fox would tend to move away from the construction zone to exploit similar habitat elsewhere. This would result in increased forage and hunting pressure in those areas temporarily occupied by animals displaced by construction. Less mobile animals within or adjacent to the pipeline ROW could suffer more severe impacts. The narrow, linear nature of the disturbance would result in short-term forage loss (Section 4.3.7.1) which is minimal compared to the availability of similar habitat in the vast area crossed by the proposed route. Reclamation of disturbed areas could take up to five years to complete (BLM, 1995). Impacts due to displacement and forage loss would be proportional to the percentage of disturbance within the vicinity of the proposed Project.
Construction would generally occur outside the breeding season of most species (approximately February through July).

Wild Horses

The Salt Wells Wild Horse Management Area (WHMA) is a Special Management Area and comprises almost 1.2 million acres. All of Segments 4 and 5 lie on the edges of the WHMA and Segment 6 lies in the western half (BLM, 1997 and 2004b). Total short-term forage loss from construction activity would be approximately 358.2 acres. The minimal disturbance compared to the total area of the WHMA combined with the mobility of horses to avoid the proposed route during construction indicates that impacts would not be anticipated. In addition, construction activities would not take place during the winter and early spring months reducing stress on critical winter and foaling habitat. Water resources for wild horses within the Project area will not be affected.

4.3.6.2 Aquatic Resources

Fish

Potential impacts to fish would be limited to the crossings of the Blacks Fork River and Rio Grande. The proposed crossing method for these streams is HDD beneath the river bottoms and disturbance within the river channel is not anticipated, therefore eliminating any turbidity issues. Potential impacts associated with spills of construction equipment and lubricants would be minimized by ensuring that such supplies are stored at safe distances from the streams in accordance with the proposed Project's SPCC Plan (summarized in Appendix D-7). In the event of an HDD failure ("frac-out"), the affected river would experience a temporary (less than one day) increase in turbidity and the release of minor amounts of bentonite-based drilling mud. Bentonite is a naturally-occurring, non-toxic clay. Some fish or benthic organisms at limited distances downstream of a drilling failure could experience increased environmental stress, potentially resulting in death. The potential impacts of such a failure cannot be calculated because of the variability of the amount of mud which could seep into the river. Major impacts from such a scenario are not anticipated.

Hydrostatic test water would be obtained from permitted sources and the USFWS would be consulted reguarding any water depletions, if necessary. Test water would be discharged into upland areas drained by ephemeral or intermittent streams not containing fish. MAPL's construction contractor would comply with discharge permit requirements of the state environment departments, New Mexico Oil Conservation Division , and EPA under the NPDES program as discussed in Section 2.4.1.1.

Amphibious Species

As discussed in Section 3.2.6.2, habitat for amphibious species is uncommon along the proposed pipeline route. The principal habitat for amphibians is associated with the Blacks Fork River and Rio Grande. The proposed crossing method for these streams is HDD beneath the river bottoms and disturbance to the river banks is not anticipated.

4.3.6.3 Threatened, Endangered, and Sensitive Species

Of the 45 threatened and endangered species addressed in the Biological Assessment, seven species have been identified as being present or having suitable habitat on or near the proposed route. These species are identified in Section 3.2.6.3 of this document. Potential impacts to these species are analyzed below.

4.3.6.3.1 Federally Listed Species

Black-footed ferrets are closely associated with large prairie dog colonies and complexes. Prairie dog colonies along the proposed route provide potential habitat for ferrets. Black-footed ferret clearance surveys are tentatively planned for July 2005. These surveys would be conducted in all prairie dog colonies identified as suitable habitat for black-footed ferrets that have not been block cleared. In the event that any ferrets are identified, consultation with USFWS would be initiated.

Bald eagle, southwestern willow flycatcher, and yellow-billed cuckoo are all dependent on riparian habitats. Suitable habitat and potential for occurrence of these species occurs along the Rio Grande, although they were not observed during field surveys in 2004. Disturbance to riparian forest along the river would be minimized by the proposed HDD. Potential impacts would likely include removal of mature trees and other vegetation in the upland approaches to the riparian zone. Trees that are removed during construction in this cottonwood forest would be replaced in accordance with regulatory requirements. Removal of riparian vegetation ultimately reduces available habitat for these listed species and will be minimized to the maximum extent possible. If the species are occupying the crossing location, construction would be prohibited in occupied territories during nesting season. If construction activities were planned during nesting season for any of these species, clearance surveys would take place prior to any disturbance. Raptor surveys would be conducted prior to construction. Any eagle nests identified would be avoided by Project activities. No direct loss to these species is anticipated as a result of this Project.

Habitats for the interior least tern and Rio Grande silvery minnow along the proposed ROWs are limited to the Rio Grande. Impacts to these species, if present, are not anticipated as a result of the proposed Project. Potential impacts from increased sedimentation or direct disturbance would be avoided by using HDD technology to drill beneath the river. Specific HDD construction techniques are discussed in detail in Section 2.4.1. Due to implementation of these techniques, the bonytail chub, humpback chub, razorback sucker, and Colorado pikeminnow would not be affected by the Project activities.

No direct impacts to the lesser prairie chicken are anticipated as a result of the proposed Project. If wildlife management agencies identify any Prairie chicken leks, they would be avoided during the breeding season (March through June). Clearance surveys would be conducted prior to construction within occupied territories if construction were planned to occur prior to July. Indirect impacts to the species would be limited to reduction in foraging and nesting habitat. Potential indirect impacts would be negligible due to the amount of available habitat adjacent to the proposed pipeline route.

4.3.6.3.2 BLM and Tribal Sensitive Species

Thirty-seven sensitive species were identified as potentially occurring or having suitable habitat along the proposed route. Impacts to these species would be minimized by avoiding sensitive areas, constructing outside of sensitive seasons, following existing disturbance corridors, and conducting clearance surveys to avoid direct impacts.

Mammals

Direct impacts may occur to burrowing mammals along the proposed route. Potentially affected species include black-tailed and white-tailed prairie dogs, which are present within the proposed segment ROWs, Wyoming pocket gopher, pygmy rabbit, and Idaho pocket gopher, which have suitable habitat present along the proposed route. Swift fox, typically associated with prairie dog towns, may be present along some portions of the proposed ROW. Impacts to these species may include direct loss and displacement. Following construction activities, the disturbance area would again be available to these species. Potential beneficial effects from construction may include revegetation of the disturbed areas with more palatable graminoid and forb species.

Potential impacts to sensitive bat species may include disturbance of roosting bats during pipeline construction and possible loss of roosting habitat from vegetation removal. No apparent or prominent karst features would be crossed by the proposed route. Hibernacula have been documented in caves of the Roswell Cave Complex ACEC, which is located at least one-quarter mile from the proposed ROW. In the unlikely event that vehicles or construction equipment were to collapse into karst features, localized damage to caves and bat roost sites could occur.

No direct impacts are anticipated for bats roosting in nearby man-made structures. Disturbance or removal of man-made structures would not occur during construction of the proposed Project. Potential impacts in forested terrain would be low, because many species occupy scattered sites for roosting, and the Project would not affect underground openings or substantial rock outcrops that may support bats in woodland areas.

Birds

Some impacts to migratory birds would be anticipated as a result of the habitat conversion from the proposed Project. Species that nest in desert scrub and desert grassland areas would be excluded from these habitats until successful reclamation occurs. Adverse affects to nesting birds would result if pipeline construction activities were to occur within nesting territories or near active nest sites. Disturbances to birds during their sensitive nesting period may result in nest failure or abandonment. Construction would generally occur outside the February through July breeding season of most species unless an area has been cleared by survey. This should minimize direct disturbance to nesting birds.

Greater sage grouse lek locations have been identified within two miles of the proposed route in Wyoming Surveys would be conducted prior to construction during the survey period of March 1 to June 30. If present, pipeline construction would avoid activities within two miles of active leks during the breeding season (March 15 through July 15). No direct impacts to sage grouse are anticipated. Indirect impacts may include displacement and reduction of available habitat. This Project is not expected to increase fragmentation because the proposed pipeline would follow an existing pipeline corridor.

Direct impacts to migratory bird species including raptors are not anticipated as proposed construction windows will be scheduled to avoid nesting raptors identified in the preconstruction surveys. Bird species would likely avoid disturbances associated with construction activities, moving out of the area, thereby avoiding direct impacts. Avoidance could increase pressure on adjacent forage, but effects are expected to be minimal as a result of the amount of available forage in the area. Raptor surveys would be conducted prior to construction during the raptor survey period February 1 to August 1 in order to identify occupied nesting territories in areas where there is a potential for nesting raptors. Construction within one-half mile of nesting raptors and within one mile of active bald eagle and ferruginous hawk nests would be avoided from February 1 to July 31 in Wyoming and from March 1 until August 1 in New Mexico or until chicks have fledged. Indirect impacts to these species include temporary displacement and habitat loss. Indirect impacts would be minimized because the proposed route is adjacent to an existing pipeline corridor.

Reptiles

Direct impacts to the Texas horned lizard may occur as a result of the proposed Project. These impacts may include direct loss and disturbance of habitat. This species has not been identified along the proposed route although suitable habitat is present. This highly mobile animal is capable of evading construction equipment. Direct impacts would be temporary and localized. Indirect impacts to the species may include temporary displacement and loss of habitat.

Direct impacts to the desert Kingsnake may occur as a result of the proposed Project. Impacts to the species may include loss of individuals and disturbance of habitat. This species has not been identified along the proposed route although suitable habitat is present. Indirect impacts to the species may include temporary displacement and loss of habitat. Mitigation efforts will include educating project personnel of the potential presence of the desert Kingsnake, a protected species, to avoid unnecessary killing of the species.

Fish

No direct impacts to sensitive fish species, if present, are anticipated as a result of the proposed Project. Potential impacts from increased sedimentation or direct disturbance would be avoided by the use of HDD methods for crossing rivers containing fisheries. Specific HDD construction techniques are discussed in detail in Section 2.4.1. Potential impacts to fisheries in the event of a HDD failure are discussed in Section 4.3.6.2.

Plants

Surveys for individual sensitive plant species will be conducted prior to construction in areas of suitable habitat where required by applicable land management agencies. Direct impacts to individuals identified within the proposed ROW would be minimized by reducing ROW width, erecting temporary fencing to protect the individuals, and by periodically monitoring the individuals during construction. Individuals identified within the ROW that are unavoidable would be excavated and transplanted to suitable habitat adjacent to the ROW. Transplanting is only occasionally successful and should be viewed as a last resort. No effects on the long-term viability of sensitive plants are anticipated due to the small numbers of plants that would be relocated, and the small amount of linear disturbance within the overall geographic range occupied by these populations.

4.3.7 Land Use, Transportation, Special Designated Areas, and Recreation

4.3.7.1 Land Use

Construction of the 12 segments would result in a total of 1,975 acres of land disturbance, including 1,221 acres of ROW which would be disturbed only during the construction phase (TUAs associated with linear pipeline construction), 121 acres of other TUAs such as extra work spaces and construction storage areas which would be disturbed only during construction, and 633 acres which would be disturbed during both construction and operation of the line (permanent ROW). Acreages of these disturbances by land use type and segment are presented below in Table 4.3-12. Acreages exclude areas which would remain undisturbed during and after construction because they are crossed by boring or by HDD. These include railroad crossings, road crossings (except some dirt roads which would be open cut), and stream and river crossings (except open cut dry washes). Acreages also exclude areas where the new line would be constructed within an existing disturbed facility such as a pump station or pigging facility.

The pipeline segments would be constructed parallel and adjacent to existing pipeline ROW. Thus, there would be no significant change in local land use.

Rangeland and Agriculture

As shown in Table 4.3-12, 99 percent of the land to be used as TUAs (1,329 of 1,342 acres), and 99 percent of the land to be used as permanent ROW (629.7 of 633 acres) is currently used for livestock grazing and also serves as wildlife habitat. There would be minor effects on the acreage of available grazing land during construction. Movement of livestock may be temporarily impeded in areas of active construction. Temporary construction and permanent ROW easements would be negotiated with both private landowners and public land management agencies. The easements would convey the ROW to MAPL and give it the right to construct, operate, and maintain the pipeline. In return, the landowners and agencies would be compensated for MAPL's use of the land, losses of any revenue during construction, and any property damage. Any construction effects on natural or man-made barriers to livestock movement would be mitigated by replacement of fences to at least the same condition as they were found before construction, repair of some fences, and construction of new fences where needed. Following restoration of the ROW and TUAs, livestock grazing would resume on the areas temporarily affected by construction. Effects of construction on use of the land by wildlife are discussed in Section 4.3.6.

Table 4.3-12 Potential Effects on Land Use for the MAPL WEP

Segment	Aerial Markers	Land use	Acreage affected		
			Linear TUAs	Other TUAs	Perm. ROW
Wyoming					
1	45.4 – 50.8	grazing & wildlife	32.4	9.8	16.2
2	16.7 – 35.0	grazing & wildlife	110.9	19.7	55.5
3	60.3 – 83.4	grazing & wildlife	139.8	17.1	69.9
4	51.2 – 60.3	grazing & wildlife	50.9	0.2	25.5
5	8.1 – 17.9	grazing & wildlife	59.7	11.8	29.8
6	851.3 – 269.8	grazing & wildlife	112.5	7.4	78.7
Sub-totals			506.2	66	275.6
New Mexico					
8	349.9 – 370.1	grazing & wildlife	121.5	13.5	60.7
9	276.7 – 277.8 277.8 – 280.1 280.7 – 299.2 280.1 – 280.5 280.5 – 280.7	open space grazing & wildlife grazing & wildlife cropland riparian	6.6 130 0.0 0.0	4.1 20.3 2.1 0.2	3.3 65 0.0 0.0

Segment	Aerial Markers	Land use	Acreage affected		
			Linear TUAs	Other TUAs	Perm. ROW
10	188.59 -223.3	grazing & wildlife	209.8	4.7	104.9
11	125.9 – 144.6	grazing & wildlife	112.8	2.7	56.4
12	107.8 – 125.8	grazing & wildlife	108.9	4.9	54.5
13	46.8 – 51.2	grazing & wildlife	25.8	2.6	12.9
Sub-totals			715.1	55.1	357.7
Totals			1221.3	121.1	633

Impacts to grazing forage losses would be low. Grazing rates throughout the Project area vary from 5 to 10 acres per animal unit month (AUM) (NRCS, 2005). Therefore an average of 8 acres per AUM [84 acres per animal unit year (AUY)] was used to evaluate impacts for the entire Project. Based on the acreages of grazing and wildlife land use provided in Table 4.3-12, the Project would result in 23.5 AUYs temporarily unavailable for livestock until vegetative cover increased on the reclaimed ROW and TUAs to a level similar to that on adjacent undisturbed rangeland. On BLM lands (which account for approximately 26 percent of the entire Project), this would equate to approximately 6 AUYs of BLM grazing leases that would be temporarily impacted.

Although Segment 9 crosses 0.4 miles of cropland in the Rio Grande valley, most surface disturbance would be avoided by use of HDDs. At MP 3.7, 2.1 acres of prime farmland would be disturbed by a 300 x 300 foot TUA which would serve as the exit point and tie-in location for two HDDs: one crossing the Rio Grande and Bernalillo Drain from the northwest and the other crossing the Algodones Canal, BNSF Railroad, State Highway 313, and the Albuquerque Main Canal from the southeast. Depending on the season of construction, MAPL may need to compensate the landowner for loss of his crop within the 2.1 acre area. Following completion of the HDDs and tie-in, the cropland would be returned to its pre-construction condition and could be cultivated during the following growing season. No other active cropland would be affected by construction of the pipeline segments.

Mineral Development

Although the pipeline segments would be constructed within several mineral resource areas, they would not interfere with present or future extraction of these resources as discussed in Section 4.3.2.2.

Residential, Park, and Open Space Areas

As shown in Table 3.2-13, five of the pipeline segments would be located near residences. The closest residences to construction are in Lybrook, New Mexico near the north end of Segment 8. Several residences in this village are located approximately 200 feet west of the proposed line. Additionally, in the communities of Red Desert and Table Rock, Wyoming as well as Zia Pueblo and Placitas, New Mexico several residences are located within 1000 feet or less of proposed construction.

Residences, schools, and churches in these communities could experience temporary impacts from pipeline construction including equipment noise, air quality deterioration, access blockage, and visual impacts. Potential noise and air quality impacts are discussed in Section 4.3.1. Access problems are addressed in Section 4.3.7.2. Visual effects of the Project are examined in Section 4.3.7.4.

Within the 1.1 miles of City of Albuquerque Open Space Area crossed by Segment 9, there would be 6.6 and 4.1 acres of land affected by linear TUAs and other TUAs, respectively. Following construction, 3.3 acres of this open space area would be used as permanent pipeline ROW. The open space is used by some Placitas area residents for hiking and horseback riding. During active construction of Segment 9 through this open space area, recreationists would not be permitted to cross the ROW which occupies a small part of the open space. Access across the ROW would be allowed after the pipeline construction spread moved to new locations. Even during active construction, access to open space outside the ROW would not be affected.

Other potential impacts of pipeline construction on recreational uses within the Albuquerque Open Space Area include access conflicts with construction vehicles and heavy equipment and noise impacts to recreation users. General access to the area by recreationists would not be restricted during pipeline construction. However, the presence of construction vehicles, pipeline trucks, and heavy equipment on gravel, two-lane roads could pose hazards to recreationists traveling in the area.

4.3.7.2 Transportation

Most of the 73 crossings of transportation routes listed in Table 3.2-14 would involve sub-surface, straight bores. In Wyoming, state highways 530 and 430 in Segments 2 and 5 would be bored. Four crossings in New Mexico would be accomplished by HDD: US Highway 550 (AM 293.8 or MP 19.8 of Segment 8), Interstate Highway 25 (AM 278.5 or MP 2.9-3.0 of Segment 9), State Highway 313 (AM 280.1 or MP 4.6 of Segment 9), and the BNSF Railroad (AM 199.6 or MP 11.2 of Segment 10). Other state and federal highway crossings in New Mexico would be bored. All bored and HDD crossings would involve acquisition of TUAs for extra work space.

Both the bored and HDD crossings would avoid most traffic delays for road users. There would be minor delays related to construction traffic (including pipe trucks) and movement of equipment near pipeline crossings, along access roads, and near pipe and equipment storage sites.

Existing roads would be used for ROW access. Although no new access roads are proposed, several dirt roads may have ruts repaired to accommodate large trucks and equipment. Some road damage can be expected especially to dirt roads during inclement weather. Timely road repairs would be made by MAPL as needed to return these roads to their pre-construction condition at a minimum.

The 16 two-track or dirt roads listed in Table 3.2-14 would be crossed by boring. Other lightly-used unimproved roads would be crossed by open-cutting. Arrangements would be made with affected landowners, oil and gas field service companies, and other users to insure that construction-related delays at open-cut crossings are minimal.

4.3.7.3 ACECs/SDAs, Trails, and Recreation

Areas of Critical Environmental Concern

In Segment 11, the Project does not cross the Roswell Cave Complex ACEC. There would be no land within the ACEC impacted by the Project. No impacts to wildlife inhabiting the area caves are foreseen.

Paleontologic ACECs/SMAs

In the northern part of Segment 8, 1,200 feet of the Lybrook Fossil Area ACEC/SMA would be crossed by the pipeline. There would be 2.1 acres of the Fossil Area ACEC/SMA that would be disturbed on the surface of the ACEC, but any impacts to paleontologic resources would limited to the 5-foot wide pipeline trench during construction, reducing the area of impact to approximately 0.14 acres. Management prescriptions for the Lybrook Fossil Area include monitoring for new oil and gas developments. Impacts will be mitigated by monitoring the excavation and following the procedures in the Paleontologic Resources Mitigation Summary in Appendix D-9.

In the southern end of Segment 8 the Project is near, but does not cross, the Torreon Fossil Fauna ACEC/SMA, protected for its paleontologic resources. The area is within a Class I paleontologic resource area, and the area will be monitored during construction, and mitigated using procedures in the Paleontologic Resources Mitigation Summary in Appendix D-9.

Wilderness Study Areas/Research Natural Areas

There are no impacts to WSAs/RNAs as a result of the Project. The Ojito WSA is not crossed or impacted by the Project.

National Historic and Scenic Trails

Impacts to trails and mitigations developed are discussed in more detail in Section 4.3.9, Cultural Resources. The 1870s Wagon Road will not be impacted by the Project.

The Continental Divide National Scenic Trail will not be crossed or impacted by the Project.

Recreation Areas

Special Recreation Management Areas

No Special Recreation Management Areas (SRMAs) would be traversed by the proposed pipeline, and no impacts would be associated with the construction of pipe and pump station facilities. Existing ROWs and access roads would be utilized where possible.

The proposed Project description states that construction of the loop lines crossing the Blacks Fork River and the Rio Grande would be accomplished via HDD assuming it is technically feasible. Consequently, river flows would not be diverted, rafters would be able to pass uninhibited, and no sedimentation or water quality impacts would be expected. Construction near the banks of the river could have an adverse impact on rafters and fisherman by detracting from their recreational experience, which includes solitude and a relatively natural setting. Any such impacts would be considered minor given their short duration.

Developed Recreation Facilities

Pipeline construction would cause a temporary impact on certain access routes to some local developed recreational facilities, such as Jemez Canyon Dam and Lake but these impacts would be short in duration (less than one day) and would not occur during expected peak use times (summer holidays or weekends).

Off-Highway Vehicle Use

During construction, some access roads for OHVs may be temporarily closed for trenching. Established OHV areas located within various proposed pipeline construction areas that could be affected include the Green River Resource Area and Crystal Caverns-Devil's Well Area. These impacts would be temporary and short in duration and should not occur during expected peak use times (e.g., summer holidays or weekends). Because of the sensitivity of the cave resource in the Crystal Caverns area, the BLM would require that construction activities remain within the existing ROW to the maximum extent practical.

Dispersed Recreation Uses

Some reductions to hunting opportunities in the vicinity of the ROWs would occur if construction of the proposed segments took place during hunting season. Noise from construction activities may disperse or move big game from the area. However, this impact would be temporary and no long-term impacts would occur. Because of the variety of public and private lands available for hunting throughout the region, this impact would be relatively minor.

Long-term operation of the pipeline would have no effect on existing dispersed recreational opportunities. MAPL would deter vehicular access to the ROW by placing berms, large rocks, or other impediments in locations where traffic could access the ROW from existing roads. Existing public access would be maintained along all pipeline segments. Therefore, no increased or decreased levels of recreation use are anticipated as a result of the proposed action.

The displacement of recreation during construction periods would be a minimal adverse impact because existing recreational use in the Project area is relatively light and no existing access would be permanently obstructed. No impacts to recreational resources are anticipated after the construction period.

4.3.8 Impacts to Visual Resources

Impacts to visual resources along the proposed route would be minor due to its location within an existing pipeline ROW. Visual contrasts in line, color, and/or texture would be created during construction due to the removal of vegetation, disturbance of the soil which would create contrasting colors, smoothing of ridges, and movement of large construction equipment along the proposed loop segments. Visible above-ground structures to be built with the pipelines would be various valves, mile markers, and other small pipe appurtenances. Minor changes would be made to existing pump stations within their existing fenced boundaries. Changes to these aboveground structures would result in new minor visual intrusions to the surrounding area, but they would be painted to blend with the natural surroundings.

Visual resources would be impacted mainly during construction and restoration activities. During construction, vegetation would be removed and soil would be disturbed for trenching, staging locations, storage facilities, waste removal, and rock blasting (if needed). Localized smoke and dust might also be generated by construction machinery. Water trucks specially modified with sprinklers would spray areas prone to high dust emissions, especially during dry conditions. This mitigation measure would locally reduce dust in the air.

After construction is completed, rangeland and agricultural areas dominated by grasses would soon return to their natural visual characteristics with the implementation of MAPL's Reclamation Plan, summarized in Appendix D. Areas dominated by scrub brush may take several years to hide the effects of pipeline construction. Mitigation efforts, such as seeding and disking would be carried out to re-establish native vegetation as soon as possible and reduce visual impacts in accordance with the Reclamation Plan. Successful revegetation would minimize visual quality changes by blending colors and texture with adjacent natural areas. This blending would minimize potential distraction of nearby viewers caused by the new pipeline ROWs. Areas where rock outcrops would be removed would also affect the visual character of the land. These impacts would be minimized by smoothing the surface to conform to the existing contours. Mitigation measures would be carried out according to the appropriate VRM requirements of the BLM.

The proposed pipeline segments and existing pump stations are located almost entirely within either a VRM Class III or Class IV area. No VRM Class I areas would be encountered by any of the proposed segments. One VRM Class II area would be crossed at the southern end of Segment 6 south of Sage Creek (AM 851.3 - 852.2). This would result in a temporary disturbance of 9.3 acres within this Class II area. It is not expected that the landscape changes will attract attention or be evident as per VRM Class II criterion. There are no expected major visual changes expected along the segment ROWs since they follow an existing ROW. There would be minimal impacts along the ROWs stemming primarily from contrast in colors between disturbed soil and adjacent undisturbed soils, in height difference between disturbed and undisturbed vegetation, and in locations where ridges and other topographic features will need to be graded.

In conclusion, visual resources would not be noticeably impacted because new segments and pump station improvements would be located along an existing pipeline ROW, viewer volumes are relatively low, few areas are crossed which are of high or unique visual character, and the visual changes resulting from construction would be compatible with VRM Class III and IV areas. Although the contrast created by ROW clearing and construction activities may attract the attention of a viewer, it is not anticipated that the new loop lines would dominate views, particularly after reclamation. Thus, construction and operation of the proposed pipeline segments would be consistent with both VRM Class III and IV designations, and visual impacts would be consistent with BLM Visual Resource Management objectives.

4.3.9 Cultural Resources

The proposed Project has the potential to have direct and indirect impacts on cultural resources, including prehistoric and historic sites and historic landscapes. Impacts to cultural resources were analyzed with respect to several criteria, including:

- Destruction of artifacts from construction or maintenance activities.
- The loss of NRHP values from sites that would otherwise be eligible for listing.
- Degradation of visual integrity in the area of historic trails from surface-disturbing activities.
- Disturbance of sites of cultural and spiritual significance to Native Americans.

Avoidance of cultural sites is generally the preferred course of action, although mitigation measures must be considered on a site by site basis.

The BLM is in the process of preparing programmatic agreements for the proposed Project which will prescribe procedures for consultations under Section 106 of the NHPA, and to conduct Native American consultation with tribes as described in 36 CFR 800.2(c)(2)(ii)(E). Separate agreements are being prepared for New Mexico and Wyoming. In New Mexico, the agreement will include the New Mexico State Historic Preservation Officer (SHPO), the Pueblo of Zia, the Pueblo of Santa Ana, the Navajo Nation, the New Mexico State Land Office, and the Bureau of Indian Affairs Regional Office as formal consulting parties. In Wyoming the agreement will include the Wyoming SHPO. The Advisory Council on Historic Preservation will be afforded an opportunity to consult, and additional parties to consultation may be identified during the process of developing the agreements. The agreements will allow consulting parties to develop consensus on Determinations of Eligibility and Determinations of Effect for cultural resources, as well as mitigating measures employed.

Cultural resource surveys conducted for the proposed Project discovered or relocated 191 sites, including multi-component (prehistoric and historic elements) sites, in or adjacent to the Wyoming portion of the segment ROWs or associated existing pump stations. This total includes 157 prehistoric and 51 historic features. Of prehistoric sites, 36 have been recommended as eligible for listing with the NRHP as well as 14 of the historic sites. The majority of the Wyoming prehistoric sites are open camps or lithic scatters. Historic sites include debris scatters, roads, trails, or abandonded railroad track beds. Specific monitoring or mitigation recommendations were proposed for 17 of the sites recommended as being eligible and additional testing of sites to be conducted. In other cases, the Project ROW did not directly impact the site or the portion of the site crossed by the ROW did not contribute to the site's eligibility for listing (Hoefer and Barclay, 2004).

As indicated in Section 3.2.9.3, no previously recorded cultural sites were located within the property boundaries of the pump stations in Colorado and Utah (Hoefer, 2004a; Hoefer, 2004b).

In New Mexico, cultural resource surveys discovered or relocated 128 sites, including multi-component sites, in or adjacent to the ROW segments or associated existing pump stations. This included 114 sites with prehistoric and 26 sites with historic features. Of prehistoric sites, 90 have been recommended as eligible for listing with the NRHP as well as 21 of the historic sites. The most common prehistoric site types consist of lithic or artifact scatter followed by residences, structures, or agricultural relicts. The most common historic features consist of structures, roads or trails, and trash scatters. Specific monitoring or mitigation measures were proposed for 99 of the sites (Gerow, 2004).

Historic Trails in Wyoming

In Wyoming, portions of eight historic roads or trails are within or adjacent to the pipeline ROW or associated facilities. These trails or roads are the Oregon, Mormon Pioneer, California and Pony Express National Historic Trail, the Overland Trail (48SW1834), the Cherokee Trail (48SW3680), the Lincoln Highway (48SW1834), the Bryan-Brown’s Park Freight Road (48SW8976), the Rock Springs-Brown’s Park Road (48SW3865), the Rock Springs-Vernal Freight Road (48SW4164), and the Rock Springs-Hiawatha Road (48SW10752).

The Oregon, Mormon Pioneer, California and Pony Express Trail is a Congressionally-designated trail of National significance. The trail is located to the north of the Segment 1 ROW at a distance of one-eighth to one-half mile. The BLM RMPs designate a conditional surface use (CSU) protective set back for one-fourth mile or the visual horizon (whichever is less) on contributing segments of this trail. The trail in the vicinity of Segment 1 has been determined to be a non-contributing section and the CSU is not applicable.

The Overland and Cherokee Trails will be impacted by Segments 2 and 6, respectively. Both of these trails are NRHP eligible trails. RMP protective measures for these trails are generally the same as designated trails with a one-fourth mile protective set back. Several contributing segments of the Overland Trail will be impacted by the pipeline. Mitigative measures are discussed below. Segment 6 crosses the Cherokee Trail in an existing pipeline corridor. The Cherokee Trail in this area is a non-contributing segment, having been destroyed by previous pipeline construction.

The remaining trails and roads are all Expansion Era (1870-1940) transportation corridors. The RMP states that Expansion Era trails and roads will be managed according to their historic context. Management prescriptions may or may not include the one-fourth mile set back, but other actions may be taken to preserve the historical integrity of NRHP contributing segments. The Lincoln Highway (48SW1834) is an NRHP eligible property that is crossed or is adjacent to portions of the pipeline in Segments 1, 2, 3, and 4. The pipeline will not directly impact any contributing segments of the road. The Bryan-Brown’s Park Freight Road (48SW8976), the Rock Springs-Brown’s Park Road (48SW3865), the Rock Springs-Vernal Freight Road (48SW4164), and the Rock Spring-Hiawatha Road (48SW10752) are all local roads that were part of regional transportation networks. These roads will not be directly impacted, do not contain contributing segments, or are not eligible for nomination to the NRHP.

In New Mexico, seven road or railroad features have been located within or adjacent to the ROW, including the Ft. Stanton-Ft. Sumner military road. Four of these roads have been recommended as eligible for listing. None of the road or trail segments in New Mexico have been designated by prior BLM NEPA analysis or management plans to warrant special protection or treatment. Monitoring during construction or additional research has been recommended. Construction impacts on the historic value of trails, roads, and railroads would be avoided or subject to mitigating measures.

The discovery and evaluation of a number of previously unknown cultural sites within the Project ROW have been a beneficial impact of the proposed Project for the public and for the advancement of historical knowledge of the area. The exact number of sites along the Project corridor will be known after the cultural resources inventory for all segments has been completed.

Mitigation

After completion of the cultural resource inventory reports, a treatment and mitigation plan will be formulated in consultation with the BLM, affected Native American tribes, and SHPOs as prescribed in the programmatic agreements developed for the Project. Mitigation measures would apply to cultural sites recommended as being eligible for listing with the NRHP. As indicated in 36 CFR 60.4, "Eligible sites are those cultural properties which possess integrity of location, design, setting, materials, workmanship, feeling, and association and are associated with events that have made a significant contribution to the broad patterns of history; are associated with the lives of persons significant in our past; embody the distinctive characteristics of a type, period, or method of construction, or that represents the work of a master, or that possesses high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction; have yielded, or may be likely to yield, information important in prehistory or history."

Potential destructive impacts to eligible cultural resources could occur primarily from construction disturbances. All ROW segments will be surveyed for cultural resources prior to construction. Where eligible sites have been located, the proposed Project will avoid impacts or mitigating measures including data recovery methods will be employed. Treatment of eligible sites will follow Treatment Plans developed under provisions of the Programmatic Agreements. Treatment may involve data recovery methods including site excavation, construction monitoring and site testing, surface collection, and sample excavation. Additional measures employed during construction will be utilized to prevent impacts to sites, including temporary fences or barriers and site monitoring.

Mitigation measures for contributing segments of trails can include avoidance or rerouting of the pipeline into previously disturbed areas. Table 4.3-13 lists each Wyoming trail and potential mitigative measure.

Table 4.3-13: Mitigative Measures for Wyoming Trails

Trail Name	Pipeline Segment	Contributing Segment	Mitigative Measures
Oregon, Mormon Pioneer, California and Pony Express National Historic Trails	1	No	None
Overland	2	Yes	Avoid by rerouting pipeline

			to the south or into the disturbed pipeline corridor
Cherokee	6	No	None
Lincoln Highway	1, 2, 3, 4	No	None
Bryan-Brown's Park	2	No	None
Rock Springs – Brown's Park	5	No	None
Rock Springs - Hiawatha	5	No	None
Rock Springs - Vernal	6	No	None

Indirect impacts to heritage resources could include an increase in illegal collection activities or inadvertent destruction by construction or maintenance workers. Mitigation measures will include directing construction crews to avoid artifact collection, construction barriers placed for site protection, and to notify supervisors of the discovery of cultural features or artifacts. A Monitoring and Discovery plan will be developed for the Project segments in New Mexico and Wyoming in consultation under the programmatic agreements, which will define stipulations and procedures for Project construction to reduce or eliminate these potential impacts.

4.3.10 Native American Concerns

In conformance with the AIRFA and the 1992 amendments to the NHPA, sites of religious or traditional significance to contemporary Native Americans may be determined as eligible for NRHP listing. Determination of site significance is usually a matter of interpretation by the affected Native American groups.

No impacts to Native American cultural values are expected. No concerns regarding the Project were identified by the NEPA scoping process including responses from Native American tribes contacted. Two sites of cultural or spiritual significance to Native Americans are known to occur within in the vicinity of the Project ROW in Segment 8, and are avoided by more than a quarter of a mile. Two features of possible concern have been identified in Wyoming, and consultations with tribal officials have been initiated. No impacts from the Project are expected, either short or long term. BLM will continue to coordinate Native American concerns, and develop mitigating measures to avoid potential direct or indirect impacts. Completion of a programmatic agreement for the proposed Project between the BLM and affected tribes is pending.

4.3.11 Social and Economic Resources

4.3.11.1 Population, Employment, and Income

As discussed in Section 2.4.1, construction of the pipeline portion of the proposed Project is anticipated to use two spreads of 300 workers each: one spread in Wyoming and the second in New Mexico. Construction of the pipeline is estimated to require approximately 3 months actual construction time in Wyoming and 4 months in New Mexico. Upgrades to existing pump stations would employ small work forces over short time periods at each facility. Socioeconomic impacts are, therefore, anticipated to be minimal for that phase of the Project.

A variety of skills would be required for construction. MAPL would use both local and out-of-state contract employees for the workforce, depending on local availability of required skills. Based on data from similar projects, it is anticipated that approximately half of the workforce would be comprised of out-of-state contract employees (BLM, 1995; BLM, 1998). For construction on Navajo lands, MAPL would comply with applicable requirements of the Navajo Preference in Employment Act and the Navajo Business Preference Act.

Construction of the pipeline segments would temporarily result in increased occupancy of motels and other housing facilities along the proposed route. Because of the speed of advance of the Project, the increased demand would be of short duration. Previous project analyses have estimated that dependents accompanying non-local workers would increase the load on temporary occupancy by approximately 30 percent of the number of non-local workers (BLM, 1995). Total temporary housing needs would thus equate to accommodations for approximately 195 persons for short durations in both Wyoming and New Mexico. Depending on the communities selected as staging areas for the work crews and the season of construction, Project workforce temporary housing needs could compete with the needs of seasonal tourists and hunters. Because of the short duration of construction, large impacts to most local community services are not anticipated. It is expected that local communities could absorb incremental increases in needs for police and fire services.

Pipeline construction costs (exclusive of pump station costs) in Wyoming are expected to be approximately $34 million and approximately $52 million in New Mexico. Of these expenditures, approximately 30 percent is expected to be used for materials and an additional 30 percent for construction labor. ROW and miscellaneous costs would constitute 40 percent of total costs. Employment of the local labor force and expenditure of funds by construction personnel within communities along the proposed route is expected to be a positive impact to local economies. Opportunities for construction employment would be particularly beneficial to counties with unemployment rates above state and national averages, as indicated in Table 3.2-21. Total payroll for the Wyoming portion of the proposed Project is estimated at $11 million with an additional $15 million for the New Mexico portion. A summary of projected construction expenditures by county is indicated in Table 4.3-13.

4.3.11.2 Public Finance and Revenue

Receipts from sales and use taxes in Wyoming and gross receipts taxes in New Mexico would increase for affected state, county, and municipal governments. Increased revenues would result from local purchases made by Project workers and by MAPL. Sales tax receipts would result in beneficial impacts to affected communities, counties, and the states of Wyoming and New Mexico. Sales tax rates or the equivalent vary from 5.0 to 6.0 percent in the various counties affected by the proposed Project in Wyoming and New Mexico. In New Mexico, the gross receipts tax applies to the performance of services, including construction services.

County property tax revenues would be increased by construction of the proposed Project. Assessment is typically done by affected counties, but may be determined by the state for projects affecting multiple counties, with tax proceeds being returned to the applicable counties. In Wyoming, pipelines are assessed at 11.5 percent of fair market value (Wyoming Taxpayers Association, 2003). Property tax rates for Wyoming portions of the pipeline vary between 66 and 75 mils, depending on the local school and special districts. Wyoming property taxes cannot be accurately estimated prior to valuation, but would likely exceed $100,000 in the first year of operation, based upon materials costs and local mil rates. Property taxes would decline over time with depreciation of the pipeline. In New Mexico, property taxes are imposed on one third of assessed value, which is typically between 80 and 100 percent of market value (NMDED, 2004a). Statewide average non-residential rates are approximately 0.8 percent of assessed value, or approximately $130,000 for the first year of pipeline operation.

4.3.11.3 Environmental Justice

Poverty and ethnicity data for counties and communities affected by the proposed Project are indicated in Tables 3.2-21 and 3.2-22 in Section 3.2.11.3. Counties and communities affected by the Project in Wyoming display very low minority population rates and low poverty levels. There would be no impacts to environmental justice in Wyoming.

Minority population rates for New Mexico counties affected by the Project are broadly similar to New Mexico as a whole, except for Rio Arriba County, which has large Hispanic and Native American populations. Within Sandoval County, the communities of Zia Pueblo and Santa Ana Pueblo are composed almost entirely of Native Americans. The communities of San Ysidro and Bernalillo contain Hispanic populations more than 150 percent of the average for New Mexico and more than twice the county average. Each of these communities is, however, located more than one mile from the proposed Project ROW, therefore, safety and environmental risks would not be disproportionately directed toward minority communities.

4.3.12 Public Health and Safety

4.3.12.1 Hazardous Waste and Materials

Hazardous materials used in the construction of the Project would consist primarily of fuel and other petroleum products necessary for the operation of the construction equipment. Any spills of these materials would be relatively small in quantity but would adhere to strict reporting and cleanup requirements in accordance with federal, state, and local regulations. Details of the handling and cleanup of hazardous waste and materials are addressed in the SPCC Plan which is summarized in Appendix D-7.

4.3.12.2 Non-hazardous Waste

Non-hazardous waste, including all debris, empty containers, and other materials will be removed from the work site as work is completed and reused, recycled or properly disposed. Frequent waste removal will help maintain a clean construction site. Additional information on handling of non-hazardous waste is found in the Summary of the SPCC Plan, Appendix D-7.

4.3.12.3 Pipeline Safety

In 1970, federal safety regulations for hazardous liquid pipelines were enacted (49 CFR Part 195). These regulations govern the design, construction, and operation of hazardous liquid pipelines. Other federal regulations control other aspects of pipeline operation, such as 49 CFR Parts 190 (Pipeline Safety Programs; OPS Authority); 193 (Emergency Response Plans), 198 (State One-Call Damage Prevention Systems), and 199 (Drug and Alcohol Testing). Recent enactment of the Integrity Management Rule for High Consequence Areas (49 CFR Part 195.452) expanded federal requirements for pipeline operators. This regulation requires operators to systematically and periodically evaluate the design and operation of their pipeline, assess various risks to the pipeline, and to prioritize pipe repair operations to reduce risk to the public and the environment.

MAPL assesses pipeline integrity by conducting pre-operational hydrostatic tests of each new pipeline to ensure structural integrity prior to operation. In addition, integrity assessments are conducted in accordance with applicable Integrity Management requirements to assure the continued safe operating condition of the pipeline. These on-going practices will continue to be followed for the new MAPL WEP segments. These practices, as well as stringent operating and maintenance procedural requirements that meet or exceed all state and federal requirements, are measures that contribute to public safety. Additionally, MAPL conducts community outreach and public education programs to keep local landowners and the general public informed of the location of MAPL pipelines and potential associated hazards.

In the case of a release from a rupture, the MAPL controllers in Houston would receive a rate of pressure drop alarm. They would examine the live pressure trend and determine whether the pressure drop is due to a rupture or is simply an anomaly. If an anomaly is suspected, the controller would continue to closely monitor the situation and act according to the available data. If a rupture is confirmed, the controller would shut down the line immediately (valve travel time is about 1.5 minutes), and the MAPL emergency response plan would be implemented immediately.

For a small release reported by the public, the controller would evaluate the magnitude of the leak based upon his data and the caller’s information. The controller would provide the caller with appropriate direction in terms of immediate action and safety. A field operations technician would be contacted immediately and directed to proceed to the reported incident location. Normal expected response would be approximately one-half hour for a small leak (less than 15 minutes in the Placitas, New Mexico area). If the leak is determined to have occurred in a heavily populated or heavily traveled area, the line may be shut down pending on-site evaluation by the technician.

Ground surface subsidence in karst terrain is the only natural hazard identified that would require special consideration for detection and control during pipeline segment construction and operation. Other natural hazards of seismicity (earthquakes), landslides, flooding, and channel incision would be minimized with application of special construction methods and equipment. Pipeline damage resulting from natural hazards represents about 3 percent of all incidents (BLM, 2003a).

Table 4.3-13 Anticipated Construction Costs By County for the Proposed MAPL WEP

Construction Costs	Wyoming		New Mexico					
	Sweetwater	Uinta	Chaves	De Baca	Lea	Rio Arriba	Sandoval	Torrance
Miles of Pipeline	82.19	1.6	21.59	15.04	4.35	1.1	41.56	34.68
% of Pipeline in State	98.09%	1.91%	18.25%	12.71%	3.68%	0.93%	35.13%	29.31%
Expenditures ($)								
Materials	11,741,000	229,000	3,340,000	2,327,000	673,000	170,000	6,430,000	5,365,000
Construction Labor	11,741,000	229,000	3,340,000	2,327,000	673,000	170,000	6,430,000	5,365,000
ROW and Misc.	10,064,000	196,000	2,863,000	1,994,000	577,000	146,000	5,511,000	4,599,000
Totals	33,546,000	654,000	9,543,000	6,648,000	1,923,000	486,000	18,371,000	15,329,000

4.4 CUMULATIVE IMPACTS

Cumulative impacts are those effects to the human and natural environment that would potentially result from the incremental impacts of the Project when added to non-Project-related impacts resulting from past, present, or reasonably foreseeable actions.

Past and existing activities within or in the vicinity of the Project ROW that BLM has determined would have a major influence on the resources in the area include:

- Disturbance from construction of additional pipelines adjacent to the current pipeline corridor,
- additive risk from operation of existing and future co-located pipelines within the current pipeline corridor,
- construction of new or expansion of existing roads, highways, or railroads adjacent to the current pipeline corridor, or
- construction of other linear projects, such as power lines, in or adjacent to the current pipeline corridor.

Past and present projects considered in this cumulative impacts assessment for the proposed MAPL WEP are the existing and approved pipelines and other linear facilities that occupy a common utility corridor or multi-pipeline route that includes both existing MAPL pipelines and other operator pipelines and other linear facilities (power lines, fiber optic cables, roads/highways).

The proposed WEP pipeline segments would be located within existing pipeline or utility corridors throughout their entire length. The incremental expansion of the total width of the disturbed area within the utility corridor would likely average 25 feet depending on location and number of other linear pipelines/facilities sharing the corridor. This incremental expansion assumes a maximum of 50 feet disturbance of previously undisturbed vegetation for 11 of the 12 proposed pipeline segments as observed on the Project alignment sheets (50 feet of a total WEP construction ROW width disturbance of 75 feet). The exception is Segment 6 where there would be a maximum of 50 additional feet of disturbance to existing vegetative cover (50 feet of a total WEP construction ROW width of disturbance of 85 feet in Segment 6). The average number of pipelines and utilities adjacent to the proposed WEP pipeline segments ranges from three to four as observed on the Project alignment sheets. The addition of permanent ROW for the WEP would be confined to previously disturbed ROW of the previously constructed, adjacent pipeline. Total ROW widths for the 12 proposed segments added to the existing adjacent ROWs would range from approximately 60 feet to 185 feet. Power lines parallel the existing utility corridor and several of the proposed segments, but contribute minimal disturbance or influence on environmental resources.

The consequences of this surface disturbance would be most noticeable on surface-related resources including geologic resources, soils, vegetation, wildlife, land use, and cultural resources. Beyond short-term pipeline and pump station construction-related impacts, air quality, noise, social, economic, and health and safety, long-term effects and contribution to cumulative impacts would come from pump station operations and associated emissions, generated noise, financial contributions to local economy, and monitoring and maintenance to limit risks to public health and safety.

4.4.1 Reasonably Foreseeable Development Scenario

The Reasonably Foreseeable Development Scenario (RFDS) describes the existing facilities identified within and adjacent to the proposed Project and how those facilities may affect future management decisions in the vicinity of the proposed Project. New facilities which are likely to be constructed in the area in the foreseeable future are also included in this discussion. To be included in the RFDS, a future action must have a high probability of occurrence. Foreseeable projects which involve BLM land would be included if the responsible BLM field offices have accepted applications for the projects. All are considered viable projects for purposes of this evaluation.

Reasonably foreseeable developments identified by the BLM in the vicinity of the proposed Project include the construction and operation of three additional pipelines adjacent and parallel to Segments 1 and 3:

- Approximately 0.75 mile of the proposed Rendezvous Phase V natural gas pipeline would be constructed adjacent to a portion of WEP Segment 1, Uinta County, Wyoming.
- Approximately 2.5 miles of the proposed Questar NGLs Pipeline would also be constructed adjacent to a portion of Segment 1, Uinta and Sweetwater counties, Wyoming.
- Approximately 10.3 miles of the proposed Entrega Pipeline would be constructed adjacent to a portion of Segment 3 in Sweetwater County, Wyoming.

Construction of Rendezvous Phase V Pipeline would add an additional 75 feet of disturbance (50 feet of permanent ROW and 25 feet of linear TUAs). Construction of the Questar 601 NGLs Pipeline would add an additional 50 feet of disturbance (30 feet of permanent ROW and 20 feet of linear TUAs). Construction of the Entrega Pipeline would add an additional 125 feet of disturbance (80 feet of permanent ROW and 45 feet of linear TUAs). The three pipeline projects, Rendezvous, Questar, and Entrega, would respectively add short-term disturbance of approximately 7 acres, 15.2 acres, and 156 acres to the cumulative disturbance of the common pipeline corridor.

4.4.2 Cumulative Impacts to Individual Resources

Cumulative effects are those determined by summarizing the incremental impacts of an action added to other past, present, and reasonably foreseeable future actions in the Area of Influence (AOI). The AOI varies by resource. Cumulative effects can be identified both quantitatively and qualitatively, by magnitude of single actions, by the number of single actions combined, and by a time period in which the actions occur and have an effect on the environment. Unless otherwise noted, the AOI for this analysis is the combined width and length of past, present, and future activity for the linear utility corridor(s) being followed by the proposed MAPL WEP.

4.4.2.1 Climate, Air Quality, and Noise

Existing pipelines within the utility corridor have no impact on climate, and no impacts from the proposed Project are anticipated.

Additional air impacts from the modified pump stations will be minimal. All the modified pump stations will meet national and state ambient air quality standards. The cumulative air emissions from Project-associated facilities and neighboring facilities associated with existing or reasonably foreseeable projects are expected to remain within state ambient air quality standards. The air impacts associated with pipeline construction will be minimal, short in duration and will not result in local exceedances of state air quality standards in either Wyoming or New Mexico.

Noise level increases from the pump station modifications are anticipated to be imperceptible and will not result in cumulative noise levels from the sources that exceed EPA's guidelines of 55 dBA at one-half mile from the pump stations. At the Lybrook station the closest receptor (300 feet) would experience a negligible increase (1.4 dbA) in noise over existing levels. Based on the minimal noise increases and conservative nature of the noise calculations, noise impacts from the pump station modifications are not anticipated. Elevated noise levels due to pipeline and pump station construction will be relatively brief and are not expected to cause local cumulative noise levels to exceed national or state guidelines.

4.4.2.2 Geological, Mineral, and Paleontological Resources

The MAPL WEP pipeline ROW would be restored to the pre-existing contour following construction. Previously constructed pipelines within the existing corridor destabilized soils and stream channels, and removed vegetation. Existing pipelines and utilities within the corridor do not prevent access to any mineral resources. Construction of an additional parallel line will still have no effect on mineral resource access. Compliance with monitoring and data recovery plans would prevent loss of scientifically important paleonotological information. Therefore, there would be no anticipated increase in the cumulative impacts to paleontological resources.

Mitigative construction measures presented in Chapter 2, under Special Areas Construction Procedures and in the summary of the SWPPP (Appendix D-3) would correct any existing geological materials stability problems and would minimize contributions of additional instability to the previously disturbed utility corridor. Application of these measures to MAPL WEP and the application of similar measures to past, present, and future pipeline or linear projects in the common pipeline corridor would result in no cumulative increases in impacts to geology, topography, and minerals recovery. The effects associated with pump station upgrades would not contribute to cumulative effects due the minimal acreage of limited disturbance and their short-term duration.

4.4.2.3 Soils

Construction of the proposed MAPL WEP pipeline segments combined with previous soil disturbance associated with the existing pipelines within the corridor plus disturbance anticipated for reasonably foreseeable pipeline projects would result in a combined impact to 4,720 acres of soils. Of this area, 1,307 acres have not been previously disturbed by pipeline construction. All disturbed soils within the utility corridor have been or would be stabilized and revegetated. The entire cumulative analysis area has and will likely experience short-term increases in soil loss from wind and/or water erosion and an associated short-term reduction in soil productivity. These soil losses have and would be controlled by the implementation of best management practices (BMPs) including erosion and sediment control procedures and revegetation plans. These BMPs were applied on past pipeline and fiber optic projects and would be applied to the proposed MAPL WEP (summarized in Appendix D-2 and D-5) and the three other reasonable foreseeable pipeline projects within the utility corridor. The effects associated with pump station upgrades would not contribute to cumulative effects on soils due the minimal acreage of limited disturbance and their short-term duration resulting from application of reclamation procedures summarized in Appendix D-4.

4.4.2.4 Water Resources, Quantity and Quality

Due to the absence of anticipated long-term impacts to both surface water and groundwater quality and quantity, there will be no expected increases in cumulative impacts to water resources from construction and operation of the proposed Project in combination with past, present, and reasonably foreseeable projects in the AOI utility corridor. The potential for a pipeline failure/release is remote (i.e. of the approximately 202 miles of new pipeline, less than 0.1 percent would be under water bodies). The only potential addition to cumulative water resource impacts is the increased probability of a pipeline accident because of the additional miles of pipeline that would be constructed in this multi-pipeline corridor. Water sources for use in pipeline construction and integrity testing would be obtained from permitted sources which would or have already considered the effects of providing water for this type of use and have found them to be acceptable. The effects associated with existing pump station upgrades would not contribute to cumulative water resource impacts due the upland locations of the pump stations away from drainages, the minimal acreage of limited disturbance (with minimal runoff and sedimentation potential), and the short-term duration of disturbance assuming timely application of reclamation procedures summarized in Appendix D-4

4.4.2.5 Wetlands

Previous pipeline projects within the existing utility corridor(s) which would be used for the MAPL WEP constructed through wetland areas. The effects of disturbance were short-term, and wetland functions were restored within a short timeframe with the exception of riparian tree reestablishment which requires more time. The proposed MAPL WEP would traverse six wetlands of minimal size in Wyoming, including fringe wetlands lining banks of the Blacks Fork River, and a single small wetland in New Mexico. Crossings would either be completed by HDD to avoid wetlands or would minimize the extent of wetland disturbance from open trenching following implementation of approved restoration techniques consistent with the U.S. Army Corps of Engineers Nationwide 12 permitting requirements. Although several small wetlands would be disturbed and wetland functions possibly reduced, the effects would be temporary and wetland functions would be restored without reduction in aerial extent or function of the wetlands. Therefore, no additions to the cumulative impacts to wetlands are anticipated as a result of implementation of the proposed MAPL WEP.

4.4.2.6 Vegetation; Invasive, Non-Native Weeds; and Livestock Grazing

Construction of the proposed MAPL WEP pipeline segments combined with disturbance associated with existing pipelines within the corridor plus disturbance anticipated for reasonably foreseeable pipeline projects would result in a combined 4,720 acres of damage or loss of vegetative cover and productivity. Of this disturbance, approximately 1,307 acres have not been previously disturbed by pipeline construction. Vegetative cover and associated productivity for grazing would be reestablished following construction of pipeline segments and pump station modifications. The entire cumulative analysis area has and will likely experience a small, short-term decrease in cover and productivity for grazing from removal of vegetation. Reestablishment of vegetative cover and control of weeds have been and would be conducted by the implementation of BMPs for reclamation and revegetation that were used on past pipeline and fiber optic projects and would be applied to the proposed MAPL WEP (summarized in Appendix D-4) and the three other reasonable foreseeable pipeline projects within the utility corridor. Effects of pump station upgrades would not contribute to cumulative effects due the minimal acreage of limited disturbance and their short-term duration with application of reclamation procedures summarized in Appendix D-4).

4.4.2.7 Wildlife and Fisheries

Approximately 323 acres of critical big game wildlife habitat would be disturbed or removed by construction of the proposed MAPL WEP pipeline segments. Combined with past construction activities within the pipeline corridor, approximately 940 acres of critical big game (pronghorn) habitat would be affected by short-term construction activity and reduction in forage from the proposed Project. Combined with the reasonable foreseeable projects paralleling the proposed Segments 1 and 3 in Wyoming, cumulative impacts to pronghorn critical habitat would total approximately 1,100 acres. A total of 4,720 acres of potential wildlife habitat would be affected by past, present, and reasonably foreseeable projects in the portions of the utility corridor where the MAPL WEP would be constructed. These acreages of wildlife habitat disturbance represent less than 1 percent of the adjacent occupied ranges available in the region. Fisheries would not be affected by the proposed Project. Therefore, increases to cumulative fisheries impacts would not occur.

Impacts to sage grouse would be negligible if pipeline construction and maintenance activities did not occur in sage grouse breeding habitat between March 15 and July 15 during the sage grouse breeding and nesting season. Construction activities would not be allowed within two miles of a sage grouse lek during strutting periods and would preclude construction within two miles of an active lek during the nesting season. Because the proposed pipeline would be constructed in parallel and partially overlapping existing pipeline ROWs, portions of the pipeline disturbance would have been previously affected by construction activities. Due to the limited disturbance to sagebrush vegetation and the large amount of habitat available to the sage grouse in lands adjacent to the proposed ROW, adverse impacts to these upland game birds are not anticipated as a result of Project activities.

4.4.2.8 Threatened and Endangered Species

Cumulative impacts to special animal and plant status species as a result of past construction activities within the pipeline corridor are unknown. However, based on existing habitat information applicable to the pipeline corridor, TES habitat and individuals would not be affected by construction and operation of the MAPL WEP. Therefore, no increases in cumulative impacts to TES species are anticipated.

Surveys will be conducted for black-footed ferrets where white-tail prairie dog town size of at least 200 acres exists. No impacts to black-footed ferrets are known to have occurred along the existing ROW in the past. It is also assumed that due to the extent of existing development, ferrets do not use the area. It is doubtful, because of their extreme rarity, that any ferrets will be impacted by past, present, or future activities along the pipeline ROW.

4.4.2.9 Prime and Unique Farmlands

Approximately 2.1 acres of prime farmland would be disturbed (soil mixing and compaction) by construction of the proposed MAPL WEP Segment 9 in the Rio Grande floodplain. Past construction activities within the pipeline corridor have disturbed an estimated 2.0 acres of prime farmland in this same area although that disturbance was subsequently mitigated following completion of past construction. Thus, there will be no cumulative impact to prime farmland soils.

4.4.2.10 Cultural Resources

Construction of the MAPL WEP and other foreseeable pipelines adjacent to the existing utility corridor would potentially result in additional direct and indirect disturbance to cultural resources. Disturbance would be minimized by avoidance of identified resources and/or mitigation and data recovery where avoidance would not be feasible. Over time, the resulting development would result in a cumulative loss of existing heritage resources. However, proposed and foreseeable construction would also increase the knowledge base about cultural resources as a result of agency-mandated data recovery.

4.4.2.11 Social and Economic Conditions

The proposed MAPL WEP pipeline segments would share ROW with several existing pipelines and, for relatively short distances in Wyoming, three other reasonably foreseeable pipeline projects. Competition for local goods and services, and cumulative impacts to local populations, housing, and infrastructure are not anticipated because the related pipelines are already in place. The proposed Project and reasonably foreseeable projects are likely to be constructed at different times. In addition, cumulative socioeconomic impacts related to future projects are not anticipated due to the short duration of the construction period. The additional tax base and worker income created by the Project would have cumulative positive impacts on the revenues collected by the affected counties and sales of goods and services to workers, respectively.

5.0 CONSULTATION AND COORDINATION

5.1 CONSULTATION

5.1.1 Scoping Process

The Council on Environmental Quality (CEQ) regulations require an "early" and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action" (40 CFR 150.1.7). To begin the scoping process, the BLM prepared a scoping notice that was published in newspapers of record, mailed out to landowners and interested parties, and sent to post offices for posting. The scoping announcement provided a brief description of the Project, a summary of the scoping process, the dates of upcoming public and agency meetings, and reference to the BLM website where a map and additional information was posted.

The scoping notice was published as a legal notice in several newspapers. It was published on June 2 and June 3, 2004, in newspapers of record in Rock Springs, Kemmerer and Rawlins, Wyoming and within the period of June 11-13, 2004 in the Farmington, Albuquerque, Roswell, and Hobbs, New Mexico newspapers.

The BLM also conducted a direct mail campaign to 307 addresses provided in Appendix A. The mailing list included landowners, county commissioners, mayors, grazing allottees, U.S. Congressmen, recreation and environmental groups, as well as other interested members of the public from the Project area. Responses to the scoping notice were accepted through July 15, 2004. The date was later extended to August 15, 2004.

The scoping notice was also mailed to Postmasters in area of the Project with a request to post the notice on a bulletin board at the post office. A list of the post offices to which the scoping notice was mailed is provided in Appendix A.

The BLM conducted an internal and public scoping process in June, July, and August 2004. Public and agency meetings were held in Rock Springs, Wyoming on June 17, in Bernalillo and Placitas, New Mexico on June 29, and in Roswell, New Mexico on June 30, 2004. The scoping period was originally to end on July 15, but was extended to August 15, 2004 to allow more public review.

An additional meeting was held with the BLM and tribes in Albuquerque, New Mexico on August 27, 2004. Attendees included representatives from the BIA, BIA Eastern Navajo Agency, BIA Southern Pueblos Agency, Pueblo of Zia, and Santa Ana Pueblo.

5.1.2 Results of the Scoping Process

During the agency and public scoping meetings, natural and human resource issues were identified. Five members of the public attended the meeting in Rock Springs and the Wyoming Game and Fish was the only agency to attend. In Bernalillo, the BIA, representatives from the

Santa Ana Pueblo and the New Mexico Department of Game and Fish attended as did one member of the public. In Placitas, approximately 50 people attended the public meeting and expressed their concerns. No agencies attended the meeting in Roswell, and only one member of the public attended who voiced no concerns. In all cases, the agencies and public expressed their concerns and were provided information on the process for submittal of written comments.

The BLM received nine comment forms and one letter from the public during the scoping process. Eight of the nine comment forms and letter were from residents of Placitas, New Mexico requesting evaluation of the Project safety and impact on the environment. Agency comments were received from the U.S. Fish and Wildlife Service, State Game and Fish Departments, and Southern Ute Tribe in Utah. Issues identified in these written letters were reviewed and incorporated into the EA as appropriate.

5.1.3 Team Organization

Lead Agency-Bureau of Land Management - Project Management Core Team

Jerry Crockford – Major Project Manager/Project Coordinator
Dave Simons – BLM NM State Office – Cultural Resources Lead
Terry Del Bene – Archeologist for Rock Springs Field Office (Wyoming Cultural Lead)
Colleen Sievers – Archeologist for Rock Springs Field Office
Jim Dunder – BLM Rock Springs Field Office – Biological Lead
J.W. Whitney – BLM NM State Office – EA/EIS Coordinator (retired)
Kent Hamilton – BLM NM State Office – EA/EIS Coordinator
Cynthia Sandoval – BLM NM State Office
Irene Gonzales – Realty Specialist for Roswell District
Connie Maestas – Realty Specialist for Albuquerque Field Office
Mary Jo Albin – Realty Specialist for Farmington Field Office
Rich McClure – Natural Resource Specialist for Moab Field Office
Maxine Deeter – Realty Specialist for San Juan Field Office
Paul Rodriguez – Realty Specialist for Vernal Field Office
Kelly Lamborn – Realty Specialist for Kemmerer Field Office
Lynn Harrell – Archaeologist for Kemmerer Field Office
Patricia Hamilton – Realty Specialist for Rock Springs Field Office
Mike Robinson – Realty Specialist for Rawlins Field Office
Patrick Walker – Archaeologist for Rawlins Field Office

Cooperating Agency - Bureau of Indian Affairs

Janelle Jersey – BIA Southern Pueblos Agency
Harrilene Yazzie– BIA Navajo Agency
Amy Hauslein – BIA Western Regional Office

5.1.4 EA Preparers

The EA was prepared by O&G Environmental Consulting, LLC of Englewood, Colorado under the direct supervision and control of the BLM. Following are the EA preparers:

Barbara Neary – Project Manager (BS, Civil Engineering)
Jack Sosebee – EA Manager (BS, Chemistry; BA, Geology; MS, Environmental Studies)
Richard Bell – EA Coordinator (BA, Biology, Geology, Chemistry)
Joe Fetzer – Cultural Resources, Socioeconomics (BS & MS, Geology)
Will Mahoney – Soils, Geology, Land Use (AS, Hazmat Tech; BA, Geology; MA, Geography)
Dan Fillipi – Vegetation, Noxious Weeds, Reclamation (BS, Botany)
Chris Gayer – Wildlife and Fisheries, Special Status Species (BS, Biology)
Steve Schreck – Water Resources (BS, Archaeology; MS, Environmental Science/Engineering)
Ethan Jahnke – Visual Resources (BS, Natural Resources Mgmt; MS, Water Resource Science)
Daniel Padilla – Recreation, ACECs/SMAs (BS, Biology)
Doug Williams – Special Construction Techniques (BS, Petroleum & Natural Gas Engineering)
Kelly Clark – Document Production (AGS, Education)

5.1.5 BLM EA Reviewers and Contributors

Wyoming State Office
Rock Springs Field Office
Rawlins Field Office
Kemmerer Field Office
Utah State Office
Vernal Field Office
Moab Field Office
Monticello Field Office
New Mexico State Office
Albuquerque District/Rio Puerco Resource Area
Farmington District
Roswell District

5.2 COORDINATION

Agencies below are anticipated to be included in project coordination.

5.2.1 Federal Government Agencies

Advisory Council on Historic Preservation

Department of Agriculture

Natural Resources Conservation Service

Department of the Interior

Bureau of Land Management (Wyoming State Office)
Bureau of Land Management (Rock Springs Field Office)
Bureau of Land Management (Rawlins Field Office)
Bureau of Land Management (Kemmerer Field Office)
Bureau of Land Management (Utah State Office)
Bureau of Land Management (Vernal Field Office)

Bureau of Land Management (Moab Field Office)
Bureau of Land Management (Monticello Field Office)
Bureau of Land Management (Colorado State Office)
Bureau of Land Management (Dolores Public Lands Office)
Bureau of Land Management (New Mexico State Office)
Bureau of Land Management (Albuquerque)
Bureau of land Management (Farmington)
Bureau of Land Management (Roswell)
Bureau of Indian Affairs (Albuquerque)
Fish and Wildlife Service, Ecological Services, State Office (Cheyenne)

5.2.2 State Government Agencies/Universities

Colorado Department of Public Health and Environment (CDPHE)
Colorado Division of Wildlife
Colorado Land Office
Colorado State Historic Preservation Office
New Mexico Bureau of Geology and Mineral Resources (Santa Fe)
New Mexico Department of Game and Fish (Santa Fe)
New Mexico Energy, Minerals and Natural Resource Department (Santa Fe)
New Mexico Environment Department (Santa Fe)
New Mexico Natural Heritage Program (Albuquerque)
New Mexico State Engineer's Office
New Mexico State Historic Preservation Office
New Mexico State Land Office
University of New Mexico, Bureau of Business and Economic Research (Albuquerque)
Utah Department of Environmental Quality
Utah Division of Wildlife Resources
Utah State Historic Preservation Office
Wyoming Department of Environmental Quality (Cheyenne)
Wyoming Department of Transportation
Wyoming Game and Fish Department
Wyoming State Engineer’s Office
Wyoming State Historic Preservation Office
Wyoming State Land Office

5.2.3 Local Governments

Wyoming

Sweetwater County (Engineering Department)
Uinta County (Road and Bridge Department)

New Mexico

Bernalillo County (Department of Building, Planning and Zoning)
Chaves County (Planning and Environmental Services)
Guadalupe County (Manager's Office)
Lea County (Road Department)
Lincoln County (Road Department)
McKinley County (Manager's Office)
Rio Arriba County
San Juan County (Manager's Office)
Sandoval County (Road Department)
Santa Fe County (Department of Land Use Planning)
Torrance County (Department of Planning and Zoning)
City of Albuquerque (Open Space)

5.2.4 Indian Tribes

Apache Nation
Comanche Nation
Eastern Shoshone Nation
Navajo Nation
Northern Arapaho Nation
Ute Indian Tribe
Shoshone-Bannock Nation
Southern Ute Tribe

5.2.5 Pueblo Tribes

Jemez Pueblo
San Felipe Pueblo
Sandia Pueblo
Santa Ana Pueblo
Zia Pueblo

6.0 REFERENCES

6.1 REFERENCES

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Western U.S. Climate Historical Summaries - Utah http://www.wrcc.dri.edu/cgi-bin/cliRECtM.pl?utbona. http://www.wrcc.dri.edu/cgi-bin/cliRECtM.pl?utdino. http://www.wrcc.dri.edu/cgi-bin/cliRECtM.pl?utmoab

Western U.S. Climate Historical Summaries - Wyoming http://www.wrcc.dri.edu/cgi-bin/cliRECtM.pl?wykemm, http://www.wrcc.dri.edu/cgi-bin/cliRECtM.pl?wyrock.

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APPENDIX A
Scoping Notice and List of Post Offices

NOTICE
DEPARTMENT OF THE INTERIOR
AGENCY: Bureau of Land Management, Interior

ACTION: Notice to announce preparation of an environmental assessment, and locations, dates, and times of scheduled agency and public meetings. The purpose of the meetings is to obtain issues, concerns, and comments for Western Expansion Rocky Mountain Pipeline Looping Project as proposed by Mid-America Pipeline, LLC (MAPL).

SUMMARY: Pursuant to Section 102 (2)(C) of the National Environmental Policy Act (NEPA) of 1969, an environmental assessment would be prepared by the Bureau of Land Management (BLM), New Mexico State Office, lead Federal office, for the proposed project. The environmental assessment would analyze the potential impacts of granting rights-of-way and temporary use permits for 12 pipeline loop sections accumulating 202 miles on an approximate 840-mile route between MAPL's Rock Springs Pump Station in Sweetwater County, Southwest Wyoming and the Hobbs Pump Station in Gaines County, West Texas. The pipelines would be six to 16 inches in diameter, buried, steel, and carry natural gas liquids. Existing ancillary facilities, including pump stations, would be up-graded to have more capacity.

DATES: Three public meetings and three agency meetings are scheduled. MAPL representatives will be on hand to present their proposal and answer questions. BLM representatives will be on hand to discuss the environmental process expected to be used for assessing the proposal. Meetings will be in an "open house" format providing attendees an opportunity to view display materials, and ask questions of the BLM, MAPL representatives, and Environmental Contractor. After a short presentation by each of these, comments and concerns will be recorded at several topical stations located at various places in the room. The meetings will be held at the following dates and locations:

- Thursday, June 17, 2004 at the Comfort Inn, 1670 Sunset Drive, Rock Springs, WY (agency meeting - 1:30 p.m. to 4:00 p.m.; public meeting – 6:30 p.m. to 9:00 p.m.).
- Tuesday, June 29, 2004 at the Quality Inn and Suites, 210 North Hill Road, Bernalillo, NM (agency meeting - 1:30 p.m. to 4:00 p.m.).
- Tuesday, June 29, 2004 at the Placitas Elementary School, 5 Calle De Carbon, Placitas, NM (public meeting – 6:30 p.m. to 9:00 p.m.).
- Wednesday, June 30, 2004 at the Best Western, Sally Port Inn and Suites, 2000 N. Main Street, Roswell, NM (agency meeting - 1:30 p.m. to 4:00 p.m.; public meeting – 6:30 p.m. to 9:00 p.m.).

Meetings are also being scheduled with the Counselor Chapter of the Navajo Nation, the Zia Pueblo, and the Zia Pueblo to provide information and obtain issues, concerns, and comments.

Individuals making written comments at the public meetings may request confidentiality. If you wish to withhold your name or street address from public review or disclosure under the Freedom of Information Act, you must state this definitively at the beginning of your written comments. Such requests will be honored to the extent allowed by law. All submissions from organizations, businesses, and for individuals identifying themselves as representatives or officials of organizations or businesses will be available for public inspection in their entirety.

FOR FURTHER INFORMATION CONTACT: Jerry Crockford, Project Manager, Bureau of Land Management, Farmington Field Office, 1235 La Plata Highway, Suite A, Farmington, NM 87401; telephone (505) 599-6333; cellular telephone (505) 486-4255; email at jcrockfo@blm.gov.

The preliminary environmental assessment, when completed, will be electronically available on a BLM web site at *http://web.nm.blm.gov/* that may be linked to another web site. The environmental assessment, when finalized, will also be at that address.

SUPPLEMENTARY INFORMATION: The environmental assessment will address the proposed action and (at this time) one alternative. Others will be developed if needed.

More detailed information on the proposed project and a project map are available at the agency/public meetings or found on a web site at *http://web.nm.blm.gov/*.

If approved the proposed pipeline would require approximately nine months spaced over an 18 month period for construction, and would operate continuously, with a projected 30-year life.

Under the no action alternative, BLM and BIA would not issue a right-of-way grant for the project. The project would not be constructed. The areas proposed for the project would remain undeveloped. The product proposed to be transported by the proposed project would not be transported, or would need to be transported in by another method.

Public participation is encouraged throughout the processing of this project. Comments presented throughout the process will be considered at the step in the process being completed at the time the comment is given.

COMMENT DATES: The comment period will commence with publication of this notice. Persons having issues, concerns, comments, or alternatives they would like to have addressed in the Environmental Assessment are invited to ask questions and/or provide oral or written comments at the public meetings. Comments are due within 15-days after the agency/public meetings.

/s/ Linda S. C. Rundell

BLM, New Mexico State Director

Date: May 28, 2004

List of Post Offices

Wyoming Offices

Kemmerer Main Office, 307-877-3432, 318 Sapphire St, Kemmerer, WY 83101

Diamondville Main Office, 307-877-3911, 317 Diamondville Ave, Diamondville, WY 83116

Little America Main Office, 307-875-2400, I80 Exit 68, Little America, WY 82929

Rock Springs Main Office, 1-800-ASK-USPS, 2829 Commercial Way, Rock Springs, WY 82901

Green River Main Office, 1-800-ASK-USPS, 350 Uinta Dr, Green River, WY 82935

Rawlins Main Office, 1-800-ASK-USPS, 106 5th St, Rawlins, WY 82301

Utah Offices

Dinosaur Pump Station
Jensen Main Office, 1-800-ASK-USPS, 9947 E 6000 S, Jensen, UT 84035

Dragon Pump Station
(Within the Uintah and Ouray Indian Reservation – not sure if there is anyone we need to notify with the reservation) Closest town is Bonanza
Vernal Main Office, 1-800-ASK-USPS, 67 N 800 W, Vernal, UT 84078

Harley Dome Pump Station
No towns nearby

Thompson Pump Station
Thompson Springs CPO, 435-285-2214, 100 N Main St, Thompson, UT 84540

Moab Pump Station
Moab Main Office, 800-275-8777, 50 E 100 N, Moab, UT 84532

Lisbon Pump Station
Monticello Main Office, Monticello, UT 84535

Colorado Pump Stations

Dove Creek Pump Station
Dove Creek Main Office, 1-800-ASK-USPS, 80 Highway 666, Dove Creek, CO 81324

Dolores Pump Station
Cortez Main Office, 1-800-ASK-USPS, 35 S Beech St, Cortez, CO 81321
Dolores Main Office, Dolores, CO 81323

List of Post Offices

Ignacio Pump Station
Ignacio Main Office, 1-800-ASK-USPS, 1001 Williams St, Ignacio, CO 81137
Durango Main Office, 1-800-ASK-USPS, 222 W 8th St, Durango, CO 81301

New Mexico Post Offices

Farmington Main Office, 505-325-5047, 2301 E 20th St, Farmington, NM 87401

Nageezi Main Office, 505-632-7106, 11577 US Highway 550, Nageezi, NM 87037

Counselor, 505-568-4453, 9766 Highway 550, Counselor, NM 87018

San Ysidro Main Office, 505-834-7099, 90 Silva Ave, San Ysidro, NM 87053

Placitas Main Office, 505-867-3460, 652 Highway 165, Placitas, NM 87043

Bernalillo, 505-771-8822, 145 Calle Del Presidente, Bernalillo, NM 87004

Edgewood Main Office, 505-281-3535, 13 Plaza Loop, Edgewood, NM 87015

Estancia Main Office, 505-384-2721, 413 E Highland Ave, Estancia, NM 87016

Roswell Main Office, 505-623-7232, 415 N Pennsylvania Ave, Roswell, NM 88201

Hagerman Main Office, 505-752-3730, 108 E Argyle, Hagerman, NM 88232

Lovington Main Office, 505-396-2300, 203 E Avenue D, Lovington, NM 88260

APPENDIX B
List of Issues

MAPL Western Expansion Project

Summary of Issues from
2004 Public and Agency Scoping Meetings
and from BLM POD Review Comments

Public and Agency Issues Summary

Scoping Issues Summary for MAPL Western Expansion Project EA				
Issue Area - Resource	ISSUE		EA Section Number	Source*
	Direct Effect	Indirect Effect		
NEPA/Other Law, RMP, & Policy Conformity				
	• An EIS should be done to assess how the environment will be impacted in the event of pipeline rupture and spill.	N/A	1.5	1-3
	• How is the EA contractor able to be objective if they are contracted by MAPL?	N/A	1.4 1.5	verbal
	• Individuals concerned that the meeting had not been well publicized.	N/A	1.6	verbal
	• In the case of ownership change, who is ultimately liable for the new project?	N/A	1.0	verbal
	• One individual expects an EIS would be required to evaluate the project, and stated it is disingenuous to portray this as a small project.	N/A	1.4 1.5	verbal
	• Who has the authority to determine whether this project would be an EA or EIS?	N/A	1.4 1.5	verbal
	• Who is the BLM director?	N/A	1.3 1.4 1.5	verbal
Alternatives including Proposed Action, Mitigation, and Monitoring				
	• A booster station should be installed at the end of the pipeline in place of new pipeline.	N/A	2.6.2	4-1
	• The proposed project is unnecessary; there are alternatives.	N/A	4.2	6-1
	• Alternative Moab Pump Station TUA location.	N/A	No alternative TUAs discussed	21-1
	• Alternative Thompson Pump Station TUA location.	N/A	No alternative TUAs discussed	22-1
	• BLM permit should not allow the company to change the type of product in the pipeline.	N/A	Outside scope of EA	5-4, 19-2

Scoping Issues Summary for MAPL Western Expansion Project EA				
Issue Area - Resource	**ISSUE**		**EA Section Number**	**Source***
	Direct Effect	**Indirect Effect**		
	• Dust monitoring for up to 10 years plus.	N/A	2.4.1.1 Reclamation Plan 4.1 in POD	17-3
	• Affected lands should be restored/reclaimed following construction and monitored for reclamation success.	N/A	4.3.5.1 4.3.5.2	7-2, 24-10
	• Monitoring of pipeline integrity and for product spills. Monitoring valves during opening and closing operations.	N/A	2.4.1	1-4, 3-2, 4-2, 5-1, 5-2, 6-2, 7-1, 7-4, 8-4
	• Education of those in vicinity of pipelines about their response in the event of a spill.	N/A	2.4.2.1	24-3
	• Cumulative impacts of multiple pipelines operating in a corridor routed through residential communities.	N/A	4.4	24-4
	• Financial ability to remediate and cover liabilities.	N/A	Addressed in ROW Grant consideration	24-9
	• Carol Parker concerned that granting the additional capacity for this project may then free up an existing line to be transferred from NGL to refined products.	N/A	1.1 1.2	verbal
	• Is a plan already in the works to construct additional segments?	N/A	1.1 1.2	verbal
	• How will these additional segments satisfy additional capacity?	N/A	1.1 1.2	verbal
	• Concern that the project will keep requesting the construction of additional segments every few years.	N/A	1.1 1.2	verbal
	• What direction would the liquids flow?	N/A	1.1.2	verbal
	• What is the new ROW width?	N/A	2.4.1	verbal
	• Is the project going west of Red Rim?	N/A	Figure 1.1-1	verbal

Scoping Issues Summary for MAPL Western Expansion Project EA				
Issue Area - Resource	**ISSUE**		**EA Section Number**	**Source***
	Direct Effect	**Indirect Effect**		
Geology, Minerals, Paleontology, and GeoHazards				
	• Effects of pipeline construction on fossil resources.	N/A	3.2.2.3 4.3.2.3	12-1, 18-4, 18-5
	• Effects of pipeline construction and operation on floodplains.	N/A	3.2.4.3 4.3.4.4	18-1
	• Effects of stream incision on pipeline integrity.	N/A	3.2.4 4.3.4	18-2
	• Effects of pipeline construction related to karst topography and cave resources.	N/A	3.2.2.1 4.3.2.1	18-3, 18-6
Water Resources				
	• Effects of pipeline construction and operations on groundwater and potable well water.	N/A	3.2.4.2 4.3.4.2	6-3, 8-3
	N/A	• Effect of spill of NGL on groundwater quality from pipeline rupture.	4.4.2.5	1-2, 5-2
	• Effects of pipeline construction and operations on wetlands.	N/A	4.4.2.6	14-1
	• Effect of pipeline construction and operation on surface water quality.	N/A	4.4.2.5	19-1
	N/A	• Effect of spill of NGL on surface water quality from pipeline rupture.	4.3.4.1 4.3.4.2	1-2, 5-2
	▪ Rock Springs Grazing Association wants to know in advance where hydrostatic discharge points will be	N/A	4.3.4	verbal
Air Quality				
	N/A	• Effects of potential pipeline rupture and release of NGL on air quality.	4.3.1	1-2, 5-3
	• Effects of dust generated by pipeline construction and operational activities.	N/A	4.3.1	17-2
	• Effects of odors resulting from pipeline leaks.	N/A	4.3.1	24-6
	• When will odor issues be addressed for the valve on the east side of the open space? When will Enterprise test stoppel fittings for this valve?	N/A	Outside scope of EA	verbal
	• Dust control during construction a big concern.	N/A	4.3.4	verbal

Scoping Issues Summary for MAPL Western Expansion Project EA				
Issue Area - Resource	**ISSUE**		**EA Section Number**	**Source***
	Direct Effect	**Indirect Effect**		
	• How will this line impact line pressures?	N/A	2.4.1.1	verbal
	• Why doesn't Enterprise just build the whole line at this time?	N/A	1.1 1.2 2.4	verbal
Soils				
	• Effects of pipeline construction and operations on cryptogamic soils crusts.	N/A	3.2.3.3 4.3.3.4	2-4
	• Effects on soil condition and stability.	N/A	3.2.2.1 3.2.3.2	17-7
Vegetation				
	• Effects of pipeline construction and operation on distribution and control of noxious/invasive weeds.	N/A	3.2.5.2 4.3.5.2	11-1, 17-1, 17-3, 23-4
	• Effects of pipeline construction and operations on Special Status Species (plant) including federally listed threatened or endangered species, BLM sensitive species, and state sensitive species.	N/A	3.2.5 4.3.5	15-2, 15-3
	N/A	• Effect of pipeline construction and operations on water quality and affected riparian areas.	3.2.5.1 4.3.4.3	19-1
	▪ Will MAPL commit to the same level of restoration and revegetation as was completed in 1995?	N/A	3.2.5.2 4.3.5	verbal
	▪ A request that native/local straw be used for revegetation effort.	N/A	4.3.5	verbal
Wildlife				
	• Effects of pipeline construction and operations on big game species and habitat/ranges.	N/A	3.2.6.1 4.3.6.1	16-2, 23-2
	• Effects of pipeline construction and operations on migratory bird species, including raptors.	N/A	3.2.6.1 3.2.6.2 4.3.6.1 4.3.6.2	15-1, 16-1, 20-2, 23-3

Scoping Issues Summary for MAPL Western Expansion Project EA				
Issue Area - Resource	**ISSUE**		**EA Section Number**	**Source***
	Direct Effect	**Indirect Effect**		
	• Effects of pipeline construction and operations on Special Status Species (animal) including federally listed threatened or endangered species, BLM sensitive species, and state sensitive species.	N/A	4.3.6	2-3, 15-4 16-1, 16-3, 16-4, 20-1, 23-1, 23-4
	• Concerns for big game winter range if constructed during the winter months.	N/A	3.2.6.1 4.3.6.1	verbal
Cultural Resources				
	• Effects of pipeline construction and operations on cultural resources – archaeological and historic sites, and historic landscapes.	N/A	4.3.9	2-2, 7-3 10-1, 17-4, 17-5, 24-7
Land Use and Transportation				
	• Inadequacy of public and previously used private access roads to support heavy trucks for pipeline construction. Increase in erosion problems along Windmill Trail since 1995.	N/A	3.2.7.2 4.3.7.2	2-5
	• Keep lands from destruction.	N/A	3.2.7.3 4.3.7.3	8-2
	• Effects of pipeline construction and operations on WSAs.	N/A	3.2.7.3 4.3.7.3	13-2, 14-4
	• Effects of pipeline construction and operations on ACECs.	N/A	3.2.7.3 4.3.7.3	14-2
	• Effects of pipeline construction and operations on SMAs.	N/A	3.2.7.3 4.3.7.3	14-3
	• A gentleman concerned about the level of detail and age of the project map. He was unable to determine where the project is relative to his home in Placitas.	N/A	Figure 1.1-1	verbal
	• When would ROW be acquired?	N/A	1.4 1.5	verbal
	• Many new houses have been built in the Placitas area since 1995, and would it be reasonable to ask for a 1,000 foot buffer from the project to any houses.	N/A	4.3.7.1	verbal

Scoping Issues Summary for MAPL Western Expansion Project EA				
Issue Area - Resource	**ISSUE**		**EA Section Number**	**Source***
	Direct Effect	**Indirect Effect**		
Livestock Management				
	• **NONE**	N/A		
Recreation				
	• Effects on recreational value in Placitas area.	N/A	3.2.7.3 4.3.7.3	24-8
Visual Resources				
	• Potential modification to rural character of the landscape from construction and operations of the pipeline.	N/A	4.3.7.4	13-1
Noise				
	N/A	• Noise impacts from development near historic trails.	4.3.1.2	10-2
Socio-economics & Quality of Life				
	• Potential destruction of the human environment from pipeline construction and operations. • Potential exacerbation of existing odor problems in the vicinity of the pipeline valve located on the east boundary of the Placitas Open Space.	N/A	3.2.11	8-1
	• Many have spent their life savings investing in homes in this area, and they want to be sure that all concerned voices be taken seriously, not just those whose property is crossed by the pipeline.	N/A	3.2.11 4.3.11	verbal
	• What is the financial incentive for the BLM?	N/A	1.3	verbal
	• Was MAPL created to shield Enterprise from bankruptcy?	N/A	1.0	verbal
Health & Safety				
	• Potential for and effects of pipeline rupture on human safety, including zone of danger and size range of spills. • Potential for long-term impacts resulting from pipeline accidents based on MAPCO experience.	N/A	2.4.2.1 3.2.12.3 4.3.12.3	1-1, 2-1, 3-1, 5-1, 24-1 5-2, 6-2 7-1, 24-2
	• Are older pipe sections stronger or weaker than new pipe?	N/A	3.2.12.3.1	verbal
	• How will Enterprise address terrorism concerns?	N/A	4.3.12.3	verbal

Scoping Issues Summary for MAPL Western Expansion Project EA				
Issue Area - Resource	**ISSUE**		**EA Section Number**	**Source***
	Direct Effect	**Indirect Effect**		
	• Does the BLM have pipeline safety individuals?	N/A	Outside scope of EA. BLM defers to US DOT - OPS	verbal
	• What is the differential between safety of NGLs and petroleum products?	N/A	3.2.12.3.4	verbal
	• What evaluations have been done of safety to area homes from gases released to the atmosphere and collecting in the arroyos?	N/A	2.4.2.1 3.2.12..3 4.3.12..3	verbal
	• The public requests that a hazard study be conducted and that Enterprise come back and hold a public meeting.	N/A	2.4.2.1 3.2.12..3 4.3.12..3	verbal

* Sources of Comments by document number-page (e.g. 6-2 indicates the second page of the 7/23/04 fax from N. Hawks):

1. Tony Trazza, 8/19/04
2. Denise and William Patterson, 8/18/04
3. Dr. Charles Mellon, 8/4/04 (fax receipt date)
4. L.R. Stephens, 8/4/04 (fax receipt date)
5. Carol Ann Skees, 7/33/04
6. N. Hawks, 7/23/04 (fax receipt date)
7. Linda Bullock, 7/6/04
8. Jennifer Delaney, 7/6/04
9. Mrs. Skees, 8/18/04
10. Lee Kreutzer, Cultural Resources Specialist, National Trails System – Salt Lake, National Park Service, 7/1/04
11. Maxine Deeter, UT BLM, 7/14/04
12. Peter Kempenich, BLM Vernal Field Office, 7/14/04
13. John Bristol, BLM Albuquerque Field Office, 7/14/04
14. Gretchen Obenauf, BLM Albuquerque Field Office, 7/14/04
15. Pamela Herrera-Olivas, BLM Albuquerque Field Office, 7/14/04
16. Bill Falvey, BLM Rawlins Field Office, 7/14/04
17. Chuck Valentine, BLM Rawlins Field Office, 7/14/04
18. Patricia Hester, BLM Albuquerque Field Office, 7/14/04
19. Danita Burns, NM BLM, 7/14/04
20. Kathleen Erwin, USFWS Wyoming, 7/14/04
21. Jan Denny, BLM Moab Field Office, 7/14/04
22. Jan Denny, BLM Moab Field Office, 7/14/04
23. Chuck Valentine, BLM Rawlins Field Office, 7/14/04
24. Carol Parker, 7/14/04

APPENDIX C
Legal Descriptions, Temporary Use Areas, Access Roads and Maps

Attachment 1 – Legal Descriptions of Lands Crossed by the MAPL WEP
Attachment 2 – Table 1 – Above Ground Facilities for Entire Project
Attachment 2 – Table 2 – Above Ground Facilities on Federal Lands
Attachment 3 – Table 1 – Project Temporary Use Area (TUA) Totals
Attachment 3 – Table 2 – Federal Temporary Use Areas
Attachment 4 – Table 1 – Access Roads
Attachment 4 – Table 2 – Federal Access Roads
Attachment 5 – Project Location Maps
Attachment 6 – Aerial Marker to Milepost Conversion

Appendix C – Attachment 1
Legal Descriptions of Lands Crossed by the MAPL Western Expansion Project

Segment	Tract	Section	Township	Range	Legal
1	655-WY-SW-WL-56 (P)	8	18N	111W	NW NW NW
1	655-WY-SW-WL-57 (P)	7	18N	111W	N/2
1	655-WY-SW-WL-58 (P)	12	18N	112W	All
1	655-WY-SW-WL-59 (P)	11	18N	112W	S/2
1	655-WY-SW-WL-60 (P)	10	18N	112W	SE/4
1	655-WY-UI-WL-1 (P)	10	18N	112W	SW/4
1	655-WY-UI-WL-2 (P)	9	18N	112W	SE/4 SE/4
1	655-WY-UI-WL-3 (P)	16	18N	112W	All
2	WY-SW-WL-24	3	17N	107W	S2 and NW4
2	WY-SW-WL-25	4	17N	107W	NE4
2	WY-SW-WL-26	33	18N	107W	SWSE and W2
2	WY-SW-WL-27	28	18N	107W	SW4
2	WY-SW-WL-28	29	18N	107W	E2 and NW4
2	WY-SW-WL-29	30	18N	107W	N2N2
2	WY-SW-WL-30	19	18N	107W	S/2 SW4
2	WY-SW-WL-31	24	18N	108W	S2
2	WY-SW-WL-32	23	18N	108W	All
2	WY-SW-WL-33	22	18N	108W	N2
2	WY-SW-WL-34	21	18N	108W	N2
2	WY-SW-WL-35	20	18N	108W	N2N2
2	WY-SW-WL-36	17	18N	108W	SW4
2	WY-SW-WL-37	18	18N	108W	S2S2
2	WY-SW-WL-38	13	18N	109W	S2S2
2	WY-SW-WL-39	14	18N	109W	SE4
2	WY-SW-WL-40	14	18N	109W	SW4
2	WY-SW-WL-41	15	18N	109W	S2
2	WY-SW-WL-42	16	18N	109W	S2 S2
2	WY-SW-WL-43	17	18N	109W	S2
2	WY-SW-WL-44	18	18N	109W	S2 S2
2	WY-SW-WL-45	13	18N	110W	S2
2	WY-SW-WL-46	14	18N	110W	NE SE
3	WY-SW-EL-01	7	19N	96W	SE4 NE4
3	WY-SW-EL-02	8	19N	96W	N2
3	WY-SW-EL-03 (P)	9	19N	96W	N2
3	WY-SW-EL-04 (P)	10	19N	96W	N2
3	WY-SW-EL-04A added	3	19N	96W	SW SE SE and SW SE
3	WY-SW-EL-05 (P) O/L for S-3	11	19N	96W	NW NW NW
3	WY-SW-EL-06 (P)	2	19N	96W	S2 SW; S2 SE

Segment	Tract	Section	Township	Range	Legal
3	WY-SW-EL-07 (P)	1	19N	96W	NE SW4
3	WY-SW-EL-07B new owner	1	19N	96W	S2 SW4
3	WY-SW-EL-07C new owner	1	19N	96W	NW SW
3	WY-SW-EL-07A	1	19N	96W	NW SE
3	WY-SW-EL-08 (P)	1	19N	96W	NE SE
3	WY-SW-EL-09 (P) O/L for Seg 3	6	19N	95W	NENW
3	WY-SW-EL-09A new owner	6	19N	95W	NW SW
3	WY-SW-EL-09B new owner	6	19N	95W	NE SW
3	WY-SW-EL-09C new owner	6	19N	95W	SE NW
3	WY-SW-EL-09D new owner	6	19N	95W	NW SE
3	WY-SW-EL-09E new owner	6	19N	95W	SW NE
3	WY-SW-EL-09F new owner	6	19N	95W	SE NE
3	WY-SW-EL-10 (P)	5	19N	95W	N2
3	WY-SW-EL-11 (P)	4	19N	95W	N2
3	WY-SW-EL-12 (P)	3	19N	95W	N2 NW
3	WY-SW-EL-13 (P)	34	20N	95W	S2
3	WY-SW-EL-14 (P)	35	20N	95W	S2
3	WY-SW-EL-15 (P)	36	20N	95W	W2 and NE4
3	WY-SW-EL-16 (P)	31	20N	94W	N2
3	WY-SW-EL-17 (P)	32	20N	94W	NW NW
3	WY-SW-EL-18 (P)	29	20N	94W	All
3	WY-SW-EL-19 (P)	28	20N	94W	S2
3	WY-SW-EL-20 (P)	27	20N	94W	S2 NW4, less and except a 15.01 parcel, and NE4
3	WY-SW-EL-20A added this after survey	27	20N	94W	a 15.010 parcel of land in the S2 NW4
3	WY-SW-EL-20AA not needed after survey O/L	27	20N	94W	17.48 acres in the N2NE4NW4
3	WY-SW-EL-21 (P)	26	20N	94W	N2
3	WY-SW-EL-22 (P)	23	20N	94W	S2
3	WY-SW-EL-23 (P)	24	20N	94W	S2
3	WY-SW-EL-24 (P)	19	20N	93W	S2 N2
3	WY-SW-EL-25 (P)	18	20N	93W	SESE
3	WY-SW-EL-26 (P)	17	20N	93W	S2
3	WY-SW-EL-27 (P)	16	20N	93W	S2
3	WY-SW-EL-28 (P)	15	20N	93W	S2
3	WY-SW-EL-29 (P)	14	20N	93W	S2

Segment	Tract	Section	Township	Range	Legal
3	WY-SW-EL-30 (P)	13	20N	93W	SW
4	WY-SW-EL-58 (P)	11	18N	99W	All of Sec.11
4	WY-SW-EL-59 (P)	2	18N	99W	SESE
4	WY-SW-EL-60 (P)	1	18N	99W	All of Sec.1
4	WY-SW-EL-61 (P)	6	18N	98W	NWNW
4	WY-SW-EL-62	31	19N	98W	S2; SENE
4	WY-SW-EL-63 (P)	32	19N	98W	NW
4	WY-SW-EL-64	29	19N	98W	SESW; SE
4	WY-SW-EL-65 (P)	28	19N	98W	All of Sec. 28
4	WY-SW-EL-66	27	19N	98W	N2
4	WY-SW-EL-67 (P)	26	19N	98W	NW NW
4	WY-SW-EL-68	23	19N	98W	A portion lying South of the RR
4	WY-SW-EL-69 (P)	24	19N	98W	All of Sec. 24
5	WY-SW-EL-09 (P)	15	16N	104W	S2 N2
5	WY-SW-EL-09A (P)	15, 14	16N	104W	NE4 SE4 Sec 15; NW4 SW4 Sec 14
5	WY-SW-EL-10 (P)	14	16N	104W	All of Sec. 14 except NW4 SW4
5	WY-SW-EL-11 (P)	13	16N	104W	S2
5	WY-SW-EL-12 (P)	24	16N	104W	N2 NE4
5	WY-SW-EL-13 (P)	19	16N	103W	N2
5	WY-SW-EL-14 (P)	20	16N	103W	SWNW
5	WY-SW-EL-15 (P)	20	16N	103W	NWSW
5	WY-SW-EL-16 (P)	20	16N	103W	NESW
5	WY-SW-EL-17 (P)	20	16N	103W	N2SE
5	WY-SW-EL-18 (P)	21	16N	103W	All
5	WY-SW-EL-19 (P)	22	16N	103W	N2
5	WY-SW-EL-20 (P)	23	16N	103W	
5	WY-SW-EL-21 (P)	24	16N	103W	N2 N2
5	WY-SW-EL-22 (P)	19	16N	102W	N2 N2
6	WY-SW-05B		13N 13N 14N 14N 15N	105W 104W 104W 105W 105W	W/2 & NE/4 Section 12; & SE/4 SE/4 Sec 1, T13N, R105W. S/2 NE/4 Sec 6, T13N, R104W. E/2 Sec 31; SW SE/4 and W/2 Sec 30; W/2 Sec 19; and W/2 Sec 18, all in T14N, R104W. E/2 NE/4 Sec 13; E/2 Sec 12; and E/2 and NE/4 NW/4 Sec 1, all in T14N, R105W. S/2 Sec 36; SW/4 SW/4 Sec 25; and E/2 Sec 26, all in T15N, R105W
6	WY-SW-06 and 07	36, 25, 26, 23	15N	105W	W/2) Section 36; SW/4 SW/4 Section 25; E/2 Section 26; SW/4 SE/4 and SE/4 SW/4 Section 23
6	WY-SW-08	23	15N	105W	NW4 & N2SW4
6	WY-SW-09	14	15N	105W	SWSW
6	WY-SW-10	15	15N	105W	E2 & N2NW4

Segment	Tract	Section	Township	Range	Legal
6	WY-SW-11	10	15N	105W	W2
6	WY-SW-12	9	15N	105W	NENENE
6	WY-SW-13	4	15N	105W	E2 & NW4
6	WY-SW-14	33	16N	105W	W2
6	WY-SW-15	32	16N	105W	E2
6	WY-SW-16	29	16N	105W	S2 & NW4
6	WY-SW-17	20	16N	105W	W2
8	NM-McK-12	5	20N	5W	NE/4 of Section 5
8	NM-SA-47N	32	21N	5W	W/2 & SWSE of Sec 32
8	NM-SA-48N	31	21N	5W	All of Section 31
8	NM-SA-49N	30	21N	5W	SE/4 of Section 30
8	NM-SA-50N	30	21N	5W	E/2 SW/4 and Lots 3 and 4 of Section 30
8	NM-SA-51N	30	21N	5W	Lots 1 and 2 and the E/2 NW/4 of Section 30
8	NM-SA-51AN	25	21N	6W	NE/4 of Section 25
8	NM-SA-52N	24	21N	6W	SE/4 of Section 24
8	NM-SA-53BN	24	21N	6W	W/2 of Section 24
8	NM-SA-53AN	13	21N	6W	SW/4 of Section 13
8	NM-SA-53N	3, 10, 11, 14	21N	6W	Sections 3, 10, 11 and 14
8	NM-SA-55N	4	21N	6W	SE/4 and W/2 of Sec. 4
8	NM-SA-54N	4	21N	6W	Lots 1 and 2 and the S/2 NE/4 of Section 4
8	NM-SA-56N	33	22N	6W	SW/4 of Section 33
8	NM-SA-57NA	32	22N	6W	E/2 of Section 32
8	NM-SA-57N	32, 29, 30, 19	22N	6W	NW/4 of Section 32; SW/4 SW/4 of Section 29; E/2 and NE/4 NW/4 of Section 30; and the S/2 of Section 19
8	NM-SA-58N	19	22N	6W	Lots 1 and 2 and the E/2 NW/4 of Section 19
8	NM-SA-58NA	24	22N	7W	SE/4 NE/4 of Section 24
8	NM-SA-59N	24	22N	7W	NE/4 of Section 24
8	NM-SA-60N	13	22N	7W	SE/4 of Section 13
8	NM-SA-61NA	13	22N	7W	SW/4 of Section 13
8	NM-SA-61N	13	22N	7W	N/2 of Section 13
8	NM-SA-62N	12	22N	7W	SW/4 of Section 12
8	NM-SA-63N	12,11	22N	7W	N/2 of Section 12 and the E/2 of Section 11
8	NM-SA-64N	2	22N	7W	SE/4 of Section 2
8	NM-SA-65N	2	22N	7W	Lots 1 and 2 and the S/2 NE/4 of Section 2
8	NM-SA-66N	35	23N	7W	SE/4 of Section 35
8	NM-SA-67NA	35	23N	7W	NE/4 of Section 35
8	NM-SA-67N	26, 25	23N	7W	E/2 of Section 26 and the NW/4 of

Segment	Tract	Section	Township	Range	Legal
					Section 25
8	NM-SA-68N	24, 23	23N	7W	SW/4 of Section 24 and the E/2 of Section 23, except a parcel in the N/2 N/2 NE/4
8	NM-SA-68NA	23	23N	7W	a parcel in the N/2 N/2 NE/4
8	NM-RA-01	14	23N	7W	S/2 S/2 of Section 14
8	NM-RA-02	14	23N	7W	N/2 S/2 of Section 14
8	NM-RA-02A	14	23N	7W	A 1.732 acre tract in the NE/4 NW/4 of Section 14
9	NM-SA-15	24, 25	13N	4E	The North Half of the Northeast Quarter (N/2 NE/4) and the Northeast Quart of the Northwest Quarter (NE/4 NW/4) of Section 25 and the South Half of the Southwest Quarter (S/2 S/4) of Section 24, T13N, R4E
9	NM-SA-16	23, 22	13N	4E	The South Half (S/2) and the Southwest Quarter of the Northwest Quarter (SW/4 NW/4) of Section 23; and part of the East Half of the Northeast Quarter (E/2 NE/4) of Section 22, T13N, R4E
9	NM-SA-16AA	23	13N	4E	Lot 86-A-1, of Sundance Mesa, a Subdivision, Placitas, Sandoval County, New Mexico, as the same is shown and designated on a Plat thereof, re-recorded on August 31, 1999 in Vol. 3, Folio 1897B
9	NM-SA-16AB	23	13N	4E	Lot 148-A, Sundance Mesa Subdivision, County of Sandoval, New Mexico, as set forth on the Plat of said Subdivision, filed on December 31, 1997, and recorded in Volume #3, Folio 1714A, of the real property records of the Sandoval County Clerk
9	NM-SA-17	15, 22	13N	4E	Sections 15 and 22, in El Ranchito Grant
9	NM-SA-17.1	15	13N	4E	S/2 S/2 of Section 15 in El Ranchito Grant
9	NM-SA-17.2	16	13N	4E	E/2 of Section 16 in El Ranchito Grant
9	NM-SA-17.3	16	13N	4E	E/2 of Section 16 in El Ranchito Grant
9	NM-SA-18	9,16, 7,8	13N	4E	Sections 7, 8, Ranchito Grant in Sections 9,16
9	NM-SA-18.1	7	13N	4E	W/2 NW/4 of Section 7
9	NM-SA-18	1, 12	13N	3E	Sections 1,12
9	NM-SA-19	2	13N	3E	The S/2, the S/2 N/2 and Lots 9, 10, 11 and 12 of Section 2
9	NM-SA-20	2	13N	3E	Lots 5, 6, 7 and 8 of Sec. 2
9		7, 17, 18,	14N	3E	Sections 7,17,18, 20, 21, 28, 27,

Segment	Tract	Section	Township	Range	Legal
		20, 21, 27, 28, 34, 35			34, 35
9	NM-SA-20.1	28	14N	3E	NE/4 NW/4 of Sec. 28
9	NM-SA-21	2,1,12	14N	2E	Sections 2,1,12,
9	NM-SA-21.1	35	15N	2E	NE/4 SW/4 of Sec. 35
9	NM-SA-21	20, 29, 28, 33, 34, 35	15N	2E	All of Sections 20, 29, 28, 33, 34, 35
9	NM-SA-22	19	15N	2E	SE/4 NW/4 of Section 19
10	NM-TO-07	19, 24	4	15 14	All of Section 19, T4N, R15E, NE/4 of Section 24, T4N, R14E
10	NM-TO-08	13, 14, 11, 10	4	14	All of Section 13, NE/4 of Sec. 14, all of Sections 10 and 11
10	NM-TO-09	3	4	14	All of Section 3
10	NM-TO-09.1	3	4	14	SW/4 SE/4 of Section 3
10	NM-TO-10	4	4	14	NE/4 of Section 4
10	NM-TO-11	32	5	14	S/2 of Section 32
10	NM-TO-12	31, 30	5	14	All of Section 31, and the SW/4 of Section 30
10	NM-TO-13	25	5	13	SE/4 of Section 25 Albuq Phone 505-299-2214
10	NM-TO-14	25, 24, 23	5	13	SW/4 & N/2 of Sec 25, SW/4 of Sec 24 & SE/4 & N/2 of Sec 23
10	NM-TO-15	14, 15	5	13	S/2, S/2 N/2 & NE/4 NE/4, less RR & Hwy 60 R/W, NW NW S of Hwy 60 Sec 14; S/2 & S/2 N/4 S of RR R/W
10	NM-TO-15.1	14, 15	5	13	between Sec 14 and 15 in the S/2
10	NM-TO-15.2	15	5	13	SE/4 NW/4 of Section 15
10	NM-TO-16	15	5	13	That part of Sec 15 lying north of Santa Fe RR [Note: And lying south of US Hwy 60]
10	NM-TO-17	9, 10	5	13	E/2 & SW/4 of Section 9; SW/4 of Section 10, less 38 ac for Hwy
10	NM-TO-17.1	9	5	13	SE/4 SE/4 of Section 9
10	NM-TO-18	9	5	13	NW/4 of Section 9
10	NM-TO-19	8, 5	5	13	N/2 of Section 8; Lots 1, 2, 3 and 4, the S/2 of N/2 and the S/2 of Section 5
10	NM-TO-20	6	5	13	All of Section 6
10	NM-TO-21	31	6	13	All of Section 31
10	NM-TO-22	36	6	12	NE/4 of Section 36
10	NM-TO-23A	25	6	12	E/2 of Section 25
10	NM-TO-23	25	6	12	W/2 of Section 25
10	NM-TO-24	26	6	12	E/2 of Section 26
10	NM-TO-25	23	6	12	E/2 of Section 23

Segment	Tract	Section	Township	Range	Legal
10	NM-TO-26	23	6	12	W/2of Section 23
10	NM-TO-27	22, 15	6	12	All of Sections 15 and 22
10	NM-TO-28	16	6	12	All of Section 16
10	NM-TO-29	9, 8, 5, 6	6	12	All of Sections 9, 8, 5 and 6
10	NM-TO-30	31	7	12	SW/4 of Section 31
10	NM-TO-31 NM-TO-31A	36	7	11 11 1/2	All Sec 36, T7N, R11E; Lots 1, 2, 3 & 4 & E/2 of Sec 36, T7N, R11 1/2 E
10	NM-TO-32	25	7	11	All of Section 25
10	NM-TO-33	26	7	11	All of Section 26
10	NM-TO-34	23	7	11	SW/4 SE/4 of Section 23
10	NM-TO-35	23	7	11	E/2 W/2 of Section 23
10	NM-TO-36	23	7	11	SW/4 NW/4 and NW/4 SW/4 of Section 23
10	NM-TO-37	22	7	11	All of Section 22
10	NM-TO-38	15	7	11	All of Section 15
10	NM-TO-39	16	7	11	All of Section 16
10	NM-TO-40	8, 9	7	11	All of Sections 8 and 9
10	NM-TO-41	5	7	11	All of Section 5
10	NM-TO-42	6	7	11	All of Section 6
10	NM-TO-43	36	8	10	All of Section 36
10	NM-TO-43A	35	8	10	ALL except Lots 7 and 8 of Section 35
10	NM-TO-44	26	8	10	All of Section 26
10	NM-TO-45	27	8	10	All of Section 27
11	NM-CH-65A	13	4S	22E	3.15 acres in the NE/4 of Section 13
11	NM-CH-65.1	13	4S	22E	NE/4
11	NM-CH-65	13, 12, 11	4S	22E	All of Section 13, less and except 3.15 acres to MAPCO - Mesa Station; all of Sections 12 and 11
11	NM-CH-65.2	11	4S	22E	NE/4
11	NM-CH-66	2	4S	22E	Lots 1, 2, 3 and 4 and the S/2 N/2 and the SW/4 of Section 2
11	NM-CH-67	3	4S	22E	Lots 1, 2, 3 and 4, S/2 N/2 and E/2 SE/4 of Section 3
11	NM-DB-01	24	3S	21E	All of Section 24
11		19, 20, 29, 28, 33, 34	3S	22E	All of Sec 19; the SW/4 of Sec 20; W/2 of Sec 28; all of Sections 29 and 33; & the S/2 of Sec 34
11	NM-DB-01.1	29	3S	22E	NW/4
11	NM-DB-02	13	3S	21E	All of Section 13
11	NM-DB-03	14	3S	21E	NE/4 NE/4 of Section 14
11	NM-DB-04	11	3S	21E	All of Section 11, except NW/4 NW/4
11	NM-DB-04.1	11	3S	21E	SE/4
11	NM-DB-05	11, 10	3S	21E	The NW/4 NW/4 of Section 11; the

Segment	Tract	Section	Township	Range	Legal
					N/2 of Section 10
11	NM-DB-06	3	3S	21E	NW/4 NW/4, SW/4 NW/4, SE/4 NW/4, NE/4 SW/4, NW/4 SE/4, SW/4 SE/4, SE/4 SE/4 of Section 3
11	NM-DB-07	4	3S	21E	The NE/4 of Section 4
11	NM-DB-08	33	2S	21E	SW/4 SE/4, SE/4 SE/4 of Section 33
11	NM-DB-09	33	2S	21E	S/2 NW/4, N/2 SW/4 of Section 33
11	NM-DB-10	33	2S	21E	NW/4 NW/4 of Section 33
11	NM-DB-11	32	2S	21E	All of Section 32
11	NM-DB-12	30, 29	2S	21E	All of Sec 29, NE/4 Sec 30
11	NM-DB-12.1	29	2S	21E	SW/4
11	NM-DB-13	4,3,10,11	2S	20E	S/2 S/2 of Section 4, SW/4 of Section 3, All of Section 10, SW/4 of Section 11
11		14,13, 24	2S	20E	All of Section 14, SW/4 Section 13, All of Section 24
11		19	2S	21E	All of Section 19
12	NM-CH-51	18, 12, 13	6S	26E, 25E	W/2 of Section 18,T6S, R26E; S/2 NW/4, SW/4, S/2 SE/4 of Section 12; N/2 NE/4 of Section 13, in T6S, R25E, NMPM
12	NM-CH-51.1	18	6S	26E	SW/4 NW/4 of Section 18, T6S, R26E, NMPM
12	NM-CH-52	11	6S	25E	NE/4 of Section 11, T6S, R25E, NMPM
12	NM-CH-52.1	11	6S	25E	E/2 NE/4 Sec 11, T6S, R25E, NMPM
12	NM-CH-53	2	6S	25E	Lots 1, 2, 3, 4 in Section 2, T6S, R25E, NMPM
12	NM-CH-54	36	5S	24E	Portions of Section 36, T5S, R25E, NMPM
12	NM-CH-55	22, 27, 26, 35	5S	24E	Portions of Sections 22, 26, 27 & 35, all in T5S, R24E, NMPM
12	NM-CH-55.1	27	5S	24E	N/2 SE/4 of Section 27, T5S, R24E, NMPM
12	NM-CH-56	20, 21	5S	24E	All of Sections 20 and 21, T5S, R24E, NMPM
12	NM-CH-57	17	5S	24E	All of Section 17, T5S, R24E, NMPM
12	NM-CH-58	7, 18	5S	24E	All of Section 7; N/2 Section 18, T5S, R24E, NMPM
12	NM-CH-59	1, 12	5S	23E	All of Section 1 and the N/2 of Section 12 in T5S, R23E, NMPM
12	NM-CH-60	2, 35, 34, 28, 29	5S, 4S	23E	All of Section 2 in T5S, R23E; all of Sections 35, 34, 28 and 29 in T4S, R23E, NMPM
12	NM-CH-60A	33	4S	23E	NE/4 NE/4 of Section 33, T4S, R23E, NMPM
12	NM-CH-60.1	28	4S	23E	NW/4 SE/4 of Section 28, T4S, R23E, NMPM

Segment	Tract	Section	Township	Range	Legal
12	NM-CH-61	20	4S	23E	All of Section 20, T4S, R23E, NMPM
12	NM-CH-62	19	4S	23E	All of Section 19, T4S, R23E, NMPM
12	NM-CH-64	18	4S	23E	NW/4 SW/4, SW/4 SW/4, SE/4 SW/4 of Section 18, T4S, R23E, NMPM
12	NM-CH-65	13	4S	22E	NE/4 of Section 13, less and except 3.15 acres, T4S, R22E, NMPM
12	NM-CH-65A	13	4S	22E	3.15 acres in the NE/4 of Section 13, T4S, R22E, NMPM
13	NM-LEA-61	6	13S	34E	Lot 7, being the Southwest Quarter of the Southwest Quarter (SW/4 SW/4), the East Half of the Southwest Quarter (E/2 S/4), the Southeast Quarter of the Northeast Quarter (SE/4 NE/4) and the Southeast Quarter (SE/4) of Section 6, T13S, R34E, NMPM
13	NM-LEA-63	1	13S	33E	The East Half of the Southeast Quarter (E/2 SE/4) and Lots 1, 2, 3 and 4 in the Northwest Quarter (NW/4) of Section 1, T13S, R33E, NMPM
13	NM-LEA-64	1	13S	33E	The Southeast Quarter of the Southwest Quarter (SE/4 SW/4), the Southwest Quarter of the Northeast Quarter (SW/4 NE/4), the North Half of the Southwest Quarter (N/2 SW/4), the South Half of the Northwest Quarter (S/2 NW/4), and the West Half of the Southeast Quarter (W/2 SE/4) of Section 1, T13S, R33E, NMPM
13	NM-LEA-65	36	12S	33E	The Southwest Quarter of the Southwest Quarter (SW/4 SW/4) of Section 36, T12S, R34E, NMPM
13	NM-LEA-66	35	12S	33E	All of Section 35, T12S, R33E, NMPM
13	NM-LEA-67	26	12S	33E	The Southwest Quarter of the Southwest Quarter (SW/4 SW/4) of Section 26, T12S, R33E, NMPM
13	NM-LEA-68	27	12S	33E	All of Section 27, T12S, R33E, NMPM

Appendix C - Attachment 2 - Table 1 - Above Ground Facilities for Entire Project

Segment	Approximate Station	Mile Post	Construction Type	Description	State	County	Ownership
1	0+00	0.00	Pig Receiver	Granger Pump Station	Wyoming	Sweetwater	BLM
1	28266.8	5.35	Pig Launcher	Opal South Meter Site	Wyoming	Uinta	State of Wyoming
2	0+00	0.00	Pig Receiver	New Valve / Tie-in Site	Wyoming	Sweetwater	Anadarko Land Corp.
2	26761	5.07	Valve w/ Check	Mainline Valve Site	Wyoming	Sweetwater	Green River Livestock
2	70340	13.32	Gate Valve	Gate Valve Site	Wyoming	Sweetwater	Anadarko Land Corp.
2	96617	18.30	Pig Launcher	Existing Valve Set / Tie-in	Wyoming	Sweetwater	BLM
3	0+00	0.00	Pig Receiver	Tipton Station	Wyoming	Sweetwater	Cyclone Rim Co.
3	64930	12.30	Gate Valve	Gate Valve Site	Wyoming	Sweetwater	Green River Livestock
3	121753.6	23.06	Pig Receiver	Wamsutter Junction	Wyoming	Sweetwater	Anadarko Land Corp.
4	0+00	0.00	Pig Receiver	Existing Valve Set	Wyoming	Sweetwater	BLM
4	64322	12.18	Valve w/ Check	Mainline Valve Site	Wyoming	Sweetwater	Anadarko Land Corp.
4	44362	8.40	Pig Launcher	New Valve / Tie-in Site	Wyoming	Sweetwater	Rock Springs Grazing
5	100	0.02	Pig Receiver	Existing Valve and Launcher Site	Wyoming	Sweetwater	Anadarko Land Corp.
5	52122	9.87	Pig Launcher	Existing Valve Site	Wyoming	Sweetwater	Anadarko Land Corp.
6	0+00	0.00	Pig Receiver	Existing Valve Site	Wyoming	Sweetwater	BLM
6	44253	8.38	Valve w/ Check	Mainline Valve Site	Wyoming	Sweetwater	BLM
6	97985.7	18.56	Pig Launcher	Rock Springs Station	Wyoming	Sweetwater	BLM
8	0+00	0.00	Pig Receiver	Existing Valve Site	New Mexico	McKinley	BLM
8	52491	9.94	Valve w/ Check	Mainline Valve Site	New Mexico	Sandoval	USA in Trust for Navajo Tribe
8	105751.7	20.03	Pig Launcher	Lybrook Station	New Mexico	Rio Arriba	Williams Gas Processing Company
9	0+37	0.01	Pig Receiver	Existing Valve Site	New Mexico	Sandoval	City of Albuquerque
9	803+50	15.22	Valve w/ Check	New MLV site	New Mexico	Sandoval	Santa Ana Pueblo
9	1186+01	22.46	Pig Launcher	San Ysidro	New Mexico	Sandoval	MAPCO Fee Property (San Ysidro Station)
9	14864	2.82	Valve w/ Check	New MLV site	New Mexico	Sandoval	Santa Ana Pueblo
9	35641	6.75	Valve w/ Check	New MLV site	New Mexico	Sandoval	Santa Ana Pueblo
10	41.2	0.01	Pig Receiver	Existing Valve Site	New Mexico	Torrance	Arthur Jerry Dunlap and Sue Dunlap Stark
10	77765	14.73	Valve w/ Check	Mainline Valve Site	New Mexico	Torrance	Albert Perez and Corinne Perez
10	132810	25.15	Valve w/ Check	Mainline Valve Site	New Mexico	Torrance	State of NM
10	182812	34.62	Pig Launcher	Existing Valve Site	New Mexico	Torrance	State of NM (MAPL - Estancia Station)
11	0+00	0.00	Pig Receiver	Mesa Station	New Mexico	Chaves	One Hundred Ranch, Inc.
11	98297	18.62	Pig Launcher	Existing Valve Site	New Mexico	De Baca	Murphy New Mexico Properties, Inc.
11	31151	5.90	Valve w/ Check	Mainline Valve Site	New Mexico	De Baca	#N/A
12	52.6	0.01	Pig Receiver	Existing Valve Site	New Mexico	Chaves	Corn Brothers, Inc.
12	94869	17.97	Pig Launcher	Mesa Station	New Mexico	Chaves	One Hundred Ranch, Inc.
12	26108	4.94	Valve w/ Check	Mainline Valve Site	New Mexico	Chaves	#N/A
12	75365	14.27	Valve w/ Check	Mainline Valve Site	New Mexico	Chaves	#N/A
13	24.4	0.00	Pig Receiver	New Valve Site	New Mexico	Lea	James L. Odle & Amelda Joyce Odle
13	22478.6	4.26	Pig Launcher	Caprock Station	New Mexico	Lea	State of NM (Caprock Station)

Appendix C - Attachment 2 - Table 2 - Above Ground Facilities on Federal Lands

Segment	Approximate Station	Mile Post	Construction Type	Description	State	County	Ownership
1	0+00	0.00	Pig Receiver	Granger Pump Station	Wyoming	Sweetwater	BLM
2	96617	18.30	Pig Launcher	Existing Valve Set / Tie-in	Wyoming	Sweetwater	BLM
4	0+00	0.00	Pig Receiver	Existing Valve Set	Wyoming	Sweetwater	BLM
6	0+00	0.00	Pig Receiver	Existing Valve Site	Wyoming	Sweetwater	BLM
6	44253	8.38	Valve w/ Check	Mainline Valve Site	Wyoming	Sweetwater	BLM
6	97985.7	18.56	Pig Launcher	Rock Springs Station	Wyoming	Sweetwater	BLM
8	0+00	0.00	Pig Receiver	Existing Valve Site	New Mexico	McKinley	BLM
8	52491	9.94	Valve w/ Check	Mainline Valve Site	New Mexico	Sandoval	USA in Trust for Navajo Tribe
9	803+50	15.22	Valve w/ Check	New MLV site	New Mexico	Sandoval	Santa Ana Pueblo
9	14864	2.82	Valve w/ Check	New MLV site	New Mexico	Sandoval	Santa Ana Pueblo
9	35641	6.75	Valve w/ Check	New MLV site	New Mexico	Sandoval	Santa Ana Pueblo

Appendix C - Attachment 3 - Table 1 - Project Temporary Use Area (TUA) Totals

Segment	Alignment Sheet	Approximate Station	Approximate Milepost	Tract	Ownership	State	County	Site Code	Construction Type	Description	TUA Width (ft)	TUA Length (ft)	TUA Quantity (ea.)	Acres Affected by Construction	Segment Total
1.0	AM46-AL-001	0+00	0.0	WY-SW-WL-56	BLM	WY	Sweetwater	11	Pig Receiver	Granger Pump Station	0	0	0	0.00	
1.0	AM46-AL-001	4+44	0.1	WY-SW-WL-56	BLM	WY	Sweetwater	1	Open Cut	Gravel Road	125	300	1	0.86	
1.0	AM46-AL-001	4+44	0.1	WY-SW-WL-57	Unita Devel. Co.	WY	Sweetwater	1	Open Cut	Gravel Road	125	300	1	0.86	
1.0	AM46-AL-001	34+67	0.7	WY-SW-WL-57	Unita Devel. Co.	WY	Sweetwater	1	Open Cut	Blacks Fork Tributary	125	600	1	1.72	
1.0	AM46-AL-001	75+66	1.4	WY-SW-WL-58	BLM	WY	Sweetwater	1	Open Cut	Gravel Road	25	150	2	0.17	
1.0	AM46-AL-001	95+33	1.8	WY-SW-WL-58	BLM	WY	Sweetwater	1	Open Cut	Gravel Road	25	150	2	0.17	
1.0	AM46-AL-001	121+61	2.3	WY-SW-WL-58	BLM	WY	Sweetwater	12	Crossover	Crosover	125	600	1	1.72	
1.0	AM46-AL-001	125+44	2.4	WY-SW-WL-59	Unita Devel. Co.	WY	Sweetwater	1	Open Cut	Gravel Road	25	150	2	0.17	
1.0	AM46-AL-001	137+42	2.6	WY-SW-WL-59	Unita Devel. Co.	WY	Sweetwater	1	Open Cut	Gravel Road	25	150	2	0.17	
1.0	AM46-AL-001	154+89	2.9	WY-SW-WL-59	Unita Devel. Co.	WY	Sweetwater	1	Open Cut	Gravel Road	25	150	2	0.17	
1.0	AM46-AL-001	187+44	3.6	WY-SW-WL-60	BLM	WY	Sweetwater	1	Open Cut	Gravel Road	25	150	2	0.17	
1.0	AM46-AL-001	216+18	4.1	WY-UI-WL-1	BLM	WY	Uinta	12	Crossover	Crossover	125	600	1	1.72	
1.0	AM46-AL-001	262+38	5.0	WY-UI-WL-3	State of Wyoming	WY	Uinta	2	Bore	Gravel Road	125	600	1	1.72	
1.0	AM46-AL-001	275+73	5.2	WY-UI-WL-3	State of Wyoming	WY	Uinta	2	Bore	Gravel Road	25	150	2	0.17	
1.0	AM46-AL-001	282+67	5.4	WY-UI-WL-3	State of Wyoming	WY	Uinta	5	Pig Receiver	Opal South Meter Site	0	0	0	0.00	**9.81**
2.0	AM17-AL-001	0+00	0.0	WY-SW-WL-24	Anadarko Land Corp.	WY	Sweetwater	11	Pig Receiver	New Valve / Tie-in Site	125	600	1	1.72	
2.0	AM17-AL-001	5+25	0.1	WY-SW-WL-24	Anadarko Land Corp.	WY	Sweetwater	12	Crossover	Foreign Line Crossing	25	150	2	0.17	
2.0	AM17-AL-001	18+15	0.3	WY-SW-WL-24	Anadarko Land Corp.	WY	Sweetwater	1	Open Cut	Drain	25	150	2	0.17	
2.0	AM17-AL-001	22+75	0.4	WY-SW-WL-24	Anadarko Land Corp.	WY	Sweetwater	1	Open Cut	Drain	25	150	2	0.17	
2.0	AM17-AL-001	49+02	0.9	WY-SW-WL-25	BLM	WY	Sweetwater	1	Open Cut	2-Track Dirt Road	25	150	2	0.17	
2.0	AM17-AL-001	72+99	1.4	WY-SW-WL-26	Anadarko Land Corp.	WY	Sweetwater	2	Bore	Wyoming State Highway 530	25	150	2	0.17	
2.0	AM17-AL-001	109+73	2.1	WY-SW-WL-26	Anadarko Land Corp.	WY	Sweetwater	1	Open Cut	2-Track Dirt Road	25	150	2	0.17	
2.0	AM17-AL-001	117+63	2.2	WY-SW-WL-26	Anadarko Land Corp.	WY	Sweetwater	12	Crossover	Foreign Line Crossing	125	600	1	1.72	
2.0	AM17-AL-001	138+10	2.6	WY-SW-WL-28	Anadarko Land Corp.	WY	Sweetwater	1	Open Cut	Drain	25	150	2	0.17	
2.0	AM17-AL-001	148+28	2.8	WY-SW-WL-28	Anadarko Land Corp.	WY	Sweetwater	1	Open Cut	Drain	25	150	2	0.17	
2.0	AM17-AL-001	170+08	3.2	WY-SW-WL-28	Anadarko Land Corp.	WY	Sweetwater	1	Open Cut	Drain	25	150	2	0.17	
2.0	AM17-AL-001	186+58	3.5	WY-SW-WL-28	Anadarko Land Corp.	WY	Sweetwater	1	Open Cut	Drain	25	150	2	0.17	
2.0	AM17-AL-001	193+70	3.7	WY-SW-WL-28	Anadarko Land Corp.	WY	Sweetwater	1	Open Cut	Drain	25	150	2	0.17	
2.0	AM17-AL-001	198+78	3.8	WY-SW-WL-28	Anadarko Land Corp.	WY	Sweetwater	1	Open Cut	Drain	25	150	2	0.17	
2.0	AM17-AL-001	211+35	4.0	WY-SW-WL-28	Anadarko Land Corp.	WY	Sweetwater	12	Crossover	Foreign Line Crossing	125	1000	1	2.87	
2.0	AM17-AL-002	259+12	4.9	WY-SW-WL-30	Anadarko Land Corp.	WY	Sweetwater	12	Crossover	Foreign Line Crossing	125	600	1	1.72	
2.0	AM17-AL-003	267+61	5.1	WY-SW-WL-31	BLM	WY	Sweetwater	4	Valve w/Check	Mainline Valve Site	0	0	0	0.00	
2.0	AM17-AL-002	331+73	6.3	WY-SW-WL-32	Anadarko Land Corp.	WY	Sweetwater	2	Bore	County Road 37	25	150	2	0.17	
2.0	AM17-AL-002	416+08	7.9	WY-SW-WL-33	BLM	WY	Sweetwater	1	Open Cut	Drain	25	150	2	0.17	
2.0	AM17-AL-002	480+23	9.1	WY-SW-WL-34	Anadarko Land Corp.	WY	Sweetwater	1	Open Cut	Drain	25	150	1	0.09	
2.0	AM17-AL-003	480+23	9.1	WY-SW-WL-35	BLM	WY	Sweetwater	1	Open Cut	Drain	25	150	1	0.09	
2.0	AM17-AL-003	511+17	9.7	WY-SW-WL-35	BLM	WY	Sweetwater	12	Crossover	Foreign Line Crossing	125	500	1	1.43	
2.0	AM17-AL-003	511+17	9.7	WY-SW-WL-36	Anadarko Land Corp.	WY	Sweetwater	12	Crossover	Foreign Line Crossing	125	500	1	1.43	
2.0	AM17-AL-003	594+76	11.3	WY-SW-WL-38	Unita Devel. Co.	WY	Sweetwater	2	Bore	Bonomo Ranch Road	25	150	2	0.17	
3.0	AM17-AL-003	649+30	12.3	WY-SW-WL-39	BLM	WY	Sweetwater	9	Gate Valve	Gate Valve Site	0	0	0	0.00	
2.0	AM17-AL-003	654+78	12.4	WY-SW-WL-39	BLM	WY	Sweetwater	12	Crossover	Foreign Line Crossing	125	600	1	1.72	
2.0	AM17-AL-003	680+51	12.9	WY-SW-WL-40	State of Wyoming	WY	Sweetwater	3	HDD	Blacks Forks River (East Side)	125	600	1	1.72	
2.0	AM17-AL-003	680+51	12.9	WY-SW-WL-40	State of Wyoming	WY	Sweetwater	3	HDD	Blacks Forks River (West Side)	125	200	1	0.57	
2.0	AM17-AL-003	702+40	13.3	WY-SW-WL-41	Anadarko Land Corp.	WY	Sweetwater	2	Bore	County Road 95	25	150	2	0.17	
2.0	AM17-AL-003	703+40	13.3	WY-SW-WL-41	Anadarko Land Corp.	WY	Sweetwater	9	Gate Valve	Gate Valve Site	0	0	0	0.00	
2.0	AM17-AL-004	748+14	14.2	WY-SW-WL-42	State of Wyoming	WY	Sweetwater	2	Bore	Private Rail Spur	25	150	2	0.17	
2.0	AM17-AL-004	966+17	18.3	WY-SW-WL-46	BLM	WY	Sweetwater	5	Pig Launcher	Existing Valve Set / Tie-in	125	600	1	1.72	**19.74**
3.0	AM60-AL-001	0+00	0.0	WY-SW-EL-01	Cyclone Rim Co.	WY	Sweetwater	11	Pig Receiver	Tipton Station	0	0	0	0.00	
3.0	AM60-AL-001	82+80	1.6	WY-SW-EL-03	Rock Springs Grazing Assn.	WY	Sweetwater	1	Open Cut	2-Track Dirt Road / Pipe Line crossing	25	150	2	0.17	
3.0	AM60-AL-001	137+20	2.6	WY-SW-EL-04	BLM	WY	Sweetwater	12	Crossover	Foreign Line crossing	25	150	2	0.17	

Segment	Alignment Sheet	Approximate Station	Approximate Milepost	Tract	Ownership	State	County	Site Code	Construction Type	Description	TUA Width (ft)	TUA Length (ft)	TUA Quantity (ea.)	Acres Affected by Construction	Segment Total
3.0	AM60-AL-001	143+54	2.7	WY-SW-EL-04	BLM	WY	Sweetwater	12	Crossover	Foreign Line crossing	25	75	1	0.04	
3.0	AM60-AL-001	143+54	2.7	WY-SW-EL-04A	Rock Springs Grazing Assn.	WY	Sweetwater	12	Crossover	Foreign Line crossing	25	75	1	0.04	
3.0	AM60-AL-002	274+12	5.2	WY-SW-EL-08	Charles A. Hammersten	WY	Sweetwater	12	Crossover	Foreign Line crossing	125	600	1	1.72	
3.0	AM60-AL-002	305+42	5.8	WY-SW-EL-09C	Weldon D. Rowe, et al	WY	Sweetwater	2	Bore	Gravel Road	25	150	2	0.17	
3.0	AM60-AL-002	305+42	5.8	WY-SW-EL-09D	Cecil T. Gordon, Sr.	WY	Sweetwater	2	Bore	Gravel Road	25	150	2	0.17	
3.0	AM60-AL-002	331+85	6.3	WY-SW-EL-09E	Lester Family Ltd. Partnership	WY	Sweetwater	2	Bore	Gravel Road	25	150	1	0.09	
3.0	AM60-AL-002	331+85	6.3	WY-SW-EL-10	Quealy Properties LLC	WY	Sweetwater	2	Bore	Gravel Road	25	150	1	0.09	
3.0	AM60-AL-002	346+88	6.6	WY-SW-EL-10	Quealy Properties LLC	WY	Sweetwater	12	Crossover	Foreign Line crossing	125	600	1	1.72	
3.0	AM60-AL-002	392+50	7.4	WY-SW-EL-11	BLM	WY	Sweetwater	2	Bore	Red Desert Road	25	150	2	0.17	
3.0	AM60-AL-003	634+00	12.0	WY-SW-EL-16	Anadarko Land Corp.	WY	Sweetwater	12	Crossover	Foreign Line crossing	125	600	1	1.72	
3.0	AM60-AL-003	642+12	12.2	WY-SW-EL-16	Anadarko Land Corp.	WY	Sweetwater	2	Bore	Rasmssen Road	125	600	1	1.72	
3.0	AM60-AL-003	643+22	12.2	WY-SW-EL-16	Anadarko Land Corp.	WY	Sweetwater	4	Valve w/Check	Mainline Valve Site	0	0	0	0.00	
3.0	AM60-AL-004	750+45	14.2	WY-SW-EL-19	BLM	WY	Sweetwater	2	Bore	Dirt Road	25	150	2	0.17	
3.0	AM60-AL-004	788+68	14.9	WY-SW-EL-20A	Rock Mtn. Pipeline System LLC	WY	Sweetwater	2	Bore	Gravel Road	125	1000	1	2.87	
3.0	AM60-AL-004	806+44	15.3	WY-SW-EL-20	Anadarko Land Corp.	WY	Sweetwater	2	Bore	County road 123 - Wamsutter Road	25	150	2	0.17	
3.0	AM60-AL-005	976+45	18.5	WY-SW-EL-24	Anadarko Land Corp.	WY	Sweetwater	12	Crossover	Foreign Line crossing	125	600	1	1.72	
3.0	AM60-AL-005	1013+73	19.2	WY-SW-EL-26	Anadarko Land Corp.	WY	Sweetwater	1	Open Cut	Drain	25	150	2	0.17	
3.0	AM60-AL-005	1085+61	20.6	WY-SW-EL-27	P. H. Livestock now, was State of WY	WY	Sweetwater	1	Open Cut	Dirt Road	25	150	2	0.17	
3.0	AM60-AL-005	1117+29	21.2	WY-SW-EL-28	Anadarko Land Corp.	WY	Sweetwater	12	Crossover	Foreign Line crossing	125	600	1	1.72	
3.0	AM60-AL-005	1128+98	21.4	WY-SW-EL-28	Anadarko Land Corp.	WY	Sweetwater	1	Open Cut	Lease Road	25	150	2	0.17	
3.0	AM60-AL-005	1168+58	22.1	WY-SW-EL-29	BLM	WY	Sweetwater	1	Open Cut	Lease Road	25	150	2	0.17	
3.0	AM60-AL-006	1216+96	23.0	WY-SW-EL-30	Anadarko Land Corp.	WY	Sweetwater	12	Crossover	Foreign Line crossing and Road crossing	125	600	1	1.72	
3.0	AM60-AL-006	1217+54	23.1	WY-SW-EL-30	Anadarko Land Corp.	WY	Sweetwater	11	Pig Receiver	Wamsutter Junction	0	0	0	0.00	**17.07**
4.0	AM44-AL-001	0+00	0.0	WY-SW-EL-58	Anadarko Land Corp.	WY	Sweetwater	11	Pig Receiver	Existing Valve Set	0	0	0	0.00	
4.0	AM44-AL-001	59+90	1.1	WY-SW-EL-60	Anadarko Land Corp.	WY	Sweetwater	1	Open Cut	Dirt Road	25	150	2	0.17	
4.0	AM44-AL-001	443+62	8.4	WY-SW-EL-69	BLM	WY	Sweetwater	5	Pig Launcher	New Valve / Tie-in Site	0	0	0	0.00	**0.17**
5.0	AM08-AL-001	1+00	0.0	WY-SW-EL-09	Anadarko Land Corp.	WY	Sweetwater	11	Pig Receiver	Existing Valve and Launcher Site	125	300	1	0.86	
5.0	AM08-AL-001	2+99	0.1	WY-SW-EL-09	Anadarko Land Corp.	WY	Sweetwater	2	Bore	Sweetwater County Road 30	125	300	1	0.86	
5.0	AM08-AL-001	16+68	0.3	WY-SW-EL-09	Anadarko Land Corp.	WY	Sweetwater	2	Bore	Sweetwater County Road 30	25	150	2	0.17	
5.0	AM08-AL-001	37+08	0.7	WY-SW-EL-09	Anadarko Land Corp.	WY	Sweetwater	2	Bore	Sweetwater County Road 30	25	150	2	0.17	
5.0	AM08-AL-001	44+08	0.8	WY-SW-EL-09	Anadarko Land Corp.	WY	Sweetwater	2	Bore	Sweetwater County Road 30	25	150	2	0.17	
5.0	AM08-AL-001	119+11	2.3	WY-SW-EL-11	Don and Peggy Vercimak	WY	Sweetwater	1	Open Cut	Wash	25	150	2	0.17	
5.0	AM08-AL-001	165+79	3.1	WY-SW-EL-13	Don and Peggy Vercimak	WY	Sweetwater	1	Open Cut	Wash	25	150	1	0.09	
5.0	AM08-AL-001	169+20	3.2	WY-SW-EL-13	Don and Peggy Vercimak	WY	Sweetwater	2	Bore	Foreign Line Crossing & CR 30 Bore	125	600	1	1.72	
5.0	AM08-AL-001	201+71	3.8	WY-SW-EL-13	Don and Peggy Vercimak	WY	Sweetwater	2	Bore	Sweetwater County Road 30	25	150	2	0.17	
5.0	AM08-AL-001	203+90	3.9	WY-SW-EL-13	Don and Peggy Vercimak	WY	Sweetwater	1	Open Cut	Wash	25	150	2	0.17	
5.0	AM08-AL-002	251+75	4.8	WY-SW-EL-17	BLM	WY	Sweetwater	3	HDD	Circle Creek	125	1000	1	2.87	
5.0	AM08-AL-002	290+20	5.5	WY-SW-EL-18	Don and Peggy Vercimak	WY	Sweetwater	1	Open Cut	Wash	25	150	2	0.17	
5.0	AM08-AL-002	301+75	5.7	WY-SW-EL-18	Don and Peggy Vercimak	WY	Sweetwater	1	Open Cut	Wash	25	150	2	0.17	
5.0	AM08-AL-002	328+25	6.2	WY-SW-EL-18	Don and Peggy Vercimak	WY	Sweetwater	1	Open Cut	Wash	25	150	1	0.09	
5.0	AM08-AL-002	328+25	6.2	WY-SW-EL-19	BLM	WY	Sweetwater	1	Open Cut	Wash	25	150	1	0.09	
5.0	AM08-AL-002	354+48	6.7	WY-SW-EL-19	BLM	WY	Sweetwater	1	Open Cut	Wash	25	150	2	0.17	
5.0	AM08-AL-002	393+73	7.5	WY-SW-EL-20	Rock Springs Grazing Assn.	WY	Sweetwater	1	Open Cut	Wash	25	150	2	0.17	
5.0	AM08-AL-002	443+95	8.4	WY-SW-EL-21	BLM	WY	Sweetwater	1	Open Cut	Wash	25	150	2	0.17	
5.0	AM08-AL-003	511+36	9.7	WY-SW-EL-22	Anadarko Land Corp.	WY	Sweetwater	3	HDD	Salt Wells Creek	125	600	1	1.72	
5.0	AM08-AL-003	512+40	9.7	WY-SW-EL-22	Anadarko Land Corp.	WY	Sweetwater	3	HDD	Salt Wells Creek	125	200	1	0.57	
5.0	AM08-AL-003	516+03	9.8	WY-SW-EL-22	Anadarko Land Corp.	WY	Sweetwater	12	Crossover	Crossover	25	150	1	0.09	
5.0	AM08-AL-003	518+69	9.8	WY-SW-EL-22	Anadarko Land Corp.	WY	Sweetwater	2	Bore	State Highway 430	25	150	1	0.09	
5.0	AM08-AL-003	521+22	9.9	WY-SW-EL-22	Anadarko Land Corp.	WY	Sweetwater	5	Pig Launcher	Existing Valve Site	125	300	1	0.86	**11.79**
6.0	AM850-AL-001	0+00	0.0	WY-SW-05B	BLM	WY	Sweetwater	11	Pig Receiver	Existing Valve Site	125	600	1	1.72	
6.0	AM850-AL-001	152+23	2.9	WY-SW-05B	BLM	WY	Sweetwater	1	Open Cut	Sage Creek	25	150	2	0.17	
6.0	AM850-AL-001	155+13	2.9	WY-SW-05B	BLM	WY	Sweetwater	2	Bore	County Road 34, Ramsey Ranch Road	25	150	2	0.17	
6.0	AM850-AL-001	176+98	3.4	WY-SW-05B	BLM	WY	Sweetwater	1	Open Cut	Parallel Wash with Foreign Lines	125	800	1	2.30	
6.0	AM850-AL-001	200+86	3.8	WY-SW-05B	BLM	WY	Sweetwater	12	Crossover	Foreign Line Crossing	125	800	1	2.30	

Segment	Alignment Sheet	Approximate Station	Approximate Milepost	Tract	Ownership	State	County	Site Code	Construction Type	Description	TUA Width (ft)	TUA Length (ft)	TUA Quantity (ea.)	Acres Affected by Construction	Segment Total
6.0	AM850-AL-002	441+17	8.4	WY-SW-05B	BLM	WY	Sweetwater	2	Bore	Maggie Springs Road	25	150	2	0.17	
6.0	AM850-AL-002	442+53	8.4	WY-SW-05B	BLM	WY	Sweetwater	4	Valve w/Check	Mainline Valve Site	0	0	0	0.00	
6.0	AM850-AL-004	805+33	15.3	WY-SW-13	BLM	WY	Sweetwater	1	Open Cut	2-Track Dirt Road	25	150	2	0.17	
6.0	AM850-AL-004	866+40	16.4	WY-SW-15	BLM	WY	Sweetwater	1	Open Cut	Wash	25	150	2	0.17	
6.0	AM850-AL-004	883+16	16.7	WY-SW-16	Anadarko Land Corp	WY	Sweetwater	2	Bore	County Road 29 / Little Bitter Creek Road	25	150	2	0.17	
6.0	AM850-AL-001	979+86	18.6	WY-SW-17	BLM	WY	Sweetwater	5	Pig Launcher	Rock Springs Station	0	0	0	0.00	**7.35**
8.0	AM349-AL-001	0+00	0.0	NM-McK-12	BLM	NM	McKinley	11	Pig Receiver	Existing Valve Site	0	0	1	0.00	
8.0	AM349-AL-001	0+37	0.0	NM-Mck-12	BLM	NM	Sandoval	13	Crossover	Existing Valve Site	125	600	1	1.72	
8.0	AM349-AL-001	83+86	1.6	NM-SA-49N	BIA	NM	Sandoval	2	Bore	Dirt Road	25	150	2	0.17	
8.0	AM349-AL-001	107+38	2.0	NM-SA-50N	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-001	172+47	3.3	NM-SA-52N	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-001	213+10	4.0	NM-SA-53BN	BIA	NM	Sandoval	2	Bore	B.I.A. Road 474	25	150	2	0.17	
8.0	AM349-AL-001	219+45	4.2	NM-SA-53AN	BIA	NM	Sandoval	2	Bore	B.I.A. Road 471	25	150	2	0.17	
8.0	AM349-AL-002	351+52	6.7	NM-SA-53N	BLM	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-002	395+78	7.5	NM-SA-55N	BLM	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-002	409+94	7.8	NM-SA-54N	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-002	462+73	8.8	NM-SA-57NA	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-002	467+11	8.8	NM-SA-57NA	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-002	473+57	9.0	NM-SA-57NA	BIA	NM	Sandoval	12	Crossover	Cross Over	125	600	1	1.72	
8.0	AM349-AL-003	523+02	9.9	NM-SA-57N	BIA	NM	Sandoval	2	Bore	County Road	25	150	2	0.17	
8.0	AM349-AL-003	524+91	9.9	NM-SA-57N	BIA	NM	Sandoval	4	Valve w/Check	Mainline Valve Site	0	0	1	0.00	
8.0	AM349-AL-003	580+00	11.0	NM-SA-57N	BIA	NM	Sandoval	1	Open Cut	Wash	25	2180	1	1.25	
8.0	AM349-AL-003	610+00	11.6	NM-SA-57N	BIA	NM	Sandoval	1	Open Cut	Wash	25	2006	1	1.15	
8.0	AM349-AL-003	636+91	12.1	NM-SA-59N	BIA	NM	Sandoval	1	Open Cut	2-Track Dirt Road	25	150	2	0.17	
8.0	AM349-AL-003	637+70	12.1	NM-SA-59N	BIA	NM	Sandoval	1	Open Cut	Drain	25	150	2	0.17	
8.0	AM349-AL-003	640+65	12.1	NM-SA-59N	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-003	644+46	12.2	NM-SA-59N	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-003	654+86	12.4	NM-SA-59N	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-003	657+53	12.5	NM-SA-59N	BIA	NM	Sandoval	1	Open Cut	2-Track Dirt Road	25	150	2	0.17	
8.0	AM349-AL-003	657+76	12.5	NM-SA-59N	BIA	NM	Sandoval	1	Open Cut	2-Track Dirt Road	25	150	2	0.17	
8.0	AM349-AL-003	717+22	13.6	NM-SA-62N	BIA	NM	Sandoval	1	Open Cut	Drain	25	150	2	0.17	
8.0	AM349-AL-004	783+47	14.8	NM-SA-64N	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-004	831+94	15.8	NM-SA-66N	BIA	NM	Sandoval	1	Open Cut	Dirt Road	25	150	2	0.17	
8.0	AM349-AL-004	839+36	15.9	NM-SA-66N	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-004	860+18	16.3	NM-SA-67NA	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-004	863+58	16.4	NM-SA-67NA	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-004	872+46	16.5	NM-SA-67NA	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-004	901+65	17.1	NM-SA-67N	BLM	NM	Sandoval	2	Bore	County Road	25	150	2	0.17	
8.0	AM349-AL-004	927+50	17.6	NM-SA-67N	BLM	NM	Sandoval	12	Crossover	Cross Over	125	600	1	1.72	
8.0	AM349-AL-004	933+27	17.7	NM-SA-67N	BLM	NM	Sandoval	2	Bore	County Road	25	150	2	0.17	
8.0	AM349-AL-005	979+87	18.6	NM-SA-68N	Gary Mannford	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-005	1037+50	19.6	NM-RA-02	BLM	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-005	1045+66	19.8	NM-RA-02	BLM	NM	Rio Arriba	3	HDD	U.S. HIGHWAY 550	25	150	1	0.09	
8.0	AM349-AL-005	1056+85	20.0	unknown	unknown	NM	Rio Arriba	2	Bore	Cross Over and County Road Crossing	125	300	1	0.86	
8.0	AM349-AL-005	1057+52	20.0	NM-RA-02A	Williams Gas Processing Company	NM	Rio Arriba	5	Pig Launcher	Lybrook Station	0	0	0	0.00	**13.51**
9.0	AM276-AL-001	0+37	0.0	NM-SA-15	City of Albuquerque	NM	Sandoval	11	Pig Receiver	Existing Valve Site	125	600	1	1.72	
9.0	AM276-AL-001	10+92	0.2	NM-SA-15	City of Albuquerque	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-001	15+44	0.3	NM-SA-15	City of Albuquerque	NM	Sandoval	14	Crossover	Foreign Line Crossing	125	600	1	1.72	
9.0	AM276-AL-001	20+90	0.4	NM-SA-15	City of Albuquerque	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-001	30+00	0.6	NM-SA-15	City of Albuquerque	NM	Sandoval	1	Open Cut	KMI CO2 line enters corridor	25	150	2	0.17	
9.0	AM276-AL-001	45+92	0.9	NM-SA-15	City of Albuquerque	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-001	64+64	1.2	NM-SA-16	BLM	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-001	97+41	1.8	NM-SA-16	BLM	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-001	100+81	1.9	NM-SA-16	BLM	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-001	111+10	2.1	NM-SA-16	BLM	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	

Segment	Alignment Sheet	Approximate Station	Approximate Milepost	Tract	Ownership	State	County	Site Code	Construction Type	Description	TUA Width (ft)	TUA Length (ft)	TUA Quantity (ea.)	Acres Affected by Construction	Segment Total
9.0	AM276-AL-001	114+45	2.2	NM-SA-16	BLM	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-001	124+79	2.4	NM-SA-16	BLM	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-001	148+64	2.8	NM-SA-17	BIA	NM	Sandoval	4	Valve w/Check	New MLV site	150	150	1	0.52	
9.0	AM276-AL-001	150+00	2.8	NM-SA-17	BIA	NM	Sandoval	14	Crossover	Foreign Line Crossing	125	600	1	1.72	
9.0	AM276-AL-001	152+00	2.9	NM-SA-17	BIA	NM	Sandoval	3	HDD	I-25 Crossing	50	1000	1	1.15	
9.0	AM276-AL-001	160+00	3.0	NM-SA-17	BIA	NM	Sandoval	3	HDD	1-25 Crossing	125	200	1	0.57	
9.0	AM276-AL-001	162+00	3.1	NM-SA-17	BIA	NM	Sandoval	12	Crossover	Foreign Line Crossing	125	600	1	1.72	
9.0	AM276-AL-001	172+00	3.3	NM-SA-17	BIA	NM	Sandoval	3	HDD	Algodones Canal, SF & AT Railroad and State Highway 313	50	1000	1	1.15	
9.0	AM276-AL-001	195+63	3.7	NM-SA-18	BIA	NM	Sandoval	3	HDD	Exit and Entrance Point	300	300	1	2.07	
9.0	AM276-AL-001	209+22	4.0	NM-SA-18	BIA	NM	Sandoval	3	HDD	Bernallio Drain & Rio Grande River	100	100	1	0.23	
9.0	AM276-AL-001	209+22	4.0	NM-SA-18	BIA	NM	Sandoval	3	HDD	Bernallio Drain & Rio Grande River	50	1000	1	1.15	
9.0	AM276-AL-002	267+43	5.1	NM-SA-18	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-002	285+74	5.4	NM-SA-18	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-002	291+61	5.5	NM-SA-18	BIA	NM	Sandoval	1	Open Cut	Drain	25	150	2	0.17	
9.0	AM276-AL-002	327+05	6.2	NM-SA-18	BIA	NM	Sandoval	1	Open Cut	2-Track Dirt Road	25	150	2	0.17	
9.0	AM276-AL-002	336+40	6.4	NM-SA-18	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-002	337+11	6.4	NM-SA-18	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-002	341+44	6.5	NM-SA-18	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-002	345+73	6.5	NM-SA-18	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-002	354+88	6.7	NM-SA-18	BIA	NM	Sandoval	2	Bore	Jemez Canyon Road	25	150	1	0.09	
9.0	AM276-AL-002	356+41	6.8	NM-SA-18	BIA	NM	Sandoval	4	Valve w/Check	New MLV site	25	400	1	0.23	
9.0	AM276-AL-002	375+18	7.1	NM-SA-18	BIA	NM	Sandoval	14	Crossover	Foreign Line Crossing	125	600	1	1.72	
9.0	AM276-AL-002	385+00	7.3	NM-SA-18	BIA	NM	Sandoval	14	Crossover	Foreign Line Crossing	125	600	1	1.72	
9.0	AM276-AL-002	415+77	7.9	NM-SA-18	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-003	491+95	9.3	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-003	563+27	10.7	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-003	606+38	11.5	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-003	612+79	11.6	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-003	622+15	11.8	NM-SA-20	BIA	NM	Sandoval	2	Bore	Santa Anna Rd	25	150	2	0.17	
9.0	AM276-AL-003	627+22	11.9	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-003	635+87	12.0	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Drain	25	150	2	0.17	
9.0	AM276-AL-003	643+82	12.2	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Drain	25	150	2	0.17	
9.0	AM276-AL-003	646+85	12.3	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Drain	25	150	2	0.17	
9.0	AM276-AL-003	704+37	13.3	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-003	706+36	13.4	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-004	729+33	13.8	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-004	803+50	15.2	NM-SA-20	BIA	NM	Sandoval	4	Valve w/Check	New MLV site	25	150	1	0.09	
9.0	AM276-AL-004	828+31	15.7	NM-SA-21	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-004	830+63	15.7	NM-SA-21	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-004	846+42	16.0	NM-SA-21	BIA	NM	Sandoval	1	Open Cut	Drain	25	150	2	0.17	
9.0	AM276-AL-004	850+89	16.1	NM-SA-21	BIA	NM	Sandoval	1	Open Cut	Drain	25	150	2	0.17	
9.0	AM276-AL-004	872+91	16.5	NM-SA-21	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-004	911+18	17.3	NM-SA-21	BIA	NM	Sandoval	1	Open Cut	Drain	25	150	2	0.17	
9.0	AM276-AL-004	940+17	17.8	NM-SA-21	BIA	NM	Sandoval	2	Bore	U.S. HIGHWAY 550	25	150	1	0.09	
9.0	AM276-AL-004	941+39	17.8	NM-SA-21	BIA	NM	Sandoval	2	Bore	U.S. HIGHWAY 550	25	150	1	0.09	
9.0	AM276-AL-005	978+27	18.5	NM-SA-21	BIA	NM	Sandoval	14	Crossover	Foreign Line Crossing	125	400	1	1.15	
9.0	AM276-AL-005	989+26	18.7	NM-SA-21	BIA	NM	Sandoval	14	Crossover	Foreign Line Crossing	125	400	1	1.15	
9.0	AM276-AL-005	1049+63	19.9	NM-SA-21	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-005	1185+50	22.5	NM-SA-21	BIA	NM	Sandoval	12	Crossover	Crossover	25	150	1	0.09	
9.0	AM276-AL-005	1187+20	22.5	NM-SA-21	BIA	NM	Sandoval	12	Crossover	Crossover	25	150	1	0.09	
9.0	AM276-AL-005	1186+01	22.5	NM-SA-22	MAPCO (San Ysidro Station)	NM	Sandoval	5	Pig Launcher	San Ysidro	0	0	0	0.00	**26.74**
10	AM189-AL-001	0+41	0.0	NM-TO-07	Arthur Jerry Dunlap and Sue Dunlap Stark	NM	Torrance	11	Pig Receiver	Existing Valve Site	125	600	1	1.72	
10	AM189-AL-001	233+41	4.4	NM-TO-09	Arthur Jerry Dunlap & Sue Dunlap Stark	NM	Torrance	2	Bore	State Highway 3	25	150	2	0.17	

Segment	Alignment Sheet	Approximate Station	Approximate Milepost	Tract	Ownership	State	County	Site Code	Construction Type	Description	TUA Width (ft)	TUA Length (ft)	TUA Quantity (ea.)	Acres Affected by Construction	Segment Total
10	AM189-AL-001	234+92	4.4	NM-TO-09	Arthur Jerry Dunlap & Sue Dunlap Stark	NM	Torrance	4	Valve w/Check	Mainline Valve Site	0	0	0	0.00	
10	AM189-AL-003	548+09	10.4	NM-TO-15	Thomas W. Burson	NM	Torrance	2	Bore	County Road C-029	25	150	2	0.17	
10	AM189-AL-003	589+20	11.2	NM-TO-15	Thomas W. Burson	NM	Torrance	3	HDD	S.F. & A.T. Railroad	150	150	1	0.52	
10	AM189-AL-003	589+20	11.2	NM-TO-15	Thomas W. Burson	NM	Torrance	3	HDD	S.F. & A.T. Railroad	50	150	1	0.17	
10	AM189-AL-003	589+20	11.2	NM-TO-16	Thomas W. Burson	NM	Torrance	3	HDD	S.F. & A.T. Railroad	150	150	1	0.52	
10	AM189-AL-003	622+53	11.8	NM-TO-17	Mary Grace Hennessey	NM	Torrance	2	Bore	U.S. Highway 60	50	200	1	0.23	
10	AM189-AL-003	622+53	11.8	NM-TO-17	Mary Grace Hennessey	NM	Torrance	2	Bore	U.S. Highway 60	150	150	2	1.03	
10	AM189-AL-004	777+65	14.7	NM-TO-21	McLaughlin Ranch LLC	NM	Torrance	4	Valve w/Check	Mainline Valve Site	0	0	0	0.00	
10	AM189-AL-005	1046+43	19.8	NM-TO-27	Lamar Bell Cravens	NM	Torrance	2	Bore	Bean Barn Road	25	150	1	0.09	
10	AM189-AL-005	1046+43	19.8	NM-TO-28	State of NM	NM	Torrance	2	Bore	Bean Barn Road	25	150	1	0.09	
10	AM189-AL-006	1328+10	25.2	NM-TO-32	State of NM	NM	Torrance	4	Valve w/Check	Mainline Valve Site	0	0	0	0.00	
10	AM189-AL-008	1828+12	34.6	NM-TO-45	State of NM (MAPL - Estancia Station)	NM	Torrance	5	Pig Launcher	Existing Valve Site	0	0	1	0.00	**4.71**
11	AM126-AL-001	0+00	0.0	NM-CH-65	One Hundred Ranch, Inc.	NM	Chaves	11	Pig Receiver	Mesa Station	0	0	0	0.00	
11	AM126-AL-001	1+47	0.0	NM-CH-65	One Hundred Ranch, Inc.	NM	Chaves	2	Bore	State Highway 20	25	150	1	0.09	
11	AM126-AL-001	81+21	1.5	NM-CH-65	One Hundred Ranch, Inc.	NM	Chaves	1	Open Cut	County Road C-1(33)P2	25	150	2	0.17	
11	AM126-AL-002	310+94	5.9	NM-DB-01	Poverty Flats Land & Cattle Company	NM	De Baca	2	Bore	County Road A-008	25	150	2	0.17	
11	AM126-AL-002	311+51	5.9	NM-DB-01	Poverty Flats Land & Cattle Company	NM	De Baca	4	Valve w/Check	Mainline Valve Site	0	0	0	0.00	
11	AM126-AL-002	393+88	7.5	NM-DB-01	Poverty Flats Land & Cattle Company	NM	De Baca	1	Open Cut	Wash	25	150	2	0.17	
11	AM126-AL-003	516+71	9.8	NM-DB-04	Laheeta L. Harvey	NM	De Baca	2	Bore	County Road A-005	25	150	2	0.17	
11	AM126-AL-004	759+58	14.4	NM-DB-12	Boot Ranch, Inc.	NM	De Baca	2	Bore	County Road A-008	25	150	2	0.17	
11	AM126-AL-004	982+97	18.6	NM-DB-13	Murphy New Mexico Properties, Inc.	NM	De Baca	5	Pig Launcher	Existing Valve Site	125	600	1	1.72	**2.67**
12	AM108-AL-001	0+53	0.0	NM-CH-51	Corn Brothers, Inc.	NM	Chaves	11	Pig Receiver	Existing Valve Site	0	0	0	0.00	
12	AM108-AL-001	0+53	0.0	NM-CH-51	Corn Brothers, Inc.	NM	Chaves	13	Crossover	Existing Valve Site	125	600	1	1.72	
12	AM108-AL-001	0+53	0.0	NM-CH-51	Corn Brothers, Inc.	NM	Chaves	2	Bore	County Road C-1(58)P2A (Roosevelt Road)	25	150	1	0.09	
12	AM108-AL-001	104+54	2.0	NM-CH-52	Corn Brothers, Inc.	NM	Chaves	14	Crossover	Foreign Line Crossing	25	150	2	0.17	
12	AM108-AL-001	183+65	3.5	NM-CH-55	BLM	NM	Chaves	14	Crossover	Foreign Line Crossing	25	150	2	0.17	
12	AM108-AL-002	260+58	4.9	NM-CH-55	BLM	NM	Chaves	2	Bore	County Road C-1(44)P4 Dona Ana Road	25	150	2	0.17	
12	AM108-AL-002	261+08	4.9	NM-CH-55	BLM	NM	Chaves	4	Valve w/Check	Mainline Valve Site	0	0	0	0.00	
12	AM108-AL-002	360+76	6.8	NM-CH-56	4N Land and Cattle, Ltd.	NM	Chaves	17	Crossover	Huggins Draw extra soil storage	25	150	2	0.17	
12	AM108-AL-002	753+65	14.3	NM-CH-60	Spikebox, LTD	NM	Chaves	4	Valve w/Check	Mainline Valve Site	0	0	0	0.00	
12	AM108-AL-004	754+13	14.3	NM-CH-60	Spikebox, LTD	NM	Chaves	2	Bore	County Road C-1(31)P1	25	150	2	0.17	
12	AM108-AL-004	791+58	15.0	NM-CH-60	Spikebox, LTD	NM	Chaves	17	Crossover	Wash	25	150	2	0.17	
12	AM108-AL-004	844+10	16.0	NM-CH-61	Spikebox, LTD	NM	Chaves	17	Crossover	Wash	25	150	2	0.17	
12	AM108-AL-004	857+46	16.2	NM-CH-61	Spikebox, LTD	NM	Chaves	17	Crossover	2-Track and Wash	25	150	2	0.17	
12	AM108-AL-004	945+53	17.9	NM-CH-65	One Hundred Ranch, Inc.	NM	Chaves	12	Crossover	Crossover	125	600	1	1.72	
12	AM108-AL-004	948+69	18.0	NM-CH-65	One Hundred Ranch, Inc.	NM	Chaves	5	Pig Launcher	Mesa Station	0	0	0	0.00	**4.91**
13	AM47-AL-001	0+24	0.0	NM-LEA-61	James L. Odle & Amelda Joyce Odle Revocable Living Trust	NM	Lea	11	Pig Receiver	New Valve Site	125	650	1	1.87	
13	AM47-AL-001	2+00	0.0	NM-LEA-61	James L. Odle & Amelda Joyce Odle Revocable Living Trust	NM	Lea	15	Crossover	Wetland Crossing	0	0	0	0.00	
13	AM47-AL-001	7+40	0.1	NM-LEA-61	James L. Odle & Amelda Joyce Odle Revocable Living Trust	NM	Lea	16	Crossover	Wetland Crossing	0	0	0	0.00	

Segment	Alignment Sheet	Approximate Station	Approximate Milepost	Tract	Ownership	State	County	Site Code	Construction Type	Description	TUA Width (ft)	TUA Length (ft)	TUA Quantity (ea.)	Acres Affected by Construction	Segment Total
13	AM47-AL-001	10+00	0.2	NM-LEA-61	James L. Odle & Amelda Joyce Odle Revocable Living Trust	NM	Lea	17	Crossover	Storage for soils excavated from Wetland area	125	250	1	0.72	
13	AM47-AL-001	224+79	4.3	NM-LEA-68	State of NM (Caprock Station)	NM	Lea	5	Pig Launcher	Caprock Station	0	0	0	0.00	**2.58**
													Total	**121.06**	**121.06**

Appendix C - Attachment 3 - Table 2 - Federal Temporary Use Area (TUA) Totals

Segment	Alignment Sheet	Approximate Station	Approximate Milepost	Tract	Ownership	State	County	Site Code	Construction Type	Description	TUA Width (ft)	TUA Length (ft)	TUA Quantity (ea.)	Acres Affected by Construction	Segment Total (Acres)
1.0	AM46-AL-001	0+00	0.0	WY-SW-WL-56	BLM	WY	Sweetwater	11	Pig Receiver	Granger Pump Station	0	0	0	0.00	
1.0	AM46-AL-001	4+44	0.1	WY-SW-WL-56	BLM	WY	Sweetwater	1	Open Cut	Gravel Road	125	300	1	0.86	
1.0	AM46-AL-001	75+66	1.4	WY-SW-WL-58	BLM	WY	Sweetwater	1	Open Cut	Gravel Road	25	150	2	0.17	
1.0	AM46-AL-001	95+33	1.8	WY-SW-WL-58	BLM	WY	Sweetwater	1	Open Cut	Gravel Road	25	150	2	0.17	
1.0	AM46-AL-001	121+61	2.3	WY-SW-WL-58	BLM	WY	Sweetwater	12	Crossover	Crosover	125	600	1	1.72	
1.0	AM46-AL-001	187+44	3.6	WY-SW-WL-60	BLM	WY	Sweetwater	1	Open Cut	Gravel Road	25	150	2	0.17	
1.0	AM46-AL-001	216+18	4.1	WY-UI-WL-1	BLM	WY	Uinta	12	Crossover	Crossover	125	600	1	1.72	**4.82**
2.0	AM17-AL-001	49+02	0.9	WY-SW-WL-25	BLM	WY	Sweetwater	1	Open Cut	2-Track Dirt Road	25	150	2	0.17	
2.0	AM17-AL-003	267+61	5.1	WY-SW-WL-31	BLM	WY	Sweetwater	4	Valve w/Check	Mainline Valve Site	0	0	0	0.00	
2.0	AM17-AL-002	416+08	7.9	WY-SW-WL-33	BLM	WY	Sweetwater	1	Open Cut	Drain	25	150	2	0.17	
2.0	AM17-AL-003	480+23	9.1	WY-SW-WL-35	BLM	WY	Sweetwater	1	Open Cut	Drain	25	150	1	0.09	
2.0	AM17-AL-003	511+17	9.7	WY-SW-WL-35	BLM	WY	Sweetwater	12	Crossover	Foreign Line Crossing	125	500	1	1.43	
3.0	AM17-AL-003	649+30	12.3	WY-SW-WL-39	BLM	WY	Sweetwater	9	Gate Valve	Gate Valve Site	0	0	0	0.00	
2.0	AM17-AL-003	654+78	12.4	WY-SW-WL-39	BLM	WY	Sweetwater	12	Crossover	Foreign Line Crossing	125	600	1	1.72	
2.0	AM17-AL-004	966+17	18.3	WY-SW-WL-46	BLM	WY	Sweetwater	5	Pig Launcher	Existing Valve Set / Tie-in	125	600	1	1.72	**5.31**
3.0	AM60-AL-001	137+20	2.6	WY-SW-EL-04	BLM	WY	Sweetwater	12	Crossover	Foreign Line crossing	25	150	2	0.17	
3.0	AM60-AL-001	143+54	2.7	WY-SW-EL-04	BLM	WY	Sweetwater	12	Crossover	Foreign Line crossing	25	75	1	0.04	
3.0	AM60-AL-002	392+50	7.4	WY-SW-EL-11	BLM	WY	Sweetwater	2	Bore	Red Desert Road	25	150	2	0.17	
3.0	AM60-AL-004	750+45	14.2	WY-SW-EL-19	BLM	WY	Sweetwater	2	Bore	Dirt Road	25	150	2	0.17	
3.0	AM60-AL-005	1168+58	22.1	WY-SW-EL-29	BLM	WY	Sweetwater	1	Open Cut	Lease Road	25	150	2	0.17	**0.73**
4.0	AM44-AL-001	443+62	8.4	WY-SW-EL-69	BLM	WY	Sweetwater	5	Pig Launcher	New Valve / Tie-in Site	0	0	0	0.00	**0.00**
5.0	AM08-AL-002	251+75	4.8	WY-SW-EL-17	BLM	WY	Sweetwater	3	HDD	Circle Creek	125	1000	1	2.87	
5.0	AM08-AL-002	328+25	6.2	WY-SW-EL-19	BLM	WY	Sweetwater	1	Open Cut	Wash	25	150	1	0.09	
5.0	AM08-AL-002	354+48	6.7	WY-SW-EL-19	BLM	WY	Sweetwater	1	Open Cut	Wash	25	150	2	0.17	
5.0	AM08-AL-002	443+95	8.4	WY-SW-EL-21	BLM	WY	Sweetwater	1	Open Cut	Wash	25	150	2	0.17	**3.30**
6.0	AM850-AL-001	0+00	0.0	WY-SW-05B	BLM	WY	Sweetwater	11	Pig Receiver	Existing Valve Site	125	600	1	1.72	
6.0	AM850-AL-001	152+23	2.9	WY-SW-05B	BLM	WY	Sweetwater	1	Open Cut	Sage Creek	25	150	2	0.17	
6.0	AM850-AL-001	155+13	2.9	WY-SW-05B	BLM	WY	Sweetwater	2	Bore	County Road 34, Ramsey Ranch Road	25	150	2	0.17	
6.0	AM850-AL-001	176+98	3.4	WY-SW-05B	BLM	WY	Sweetwater	1	Open Cut	Parallel Wash with Foreign Lines	125	800	1	2.30	
6.0	AM850-AL-001	200+86	3.8	WY-SW-05B	BLM	WY	Sweetwater	12	Crossover	Foreign Line Crossing	125	800	1	2.30	
6.0	AM850-AL-002	441+17	8.4	WY-SW-05B	BLM	WY	Sweetwater	2	Bore	Maggie Springs Road	25	150	2	0.17	
6.0	AM850-AL-002	442+53	8.4	WY-SW-05B	BLM	WY	Sweetwater	4	Valve w/Check	Mainline Valve Site	0	0	0	0.00	
6.0	AM850-AL-004	805+33	15.3	WY-SW-13	BLM	WY	Sweetwater	1	Open Cut	2-Track Dirt Road	25	150	2	0.17	
6.0	AM850-AL-004	866+40	16.4	WY-SW-15	BLM	WY	Sweetwater	1	Open Cut	Wash	25	150	2	0.17	
6.0	AM850-AL-001	979+86	18.6	WY-SW-17	BLM	WY	Sweetwater	5	Pig Launcher	Rock Springs Station	0	0	0	0.00	**7.17**
8.0	AM349-AL-001	0+00	0.0	NM-McK-12	BLM	NM	McKinley	11	Pig Receiver	Existing Valve Site	0	0	1	0.00	
8.0	AM349-AL-001	0+37	0.0	NM-Mck-12	BLM	NM	Sandoval	13	Crossover	Existing Valve Site	125	600	1	1.72	
8.0	AM349-AL-001	83+86	1.6	NM-SA-49N	BIA	NM	Sandoval	2	Bore	Dirt Road	25	150	2	0.17	
8.0	AM349-AL-001	107+38	2.0	NM-SA-50N	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-001	172+47	3.3	NM-SA-52N	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-001	213+10	4.0	NM-SA-53BN	BIA	NM	Sandoval	2	Bore	B.I.A. Road 474	25	150	2	0.17	
8.0	AM349-AL-001	219+45	4.2	NM-SA-53AN	BIA	NM	Sandoval	2	Bore	B.I.A. Road 471	25	150	2	0.17	
8.0	AM349-AL-002	351+52	6.7	NM-SA-53N	BLM	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-002	395+78	7.5	NM-SA-55N	BLM	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-002	409+94	7.8	NM-SA-54N	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-002	462+73	8.8	NM-SA-57NA	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	

Segment	Alignment Sheet	Approximate Station	Approximate Milepost	Tract	Ownership	State	County	Site Code	Construction Type	Description	TUA Width (ft)	TUA Length (ft)	TUA Quantity (ea.)	Acres Affected by Construction	Segment Total (Acres)
8.0	AM349-AL-002	467+11	8.8	NM-SA-57NA	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-002	473+57	9.0	NM-SA-57NA	BIA	NM	Sandoval	12	Crossover	Cross Over	125	600	1	1.72	
8.0	AM349-AL-003	523+02	9.9	NM-SA-57N	BIA	NM	Sandoval	2	Bore	County Road	25	150	2	0.17	
8.0	AM349-AL-003	524+91	9.9	NM-SA-57N	BIA	NM	Sandoval	4	Valve w/Check	Mainline Valve Site	0	0	1	0.00	
8.0	AM349-AL-003	580+00	11.0	NM-SA-57N	BIA	NM	Sandoval	1	Open Cut	Wash	25	2180	1	1.25	
8.0	AM349-AL-003	610+00	11.6	NM-SA-57N	BIA	NM	Sandoval	1	Open Cut	Wash	25	2006	1	1.15	
8.0	AM349-AL-003	636+91	12.1	NM-SA-59N	BIA	NM	Sandoval	1	Open Cut	2-Track Dirt Road	25	150	2	0.17	
8.0	AM349-AL-003	637+70	12.1	NM-SA-59N	BIA	NM	Sandoval	1	Open Cut	Drain	25	150	2	0.17	
8.0	AM349-AL-003	640+65	12.1	NM-SA-59N	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-003	644+46	12.2	NM-SA-59N	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-003	654+86	12.4	NM-SA-59N	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-003	657+53	12.5	NM-SA-59N	BIA	NM	Sandoval	1	Open Cut	2-Track Dirt Road	25	150	2	0.17	
8.0	AM349-AL-003	657+76	12.5	NM-SA-59N	BIA	NM	Sandoval	1	Open Cut	2-Track Dirt Road	25	150	2	0.17	
8.0	AM349-AL-003	717+22	13.6	NM-SA-62N	BIA	NM	Sandoval	1	Open Cut	Drain	25	150	2	0.17	
8.0	AM349-AL-004	783+47	14.8	NM-SA-64N	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-004	831+94	15.8	NM-SA-66N	BIA	NM	Sandoval	1	Open Cut	Dirt Road	25	150	2	0.17	
8.0	AM349-AL-004	839+36	15.9	NM-SA-66N	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-004	860+18	16.3	NM-SA-67NA	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-004	863+58	16.4	NM-SA-67NA	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-004	872+46	16.5	NM-SA-67NA	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-004	901+65	17.1	NM-SA-67N	BLM	NM	Sandoval	2	Bore	County Road	25	150	2	0.17	
8.0	AM349-AL-004	927+50	17.6	NM-SA-67N	BLM	NM	Sandoval	12	Crossover	Cross Over	125	600	1	1.72	
8.0	AM349-AL-004	933+27	17.7	NM-SA-67N	BLM	NM	Sandoval	2	Bore	County Road	25	150	2	0.17	
8.0	AM349-AL-005	1037+50	19.6	NM-RA-02	BLM	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
8.0	AM349-AL-005	1045+66	19.8	NM-RA-02	BLM	NM	Rio Arriba	3	HDD	U.S. HIGHWAY 550	25	150	1	0.09	**12.47**
9.0	AM276-AL-001	64+64	1.2	NM-SA-16	BLM	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-001	97+41	1.8	NM-SA-16	BLM	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-001	100+81	1.9	NM-SA-16	BLM	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-001	111+10	2.1	NM-SA-16	BLM	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-001	114+45	2.2	NM-SA-16	BLM	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-001	124+79	2.4	NM-SA-16	BLM	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-001	148+64	2.8	NM-SA-17	BIA	NM	Sandoval	4	Valve w/Check	New MLV site	150	150	1	0.52	
9.0	AM276-AL-001	150+00	2.8	NM-SA-17	BIA	NM	Sandoval	14	Crossover	Foreign Line Crossing	125	600	1	1.72	
9.0	AM276-AL-001	152+00	2.9	NM-SA-17	BIA	NM	Sandoval	3	HDD	I-25 Crossing	50	1000	1	1.15	
9.0	AM276-AL-001	160+00	3.0	NM-SA-17	BIA	NM	Sandoval	3	HDD	1-25 Crossing	125	200	1	0.57	
9.0	AM276-AL-001	162+00	3.1	NM-SA-17	BIA	NM	Sandoval	12	Crossover	Foreign Line Crossing	125	600	1	1.72	
9.0	AM276-AL-001	172+00	3.3	NM-SA-17	BIA	NM	Sandoval	3	HDD	Algodones Canal, SF & AT Railroad and State Highway 313	50	1000	1	1.15	
9.0	AM276-AL-001	195+63	3.7	NM-SA-18	BIA	NM	Sandoval	3	HDD	Exit and Entrance Point	300	300	1	2.07	
9.0	AM276-AL-001	209+22	4.0	NM-SA-18	BIA	NM	Sandoval	3	HDD	Bernallio Drain & Rio Grande River	100	100	1	0.23	
9.0	AM276-AL-001	209+22	4.0	NM-SA-18	BIA	NM	Sandoval	3	HDD	Bernallio Drain & Rio Grande River	50	1000	1	1.15	
9.0	AM276-AL-002	267+43	5.1	NM-SA-18	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-002	285+74	5.4	NM-SA-18	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-002	291+61	5.5	NM-SA-18	BIA	NM	Sandoval	1	Open Cut	Drain	25	150	2	0.17	
9.0	AM276-AL-002	327+05	6.2	NM-SA-18	BIA	NM	Sandoval	1	Open Cut	2-Track Dirt Road	25	150	2	0.17	
9.0	AM276-AL-002	336+40	6.4	NM-SA-18	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-002	337+11	6.4	NM-SA-18	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-002	341+44	6.5	NM-SA-18	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-002	345+73	6.5	NM-SA-18	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-002	354+88	6.7	NM-SA-18	BIA	NM	Sandoval	2	Bore	Jemez Canyon Road	25	150	1	0.09	
9.0	AM276-AL-002	356+41	6.8	NM-SA-18	BIA	NM	Sandoval	4	Valve w/Check	New MLV site	25	400	1	0.23	
9.0	AM276-AL-002	375+18	7.1	NM-SA-18	BIA	NM	Sandoval	14	Crossover	Foreign Line Crossing	125	600	1	1.72	
9.0	AM276-AL-002	385+00	7.3	NM-SA-18	BIA	NM	Sandoval	14	Crossover	Foreign Line Crossing	125	600	1	1.72	
9.0	AM276-AL-002	415+77	7.9	NM-SA-18	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	

Segment	Alignment Sheet	Approximate Station	Approximate Milepost	Tract	Ownership	State	County	Site Code	Construction Type	Description	TUA Width (ft)	TUA Length (ft)	TUA Quantity (ea.)	Acres Affected by Construction	Segment Total (Acres)
9.0	AM276-AL-003	491+95	9.3	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-003	563+27	10.7	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-003	606+38	11.5	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-003	612+79	11.6	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-003	622+15	11.8	NM-SA-20	BIA	NM	Sandoval	2	Bore	Santa Anna Rd	25	150	2	0.17	
9.0	AM276-AL-003	627+22	11.9	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-003	635+87	12.0	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Drain	25	150	2	0.17	
9.0	AM276-AL-003	643+82	12.2	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Drain	25	150	2	0.17	
9.0	AM276-AL-003	646+85	12.3	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Drain	25	150	2	0.17	
9.0	AM276-AL-003	704+37	13.3	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-003	706+36	13.4	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-004	729+33	13.8	NM-SA-20	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-004	803+50	15.2	NM-SA-20	BIA	NM	Sandoval	4	Valve w/Check	New MLV site	25	150	1	0.09	
9.0	AM276-AL-004	828+31	15.7	NM-SA-21	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-004	830+63	15.7	NM-SA-21	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-004	846+42	16.0	NM-SA-21	BIA	NM	Sandoval	1	Open Cut	Drain	25	150	2	0.17	
9.0	AM276-AL-004	850+89	16.1	NM-SA-21	BIA	NM	Sandoval	1	Open Cut	Drain	25	150	2	0.17	
9.0	AM276-AL-004	872+91	16.5	NM-SA-21	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-004	911+18	17.3	NM-SA-21	BIA	NM	Sandoval	1	Open Cut	Drain	25	150	2	0.17	
9.0	AM276-AL-004	940+17	17.8	NM-SA-21	BIA	NM	Sandoval	2	Bore	U.S. HIGHWAY 550	25	150	1	0.09	
9.0	AM276-AL-004	941+39	17.8	NM-SA-21	BIA	NM	Sandoval	2	Bore	U.S. HIGHWAY 550	25	150	1	0.09	
9.0	AM276-AL-005	978+27	18.5	NM-SA-21	BIA	NM	Sandoval	14	Crossover	Foreign Line Crossing	125	400	1	1.15	
9.0	AM276-AL-005	989+26	18.7	NM-SA-21	BIA	NM	Sandoval	14	Crossover	Foreign Line Crossing	125	400	1	1.15	
9.0	AM276-AL-005	1049+63	19.9	NM-SA-21	BIA	NM	Sandoval	1	Open Cut	Wash	25	150	2	0.17	
9.0	AM276-AL-005	1185+50	22.5	NM-SA-21	BIA	NM	Sandoval	12	Crossover	Crossover	25	150	1	0.09	
9.0	AM276-AL-005	1187+20	22.5	NM-SA-21	BIA	NM	Sandoval	12	Crossover	Crossover	25	150	1	0.09	**22.61**
10															**0.00**
11															**0.00**
12	AM108-AL-001	183+65	3.5	NM-CH-55	BLM	NM	Chaves	14	Crossover	Foreign Line Crossing	25	150	2	0.17	
12	AM108-AL-002	260+58	4.9	NM-CH-55	BLM	NM	Chaves	2	Bore	County Road C-1(44)P4 Dona Ana Road	25	150	2	0.17	
12	AM108-AL-002	261+08	4.9	NM-CH-55	BLM	NM	Chaves	4	Valve w/Check	Mainline Valve Site	0	0	0	0.00	**0.34**
13															**0.00**
													Total	**56.77**	**56.77**

Appendix C - Attachment 4 - Table 1 - Access Roads

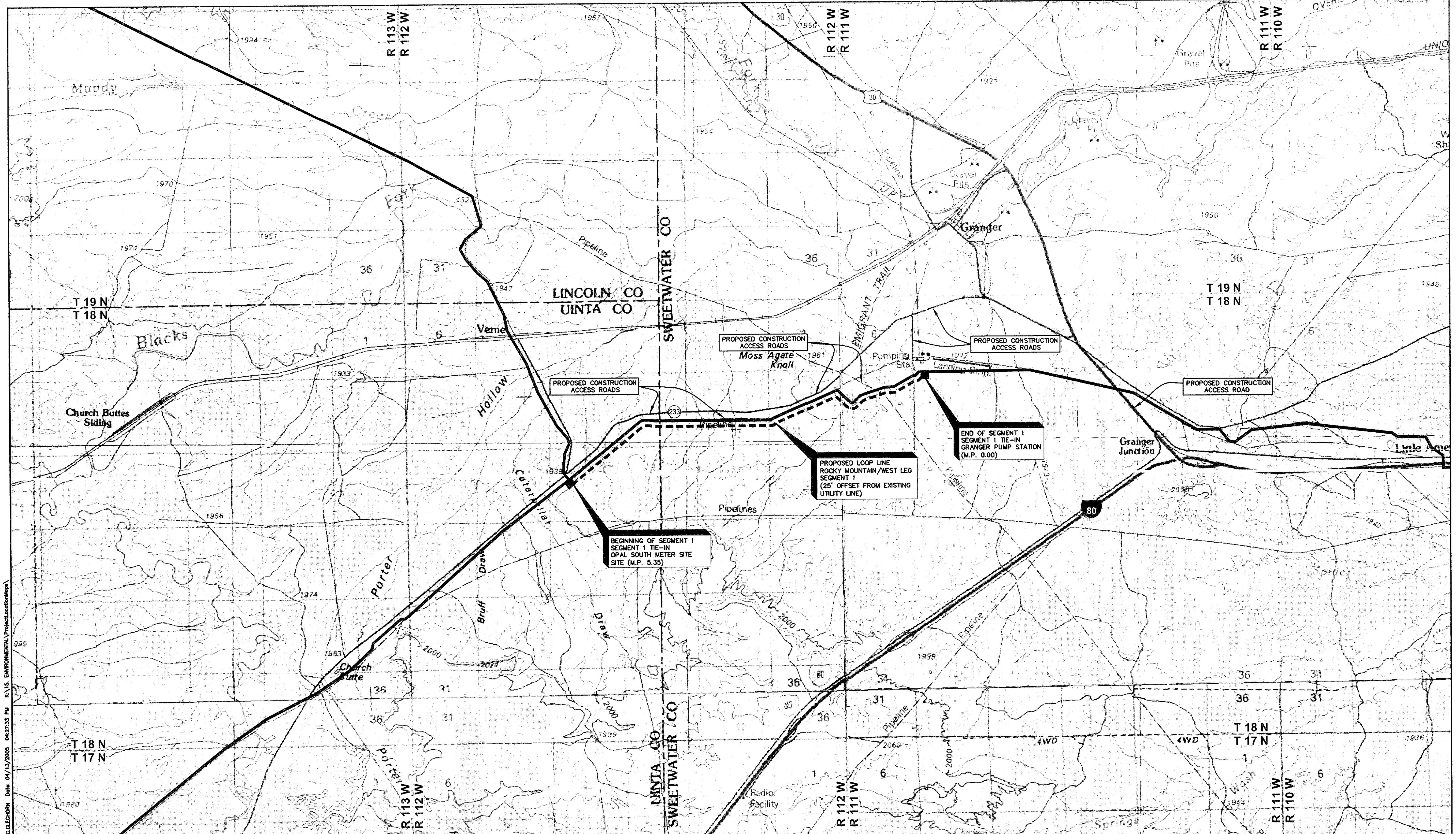
Segment	Alignment Sheet	Approxi-mate Begin Station	Approxi-mate Begin Milepost	Approxi-mate End Station	Approxi-mate End Milepost	Tract	Ownership	State	County	Access Road Description	Acres Affected by Construction	Acres of Roads used that are Not Public Thorough fares
1.0	AM46-AL-001	4+44	0.1	4+44	0.1	WY-SW-WL-56	BLM	WY	Sweetwater	Gravel Road	0.00	0.00
1.0	AM46-AL-001	4+44	0.1	4+44	0.1	WY-SW-WL-57	Unita Devel. Co.	WY	Sweetwater	Gravel Road	0.00	0.00
1.0	AM46-AL-001	64+28	1.2	123+56	2.3	WY-SW-WL-58	BLM	WY	Sweetwater	Gravel Road	0.00	0.00
1.0	AM46-AL-001	95+33	1.8	95+33	1.8	WY-SW-WL-58	BLM	WY	Sweetwater	Gravel Road	0.00	0.00
1.0	AM46-AL-001	125+44	2.4	125+44	2.4	WY-SW-WL-59	Unita Devel. Co.	WY	Sweetwater	Gravel Road	0.00	0.00
1.0	AM46-AL-001	137+42	2.6	137+42	2.6	WY-SW-WL-59	Unita Devel. Co.	WY	Sweetwater	Gravel Road	0.00	0.00
1.0	AM46-AL-001	154+89	2.9	154+89	2.9	WY-SW-WL-59	Unita Devel. Co.	WY	Sweetwater	Gravel Road	0.00	0.00
1.0	AM46-AL-001	175+86	3.3	202+26	3.8	WY-SW-WL-60	BLM	WY	Sweetwater	Gravel Road	0.00	0.00
1.0	AM46-AL-001	187+44	3.6	187+44	3.6	WY-SW-WL-60	BLM	WY	Sweetwater	Gravel Road	0.00	0.00
1.0	AM46-AL-001	202+26	3.8	228+66	4.3	WY-UI-WL-1	BLM	WY	Uinta	Gravel Road	0.00	0.00
1.0	AM46-AL-001	262+38	5.0	262+38	5.0	WY-UI-WL-3	State of Wyoming	WY	Uinta	Gravel Road	0.00	0.00
1.0	AM46-AL-001	275+73	5.2	275+73	5.2	WY-UI-WL-3	State of Wyoming	WY	Uinta	Gravel Road	0.00	0.00
2.0	AM17-AL-001	26+41	0.5	71+84	1.4	WY-SW-WL-25	BLM	WY	Sweetwater	Gravel Road	0.00	0.00
2.0	AM17-AL-001	72+99	1.4	72+99	1.4	WY-SW-WL-26	Anadarko Land Corp.	WY	Sweetwater	Wyoming State Highway 530 (paved)	0.00	0.00
2.0	AM17-AL-002	331+73	6.3	331+73	6.3	WY-SW-WL-33	BLM	WY	Sweetwater	County Road 37 (gravel)	0.00	0.00
2.0	AM17-AL-003	594+76	11.3	594+76	11.3	WY-SW-WL-38	Unita Devel. Co.	WY	Sweetwater	Bonomo Ranch Road (gravel)	0.00	0.00
2.0	AM17-AL-003	594+76	11.3	634+77	12.0	WY-SW-WL-38	Unita Devel. Co.	WY	Sweetwater	Gravel Road	0.00	0.00
2.0	AM17-AL-003	634+77	12.0	655+00	12.4	WY-SW-WL-39	BLM	WY	Sweetwater	Gravel Road	0.00	0.66
2.0	AM17-AL-003	702+40	13.3	702+40	13.3	WY-SW-WL-41	Anadarko Land Corp.	WY	Sweetwater	County Road 95 (gravel)	0.00	0.00
2.0	AM17-AL-003	702+40	13.3	740+86	14.0	WY-SW-WL-41	Anadarko Land Corp.	WY	Sweetwater	Gravel Road	0.00	0.00
2.0	AM17-AL-004	740+86	14.0	748+14	14.2	WY-SW-WL-42	State of Wyoming	WY	Sweetwater	Gravel Road	0.00	0.00
2.0	AM17-AL-004	966+17	18.3	966+17	18.3	WY-SW-WL-46	BLM	WY	Sweetwater	County Road 85 (paved)	0.00	0.00
3.0	AM60-AL-001	0+00	0.0	0+00	0.0	WY-SW-EL-01	Cyclone Rim Co.	WY	Sweetwater	Gravel Road to Tipton Station	0.00	0.00
3.0	AM60-AL-002	305+42	5.8	305+42	5.8	WY-SW-EL-09D	Cecil T. Gordon, Sr.	WY	Sweetwater	Gravel Road	0.00	0.00
3.0	AM60-AL-002	331+85	6.3	331+85	6.3	WY-SW-EL-09E	Lester Family Ltd. Partnership	WY	Sweetwater	Gravel Road	0.00	0.00
3.0	AM60-AL-002	392+50	7.4	392+50	7.4	WY-SW-EL-11	BLM	WY	Sweetwater	Red Desert Road (gravel)	0.00	0.00
3.0	AM60-AL-003	552+45	10.5	552+45	10.5	WY-SW-EL-15	BLM	WY	Sweetwater	Gravel Road	0.00	0.00
3.0	AM60-AL-003	642+12	12.2	642+12	12.2	WY-SW-EL-16	Anadarko Land Corp.	WY	Sweetwater	Rasmssen Road (gravel)	0.00	0.00
3.0	AM60-AL-004	750+45	14.2	750+45	14.2	WY-SW-EL-19	BLM	WY	Sweetwater	Dirt Road	0.00	0.00
3.0	AM60-AL-004	788+68	14.9	788+68	14.9	WY-SW-EL-20A	Rock Mtn. Pipeline System LLC	WY	Sweetwater	Gravel Road	0.00	0.00
3.0	AM60-AL-004	806+44	15.3	806+44	15.3	WY-SW-EL-20	Anadarko Land Corp.	WY	Sweetwater	County Road 23 - Wamsutter Road (gravel)	0.00	0.00
3.0	AM60-AL-005	1085+61	20.6	1085+61	20.6	WY-SW-EL-27	P. H. Livestock now, was State of WY	WY	Sweetwater	Dirt Road	0.00	0.00
3.0	AM60-AL-005	1128+98	21.4	1128+98	21.4	WY-SW-EL-28	Anadarko Land Corp.	WY	Sweetwater	Gravel Road	0.00	0.00
3.0	AM60-AL-005	1157+18	21.9	1210+75	22.9	WY-SW-EL-29	BLM	WY	Sweetwater	Gravel Road	0.00	1.70
3.0	AM60-AL-006	1216+96	23.0	1216+96	23.0	WY-SW-EL-30	Anadarko Land Corp.	WY	Sweetwater	Gravel Road	0.00	1.86
4.0	AM44-AL-001	0+00	0.0	0+00	0.0	Exit 142 from I-80	BLM	WY	Sweetwater	Bitter Creek Road (gravel)	0.00	2.50
4.0	AM44-AL-001	443+62	8.4	443+62	8.4	WY-SW-EL-69	BLM	WY	Sweetwater	Table Rock Road (gravel)	0.00	0.22
5.0	AM08-AL-001	1+00	0.0	1+00	0.0	WY-SW-EL-09	Anadarko Land Corp.	WY	Sweetwater	Sweetwater County Road 30 (gravel)	0.00	0.00
5.0	AM08-AL-001	2+99	0.1	2+99	0.1	WY-SW-EL-09	Anadarko Land Corp.	WY	Sweetwater	Sweetwater County Road 30 (gravel)	0.00	0.00
5.0	AM08-AL-001	16+68	0.3	16+68	0.3	WY-SW-EL-09	Anadarko Land Corp.	WY	Sweetwater	Sweetwater County Road 30 (gravel)	0.00	0.00
5.0	AM08-AL-001	37+08	0.7	37+08	0.7	WY-SW-EL-09	Anadarko Land Corp.	WY	Sweetwater	Sweetwater County Road 30 (gravel)	0.00	0.00
5.0	AM08-AL-001	44+08	0.8	44+08	0.8	WY-SW-EL-09	Anadarko Land Corp.	WY	Sweetwater	Sweetwater County Road 30 (gravel)	0.00	0.00
5.0	AM08-AL-002	49+18	0.9	104+13	2.0	WY-SW-EL-10	BLM	WY	Sweetwater	Sweetwater County Road 30 (gravel)	0.00	0.00
5.0	AM08-AL-002	149+62	2.8	161+53	3.1	WY-SW-EL-12	BLM	WY	Sweetwater	Sweetwater County Road 30 (gravel)	0.00	0.00
5.0	AM08-AL-002	201+71	3.8	201+71	3.8	WY-SW-EL-13	Don and Peggy Vercimak	WY	Sweetwater	Sweetwater County Road 30 (gravel)	0.00	0.00
5.0	AM08-AL-002	247+50	4.7	276+00	5.2	WY-SW-EL-17	BLM	WY	Sweetwater	2-Track Dirt Road	2.13	0.27
5.0	AM08-AL-003	518+69	9.8	518+69	9.8	WY-SW-EL-22	Anadarko Land Corp.	WY	Sweetwater	State Highway 430 (paved)	0.00	0.00
6.0	AM850-AL-001	0+00	0.0	0+00	0.0	WY-SW-05B	BLM	WY	Sweetwater	Gravel Road	0.00	3.97
6.0	AM850-AL-001	155+13	2.9	155+13	2.9	WY-SW-05B	BLM	WY	Sweetwater	County Road 34, Ramsey Ranch Road (gravel)	0.00	0.00
6.0	AM850-AL-001	277+24	5.3	277+24	5.3	WY-SW-05B	BLM	WY	Sweetwater	2-Track Dirt Road	0.00	0.10
6.0	AM850-AL-002	441+17	8.4	441+17	8.4	WY-SW-05B	BLM	WY	Sweetwater	Maggie Springs Road (gravel)	0.00	0.00
6.0	AM850-AL-004	805+33	15.3	805+33	15.3	WY-SW-13	BLM	WY	Sweetwater	2-Track Dirt Road	0.00	0.18
6.0	AM850-AL-004	883+16	16.7	883+16	16.7	WY-SW-16	Anadarko Land Corp	WY	Sweetwater	County Road 29 / Little Bitter Creek Road (gravel)	0.00	0.00
6.0	AM850-AL-004	979+86	18.6	979+86	18.6	WY-SW-17	BLM	WY	Sweetwater	Entrance into Pump Station	0.00	0.10
											0.00	0.00
8.0	AM349-AL-001	0+37	0.0	0+37	0.0	NM-Mck-12	BLM	NM	McKinley	2-Track Dirt Road	0.99	1.01

Segment	Alignment Sheet	Approxi-mate Begin Station	Approxi-mate Begin Milepost	Approxi-mate End Station	Approxi-mate End Milepost	Tract	Ownership	State	County	Access Road Description	Acres Affected by Construction	Acres of Roads used that are Not Public Thorough fares
8.0	AM349-AL-001	83+86	1.6	83+86	1.6	NM-SA-49N	BIA	NM	Sandoval	Dirt Road	0.00	0.26
8.0	AM349-AL-001	213+10	4.0	213+10	4.0	NM-SA-53BN	BIA	NM	Sandoval	B.I.A. Road 474 (paved)	0.00	0.00
8.0	AM349-AL-001	219+45	4.2	219+45	4.2	NM-SA-53AN	BIA	NM	Sandoval	B.I.A. Road 471 (gravel)	0.00	0.00
8.0	AM349-AL-003	523+02	9.9	523+02	9.9	NM-SA-57N	BIA	NM	Sandoval	BIA Road 46 (gravel)	0.00	4.39
8.0	AM349-AL-003	588+27	11.1	588+27	11.1	NM-SA-57N	BIA	NM	Sandoval	2-Track Dirt Road	0.00	1.99
8.0	AM349-AL-004	755+41	14.3	755+41	14.3	NM-SA-63N	BLM	NM	Sandoval	2-Track Dirt Road	0.00	0.00
8.0	AM349-AL-004	831+94	15.8	831+94	15.8	NM-SA-66N	BIA	NM	Sandoval	Dirt Road	0.00	3.17
8.0	AM349-AL-004	831+94	15.8	940+36	17.8	NM-SA-66N	BIA	NM	Sandoval	Dirt Road	0.00	0.00
8.0	AM349-AL-004	901+65	17.1	901+65	17.1	NM-SA-67N	BLM	NM	Sandoval	Dirt Road	0.00	5.71
8.0	AM349-AL-004	926+93	17.6	926+93	17.6	NM-SA-67N	BLM	NM	Sandoval	Dirt Road	0.00	0.00
8.0	AM349-AL-004	1004+84	19.0	1044+70	19.8	NM-RA-01	BLM	NM	Sandoval	Dirt Road	0.00	1.65
8.0	AM349-AL-005	1045+66	19.8	1045+66	19.8	NM-RA-02	BLM	NM	Rio Arriba	U.S. HIGHWAY 550 (paved)	0.00	0.00
8.0	AM349-AL-005	1056+85	20.0	1056+85	20.0	NM-RA-01AA	BIA	NM	Rio Arriba	County Road (dirt)	0.00	0.00
9.0	AM276-AL-001	153+37	2.9	153+37	2.9	NM-SA-17	BIA	NM	Sandoval	2-Track Dirt Road	0.73	0.00
9.0	AM276-AL-001	160+72	3.0	160+72	3.0	NM-SA-17	BIA	NM	Sandoval	2-Track Dirt Road	0.00	0.00
9.0	AM276-AL-001	181+29	3.4	181+29	3.4	NM-SA-17	BIA	NM	Sandoval	State Highway 313 (paved)	0.00	0.00
9.0	AM276-AL-002	277+66	5.3	334+00	6.3	NM-SA-18	BIA	NM	Sandoval	2-Track Dirt Road	0.00	0.00
9.0	AM276-AL-002	354+88	6.7	354+88	6.7	NM-SA-18	BIA	NM	Sandoval	Jemez Canyon Road (paved)	0.00	0.00
9.0	AM276-AL-003	622+15	11.8	622+15	11.8	NM-SA-20	BIA	NM	Sandoval	Santa Anna Road (paved)	0.00	0.00
9.0	AM276-AL-004	940+17	17.8	940+17	17.8	NM-SA-21	BIA	NM	Sandoval	U.S. HIGHWAY 550 (paved)	0.00	0.00
9.0	AM276-AL-004	1030+81	19.5	1030+81	19.5	NM-SA-21	BIA	NM	Sandoval	2-Track Dirt Road	0.00	0.24
9.0	AM276-AL-005	1186+01	22.5	1186+01	22.5	NM-SA-22	MAPCO (San Ysidro Station)	NM	Sandoval	2-Track Dirt Road	0.40	0.13
10	AM189-AL-001	0+00	0.0	0+00	0.0	NM-TO-07	Various Owners beside the road	NM	Torrance	County Road 71 (gravel)	0.00	0.00
10	AM189-AL-001	233+41	4.4	233+41	4.4	NM-TO-09	Arthur Jerry Dunlap & Sue Dunlap Stark	NM	Torrance	State Highway 3 (paved)	0.00	0.00
10	AM189-AL-003	548+09	10.4	548+09	10.4	NM-TO-15	Thomas W. Burson	NM	Torrance	County Road C-029 (gravel)	0.00	0.00
10	AM189-AL-003	622+53	11.8	622+53	11.8	NM-TO-17	Mary Grace Hennessey	NM	Torrance	U.S. Highway 60 (paved)	0.00	0.00
10	AM189-AL-004	763+72	14.5	763+72	14.5	NM-TO-19	McLaughlin Ranch LLC	NM	Torrance	2-Track Dirt Road	0.00	0.00
10	AM189-AL-005	1046+43	19.8	1046+43	19.8	NM-TO-27	Lamar Bell Cravens	NM	Torrance	Bean Barn Road (gravel)	0.00	0.00
10	AM189-AL-008	1828+12	34.6	1828+12	34.6	NM-TO-45	State of NM (MAPL - Estancia Station)	NM	Torrance	County Road A080 (gravel)	0.00	0.00
11	AM126-AL-001	1+47	0.0	1+47	0.0	NM-CH-65	One Hundred Ranch, Inc.	NM	Chaves	State Highway 20 (paved)	0.00	0.00
11	AM126-AL-001	81+21	1.5	81+21	1.5	NM-CH-65	One Hundred Ranch, Inc.	NM	Chaves	County Road C-1(33)P2 (gravel)	0.00	0.00
11	AM126-AL-002	310+94	5.9	310+94	5.9	NM-DB-01	Poverty Flats Land & Cattle Company	NM	De Baca	County Road A-008 (gravel)	0.00	0.00
11	AM126-AL-003	516+71	9.8	516+71	9.8	NM-DB-04	Laheeta L. Harvey	NM	De Baca	County Road A-005 (gravel)	0.00	0.00
11	AM126-AL-004	759+58	14.4	759+58	14.4	NM-DB-12	Boot Ranch, Inc.	NM	De Baca	County Road A-008 (dirt)	0.00	0.00
11	AM126-AL-004	982+97	18.6	982+97	18.6	NM-DB-13	Murphy New Mexico Properties, Inc.	NM	De Baca	County Road A-006 (gravel)	0.00	0.00
12	AM108-AL-001	0+74	0.0	0+74	0.0	NM-CH-51	Corn Brothers, Inc.	NM	Chaves	County Road C-1(58)P2A (Roosevelt Road) (gravel)	0.00	0.00
12	AM108-AL-001	10+74	0.2	79+41	1.5	NM-CH-52	Corn Brothers, Inc.	NM	Chaves	Gravel Road	0.00	0.00
12	AM108-AL-002	260+58	4.9	260+58	4.9	NM-CH-55	BLM	NM	Chaves	County Road C-1(44)P4 Dona Ana Road (gravel)	0.00	0.00
12	AM108-AL-004	754+13	14.3	754+13	14.3	NM-CH-60	Spikebox, LTD	NM	Chaves	County Road C-1(31)P1 (dirt)	1.29	0.00
12	AM108-AL-004	857+46	16.2	857+46	16.2	NM-CH-61	Spikebox, LTD	NM	Chaves	2-Track Dirt Road	0.00	0.00
12	AM108-AL-004	948+69	18.0	963+00	18.2	NM-CH-65	One Hundred Ranch, Inc.	NM	Chaves	2-Track Dirt Road	0.00	0.00
13	AM47-AL-001	0+24	0.0	0+24	0.0	NM-LEA-61	James L. Odle & Amelda Joyce Odle Revocable Living Trust	NM	Lea	Frier Road (gravel)	0.00	0.00
13	AM47-AL-001	224+79	4.3	224+79	4.3	NM-LEA-68	State of NM (Caprock Station)	NM	Lea	State Road 457 (paved)	0.00	0.00
										Total	**5.54**	**30.11**
										Total on BLM Land	**3.12**	**18.07**

Appendix C - Attachment 4 - Table 2 - Federal Access Roads

Segment	Alignment Sheet	Approximate Begin Station	Approximate Begin Milepost	Approximate End Station	Approximate End Milepost	Tract	Ownership	State	County	Access Road Description	Acres Affected by Construction	Acres of BLM Roads Used during Construction
1.0	AM46-AL-001	4+44	0.1	4+44	0.1	WY-SW-WL-56	BLM	WY	Sweetwater	Gravel Road	0.00	0.00
1.0	AM46-AL-001	64+28	1.2	123+56	2.3	WY-SW-WL-58	BLM	WY	Sweetwater	Gravel Road	0.00	0.00
1.0	AM46-AL-001	95+33	1.8	95+33	1.8	WY-SW-WL-58	BLM	WY	Sweetwater	Gravel Road	0.00	0.00
1.0	AM46-AL-001	175+86	3.3	202+26	3.8	WY-SW-WL-60	BLM	WY	Sweetwater	Gravel Road	0.00	0.00
1.0	AM46-AL-001	187+44	3.6	187+44	3.6	WY-SW-WL-60	BLM	WY	Sweetwater	Gravel Road	0.00	0.00
1.0	AM46-AL-001	202+26	3.8	228+66	4.3	WY-UI-WL-1	BLM	WY	Uinta	Gravel Road	0.00	0.00
2.0	AM17-AL-001	26+41	0.5	71+84	1.4	WY-SW-WL-25	BLM	WY	Sweetwater	Gravel Road	0.00	0.00
2.0	AM17-AL-002	331+73	6.3	331+73	6.3	WY-SW-WL-33	BLM	WY	Sweetwater	County Road 37 (gravel)	0.00	0.00
2.0	AM17-AL-003	634+77	12.0	650+00	12.3	WY-SW-WL-39	BLM	WY	Sweetwater	Gravel Road	0.00	0.00
2.0	AM17-AL-004	966+17	18.3	966+17	18.3	WY-SW-WL-46	BLM	WY	Sweetwater	County Road 85 (paved)	0.00	0.00
3.0	AM60-AL-002	392+50	7.4	392+50	7.4	WY-SW-EL-11	BLM	WY	Sweetwater	Red Desert Road (gravel)	0.00	0.00
3.0	AM60-AL-003	552+45	10.5	552+45	10.5	WY-SW-EL-15	BLM	WY	Sweetwater	Gravel Road	0.00	0.00
3.0	AM60-AL-004	750+45	14.2	750+45	14.2	WY-SW-EL-19	BLM	WY	Sweetwater	Dirt Road	0.00	0.00
3.0	AM60-AL-005	1157+18	21.9	1210+75	22.9	WY-SW-EL-29	BLM	WY	Sweetwater	Gravel Road	0.00	0.00
4.0	AM44-AL-001	0+00	0.0	0+00	0.0	Exit 142 from I-80	BLM	WY	Sweetwater	Bitter Creek Road (gravel)	0.00	0.00
4.0	AM44-AL-001	443+62	8.4	443+62	8.4	WY-SW-EL-69	BLM	WY	Sweetwater	Table Rock Road (gravel)	0.00	0.00
5.0	AM08-AL-002	49+18	0.9	104+13	2.0	WY-SW-EL-10	BLM	WY	Sweetwater	Sweetwater County Road 30 (gravel)	0.00	0.00
5.0	AM08-AL-002	149+62	2.8	161+53	3.1	WY-SW-EL-12	BLM	WY	Sweetwater	Sweetwater County Road 30 (gravel)	0.00	0.00
5.0	AM08-AL-002	247+50	4.7	276+00	5.2	WY-SW-EL-17	BLM	WY	Sweetwater	2-Track Dirt Road	2.13	0.00
6.0	AM850-AL-001	0+00	0.0	0+00	0.0	WY-SW-05B	BLM	WY	Sweetwater	Gravel Road	0.00	0.00
6.0	AM850-AL-001	155+13	2.9	155+13	2.9	WY-SW-05B	BLM	WY	Sweetwater	County Road 34, Ramsey Ranch Road (gravel)	0.00	0.00
6.0	AM850-AL-001	277+24	5.3	277+24	5.3	WY-SW-05B	BLM	WY	Sweetwater	2-Track Dirt Road	0.00	0.00
6.0	AM850-AL-002	441+17	8.4	441+17	8.4	WY-SW-05B	BLM	WY	Sweetwater	Maggie Springs Road (gravel)	0.00	0.00
6.0	AM850-AL-004	805+33	15.3	805+33	15.3	WY-SW-13	BLM	WY	Sweetwater	2-Track Dirt Road	0.00	0.00
6.0	AM850-AL-004	979+86	18.6	979+86	18.6	WY-SW-17	BLM	WY	Sweetwater	U.S. Highway 191 (paved)	0.00	0.00
											0.00	0.00
8.0	AM349-AL-001	0+37	0.0	0+37	0.0	NM-Mck-12	BLM	NM	McKinley	2-Track Dirt Road	0.99	0.00
8.0	AM349-AL-001	83+86	1.6	83+86	1.6	NM-SA-49N	BIA	NM	Sandoval	Dirt Road	0.00	0.00
8.0	AM349-AL-001	213+10	4.0	213+10	4.0	NM-SA-53BN	BIA	NM	Sandoval	B.I.A. Road 474 (paved)	0.00	0.00
8.0	AM349-AL-001	219+45	4.2	219+45	4.2	NM-SA-53AN	BIA	NM	Sandoval	B.I.A. Road 471 (gravel)	0.00	0.00
8.0	AM349-AL-003	523+02	9.9	523+02	9.9	NM-SA-57N	BIA	NM	Sandoval	BIA Road 46 (gravel)	0.00	0.00
8.0	AM349-AL-003	588+27	11.1	588+27	11.1	NM-SA-57N	BIA	NM	Sandoval	2-Track Dirt Road	0.00	0.00
8.0	AM349-AL-004	755+41	14.3	755+41	14.3	NM-SA-63N	BLM	NM	Sandoval	2-Track Dirt Road	0.00	0.00
8.0	AM349-AL-004	831+94	15.8	831+94	15.8	NM-SA-66N	BIA	NM	Sandoval	Dirt Road	0.00	0.00
8.0	AM349-AL-004	831+94	15.8	940+36	17.8	NM-SA-66N	BIA	NM	Sandoval	Dirt Road	0.00	0.00
8.0	AM349-AL-004	901+65	17.1	901+65	17.1	NM-SA-67N	BLM	NM	Sandoval	Dirt Road	0.00	0.00
8.0	AM349-AL-004	926+93	17.6	926+93	17.6	NM-SA-67N	BLM	NM	Sandoval	Dirt Road	0.00	0.00
8.0	AM349-AL-004	1004+84	19.0	1044+70	19.8	NM-RA-01	BLM	NM	Sandoval	Dirt Road	0.00	0.00
8.0	AM349-AL-005	1045+66	19.8	1045+66	19.8	NM-RA-02	BLM	NM	Rio Arriba	U.S. HIGHWAY 550 (paved)	0.00	0.00
8.0	AM349-AL-005	1056+85	20.0	1056+85	20.0	NM-RA-01AA	BIA	NM	Rio Arriba	County Road (dirt)	0.00	0.00
9.0	AM276-AL-001	153+37	2.9	153+37	2.9	NM-SA-17	BIA	NM	Sandoval	2-Track Dirt Road	0.73	0.00
9.0	AM276-AL-001	160+72	3.0	160+72	3.0	NM-SA-17	BIA	NM	Sandoval	2-Track Dirt Road	0.00	0.00
9.0	AM276-AL-001	181+29	3.4	181+29	3.4	NM-SA-17	BIA	NM	Sandoval	State Highway 313 (paved)	0.00	0.00
9.0	AM276-AL-002	277+66	5.3	334+00	6.3	NM-SA-18	BIA	NM	Sandoval	2-Track Dirt Road	0.00	0.00
9.0	AM276-AL-002	354+88	6.7	354+88	6.7	NM-SA-18	BIA	NM	Sandoval	Jemez Canyon Road (paved)	0.00	0.00
9.0	AM276-AL-003	622+15	11.8	622+15	11.8	NM-SA-20	BIA	NM	Sandoval	Santa Anna Road (paved)	0.00	0.00
9.0	AM276-AL-004	940+17	17.8	940+17	17.8	NM-SA-21	BIA	NM	Sandoval	U.S. HIGHWAY 550 (paved)	0.00	0.00
9.0	AM276-AL-004	1030+81	19.5	1030+81	19.5	NM-SA-21	BIA	NM	Sandoval	2-Track Dirt Road	0.00	0.00
12	AM108-AL-002	260+58	4.9	260+58	4.9	NM-CH-55	BLM	NM	Chaves	County Road C-1(44)P4 Dona Ana Road (gravel)	0.00	0.00
										Total	**3.85**	**0.00**

Appendix C
Attachment 5
Project Location Maps



0 1/2 1 2 3 4 Miles

LEGEND

PROPOSED LOOP

EXISTING PIPELINES

THIS DRAWING IS BASED UPON 100 KM QUADS

MID-AMERICA PIPELINE COMPANY, LLC.

ROCKY MOUNTAIN/WEST LEG LOOP
SEGMENT 1 - PROJECT LOCATION MAP

SWEETWATER & UINTA COUNTIES WYOMING

DRAWN	DATE	CHECKED	APPROVED	SCALE	DRAWING NO.
CC	4/04/05	B. OLSEN	D. WILLIAMS	AS NOTED	

SEGMENT 1

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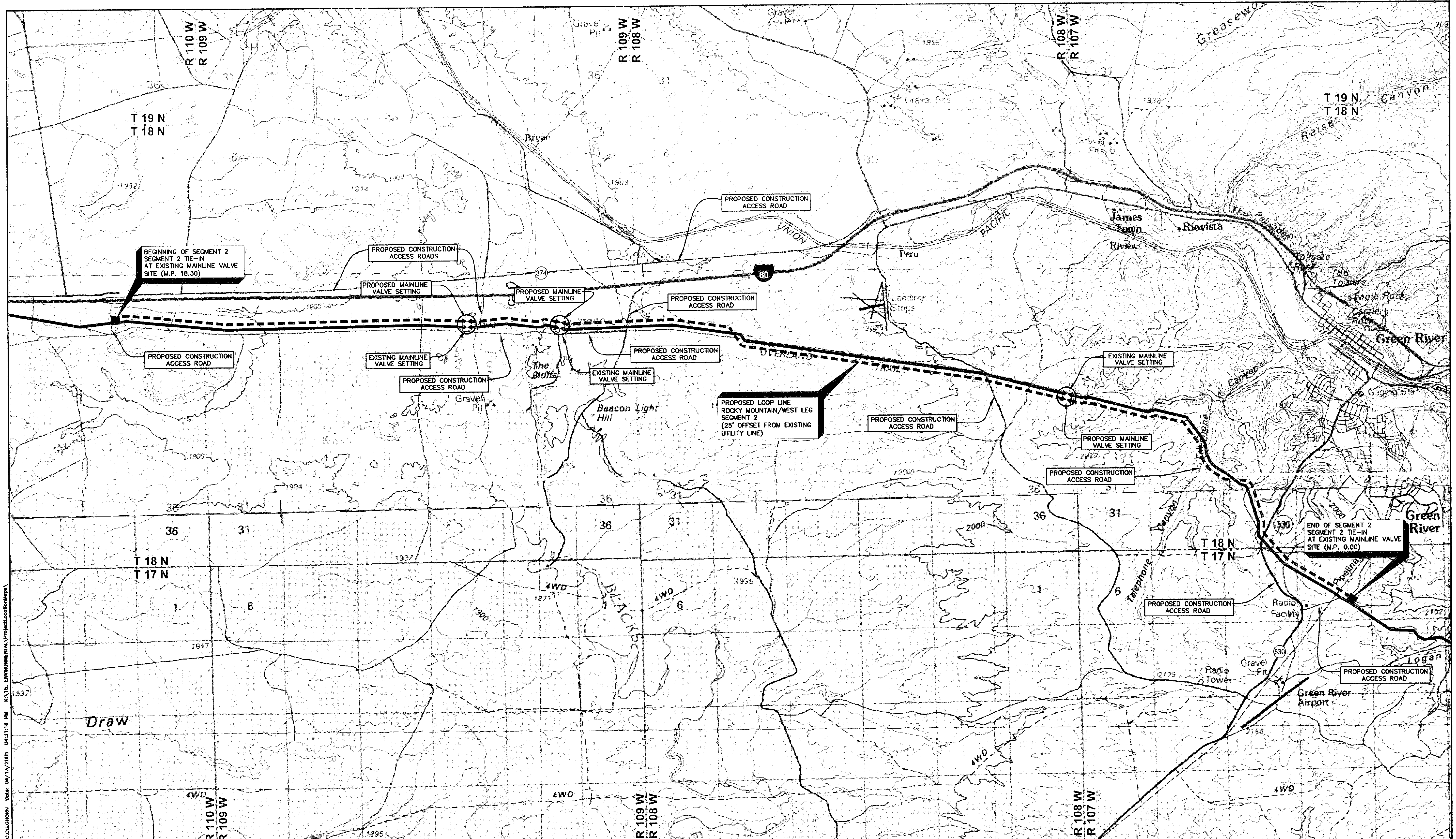

0 1/2 1 2 3 4 Miles

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LEGEND

PROPOSED LOOP
EXISTING PIPELINES

THIS DRAWING IS BASED UPON 100 KM QUADS

MID-AMERICA PIPELINE COMPANY, LLC.

ROCKY MOUNTAIN/WEST LEG LOOP
SEGMENT 2 - PROJECT LOCATION MAP

SWEETWATER COUNTY — WYOMING

DRAWN	DATE	CHECKED	APPROVED	SCALE	DRAWING NO.
CC	4/04/05	B. OLSEN	D. WILLIAMS	AS NOTED	

SEGMENT 2

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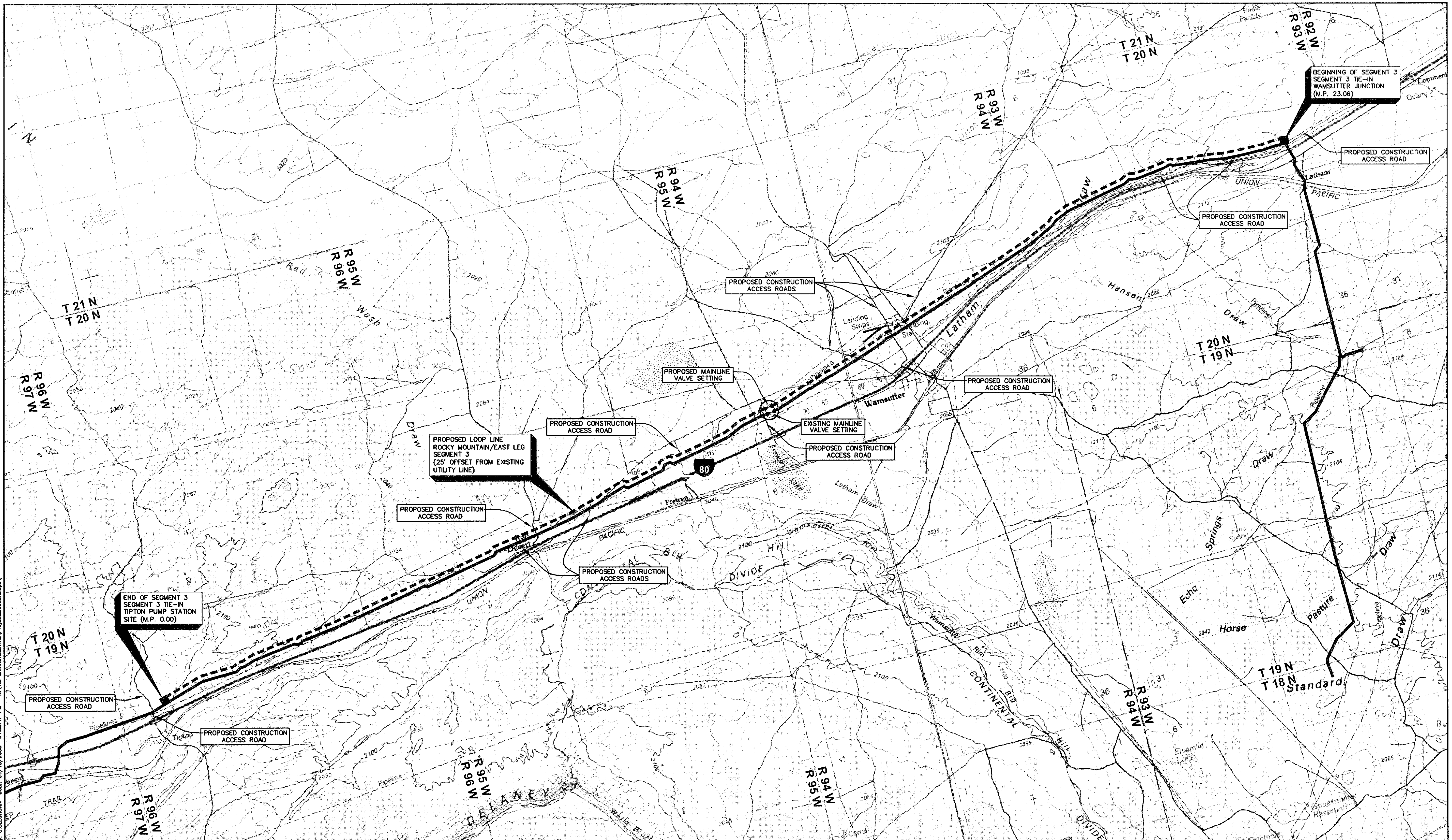

0 1/2 1 2 3 4 Miles

LEGEND

PROPOSED LOOP

EXISTING PIPELINES

THIS DRAWING IS BASED UPON 100 KM QUADS

MID-AMERICA PIPELINE COMPANY, LLC.

ROCKY MOUNTAIN/EAST LEG LOOP
SEGMENT 3 - PROJECT LOCATION MAP

SWEETWATER COUNTY WYOMING

DRAWN	DATE	CHECKED	APPROVED	SCALE	DRAWING NO.
CC	4/04/05	B. OLSEN	D. WILLIAMS	AS NOTED	

SEGMENT 3

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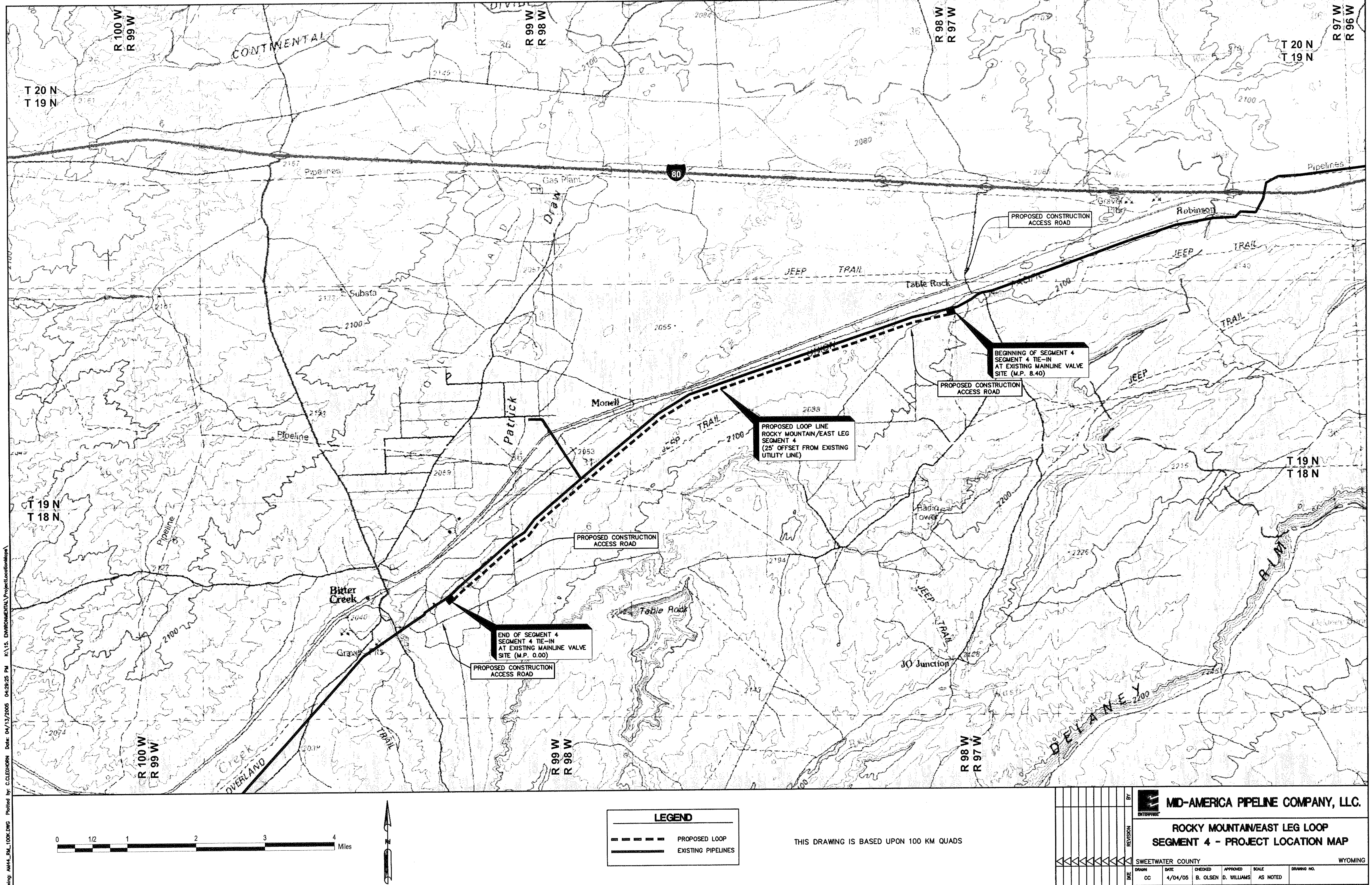

LEGEND

- - - - -	PROPOSED LOOP
———	EXISTING PIPELINES

THIS DRAWING IS BASED UPON 100 KM QUADS

MID-AMERICA PIPELINE COMPANY, LLC.

ROCKY MOUNTAIN/EAST LEG LOOP
SEGMENT 4 - PROJECT LOCATION MAP

SWEETWATER COUNTY WYOMING

DRAWN	DATE	CHECKED	APPROVED	SCALE	DRAWING NO.
CC	4/04/05	B. OLSEN	D. WILLIAMS	AS NOTED	

SEGMENT 4

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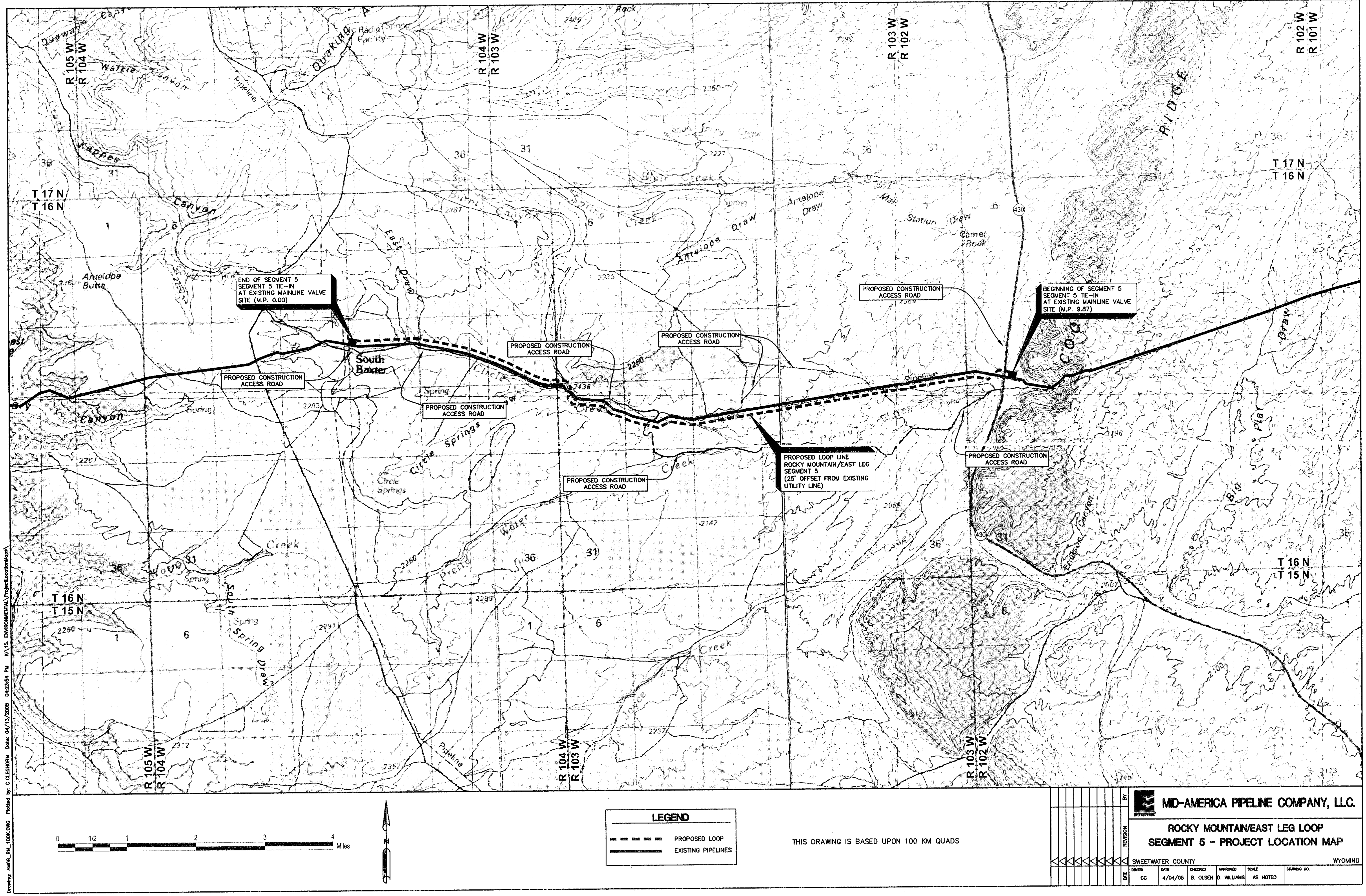

END OF SEGMENT 5
SEGMENT 5 TIE-IN
AT EXISTING MAINLINE VALVE
SITE (M.P. 0.00)
BEGINNING OF SEGMENT 5
SEGMENT 5 TIE-IN
AT EXISTING MAINLINE VALVE
SITE (M.P. 9.87)
PROPOSED CONSTRUCTION ACCESS ROAD
PROPOSED LOOP LINE
ROCKY MOUNTAIN/EAST LEG
SEGMENT 5
(25' OFFSET FROM EXISTING
UTILITY LINE)
South Baxter
R 105 W
R 104 W
R 103 W
R 102 W
R 101 W
T 17 N
T 16 N
T 15 N
Antelope Butte
Circle Springs
Camel Rock
Pretty Water Creek
Burnt Canyon
Antelope Draw
Mail Station Draw
Big Flat Draw
Spring Creek
Kappes Canyon
Walkie Canyon
Quaking Asp
Radio Facility
Pipeline
RIDGE
South Spring Draw
Joyce Creek
Ericson Canyon
0
1/2
1
2
3
4
Miles
LEGEND
PROPOSED LOOP
EXISTING PIPELINES
THIS DRAWING IS BASED UPON 100 KM QUADS
MID-AMERICA PIPELINE COMPANY, LLC.
ROCKY MOUNTAIN/EAST LEG LOOP
SEGMENT 5 - PROJECT LOCATION MAP
SWEETWATER COUNTY
WYOMING
DRAWN CC
DATE 4/04/05
CHECKED B. OLSEN
APPROVED D. WILLIAMS
SCALE AS NOTED
DRAWING NO.
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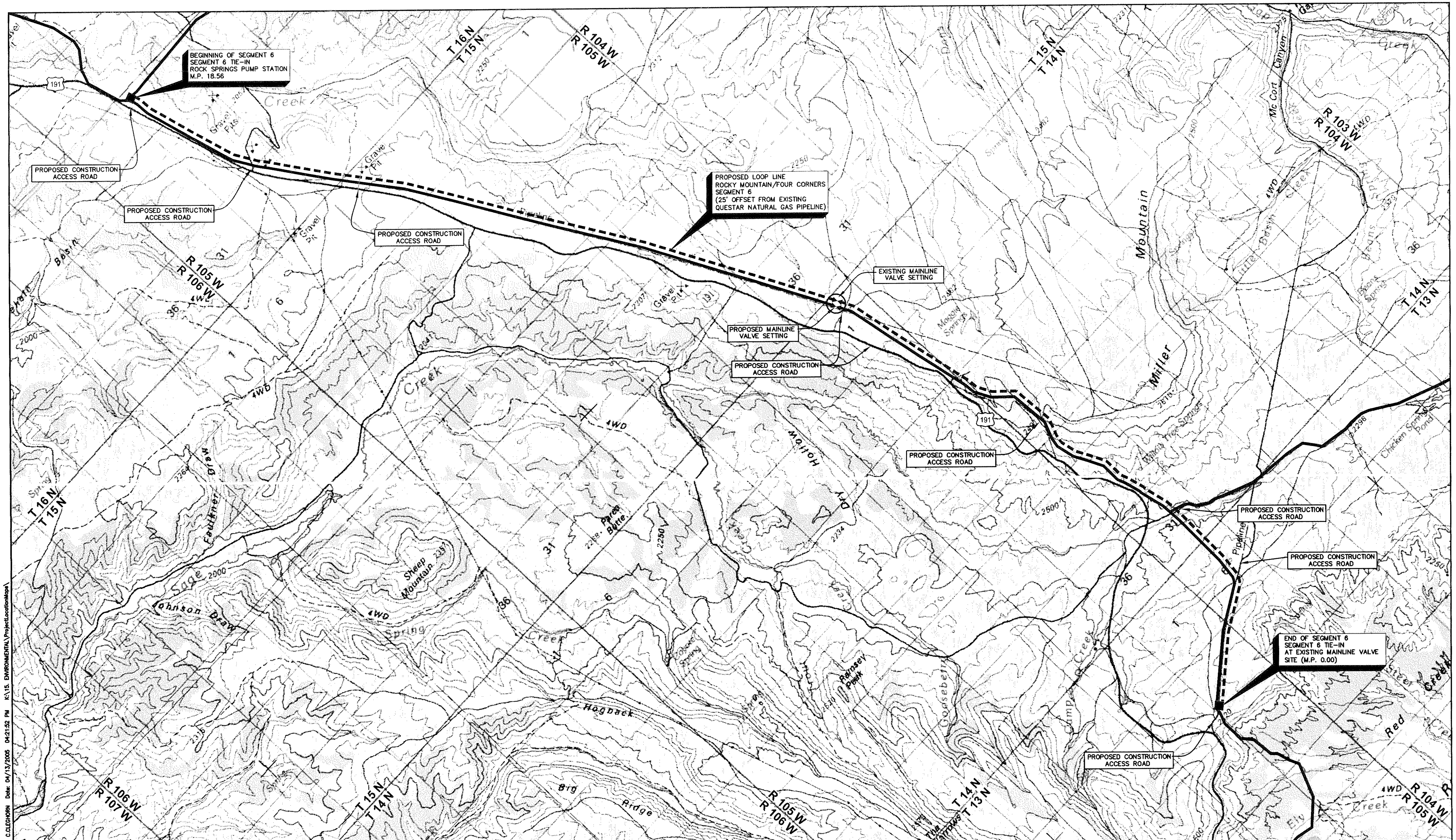
SEGMENT 5



0 1/2 1 2 3 4 Miles

LEGEND

- - - - PROPOSED LOOP
—— EXISTING PIPELINES

THIS DRAWING IS BASED UPON 100 KM QUADS

MID-AMERICA PIPELINE COMPANY, LLC.

ENTERPRISE

ROCKY MOUNTAIN/FOUR CORNERS LOOP
SEGMENT 6 - PROJECT LOCATION MAP

SWEETWATER COUNTY					WYOMING
DRAWN	DATE	CHECKED	APPROVED	SCALE	DRAWING NO.
CC	4/04/05	B. OLSEN	D. WILLIAMS	AS NOTED	

REVISION | DATE | BY

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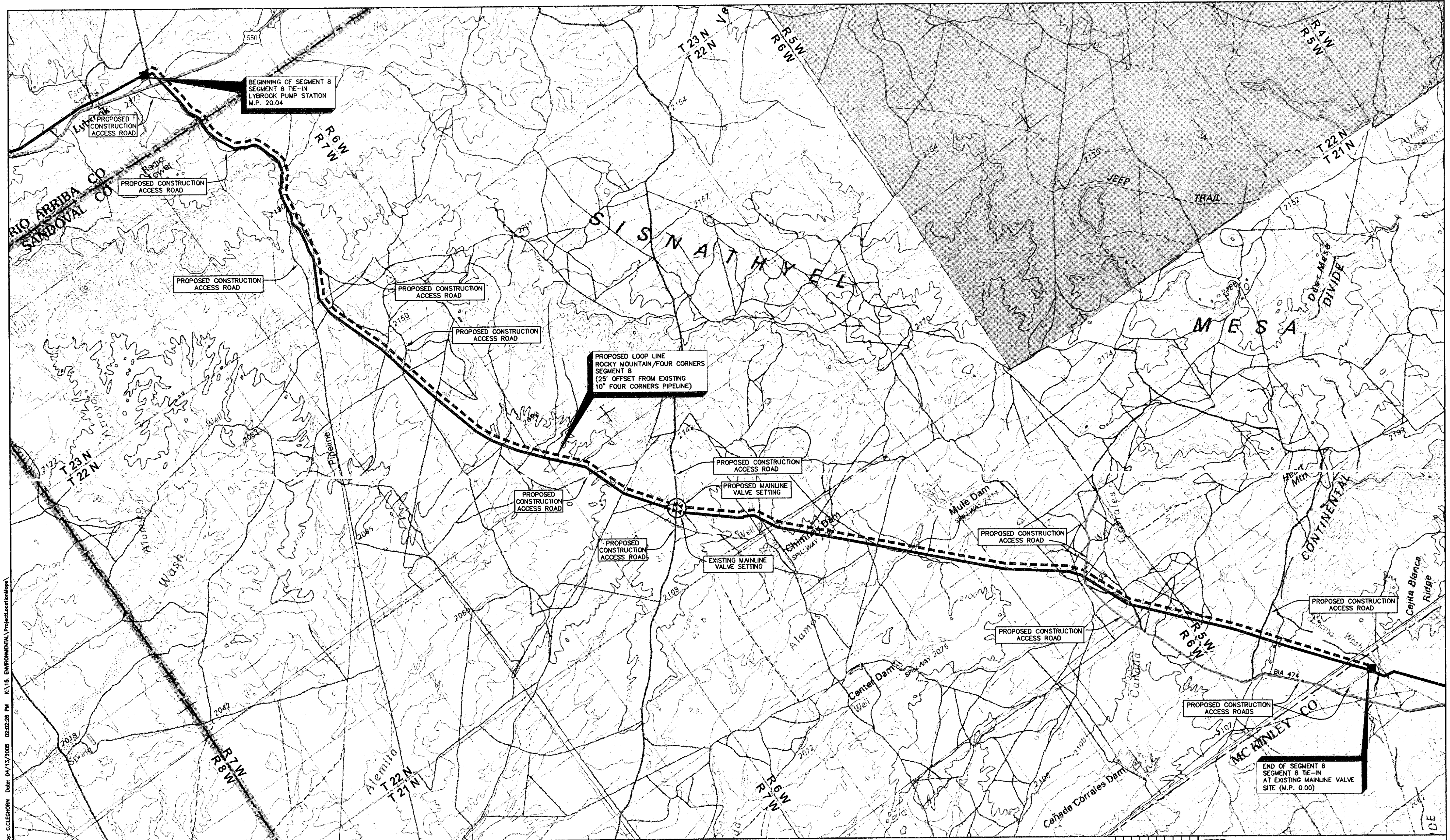
SEGMENT 6



THIS DRAWING IS BASED UPON 100 KM QUADS

MID-AMERICA PIPELINE COMPANY, LLC.

ROCKY MOUNTAIN/FOUR CORNERS LOOP
SEGMENT 8 - PROJECT LOCATION MAP

RIO ARRIBA, SANDOVAL & McKINLEY COUNTIES — NEW MEXICO

DRAWN	DATE	CHECKED	APPROVED	SCALE	DRAWING NO.
CC	3/22/05	B. OLSEN	D. WILLIAMS	AS NOTED	

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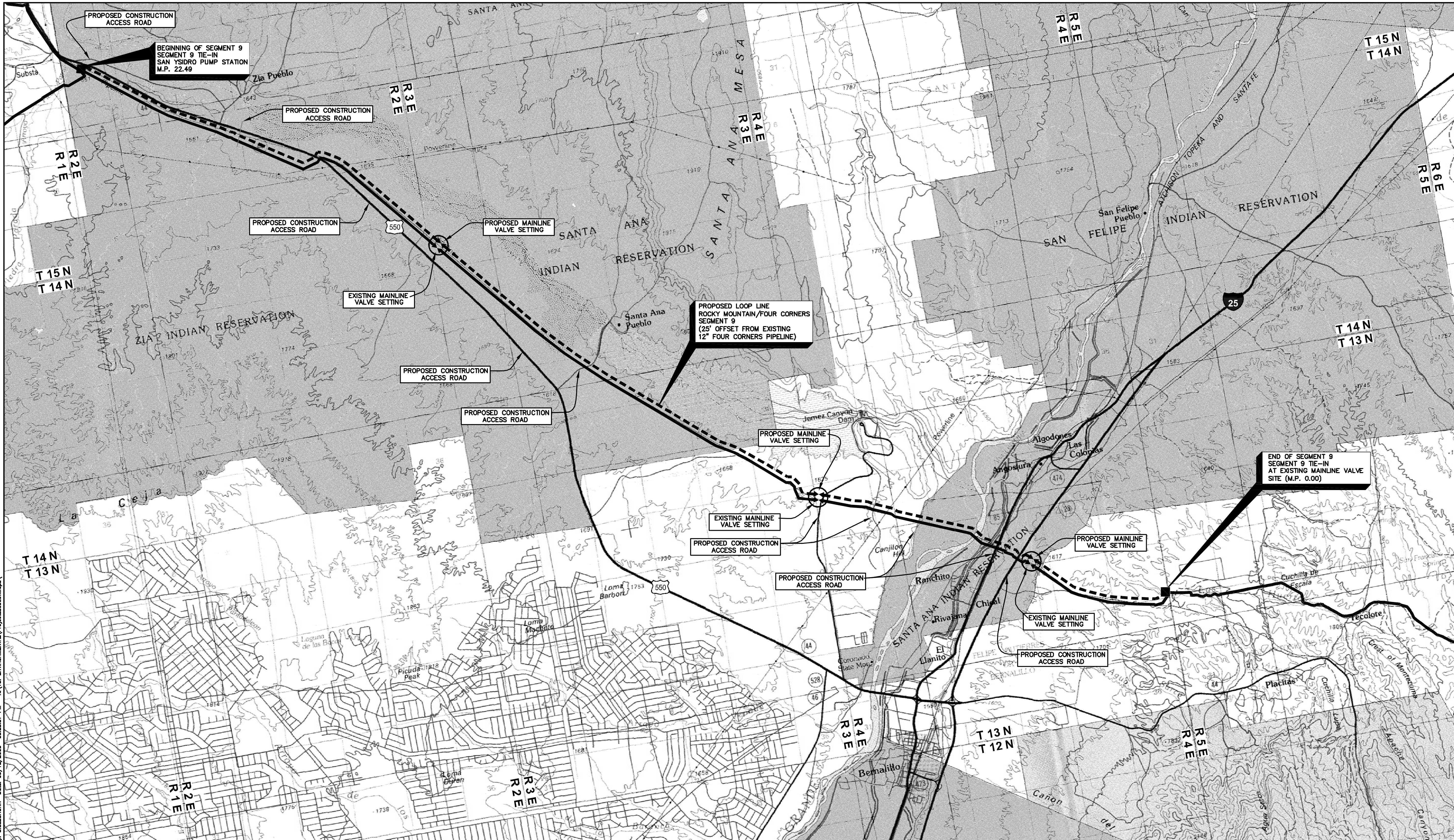
SEGMENT 8



0 1/2 1 2 3 4 Miles

LEGEND

PROPOSED LOOP

EXISTING PIPELINES

THIS DRAWING IS BASED UPON 100 KM QUADS.
FOR AERIAL IMAGE, SEE MAPL ENVIRONMENTAL ASSESSMENT, CHAPTER 3, FIGURE 3.1-1,
PLACITAS RESIDENTIAL AREA &
CITY OF ALBUQUERQUE OPEN SPACE AREA.

MID-AMERICA PIPELINE COMPANY, LLC.

ROCKY MOUNTAIN/FOUR CORNERS LOOP
SEGMENT 9 - PROJECT LOCATION MAP

SANDOVAL COUNTY — NEW MEXICO

DRAWN	DATE	CHECKED	APPROVED	SCALE	DRAWING NO.
CC	4/04/05	B. OLSEN	D. WILLIAMS	AS NOTED	

5/12/05 ISSUED FOR COMMENT

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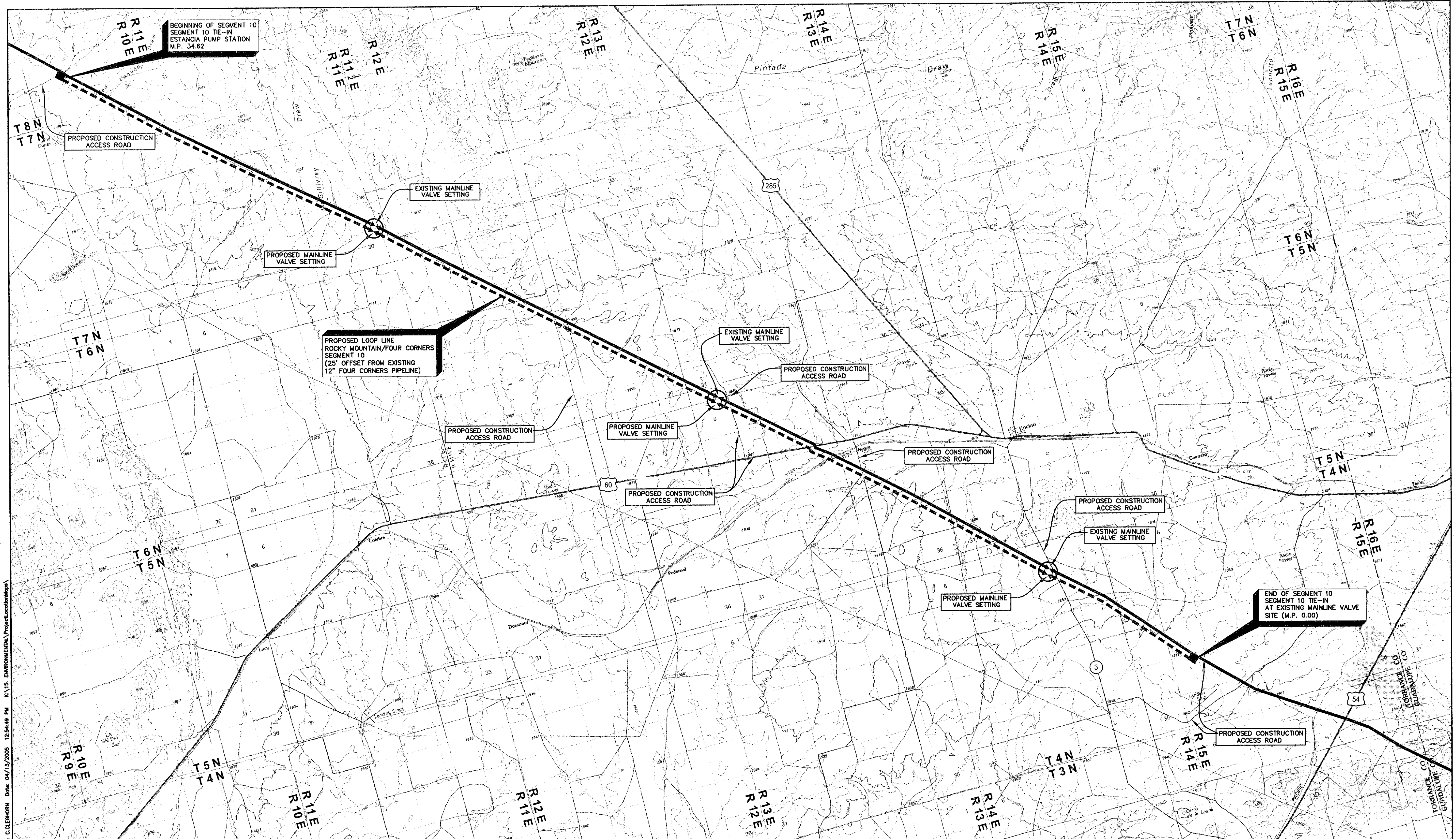
SEGMENT 9



0 1/2 1 2 3 4 5 Miles

LEGEND

PROPOSED LOOP

EXISTING PIPELINES

THIS DRAWING IS BASED UPON 100 KM QUADS

MID-AMERICA PIPELINE COMPANY, LLC.

ROCKY MOUNTAIN/FOUR CORNERS LOOP
SEGMENT 10 - PROJECT LOCATION MAP

TORRANCE COUNTY NEW MEXICO

DRAWN	DATE	CHECKED	APPROVED	SCALE	DRAWING NO.
CC	4/04/05	B. OLSEN	D. WILLIAMS	AS NOTED	

BY REVISION DATE

SEGMENT 10

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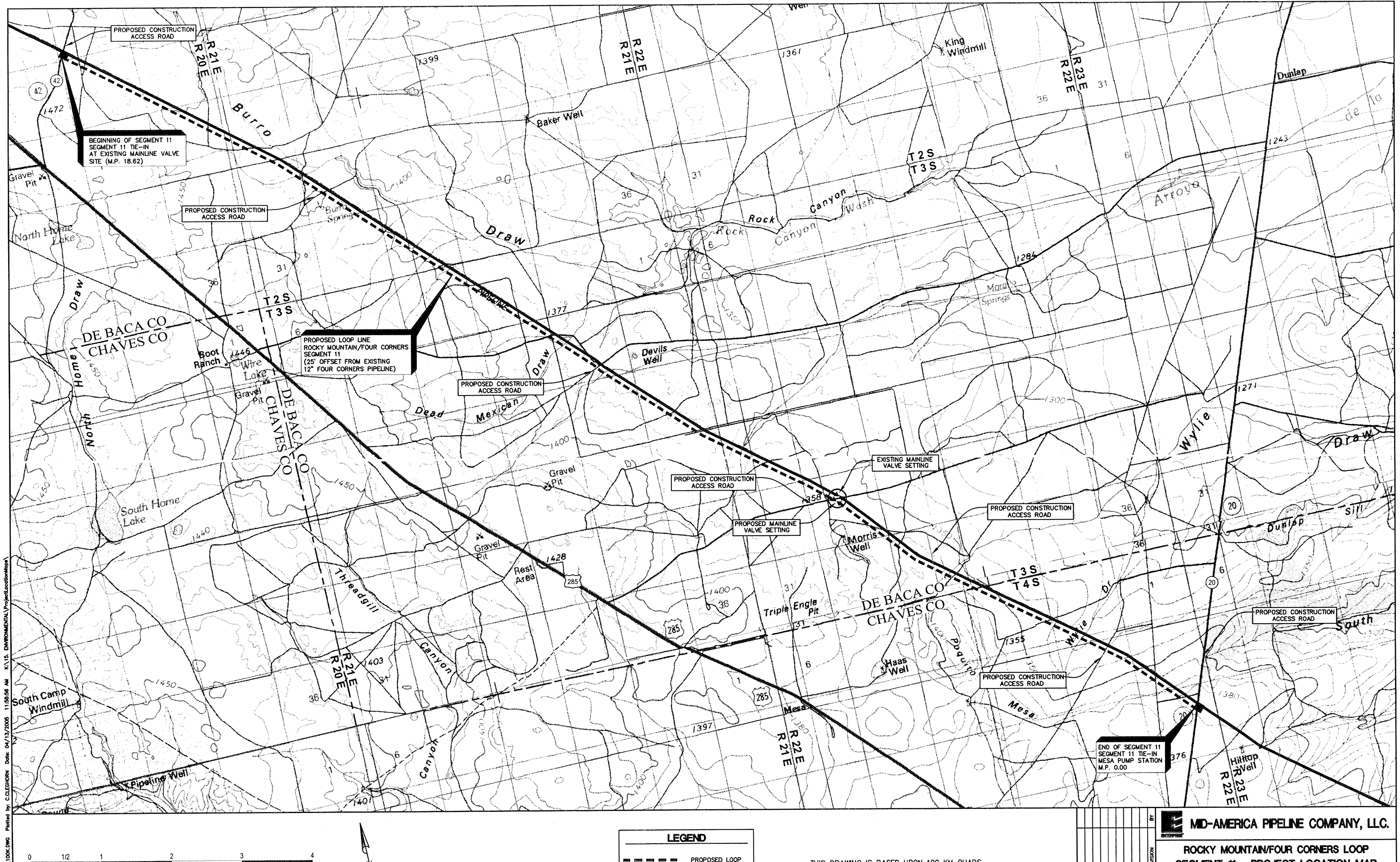

LEGEND

— — — —	PROPOSED LOOP
———	EXISTING PIPELINES

THIS DRAWING IS BASED UPON 100 KM QUADS

MID-AMERICA PIPELINE COMPANY, LLC.

ROCKY MOUNTAIN/FOUR CORNERS LOOP
SEGMENT 11 - PROJECT LOCATION MAP

CHAVES & DE BACA COUNTIES — NEW MEXICO

DRAWN	DATE	CHECKED	APPROVED	SCALE	DRAWING NO.
CC	4/04/05	B. OLSEN	D. WILLIAMS	AS NOTED	

SEGMENT 11

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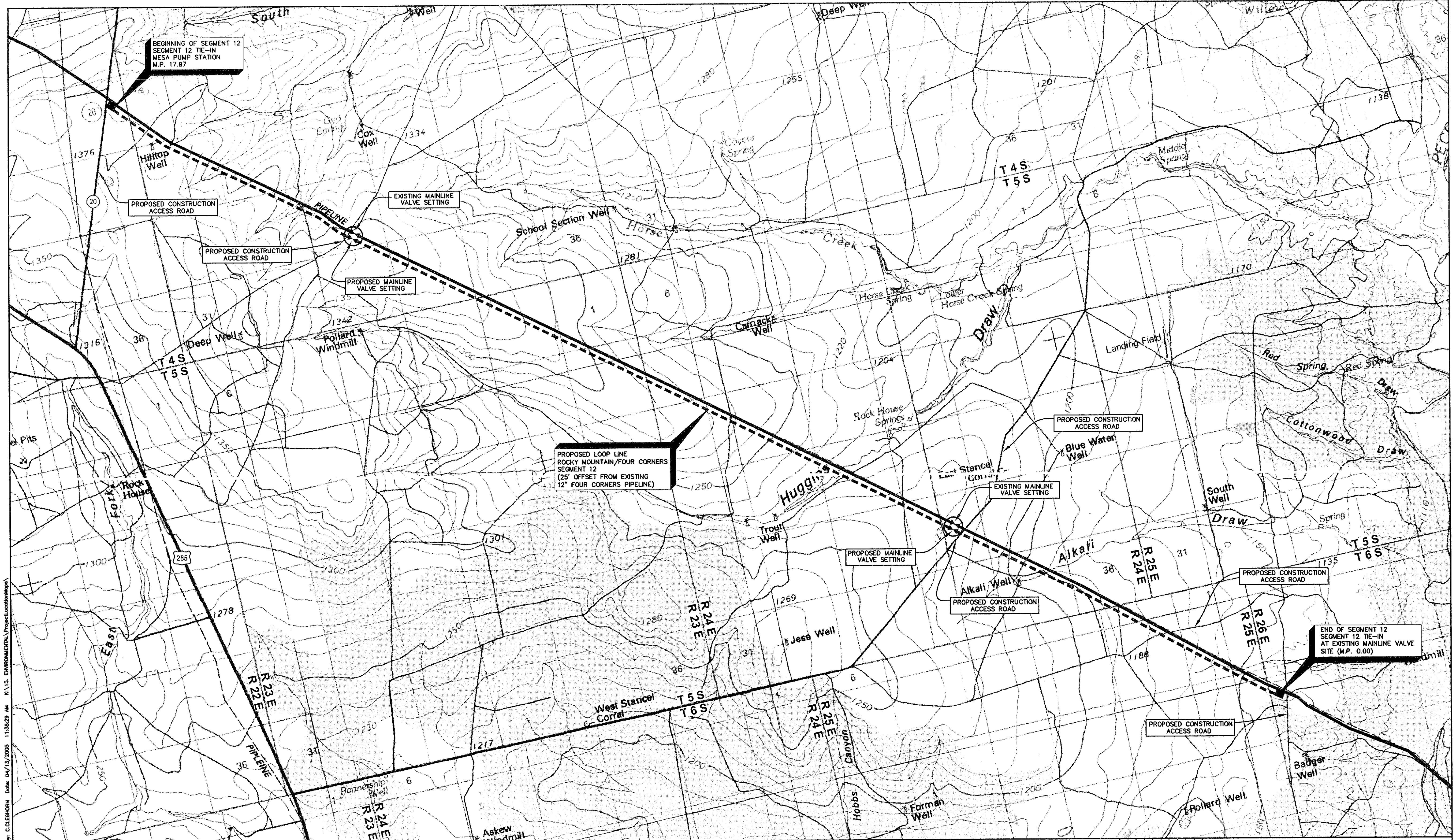

0 1/2 1 2 3 4 Miles

LEGEND

- - - - PROPOSED LOOP
——— EXISTING PIPELINES

THIS DRAWING IS BASED UPON 100 KM QUADS

MID-AMERICA PIPELINE COMPANY, LLC.

ROCKY MOUNTAIN/FOUR CORNERS LOOP
SEGMENT 12 - PROJECT LOCATION MAP

CHAVES COUNTY — NEW MEXICO

DRAWN	DATE	CHECKED	APPROVED	SCALE	DRAWING NO.
CC	4/04/05	B. OLSEN	D. WILLIAMS	AS NOTED	

SEGMENT 12

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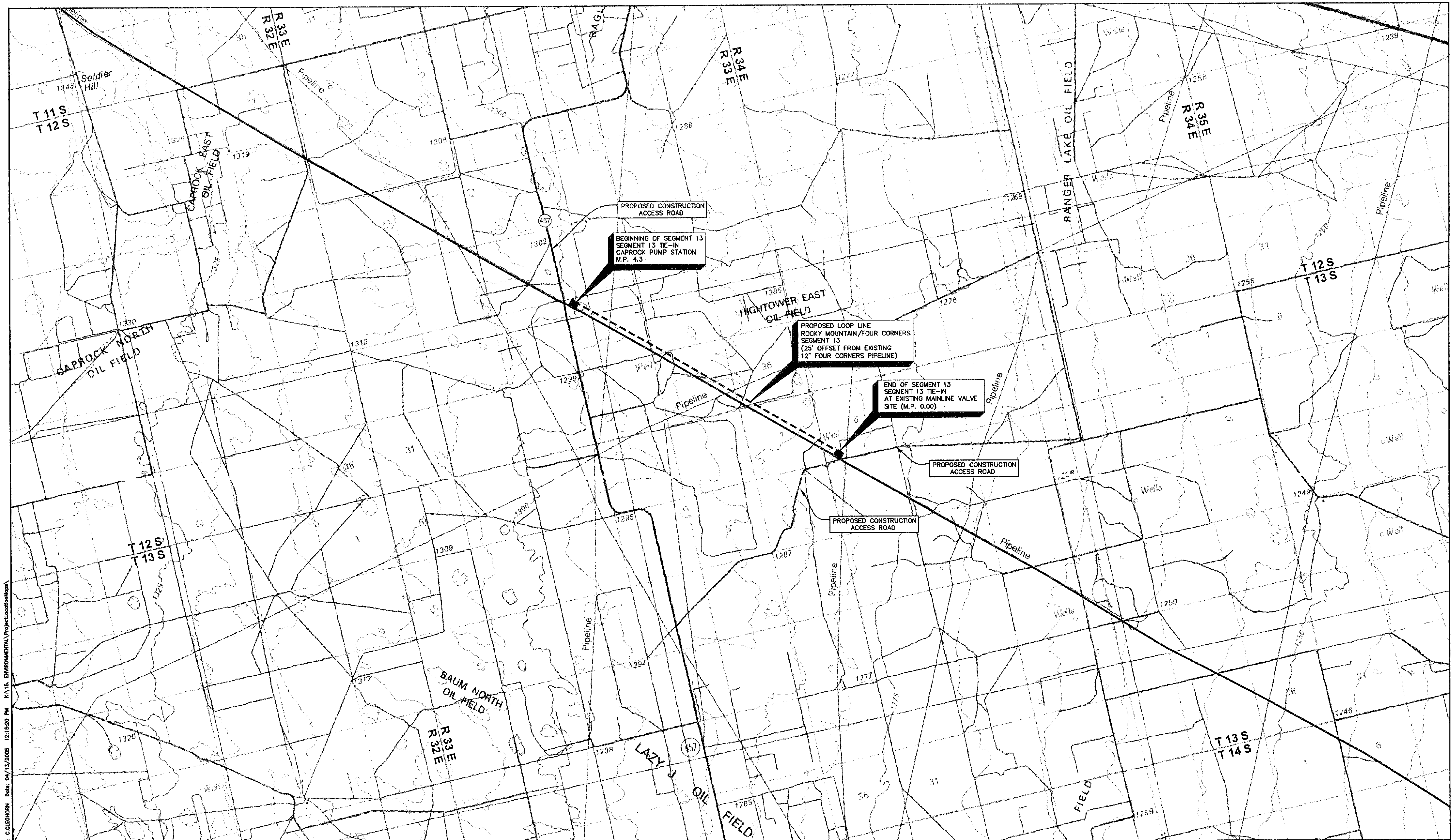

0 1/2 1 2 3 4 Miles

LEGEND

PROPOSED LOOP

EXISTING PIPELINES

THIS DRAWING IS BASED UPON 100 KM QUADS

MID-AMERICA PIPELINE COMPANY, LLC.

ROCKY MOUNTAIN/FOUR CORNERS LOOP
SEGMENT 13 - PROJECT LOCATION MAP

LEA COUNTY NEW MEXICO

DRAWN	DATE	CHECKED	APPROVED	SCALE	DRAWING NO.
CC	4/04/05	B. OLSEN	D. WILLIAMS	AS NOTED	

REVISION BY DATE

SEGMENT 13

Drawing: AM47_RM_100K.DWG Plotted by: C.CLEGHORN Date: 04/13/2005 12:15:20 PM K:\15. ENVIRONMENTAL\ProjectLocationMaps\

Appendix C – Attachment 6 - MAPL WEP Aerial Marker to Milepost Conversion

Segment	Aerial Marker (AM)	WEP Revised Milepost (MP)	Comments
1	50.80	5.35	Opal Meter Site (West End)
	45.40	0.0	Granger (East End)
2	35.00	18.30	Valve Site (West End)
	16.67	0.0	WGP Tie-In (East End)
3	83.43	23.06	Wamsutter Junction Valve Site (East End)
	60.29	0.0	Tipton (West End)
4	60.30	8.40	Tipton (East End) – New Segment Shifted West
	51.16	0.0	New Site (West End)
5	17.90	9.87	Existing Valve Site (East End)
	8.09	0.0	Existing Valve Site (West End)
6	869.87	18.56	Rock Springs (North End)
	851.26	0.0	Existing Valve Site (South End)
8	370.08	20.04	Lybrook (North End)
	349.90	0.0	Existing Valve Site (South End)
9	299.30	22.49	San Ysidro (West End)
	276.74	0.0	Existing Valve Site (East End)
10	223.27	34.62	Estancia (West End)
	188.59	0.0	Existing Valve Site (East End)
11	144.56	18.62	Existing Valve Site (West End)
	125.92	0.0	Mesa Pump Station (East End)
12	125.83	17.97	Mesa Pump Station (West End)
	107.84	0.0	Existing L/R Site (East End)
13	51.15	4.26	Caprock (West End)
	46.80	0.0	County Road New Site (East End)

APPENDIX D
POD Mitigation Summary

APPENDIX D-1: QA/QC PLAN MITIGATION SUMMARY

MAPL plans to sponsor a third-party “Quality Assurance and Quality Control (QA/QC)” independent contractor, as approved by the Major Projects Office, New Mexico State Office of the BLM, BIA and Tribes for construction of the project. The QA/QC program will cover all components of the proposed Project except for cultural/paleontological resources, which are planned to be contracted separately.

QA/QC Process

One “Lead QA/QC inspector” will oversee the entire project for continuity and will be the liaison between the agencies and the contractor. One “Spread QA/QC inspector” per construction spread will oversee the entire inspection process on that spread. Other “QA/QC inspectors” will be assigned to various portions of the project for specific purposes, such as for biological, cultural, and paleontological resources. The QA/QC inspectors are responsible for enforcing compliance with the construction stipulations, cultural stipulations (in coordination with archaeological monitors), paleontological stipulations, biological stipulations, and the POD. MAPL’s third-party Compliance Contractor (i.e., the “Lead QA/QC inspector”) will provide the “QA/QC inspectors” with the necessary communication, record, and measuring equipment.

One “QC inspector” is needed in each equipment spread to patrol and monitor vehicles on the ROW, temporary use areas, and existing roads. The “QC inspector” will be responsible for determining non-compliance activities and anticipating activities and situations that could result in non-compliance to grant stipulations.

If non-compliance occurs, the “QC inspector” will cause the individuals involved to immediately cease the action by contact with the “Lead Individual” or immediate direct contact with the individual if conditions warrants a quick action. The non-compliance occurrence will be reported to the “Lead QA inspector”. No work will resume in that area until clearance is received from the Responsible Office’s Designated Compliance Lead.

All incidence of non-compliance will be documented in the daily “QC inspector” report and the weekly “QA inspector” report. Responsible Officer Designated Compliance Lead will inspect the project with or without the “QA inspector” on a random schedule.

A “Work Stoppage Order” to temporarily suspend construction activities pursuant to 43 CFR 2883.5 shall be issued by BLM to MAPL for not taking action to remove employee(s), including supervisors, that are consistently in non-compliance.

Excessive or continuous non-compliance that demonstrates this Compliance Plan is not ensuring compliance with the mitigation included in the ROW grant, as determined by BLM, shall cause issuance of a “Work Stoppage Order”. This will affect all areas of construction on the project where the Responsible Office does not have sufficient personnel to monitor. Excessive or continuous non-compliance that would demonstrate a disregard for stipulations or components that the stipulations were designed to protect will result in suspension or termination of the ROW grant pursuant to 43 CFR 2883.6-1.

BLM/BIA shall cause MAPL to remove individual truck drivers or equipment operators that are directly involved in more than three (3) cases on non-compliance, or a supervisor that may be causing/ordering the non-compliance.

QA/QC for Cultural Resources

The BLM- and BIA-permitted spread “Monitoring Archaeologist” will oversee the cultural monitoring operation and will report to the “Lead QA inspector” and the New Mexico State Office’s project “Archaeological Lead” who will coordinate with the Wyoming, Utah, Colorado State “Archaeological Leads”. The “Monitoring Archaeologist” will have oversight of the “Compliance Archaeologist” and implementing cultural stipulations provided by BLM/BIA.

The construction spreads will accommodate sufficient archaeological monitoring as determined by the “monitoring Archaeologist” and the “Lead QA Inspector” in coordination with MAPL to prevent disturbance of known cultural sites and also to identify and protect buried cultural remains. The Wyoming, Utah, Colorado and New Mexico State Office Archaeologist lead will resolve differences on what constitute an adequate number after consulting with the other parties.

Paleontological Resource Program

Paleontological monitoring of certain portions of the project will be required where there is potential for paleontological resources to occur. In Wyoming, spot checks will be required in areas of paleontologic resource potential where bedrock is unearthed. In New Mexico, monitoring is required on BLM lands crossed by Segment 8. A “Paleontological Monitor” would be required to perform monitoring functions where potential disturbance to paleontological resources have been identified. The paleontology monitor will report to the “Responsible Office Paleontological lead”.

Biological Resource Program

A biological resource compliance program is required to address mitigation requirements associated with the avoidance of sensitive plant and animal species located with or adjacent to the pipeline construction ROW. MAPL has committed to resource protection measures for this project which are described in the Biological Assessment (BA) submitted to the U.S. Fish and Wildlife Service. The BA is provided as an appendix to this EA. Prior to construction, these measures will be amended as required as a result of reviews by the USFWS, BLM, BIA and Tribes, and the Wyoming, Utah, Colorado and New Mexico Game and Fish Departments.

Project Progress Meetings

The weekly meeting with the “responsible Office Designated Compliance Lead” and a monthly meeting with the “Designated Compliance Lead” will be conducted by the “Lead QA Inspector” with the Major Projects Office and New Mexico State Office Designated Compliance Lead to discuss the progress of work, issues of Quality Assurances, Archaeological and Paleontological (if applicable) compliance and other problems with the Compliance Plan. The Compliance Plan will be evaluated after the monthly meetings to assess need of any amendments. The monthly meeting will be attended by MAPL "Project Manager" or designated representative.

A summary report will be completed by MAPL in conjunction with the "Compliance Contractor", the various Responsible Offices, and the Major Projects Office and the New Mexico State BLM discussing the effectiveness of the QA/QC program and the overall compliance effort. The report will be presented at a meeting at the conclusion of the Project.

APPENDIX D-2: WEED MANAGEMENT PLAN MITIGATION SUMMARY

A pre-construction survey for invasive, non-native weeds will be conducted to determine the presence, type, and extent of invasive, non-native weeds along the existing and proposed pipeline ROW. This management plan will be submitted for review and approval prior to construction. The results of the pre-construction survey will also be communicated to the BLM and other agencies, as appropriate.

Weed Mapping

Pre-construction weed population mapping will be performed along the proposed pipeline route within all lands administered by BLM or BIA. Mapping activities will be performed by a botanist or biologist knowledgeable in identification of invasive, non-native weeds and will be conducted prior to construction activities. Upon completion of the pre-construction weed survey and mapping, a report will be submitted to the BLM and BIA.

Post-construction weed surveys will be conducted as part of the monitoring program. New populations may or may not be connected to construction activities. Mapping of populations which include part of the ROW and continue off the ROW will also be mapped.

Weed Management

Attachments and Appendices in the POD detail weed management options for each invasive, non-native weed species potentially found in the project area. The weed management plan shall be carried out by a weed management specialist with the appropriate qualifications.

The weed management plan shall require the following equipment for weed control: backpack sprayer, four-wheel drive truck and trailer, all-terrain vehicle, chemical or biological supplies, tractor and disc or dozer equipped with ripper.

The weed management specialist will coordinate with the Authorized Officer for the jurisdiction involved for the approval of recommended treatment methods. For private land, the weed management specialist will contact the landowner to inform him/her of any noxious weed found on the land in question. If treatment is requested by the landowner, and approved by the local field office of the NRCS, the weed management specialist will treat and monitor the weed population as allowable by the landowner. Large pre-existing infestations of invasive, non-native weeds will not be treated under this management plan. In addition, the weed management specialist shall submit annual reports on weed treatment areas and methods to the Authorized Officer of the land jurisdiction involved, and in the case of private land, to the appropriate office of the NRCS.

Any weed population which occurs on the proposed pipeline ROW will be treated using a single or combined treatment method. Enterprise will also treat infestations which occur on the ROW and spread off the ROW within an area of less than 10 acres.

Prevention

All Contractor vehicles and equipment will arrive at the work site clean and weed free. Prior to being allowed ROW access, the project field supervisor will ensure that vehicles and equipment are free of soil and debris capable of transporting invasive, non-native weed seeds, roots, or rhizomes.

The pipeline ROW and ancillary facilities will be inspected for invasive, non-native weeds by the field supervisor prior to vegetation clearing. Any infestations will be recorded for reference in clearing the ROW and facilities for construction and for post-construction monitoring.

In areas where invasive, non-native weeds have been noted, the Contractor will stockpile cleared vegetation and salvaged topsoil adjacent to the area from which they are stripped to eliminate transport of soil-born invasive, non-native weed seeds, roots, or rhizomes. During reclamation, the Contractor will return topsoil and vegetative material from infestation sites to the areas from which they were stripped.

The Contractor will dedicate one piece of heavy equipment for clearing, topsoil salvage, and topsoil redistribution in areas of known infestations. The Contractor will use compressed air to remove seeds, roots, and rhizomes from the equipment prior to transport from the site. This will minimize the potential transport of invasive, non-native weeds to other areas.

The Contractor will implement the reclamation of disturbed lands immediately following construction as outlined in the POD. Continuing revegetation efforts will ensure adequate vegetative cover to prevent the invasion of non-native weeds.

The Contractor will not apply fertilizer to reclaimed areas unless directed by the property owner, project field supervisor, or jurisdictional agency as fertilizer can enhance the growth of invasive, non-native weeds. Procedures for application of fertilizer will be identified where needed.

The Contractor will ensure that straw bales used on the project for sediment barrier installations or mulch distribution are certified weed free.

Equipment will not be sprayed with pre-emergent chemicals as a preventative measure as these chemicals target a wide range of vegetation. As a result, the use of such chemicals may affect the success of revegetation efforts.

Field wash stations will not be used as a preventative measure as they have not proven to be an effective means of weed control. In order for a wash station to be effective, high pressure steam cleaners and controlled drainage are essential. These criteria can not be met in the field.

Follow up long-term monitoring is also an important preventative measure. Invasive, non-native weed monitoring will be conducted annually for five years following construction activities to ensure that noxious and invasive species do not get a foothold along the pipeline ROW.

Mechanical control methods range from manual pulling of individual plants to the use of hand and power tools to uproot, girdle, or cut plants. Hand removal by pulling is appropriate when the plants are large enough that they will not break and leave the roots, which may resprout. Mowing or cutting of most weed species is seldom successful as it may stimulate lateral growth below the cut portion. To be effective, this method must generally be combined with hand application of an herbicide. Equipment may also be utilized to rip or disc weed populations as necessary for control or eradication. If this action is used, reseeding would be conducted using approved seed mixtures. In some cases, covering and compacting soil may be appropriate.

Use of native plant species to out-compete noxious and invasive species is an effective, long-term control method. In areas where invasive, non-native weeds have been allowed to flourish, weeds may likely out-compete native grasses. In these areas, a more vigorous approach such as the use of native PLS mixes will help ensure a healthy and strong revegetated site. Some biological agents may attack plant species that are either sensitive or endangered. Therefore before considering this as a management option, approval shall be secured from the Department of Agriculture.

If herbicides are used, it will be on a plant by plant basis by hand application with backpack sprayers to avoid overspray to adjacent non-target species. Broadcast spraying will not be conducted, and spraying will only take place when wind speeds are less than 8 miles per hour. This limits use of herbicides to isolated stands of plants when individual plants are relatively small. Appropriate herbicides would be target-specific and have a short residue time in the environment. Herbicides would not be used within 100 feet of any wetland area or waterbody. Coordination with public land management agencies and with private landowners is required.

Although burning weed populations is sometimes an effective treatment, pipeline safety requirements preclude the use of this method.

Monitoring and Record Keeping

A third party weed management specialist shall monitor the pipeline ROW and any other areas of disturbance which are associated with the construction of this project. Monitoring will be conducted each season, approximately bi-monthly, during the growing season for five years after acceptance of the final reclamation. The growing season shall be defined by the life cycles of the species concerned. Growing seasons will vary from year to year and, therefore, the length of monitoring will vary as well.

The weed management specialist shall submit an annual report to the BLM Authorized Officer. The Authorized Officer will be responsible for submission to other appropriate land management agencies such as the BIA and state agencies. Reports shall include weed mapping information as well as methods of treatment applied. The reports shall include details such as types of herbicide, rate, approximate acreage treated, and target species.

APPENDIX D-3: STORM WATER POLLUTION PREVENTION PLAN (SWPPP) MITIGATION SUMMARY

Erosion and Sediment Controls

The project will be constructed in the strict accordance with measures stipulated by the BLM and U.S. Army Corps of Engineers 404 approval under Nationwide Permit No. 26 for wetlands. In summary, the stabilization practices that will be used are as follows:

- The amount of vegetative cover disturbed by construction activities will be minimized.
- All staging and parking activities will be confined to the right-of- way (ROW) and to temporary use areas (TUAs) granted in the BLM permit.
- Areas near water bodies and wetlands where excavation material is stored will be protected by silt fences and certified weed free hay bale structures as outlined in the POD.
- Final stabilization of the project area will be carried out according to the reclamation requirements of the POD.
- Excavated materials from the pipeline trench will be placed next to the trench on the up slope side where practical, forming a filter berm. Where materials cannot be placed on the up slope side, erosion of the materials will be contained by a silt fence or straw bales.
- Storm water flow into and down the pipeline trench on the slopes in and out of drainage swales will be contained in the swale at the base of the trench using a sediment trap. The sediment traps will be constructed of silt fences and straw bales.
- Temporary earth stockpiles that cannot be placed immediately adjacent to the trench will be enclosed by silt fence or straw bales to contain runoff from the pile. Where possible, stockpiles will be placed down slope outside of established setback limits for water bodies.
- Pollutants occurring in storm water discharge after construction is complete will be controlled according to re-vegetation and restoration requirements outlined in the POD.
- The ROW will be restored to its pre-construction topography. Water bars will be constructed in all disturbed areas to the required spacing and cross section specifications.

Stabilization of Highly Erodible Soils

Use of certified weed free straw mulch and crimping or punching devices will aid in stabilization of highly erodible soils by binding loosened soils. Straw will be spread over the surface, then crimped or punched to anchor the soil in place, reducing wind and water erosion. When water bars are needed, they could be built before crimping and punching, then inspected and repaired by hand to prevent the flattening of portions of the water bar by heavy equipment.

On slopes of less than 15 percent, seed will either be broadcast to the surface prior to the imprinting or dragging process, or will be drill seeded. On slopes steeper than 15 percent that can be punched with straw, seed will be applied by broadcasting following the first straw application. Slope which cannot be straw punched, but will still support topsoil or fines may be broadcast seeded and hand-raked or chained. Broadcast seeding will be accomplished using a hand-operated cyclone-type seeder or a specially-designed blower that distributes the seed on top of the surface without mulch. Imprinting with a straw punch treatment may also be used to seed the soil. A cyclone-type seeder can be used on any slope that can be reached by foot. However, a blow seeder is limited by equipment access. Drill seeding places seeds into soils at a uniform depth, but can only be used on fairly gentle slopes. While drill seeding is an effective method of seed placement, it is not necessary if imprinting or straw punching follows broadcast seeding.

Where slopes exceed 15 percent and straw punching is not used, erosion-control blankets may be utilized following seeding. Blankets should be rolled in the direction of water flow and fastened.

To encourage rapid growth of plants on steep slopes, fertilizer can be used to provide adequate nutrients for certain species. Fertilizers could encourage premature growth of native seeds and spread of noxious weeds. Thus, reseeding and weed management planning will be utilized.

Sediment Trapping and Erosion Control Structures

Certified weed free straw bales can be used where the ROW is steep. The straw bales will slow water moving off site and trap sediment onsite. Straw bales will be placed on the down slope edge of the daily construction site. Once the project is completed, water bars can be installed during recontouring to provide continued erosion control and sediment trapping.

Water bars will be used where the pipeline ROW crosses up-slopes and down-slopes. They will be constructed at intervals along the ROW defined by length limits for spacing for a given percent slope. Chevron-shaped water bars split the water flow and may be used where the drainage pattern parallels the disturbed area.

Other sediment trapping techniques as defined in EPA 832-R-92-005, Storm Water Management for Construction Activities will be utilized as appropriate for site specific conditions.

Where the construction site is on relatively flat topography, vegetation already established at the edge of the cleared ROW will act sufficiently to hinder erosion and promote sediment trapping.

Additional erosion control may be necessary in areas of steep terrain. Ditch line breakers (trench plugs) will prevent channeling of water and accelerated erosion within the pipeline trench. They will be installed during construction activities after pipeline placement. Earth or sand-filled sacks will be placed around and above the pipeline, then surrounded with backfill material.

The original land contour will be approximated to re-establish drainage patterns and avoid concentration of water in areas not suited to high volume flow. Recontouring will also help eliminate increases in slope gradient to avoid fast water movement and soil erosion.

Pipeline ROW Maintenance Requirements

As soon as practical following pipeline installation, backfilling and cleanup will begin. Cleanup will consist of manual removal of trash, scrap steel, and contaminated soil. This refuse will be trucked to an approved disposal site. No construction waste material will be buried on site. All personnel will be instructed regarding the correct procedure for waste disposal. No hazardous waste should be generated or encountered dining this project. In the event any is encountered, it will be disposed in the manner prescribed by the appropriate regulation.

Construction access routes subject to traffic will be watered as necessary to provide dust control and soil stability. Any road not used after construction will be mechanically conditioned and seeded. Paved roads crossed by construction vehicles or equipment will be scraped regularly to remove excess mud, dirt or rock tracked from the construction ROW.

Portable sanitary units will be provided for use by all workers throughout the life of the project. All waste will be routinely hauled to a licensed sanitary landfill.

Non-Storm Water Discharges

Storm water discharge from the project will not contain non-storm components. Other water released during the course of the project, such as discharge of hydrostatic test water, is covered by state-issued discharge permits. MAPL will be permitted to dispose hydrotest water from the new pipe for those tests that do not exceed the daily discharge volumes noted in the permits.

Employee Training

Once construction has started, MAPL and its contractors will conduct weekly meetings. Topics of discussion at these meetings will include erosion control and sediment trapping procedures. These topics will also be discussed at pre-construction meetings required by the BLM.

Inspection and Record Keeping

The MAPL construction supervisor will inspect the active construction site and equipment and material staging areas weekly to ensure compliance with this SWPPP. A record of the weekly and periodic site inspections will be kept on the inspection form. This form will state who conducted the inspection, the date, and any observations made during the inspection.

In addition weekly inspections, as much of the entire construction site as possible will be inspected prior to anticipated storm events and after actual storm events. These inspections will identify areas contributing to storm water discharges associated with construction activity, and evaluate whether control practices have reduced pollutants in storm water.

MAPL will annually certify Project compliance with this SWPPP. This certification will be based on site inspections. The first annual certification will be completed prior to construction and once each subsequent year until storm water control and vegetation have been reestablished. The reporting period will be 3-5 years or longer if construction sites have not stabilized.

If MAPL cannot certify compliance with this SWPPP, MAPL will notify BLM within 30 days of its discovery. The non-compliance notification will include the type(s) of non-compliance, action(s) necessary to achieve compliance and the time required to achieve compliance.

Records of inspections, compliance certifications and non-compliance reports will be retained by MAPL for three years. With the exception of non-compliance reports, MAPL will submit no records. If required, compliance inspection records can be submitted to the jurisdictional agency.

APPENDIX D-4: RECLAMATION PLAN MITIGATION SUMMARY

Revegetation and restoration practices for the MAPL Project have been developed from coordination with the local BLM technical staff with reference to reclamation stipulations contained in the POD.

Reclamation Processes

Final grading and installation of erosion control measures will be completed after the trench is backfilled. All non-essential access roads, hillsides, creek banks and beds, and other areas where earth has been moved will be restored to approximately the original land contour. Proper compaction and contouring will be completed prior to topsoil placement. Where settling may be a problem, backfill will be mounded over the trench to account for subsidence. The ROW (ROW) and expanded work areas will not be lower than the natural grade.

Best management practices will be implemented to control erosion. All soil conservation features (such as terraces, rip-rapped channels, grassed waterways, etc.) which are damaged by construction will be restored, as nearly as possible, to their pre-construction condition. After refilling the trench, water bars will be constructed at appropriate intervals depending on slope. When the pipeline is laid vertically down a slope, adjacent water bars will spill water to the opposite side of the disturbed area to avoid a concentration of water.

Once contouring is completed, stockpiled topsoil will be distributed over the entire disturbed area from which it was salvaged. Topsoil will not be mixed with pipe trench spoil material before or during replacement. Topsoil from undisturbed areas will not be used to cover adjacent disturbances. Topsoil may not be handled during excessively wet conditions or at times when the ground or topsoil is frozen. Replaced topsoil will be left in a roughened condition to discourage erosion. Additional erosion control and soil stabilization may be required on steeper slopes, in areas of erodible soils, and in areas adjacent to or within drainages. The length of time topsoil is stockpiled will be minimized, based on the proposed construction schedule.

The Contractor will scarify, till, or harrow the seedbed to a depth of 3 to 4 inches to enhance revegetation. Where this method is not practical (e.g., steep slopes or rocky areas) will be dozer-tracked perpendicular to the slope or otherwise left with adequate roughness following topsoil placement to provide microsites for seed germination and to reduce soil movement.

The Contractor will not apply nitrogen-based fertilizer or lime on reclaimed sites unless recommended by the landowner or jurisdictional agency. Fertilizer can be used on steep slopes where growth of some grass species will assist in stabilization of the slope or where wood chips are placed on the ROW.

Seeding mixtures, seeding rates, seeding methods, and scheduling of reclamation activities have been compiled in coordination with local jurisdictional agencies and through experience gained on previous pipeline projects within the area.

Selection of plant species for vegetation will be based on plant community composition and soil types, as well as establishment potential, growth characteristics, soil stabilizing qualities, palatability to wildlife and livestock, commercial availability, post-construction land use objectives, and agency recommendations. Seed will be purchased from a certified seed source in accordance with pure-live-seed specifications for seed mixtures and will be weed-free. Seeds will be used within 12 months of testing to assure seed viability.

Basic seed mixtures and seeding rates will be based on agency stipulations and private landowner approvals. Where agencies provide specific seed mixes for specific locations along the ROW, the information will be directly incorporated into the seeding specifications. In some instances, seed mixtures may need to be modified as a result of limited species availability, poor seed quality, or site conditions. Modifications will only be undertaken with the concurrence of the landowner or jurisdictional agency.

Either drill or broadcast seeding will be used for seed application, based on site-specific conditions. Drill seeding will be employed on level to gently sloping areas where coarse fragment content allows drilling. Seeding depth will reflect requirements of the specific seed mixtures. A rangeland drill or comparable equipment designed for fluffy seed will be used. Broadcast seeding will be employed on steep and/or rocky areas where drill seeding is not practical. Seed will be broadcast using manually operated cyclone-type bucket spreaders, mechanical seed spreaders, blowers, hydroseeders, or all-terrain vehicles equipped with mechanical broadcast spreaders. Where possible, broadcast areas will be chained, harrowed, or cultipacked to cover the seed. On small or inaccessible sites, hand raking will be used to cover seed. On steeper slopes where tilling or harrowing are not practical, areas will be dozer-tracked perpendicular to the slope prior to seeding, or otherwise left in a roughened state, to provide microsites for seed germination. Broadcast seed mix concentrations will be doubled.

Rocks cleared during construction will be randomly placed back on the ROW to approximate the density of surface rock on adjacent lands. Rock excavated during construction will be used for rip-rap at stream crossings, buried on the ROW during recontouring, used to construct barricades to prevent unauthorized use of the ROW, or used to reform sandstone cliffs. Rocks will not be distributed on cultivated lands or permanently windrowed along the edge of the ROW.

Trees and other vegetation will not be permanently windrowed along the edge of the ROW. Larger trees will be salvaged by contractors for firewood. The remaining woody and non-woody vegetation will be chipped and randomly scattered over the ROW and temporary use areas.

All damaged livestock fences will be repaired to the landowner's satisfaction. All existing improvements, such as fences and gates, will be maintained and repaired to meet or exceed the pre-construction condition. Where construction has damaged or removed a natural barrier used for livestock control, a fence will be constructed in its place to agency specifications.

Following construction, all above ground facilities will be painted to blend with the natural surroundings or the same color as existing facilities. A reflective material may be used to reduce hazards that may occur when structures are near roads. Basic color selections and applicable uses will be coordinated with the jurisdictional agencies. Following completion of reclamation, all trash, debris, and other solid wastes will be removed from the ROW, temporary use areas, and auxiliary facilities. All material will be disposed at authorized sanitary landfills. No solid waste will be buried along the ROW. After final cleanup, the area will be inspected by the QC inspector, landowner, or authorized officer representative to verify that pre-construction commitments for the ROW and ancillary facilities are satisfied.

Reclamation Schedule

Vegetation activities will be determined in part by construction schedules and seasonal climatic conditions. Seeding and planting will be coordinated with other reclamation activities to occur as soon after seedbed preparation as possible. The goal is to complete reclamation prior to winter. If weather conditions preclude revegetation of some areas during or immediately after construction, these areas will be revegetated as soon as access allows.

Post-Construction Management

Following construction and reclamation, a qualitative annual monitoring program will determine the need for further reclamation. Annual monitoring will be conducted for 3 to 5 years after construction by QC inspectors. A qualified specialist approved by the agencies will conduct the monitoring. Native herbaceous and woody species will be monitored to ensure they permanently vegetate. Problem areas identified during inspections will receive additional vegetation efforts. Erosion and sediment control measures will be assessed with vegetation monitoring during the first 2 years following construction and 5 years routinely thereafter. Remedial actions will be taken for any problem areas identified by QC inspectors.

MAPL will seed any portion of the ROW that does not exhibit 50 percent total herbaceous cover (comprised of seeded species plus desirable volunteers) relative to adjacent off ROW vegetation after the second complete growing season. Seeding activity can be deferred a year if the area is affected by drought. Additional seeding will be completed during the next seeding season.

Vegetation will be considered successful when total herbaceous cover is at least 60 percent of that on adjacent land with species composition including a mix of seed species and desirable volunteers from adjacent plant communities. In arid areas, vegetation will be left to natural means as long as surface stability is not a problem. Areas with poor germination and/or growth will be evaluated to determine the cause of the problem. Reclamation techniques will be modified to address identified problems.

Vegetation of wetlands is considered successful when cover of the native species is at least 80 percent of the total area and the diversity of native species is at least 50 percent of the original diversity. No noxious weeds or undesirable exotic vegetation will be present with at least 50 percent survival of woody plants. If vegetation in the wetland is not successful at the end of 3 years, a remedial vegetation plan will be developed and implemented.

APPENDIX D-5: FIRE PREVENTION AND SUPPRESSION PLAN MITIGATION SUMMARY

Responsibilities and Coordination

This plan will be implemented by MAPL and the contractor on the project. MAPL and the contractor have the responsibility for providing all necessary fire-fighting equipment on the project site and operating under the requirements of this plan. Prior to construction, MAPL will contact the appropriate authorities to establish communications, obtain applicable permits, and/or fulfill other obligations as directed by fire control authorities. In addition MAPL will:

- Ensure that prevention, detection, pre-suppression, and suppression activities are in accordance with this plan and federal, state, and county laws, ordinances, and regulations;

- Accompany agency representatives on fire tool and equipment inspections and take corrective action upon notification of any fire requirements not in compliance; and

- Restrict operations on federal lands during high fire danger conditions as directed by BLM, tribal or BIA Fire Management Officer.

These fire prevention and suppression measures will be in effect throughout construction. These restrictions may change by advance written notice by fire control authorities. Required tools and equipment will be kept serviceable and immediately available for fire suppression at all times.

Fire Prevention Measures

The Contractor will train all personnel about the measures to take in the event of a fire. The Contractor will also inform each construction crewmember of fire dangers, locations of extinguishers and equipment, and individual responsibilities for fire prevention and suppression during regular safety briefings. Smoking and fire rules will also be discussed with the Contractor and all field personnel during the project's environmental training program.

Smoking is prohibited except in areas cleared and graded a minimum of 10 feet in diameter to mineral soil All burning tobacco and matches will be extinguished before discarding. Smoking is also prohibited while operating equipment or vehicles, except in enclosed cabs or vehicles.

Throughout the life of the project, all equipment operating with an internal combustion engine will be equipped with federally approved spark arresters. Spark arresters are not required on vehicles (excluding motorcycles) with unaltered mufflers or on diesel engines equipped with a turbocharger. Agency fire prevention officers will have full authority to inspect spark arresters on project equipment prior to its use on federal lands and periodically during construction.

Motorized equipment and vehicles be not be driven or parked outside of designated and approved work limits. Areas where equipment and vehicles are to operate or be parked will be cleared of all flammable materials where permitted. Clearing will extend a minimum of 10 feet

beyond the edge of the area but not beyond approved boundaries of the ROW, extra workspaces, or ancillary sites. Glass containers will not be used to store gasoline or other flammables.
All motor vehicles and equipment will carry one long-handled round-point shovel, one Pulaski, and one dry chemical fire extinguisher. Individuals using power saws and grinders will have a shovel and fire extinguisher immediately available. The Fire Guard will operate a truck equipped with a 125-gallon slip-on pump unit designed for wildland firefighting. All equipment will be kept in a serviceable condition and readily available.

The Contractor will notify the appropriate fire suppression agency of scheduled closures prior to open-cut road crossings. If required, the Contractor will construct a bypass prior to open-cut road crossing installation, unless a convenient detour can be established. All bypasses will be clearly marked by the Contractor. During road closures, the Contractor will designate someone to direct traffic. The Contractor will minimize the duration of road closures.

Fuel trucks will have a large fire extinguisher charged with the appropriate chemical to control electrical and gas fires. The extinguisher will be a minimum size 35-pound capacity with 40 B.C. or higher rating.

Power saw refueling will take place in areas cleared of material that can catch fire.

No burning of project debris will be permitted. No fires or barbecue grills will be allowed from June 22 to October 31. At other times, they may be allowed by written authorization by MAPL.

The Contractor will designate a Fire Guard for each construction spread prior to construction activities. An alternate or back-up Fire Guard will be designated to assume responsibility, if the primary guard is unavailable. The Contractor will provide additional fire watchers with radio communication to the Fire Guard should construction activities be widely spread.

The Fire Guard will be responsible for maintaining contact with fire control agencies, and will be equipped with a radio or cellular telephone so immediate contact with local fire control agencies can be made. If cellular phone coverage is not available, the Fire Guard will use the Contractor's frequency to contact their radio base at the Contractor's yard.

One 5-gallon backpack pump will be required with each welding unit in addition to standard fire equipment required in all vehicles. Equipment will be serviceable and readily available.

The Contractor will restrict or cease operations on federal lands during period of high fire danger at the direction of the responsible agency Fire Management Officer. Restrictions may vary from stopping certain operations at a given time to stopping all operations. MAPL may obtain approval to continue some or all operations if acceptable precautions are implemented. The Fire Management Officer will notify MAPL the previous day if fire danger predictions call for restrictions the following day. If a sudden change in fire danger requires restrictions during the day, the Fire Management Officer will notify MAPL immediately. MAPL will then notify the Contractor to restrict activities as soon as possible.

Construction and Environment inspectors for MAPL will inspect the job site and the contractor's operations for compliance with all provisions of this plan. In addition, federal, state, and local fire control agencies may perform inspections in areas under their jurisdiction at their discretion. During pipeline operation, fire risk will be minimized by restricting access to the ROW in accordance with jurisdictional agency or landowner requirements.

During maintenance operations, MAPL or its Contractor will equip personnel with basic fire-fighting equipment including fire extinguishers, shovels, and Pulaskis. Maintenance crews will also carry emergency response/fire control contact phone numbers.

Fire Suppression

The Contractor will take the following actions should a fire occur within the project area during construction: 1) Take immediate action to suppress fires using all available manpower and equipment; 2) Notify the Fire Guard; 3) Immediately notify the nearest fire suppression agency of the fire location, action taken, and status; 4) Immediately notify Mid-America of the fire location and action taken; 5) Relinquish the Fire Guard's direction of fire suppression activities to agency fire management officers upon their arrival.

If a fire is controlled, the Fire Guard will note the location and monitor progress in extinguishing it. The Fire Guard, or designee, will remain at the fire scene until it is fully extinguished. The extinguished fire will be monitored in accordance with procedures described below.

When required by a responsible land management officer, the Contractor will make equipment and personnel at the site temporarily available for fighting fires in the vicinity of the project.

The Contractor will mark the location and boundaries of all extinguished fires and monitor sites for a minimum of 24 hours. The Fire Guard will maintain a log of all extinguished fire locations.

Notification

Construction crew members will report all fires, whether extinguished or uncontrolled, to the Fire Guard. If the fire is uncontrolled, the Fire Guard will call the nearest fire suppression agency and MAPL. Information regarding the location of the fire, property ownership, and closest access roads should be provided to the Dispatch Office and MAPL.

If a reported fire is controlled, but not extinguished, the Fire Guard will call to notify the nearest fire suppression agency to alert them of the situation. The status of the fire will be monitored by the Fire Guard and when extinguished, the nearest fire suppression agency will be notified.

MAPL will also immediately contact the nearest landowner(s). MAPL will maintain and provide the Contractor with a list of landowner and land management agency contacts along the ROW.

APPENDIX D-6: Winter Construction Plan Mitigation Summary

Snow Removal

Snow will be removed from the construction ROW where necessary to provide access to work sites and to expose soils for backfilling and grading. It will also be removed where necessary along project access roads to allow access to the ROW. The snow will typically be bladed or pushed off the access roads and ROW with a motor grader, snowplow, or dozer. Care will be taken when removing snow from the access roads and ROW to minimize mixing of soil with snow.

The contractor may use snow as a thermal blanket to prevent deep freezing over the ditch line. In areas where snow fills the trench, the Contractor will remove it to allow visual inspection of the trench prior to installing bottom padding, lowering in and backfilling.

Backfilling and Topsoil protection

Padding and backfilling of the trench will continue where possible once the pipe has been lowered-in. Due to the typically dry nature of most trench spoils, it is likely that only the top several inches of stockpiled spoil will be frozen. The Contractor will backfill the trench with unfrozen soils to the extent practicable to minimize potential for ditch line settlement resulting from voids between frozen chunks of backfill.

If backfill is frozen, topsoil will not be replaced across the permanent ROW or linear TUA until soils thaw out in the spring and any ditch line settlement has been repaired. Similarly, the Contractor will minimize the amount of snow incorporated into the backfill to reduce the potential for ditch line settlement. In areas where significant amounts of snow are incorporated into the soils during backfilling or regrading operations, stockpiled topsoil will not be replaced across the permanent ROW and TUA until spring after the soils have thawed.

In all areas of the ROW where final cleanup and reclamation have not been completed, the ROW will be left in a roughened condition to reduce potential for erosion during snowmelt. If these areas occur on private land, a letter will be sent to the landowner to notify them that their property will be monitored during the winter and that final cleanup and reclamation will be completed in spring and summer.

In areas where topsoil or subsoil stockpiles remain in place during winter, the Contractor will ensure that openings are created in the soil stockpiles to allow runoff and snowmelt to be diverted off the ROW. The locations and approximate length of the topsoil stockpiles will be recorded. The piles are expected to remain frozen, and thereby be protected from erosion. Temporary erosion control will include seeding topsoil piles with a temporary cover crop as noted below.

Temporary Erosion and Sediment Control Measures

Temporary erosion and sediment control measures will be installed in all areas where final cleanup and reclamation efforts have not been completed. Theses measures will help stabilize the ROW until final reclamation can be completed in the spring.

Temporary erosion and sediment control measures will include installation of waterbars, application of mulch and temporary seeding, and installation of sediment control measures where necessary. These areas will be monitored until completion of ROW reclamation and stabilization is achieved. Erosion and sediment controls will be maintained and repaired as necessary.

Temporary waterbars will be constructed on slopes greater than five percent where final cleanup and installation of permanent erosion and sediment control measures have not been completed. Openings will be created in the topsoil and subsoil stockpiles at the ends of these waterbars to ensure that runoff is diverted off the ROW. These areas will have sediment controls installed as necessary. Waterbars will also be installed across the ROW where slopes occur above dry washes, waterbodies, and wetlands.

Temporary mulch will be applied on ROW slopes greater than five percent and within 100 feet of all waterbodies and wetlands where final cleanup and reclamation have not been completed. Temporary mulch will be crimped in where possible, or will be track-walked into the ROW where ground conditions or slopes are not favorable for crimping. Erosion control blankets may be necessary on steep slopes and banks.

Permanent seed will be applied to areas where the topsoil has been replaced on the ROW. Every effort will be made to apply permanent seed to the ROW, even under less than optimal condition. Permanent seeding will be suspended where the ROW is too wet to operate seeding equipment without damaging the ROW. Application of the permanent seed mixture will be augmented with cover crop seed when needed.

Temporary seeding will be applied as necessary to areas where the topsoil has not been replaced. Temporary seeding will be performed in sensitive areas of the project to help stabilize the ROW during spring run-off and on slopes where permanent seeding operations have been suspended. Temporary seeding will be broadcast on the ROW within 100 feet of waterbodies and wetlands, and on slopes greater than five percent. Temporary seed will also be applied to the topsoil piles left in place during the winter.

Sediment barriers (i.e., silt fence, straw bales, earthen berms) will be installed and maintained across the ROW at all waterbodies, wetlands, and paved road crossings where a slope greater than five percent exists adjacent to these areas. Additional sediment barriers and erosion control measures will be installed as necessary.

Access Road Usage

Access roads currently approved for use by the project will continue to be used during winter construction. All access roads will be maintained in accordance with applicable permit and landowner requirements, where cultural clearances allow. Snow removal activities will take special care to avoid significant grading of the access roads.

Temporary bridges and mats installed across waterbodies and wetlands will be removed before the Contractor leaves the ROW in winter. Temporary bridges may need to be reinstalled, where necessary, to access the ROW for final cleanup and reclamation.

Winter Monitoring and Remediation

The ROW will be inspected on a regular basis throughout the winter months to identify areas where erosion control measures are damaged and where corrective actions are required to address developing erosion problems. Damage to erosion control structures will be noted and repaired, as practicable. Except for emergency situations where significant resource damage may occur, repairs to eroded areas and erosion control structures will be limited to hand work only. In some cases, repairs will be deferred until the spring remediation period. Deferred areas may include areas of ditch line settlement, eroded areas where no sensitive resources are impacted, areas where access and repairs are not feasible, or where damage from accessing the site would outweigh the benefits of correcting the issue during winter.

Logs that document winter monitoring and repair efforts will be produced and submitted to the BLM, and other applicable agencies. The report will identify areas where erosion control issues have been corrected and areas where final resolution and repairs will be deferred until the spring remediation period.

Final Remediation and Restoration in Spring and Summer

In order to address final restoration and winter damage to the ROW, MAPL will thoroughly review the ROW in the spring following construction. Following initial review, MAPL will repair all damaged areas of the ROW, complete final cleanup and reclamation, re-seed and re-mulch areas as necessary, and remove silt fence or other erosion control structures that are no longer needed.

APPENDIX D-7: SPILL PREVENTION, CONTROL, AND COUNTERMEASURES PLAN MITIGATION SUMMARY

General

The pipeline contractor generally is responsible for the implementation of spill control procedures for hazardous materials and petroleum products. During the course of construction, a company inspector will be on hand to ensure that the following guidelines and measures are adhered to in the event of a spill and for the prevention of spills:

All spills occurring on land, regardless of quantity, would immediately be reported to the MAPL inspector and would be cleaned up within 24 hours. All spills occurring in watercourses, including intermittent and ephemeral streams, would be followed by an immediate report to the MAPL inspector. Following the report, clean-up would be prompt. Should a spill occur that requires a report to the local emergency management authority, or the state or federal response authorities, the necessary report would be made by MAPL.

All waste materials, including contaminated soil, would be properly disposed in accordance with federal, state, and local regulations, using the appropriate identification and hazard markings, as required by the Hazard Communication program and DOT Hazardous Materials regulations. Wastes or unused materials will not be buried, dumped, or discharged on the ROW.

All equipment staging areas shall be located at least 50 feet from all water courses and wetland areas. The re-fueling of construction equipment shall take place at least 100 feet from stream banks. If vehicles/equipment require maintenance on the ROW, the contractor shall install drip pans or other suitable containment devices to collect all vehicle fluids. All waste fluids would be removed from the site and disposed properly.

Frequent garbage removal will help maintain a clean construction site. Waste containers will be labeled and located in a designated area. Lids will be kept closed at all times. Sanitary facilities will be convenient and well maintained.

Control of Non-sediment Pollutants

The following general guidelines will be used during construction activities for the control of pollutants other than sediment.

- MAPL and MAPL contractors will attempt to buy only what is needed. Remaining portions will be stored in an approved manner, reused, recycled, or disposed safely.
- All Material Safety Data Sheets (MSDSs) will be read and directions will be followed.
- Products will be kept in original, well-labeled containers. If a product must be transferred to smaller containers, spills will be avoided by the use of the proper size of funnel.
- All containers will have proper labels. If necessary, labels will be covered with transparent tape. A metal tag will be affixed or a stencil and spray paint will be used if the containers need to be re-labeled.

- Chemical substances will not be mixed.
- Chemicals will only be used in well-ventilated areas. Protective gloves, eye-wear, respirators, and other devices will be utilized if when needed.
- Corrosive liquids will be kept away from flammable liquids.
- Spills will be covered with absorbent material. Used absorbent material will be disposed according to current regulations.
- Hazardous materials will be prevented from migrating off-site.

Equipment Storage, Cleaning, and Maintenance Practices

Routine maintenance of construction equipment on the ROW will be limited to the fueling and lubricating. Drip pans will be used during fueling and lubricating to contain spills or leaks. If a significant volume of hydraulic oil or fuel is lost, a catch basin will be constructed with soil berms that are double-lined with 6-mil plastic sheeting, to prevent soil contamination. The waste product will then be contained and removed from the ROW.

Major cleaning and repair of equipment will be conducted away from the pipeline ROW. If major equipment maintenance is required, the equipment will be transported off-site to a facility capable of supporting these activities. To control the transportation of noxious weeds to unaffected areas, equipment tracks and tires may be cleaned with water on the pipeline ROW.

Storage and Handling of Petroleum Products

Oil and oily wastes such as crankcase oil, cans, rags, lubricants and paper dropped in oils will be collected in the proper receptacles and disposed or recycled. Waste oil for recycling will not be mixed with degreasers, solvents, antifreeze, or brake fluids. A routing inspection will be conducted on a daily basis to identify leaks.

There will be a need to store petroleum products at the directional drill crossings and possibly at bored crossing locations. The following guidelines will be used:

- Products will be stored in staging areas and covered with tarps where possible.
- The storage area will be lined with a double layer of 6-mil sheeting.
- A berm will be created around the perimeter of the storage areas.
- Capacity of bermed areas will be approximately 10% greater than the largest container.
- All products will be clearly labeled.
- Tanks will be kept off the ground.
- Lids on drummed material will be securely fastened.
- Emergency response procedures will be posted. Persons trained in handling spills will be on call at all times.
- Materials for cleaning up spills will be kept on site and will be readily available. Spills will be cleaned up immediately and the contaminated material will be properly stored on site until it can be disposed in accordance with regulations.

- All storage areas, dumpsters or other storage facilities will be monitored for leaks on a regular basis, and repaired when necessary. Workers will receive weekly reviews of proper storage and handling procedures.

Spill Prevention

The Area Manager in Farmington, New Mexico is responsible for spill prevention. These duties include, but are not limited to the following:

- Instruction of personnel in the operation and maintenance of equipment to ensure the prevention of the discharge of oil.
- Organization and implementation of briefings in sufficient intervals to ensure that operating personnel have an adequate understanding of the Spill Plan.
- Each individual facility would be inspected by the District Manager or designee to determine the potential for discharges or spills of oil or hazardous substances.

All facilities that have the potential for discharging or spilling oil or hazardous substances into a watercourse are required to have the following preventative measures:

- Examination of all tanks, valves and fittings to determine maintenance requirements. The Area Manager will evaluate monitoring requirements for tank levels to prevent overflow.
- All tank batteries will have a secondary means of containment for the entire contents of the largest single tank, plus sufficient freeboard to allow for precipitation.
- A system will be implemented to carefully monitor and inspect all tanks, to prevent accidental spills or discharges into watercourses.
- Any field drainage ditches, road ditches, or pumps will be inspected at regularly scheduled intervals for the accumulation of liquid hydrocarbons or other hazardous substances that may have escaped. Any such accumulations will be removed.

A tank would not be used for storage of oil or hazardous substances, unless the material and construction of the tank, along with the conditions of storage are compatible with the material stored. Leaks that are sufficiently large enough to cause oil or other hazardous substances to accumulate in diked areas due to loss from tank seams, gaskets and bolts will be promptly corrected. Mobile or portable oil, or hazardous substance storage tanks will be positioned or located to prevent the contents from reaching a watercourse. The mobile facilities will be located so their support structures would not be undermined by flooding or washout.

Facility Drainage

Provisions will be made for drainage from diked storage facilities in areas with high precipitation. Drainage from diked areas will be restrained by valves or other means to prevent a discharge or spill. Diked areas will be emptied by pumps or ejectors that are manually activated. Valves used for the drainage of diked areas will be designed for manual operation. Rain water may be drained from diked areas, providing the water does not contain oil or hazardous substances. Drain valves must be closed following drainage of diked areas. The construction of dikes must meet the following requirements:

- Capacity must be at least equivalent to the capacity of the largest tank of the battery. Sufficient freeboard must allow for precipitation or displacement by foreign materials.
- Small dikes for temporary containment will be constructed at valves if leaks of oil or hazardous substances develop.
- Any dike three feet or higher will have a minimum cross section of two feet at the top.

Spill Response Procedures

Upon noticing a discharge or spill of an oil or hazardous substance in any quantity, an employee will initiate immediate containment procedures and notify Tulsa Dispatch and the Area Manager. Said employee will provide the following information:

a. Name of facility and/or location of facility and nature of discharge or spill.
b. Description and quantity of substance discharged.
c. Name, title, and telephone number of person who initially reported the discharge
d. Action taken or being taken to mitigate and correct discharge or spill.
e. Water bodies or streams involved.
f. Time and duration of discharge or spill.
g. Outside involvement during discharge or spill (public, government agencies, etc.).

Dispatch will immediately advise the responsible District Manager and Environmental Services department by telephone about the incident.

The Area Manager has the following responsibilities:

1. Coordination of the containment and clean-up of a discharge or spill.
2. If the discharge or spill is too large for company personnel to contain, he/she will contact the qualified local contractors for assistance
3. Advise Environmental Services by telephone if emergency containment or clean-up assistance is required from a state agency or a response team.

Environmental Services has the following responsibilities:

1. Contact the Legal Department (and Right-of-Way Department, if appropriate) and assessing report requirements of state and federal agencies.
2. Make appropriate contacts with state and federal agencies if necessary.
3. If the spill is significant, an environmental specialist will be dispatched to the scene by Environmental Services to oversee cleanup and reporting.

The MAPL District Manager in Tulsa will provide a written description of the incident as soon as possible after initial notification has been given. He or she will forward the completed report to Environmental Services and a copy to legal departments and retain a copy for future reference. Environmental Services, in coordination with the Legal Department, will submit written reports to government agencies.

APPENDIX D-8: DRILLING CONTINGENCY PLAN MITIGATION SUMMARY

MAPL will utilize the directional drilling process to drill underneath the Rio Grande, Blacks Fork River and Circle Creek and beneath the Albuquerque Canal and Algodones Canal. The following mitigation measures have been adopted to prevent and handle drilling fluid seepage.

Avoiding Drilling Fluid Seepage

Pipeline crossing locations and profiles have been selected to take advantage of cohesive soils and adequate overburden material. A minimum depth of cover of fifteen feet in competent soils will be maintained to provide a margin of safety against drilling fluid seepage.

As the drill and hole opening assembly nears the ground surface on either side of the river, it passes through the area that presents some potential for drilling fluid seepage. At the exit point, an exit pit will be constructed to allow the pipeline to terminate below the ground surface to prevent seepage. If seepage does occur, detection will be enhanced as the seepage is on land rather than under water. Subsequent containment of the mud can therefore be planned and managed. Containment dikes in the form of berms and hay bales will contain any seepage and minimize any migration of the mud from the work area.

If the geometry of the pipeline profile can also affect the potential for drilling fluid seepage. In a profile forces the pipe to make compound or tight radii turns, downhole pressures can build up, thereby increasing the potential for drilling fluid seepage. The profiles for the river crossings on the MAPL Western Expansion Project avoid this potential as they are designed to be very smooth and gradual vertical curves. In addition, all horizontal curves have been eliminated.

The drilling contractor is responsible for execution of the directional drilling operation, including actions for detecting and controlling drilling fluid seepage. The progress and actions of the drilling contractor will be closely supervised by MAPL's inspection staff.

The detection of a potential seep prior to it actually occurring is dependent upon the skill and experience of the drilling crew. For this reason, MAPL will use experienced firms which specialize in directional drilling to perform the proposed river and canal crossings.

Corrective Action

Once surface seepage of drilling fluid is detected, the drilling crew will take immediate corrective action. The most direct corrective action is to stop the rig pumps to quickly bleed off pressure in the hole. Stopping the pumps will occur as soon as surface seepage is detected.

If seepage occurs in a river, there may be a visible plume. Minor seepage may be difficult to detect due to turbidity of the river water and the high specific gravity of bentonite drilling fluid. Once seepage is detected and the mud pumps are immediately stopped, there will be minimal disturbance to surface sediment. The composition of the drilling fluid is primarily water and bentonite clay. If a small amount is released, it is usually quickly dissipated by river currents.

The entry and exit locations on all directionally drilled crossings have dry land segments where drilling fluid seepage can be easily detected and contained. To isolate and contain potential drilling fluid seepage at each of the drill sites, there can be a berm around the entire drilling site area. Hay bales or silt screen can be part of the berm on the water side of the drilling area. To contain and control drilling fluid seepage on the land area, there will be earth moving equipment, portable pumps, sand, and hay bales available at each drilling site. Any drilling fluid seepage will first be contained and isolated using dirt berms, hay bales, or silt screens. It will then be cleaned up from the area and hauled to one of the storage pits at the closest drilling site

After drilling fluid seepage has been contained and disposed, the drilling contractor and MAPL will make every effort to determine why the seepage occurred. Measures will then be developed to control the factors causing the seepage and to minimize chance of recurrence. In no case will MAPL resume drilling operation until it has determined the cause of the drilling fluid seepage and instituted preventative measures.

In some cases, it may be determined that the existing hole encountered a void which could be bypassed with a slight change in the profile. In other cases, the existing hole may have encountered a zone of unsatisfactory soil material and the hole will have to be abandoned. If the hole is abandoned, it can be filled with drilling cement.

Containment items for drilling fluid seepage will be stored within the drilling sites, such as lumber for temporary shoring, sand, portable pumps, hand tools, and hay bales. The drilling contractor will also have heavy equipment such as backhoes which can be utilized to control and clean up drilling fluid seepage. The drilling contractor will also have a boat which can be utilized if seepage should occur in the river.

APPENDIX D-9: PALEONTOLOGY RESOURCES MITIGATION SUMMARY

Appendices to the MAPL POD contain two attachments related to mitigation of impact to paleontological resources. These consist of an Unanticipated Discovery Plan and a Monitoring and Mitigation Procedures. These attachments are summarized below.

Unanticipated Discovery Plan

A qualified paleontologist will monitor (spot check) excavation along especially sensitive BLM lands. In addition, qualified archaeologists monitoring excavation of pipeline trenches in limited areas of the MAPL project will be made aware that fossil remains may be encountered here and elsewhere along the pipeline and the procedures to follow if such remains are discovered.

In areas where neither a qualified paleontologist nor archaeologist will be present during construction activities, MAPL environmental inspectors and contractor personnel will be responsible for identification of unanticipated scientifically significant paleontologic resources. As such, prior to commencement of construction, MAPL will provide training to contractor personnel concerning the nature of fossil resources and procedures to be followed when unanticipated paleontologic resources are discovered. This training should be conducted by a qualified paleontologist with illustrated reference materials.

MAPL will also provide contractor personnel with illustrated reference materials and instructions for use during all field construction activities. The training will also emphasize the sensitive nature of fossil resources and implement a strict policy prohibiting the collection of fossils or other paleontological resources.

If unanticipated paleontologic resources of scientific significance are discovered, all construction activity will immediately cease within 100 feet in all directions from the discovery, and the discovery will be immediately reported to the MAPL construction supervisor responsible for protection of environmental resources on that spread or construction activity. The MAPL construction supervisor will immediately report the discovery to MAPL's consultant paleontologist. The consultant paleontologist will examine and record the paleontological resource and evaluate its significance and determine if additional mitigation (collection and curation) are applicable. Ground-disturbing construction activities will not occur within 100 feet in any direction from the paleontological resource until the appropriate agencies have concurred that construction may resume.

All paleontologic materials of scientific significance discovered during construction will be recorded using methods consistent with modern professional paleontology standards. Scientifically significant fossil vertebrates will be collected and curated into an acceptable museum or academic repository.

If paleontological resources discovered during construction are in imminent danger of destruction, MAPL will, without delay, apply prudent methods to preserve as much paleontological information as possible. Salvage activities will follow standard paleontological procedures as much as possible, but human safety concerns or the immediacy of the threat to the paleontological resource may require less exact methods of material extraction, including rapid shovel excavation or use of backhoes or other heavy equipment.

Monitoring and Mitigation Procedures

When fossil material (vertebrate, invertebrate, plant, or trace) is encountered during ground disturbance and excavation for the MAPL Western Expansion Project, appropriate recommendations for mitigation are similar to those associated with the pre-construction field survey. During construction, fossil material should be sampled to facilitate further analyses to determine significance. Frequently fossil taxa are not sufficiently well known to allow the determination of significance in the field. Salvage is requested when the fossil discovery is of scientific interest and if the construction could destroy the site. A request for a reroute is made if critical or significant fossil material is encountered directly on the route or site and the salvage cost or time factor is unacceptably high. No rerouting is necessary, based upon the preliminary surveys of the route.

All phases of the mitigation are to be supervised by a qualified professional paleontologist who will establish the following procedures:

1. To prevent damage to a known paleontologically sensitive resource and to prevent construction delays, salvage or rerouting recommendations are to be made prior to the beginning of construction,

2. Specific boundaries of sensitive formations or fossil sites are to be delineated on construction maps so the company personnel, developers, and/or contractors are aware of areas with potential problems.

3. A fossil identification pamphlet will be prepared before construction begins for environmental inspector and construction foreman orientation. Responsibility for the protection of the resource will be outlined as well as the definition and description of the fossils commonly found along the route. Procedures to be followed in the event of fossil discoveries will be clearly defined.

4. Contractors are to be made aware that the environmental inspector and the paleontological supervisor have to be contacted immediately if vertebrate fossil material is unearthed during construction. Work is to be halted in the immediate area of discoveries. In addition, any vertebrate fossil discovery on federal or state land is to be reported immediately to the appropriate land managers.

During construction there will be adequate paleontological monitoring of significant units to salvage specimens. In sedimentary units established as highly paleontologically significant (Condition 1 Unit), a qualified paleontological monitor is to be present during 100 percent of the ground-disturbing activity, unless it has been previously determined by the project paleontologists that reduced monitoring is appropriate. In geologic units classified as moderately significant (Type 2 unit) the monitor will perform spot checks during construction based on the lithology of the unit.

Preparation of small to medium size vertebrate fossil material will be conducted by the primary investigators. In addition plant or invertebrate fossils will also be collected if scientifically important. Under no circumstances will fossils be removed from private lands for any reason, including curation, without the written consent of the landowner.

Numbering, boxing, and storage will be done as prescribed by the designated curation facility. A complete set of records and photographs with an itemized specimen inventory will be compiled and filed at the curation facility.

Upon completion of construction and evaluation of samples collected along the route, a final report will be compiled.

APPENDIX E
Paleontological Summary Table and Report

Paleontological Summary Table

BLM Condition 1 Paleo Formations Crossed by the MAPL WEP

State / Segment	Formation	Start MP	End MP	Start AM	End AM	Miles
Wyoming						
Segment 1	Bridger	0.0	3.3	45.4	48.7	3.3
	Bridger	3.9	5.4	49.3	50.8	1.5
Segment 2	Green River Laney Member	0.0	12.7	16.7	29.4	12.7
	Green River Laney Member	13.6	16.0	30.3	32.7	2.4
	Bridger	16.0	18.3	32.7	35.0	2.3
Segment 3	Green River Luman Member	0.0	3.2	60.3	63.5	3.2
	Wasatch Main Body	3.2	5.7	63.5	66.0	2.5
	Wasatch Main Body	7.0	7.6	67.3	67.9	0.6
	Wasatch Main Body	7.8	8.1	68.1	68.4	0.3
	Green River Luman Member	8.1	9.7	68.4	70.0	1.6
	Green River Luman Member	11.0	11.3	71.3	71.6	0.3
	Wasatch Main Body	11.3	23.1	71.6	83.4	11.8
Segment 4	Wasatch Main Body	0.0	8.5	51.2	59.7	8.5
Segment 5	NONE CROSSED					0.0
Segment 6	Wasatch Main Body	0.9	4.1	852.2	855.4	3.2
	Wasatch Main Body	4.6	5.1	855.9	856.4	0.5
	Wasatch Main Body	17.8	18.2	869.1	869.5	0.4
Total Wyoming						55.1
New Mexico						
Segment 8	Naciemento	0.0	16.5	349.9	366.4	16.5
	San Jose	16.5	20.1	366.4	370.0	3.6
Segment 9	Santa Fe	0.0	1.9	276.7	278.6	1.9
	Upper Santa Fe	1.9	2.8	278.6	279.5	0.9
	Q. Alluvium	2.8	5.0	279.5	281.7	2.2
	Santa Fe	5.0	8.5	281.7	285.2	3.5
	Q. Alluvium	8.5	22.6	285.2	299.3	14.1
Segment 10	Q. Playa	2.3	5.8	190.9	194.4	3.5
	Q. Pediment	7.7	10.9	196.3	199.5	3.2
	Q. Pediment	11.3	16.4	199.9	205.0	5.1
	Q. Pediment	17.8	18.9	206.4	207.5	1.1
	Q. Alluvium	21.8	26.7	210.4	215.3	4.9
Segment 11	Q. Pediment	18.0	18.6	143.9	144.5	0.6
Segment 12	NONE CROSSED					0.0
Segment 13	Oglalla	0.0	4.4	46.8	51.2	4.4
Total New Mexico						65.5

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PALEONTOLOGIC RESOURCES LETTER REPORT

Project: Paleontological evaluation of Enterprise Products Operating L.P. looping pipeline project

Location: Sweetwater and Uinta Counties, Wyoming (Figure 1)

Status of Lands Studied: Public lands administered by the BLM.

Agency Contacts: Mr. Dale Hansen, Lead Paleontologist, Wyoming State Office.

Project Description: Enterprise Products Operating L.P. (Enterprise) is proposing to expand its Mid-America Pipeline Company LLC (MAPL) system by constructing 12 pipeline segments (totaling approximately 202 miles) between Hobbs, New Mexico and Wamsutter, Wyoming. In addition, each existing pump station along the entire pipeline in New Mexico, Colorado, Utah and Wyoming is expected to be modified or upgraded. No new pump stations are required. The project will be known as the MAPL Western Expansion Project (WEP), and will increase the transportation capacity of the system from 225,000 barrels per day (bpd) to 275,000 bpd. The proposed pipeline looping segments and station modifications will increase the natural gas liquid (NGL) transmission capacity of the system, to meet the foreseeable production needs of the area served. In Wyoming 6 segments have been identified where the existing pipelines will be looped. These loops, identified as segments 1 through 6 occur between Latham and Granger, Wyoming.

Work Conducted/Personnel/Permit: At the request of O & G Environmental, Erathem-Vanir Geological PLLC (EVG) in Pocatello, ID conducted a paleontological evaluation for the proposed Mid-American Pipeline in Sweetwater and Uinta Counties, Wyoming. This evaluation was conducted in November 2004, as required by Bureau of Land Management (BLM). Gustav F. Winterfeld, PhD, the PI for the project, conducted a combined drive-through and walk-through survey of BLM lands traversed by the proposed pipeline right of way as authorized on BLM lands by a Paleontological Resources Use Permit (137-WY-PA94) issued to Dr. Winterfeld, by the BLM. Prior to the survey Ms. Barbara Neary with O&G was provided with the paleontological survey requirements of the project from Mr. Dale Hansen, Lead Paleontologist with the BLM in Wyoming, via the Major Projects Manager Jerry Crockford, in the Farmington, New Mexico BLM Field Office.

Previous work: Several of the loop segments have been previously surveyed or studied for paleontology for other projects by the PI for this project:

- Segment 1 trends along parts of the Blacks Fork Pipeline which was surveyed and reported on.
- Segments 2 and 3 trend along parts of the Pioneer Pipeline which was surveyed and reported on.
- Segment 6 trends along the Western Pipeline, which was surveyed, monitored and reported on

- Segments 4 and 5 (Loops AM 44 and AM 08) I have not previously examined by the PI, but the geology of underlying bedrock has been studied in detail by the PI as part of his research on the Eastern flank of the Rock Springs Uplift.

Previous work did not identify any specific paleontological resources of very important scientific significance along the proposed segments as the result of literature and locality reviews or field survey. However, there is the distinct possibility that such resources could be discovered during excavation of the pipeline loops, because several of the formations underlying the proposed pipeline loop ROW are known to produce scientifically significant fossil.

BLM Ranking of Fossil Resources: The BLM ranks areas according to their potential to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. As described in Paleontological Resource Management Handbook 8270-I, these are as follows:

<u>Condition 1</u>: Areas that are know to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. Consideration of paleontological resources will be necessary if the Field Office review of available information indicates that such fossils are present in the area.

<u>Condition 2</u>: Areas with exposures of geological units or settings that have high potential to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. The presence of geologic units from which such fossils have been recovered elsewhere may require further assessment of these same units where they are exposed in the area of consideration.

<u>Condition 3</u>: Areas that are very unlikely to produce vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils based on their surficial geology, igneous or metamorphic rocks, extremely young alluvium, colluvium or eolian deposits or the presence of deep soils. However, it possible it should be noted at what depth bedrock may be expected in order to determine if fossiliferous deposits may be uncovered during surface disturbing activities.

Probable Fossil Yield Class is an additional planning tool used by the BLM in Wyoming to classify geological units, usually at the formation or member level, according to the probability that they will yield paleontological resources that are of concern to land managers. Existing statutes and policies regulate the collection and curation of vertebrate fossils, but not non-vertebrate fossils except in special circumstances. Therefore, this classification is based largely on how likely a geologic unit is to produce vertebrate fossils. The classes are described below, along with corresponding management considerations or actions.

Class 1: This class includes igneous and metamorphic (tuffs are excluded from this category) geologic units or units representing heavily disturbed preservational environments that are not likely to contain recognizable fossil remains. Class 1 geologic units include rock units that lack fossils of any kind, or that fossils are not known to occur except in the rarest of circumstances. This class includes rocks of igneous or metamorphic origin, as well as landslides and glacial deposits.

The land manager□s concern for paleoresources on Class 1 acres is negligible. Ground-disturbing activities will not require mitigation except in rare circumstances.

Class 2: This class includes sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant non-vertebrate fossils. These geologic units include those in that vertebrate fossils are known to occur very rarely or not at all, or that have an age greater than Devonian or age younger than 10,000 years before present. They may have a deep marine or aeolian origin, or have been diagenetically altered.

The land manager's concern for paleoresources on Class 2 acres is low. Ground-disturbing activities are not likely to require mitigation.

Class 3: This class includes fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence. This class also includes sedimentary units of unknown fossil potential. Class 3 geologic units include units with sporadic known occurrences of vertebrate fossils, or are known to have vertebrate fossils and significant non-vertebrate fossils occur inconsistently with predictability known to be low, or that are poorly studied, poorly documented, or both. Potential yield cannot be assigned without ground reconnaissance.

The land manager's concern for paleoresources on Class 3 acres may extend across the entire range of management. Ground-disturbing activities will require sufficient mitigation to determine whether significant paleoresources occur in the area of a proposed action. Mitigation beyond initial findings will range from no further mitigation necessary to full and continuous monitoring of significant localities during the action.

Class 4: These geologic units are Class 5 units (see below) that have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation. These units may have significant soil/vegetative cover; or include areas where outcrops are not likely to be impacted. They may also include areas of exposed outcrop that are smaller than 2 contiguous acres, have outcrop that form cliffs of sufficient height and slope that most is out of reach by normal means, or have other characteristics that lower the vulnerability of both known and unidentified fossil sites.

The land manager's concern for paleoresources on Class 4 acres is toward management and away from unregulated access. Proposed ground-disturbing activities will require assessment to determine whether significant paleoresources occur in the area of a proposed action and whether the action will impact the paleoresources. Mitigation beyond initial findings will range from no further mitigation necessary to full and continuous monitoring of significant localities during the action. This classification will often not be applied until after on-the-ground assessments are made.

Class 5: This class includes highly fossiliferous geologic units that regularly and predictably produce vertebrate fossils and/or scientifically significant non-vertebrate fossils, and that are at risk of natural degradation and/or human-caused adverse impacts. Class 5 geological units are known to yield vertebrate fossils and/or scientifically significant non-vertebrate fossils consistently, predictably, and/or abundantly, are exposed; little or no soil/vegetative cover, include outcrop areas that are extensive with discontinuous areas are larger than 2 contiguous acres, or outcrop that erode readily and may form badlands, that have easy access to extensive outcrop in remote areas, and may have other characteristics that increase the sensitivity of both known and unidentified fossil sites.

The land manager's highest concern for paleoresources should focus on Class 5 acres. These areas are likely to be poached. Mitigation of ground disturbing activities is required and may be intense. Areas of special interest and concern should be designated and intensely managed.

Results of Study: Survey confirmed geologic mapping of the project area which depicts the area underlain by sedimentary rocks of Tertiary and Cretaceous age and sedimentary deposits of Quaternary age. A list of these rocks and deposits, their environment of deposition, fossil they are known to contain and the segments they underlie is provided in Table 1.

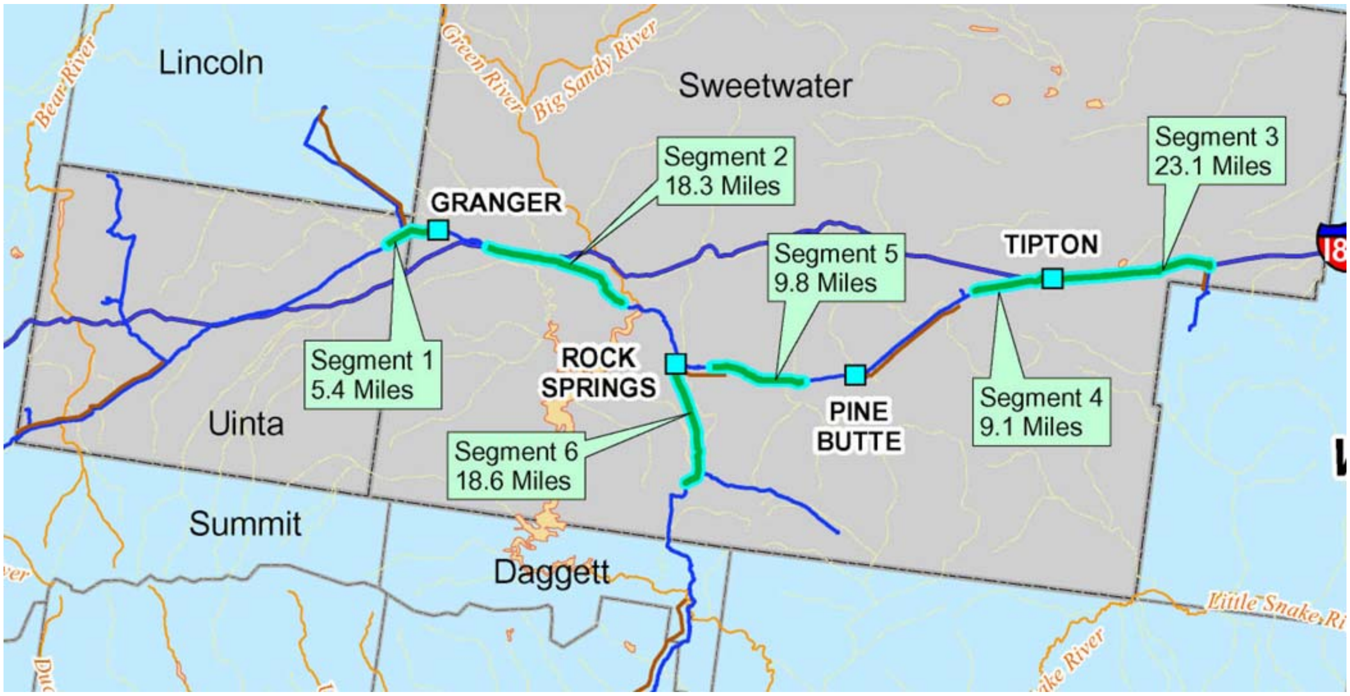

Figure 1. Location of Mid American Pipeline loop segments 1 through 6 in southwestern Wyoming.

Paleontological Overview/Classification of Formations*:* Unnamed Quaternary Sediments: A variety of unconsolidated or semi-consolidated sediments of Quaternary age are traversed by all six of the proposed loop segments. These sediments include: alluvium, colluvium, dune sand, loess, and playa lake deposits (Love and Christiansen, 1985 Love and others, 1993; Grasso, 1990; Mears, 1987). Alluvium and colluvium composed of clay, silt, sand, and gravel of late Holocene age is preserved at locations on flood plains and slopes across the area. Clay, silt, sand and travertine of similar age is preserved chiefly at widespread locations in modern playa lakes. Older lake deposits and associated remnant shorelines, deltas, and spillway deposits cover a large part of the central Great Divide Basin. A continuous blanket of these deposits extends throughout the Red Desert Basin into Dry Lake, south of Wamsutter and may extend into the eastern part of the project area and underlie loop segment 3. Although partly buried by eolian sands, these lake deposits lay at elevations well beyond and above the limits of modern playas, and appear to have accumulated in an older, more persistent, lake. This lake, named Lake Wamsutter (Grasso, 1990) probably reached its maximum extent sometime during the late Pleistocene (circa 12,000 to 20,000 years ago) at

Table 1. Geologic Units, their ages, depositional environment, contained fossil resources, and distribution.

Geologic Deposit	Geologic Age	Type of Deposit/ Environment of Deposition	Fossil Resources	BLM Paleontology Condition/Probable Fossil Yield	Loop Segments Present
alluvial sediments (including alluvium, and colluvium)	Holocene	Unconsolidated silts, sands of valleys and plains. Terrestrial-fluvial.	none	Condition 1/PFYC 2	1, 2, 3, 4, 5, 6
eolian sediments	Holocene (less than 2,000 ybp)	Unconsolidated active and dormant sands dunes sands and silts. Terrestrial-eolian	none	Condition 1/PFYC 2	1, 2, 3, 4, 5, 6
playa lake and lake margin deposits	Holocene (to 7,000 ybp)	Unconsolidated silts, sands, clays. Lacustrine.	none known	Condition 2/PYFC 2	1, 2, 3, 4, 5, 6
Bridger Formation	middle Eocene	Mudstone and sandstone, tuffaceous and bentonitic, limestone, ash layers, Terrestrial-fluvial, floodplain accumulated during last phase of Lake Gosiute and its drying up/infilling	vertebrates, invertebrates, plants, trace fossils	Condition 3/PFYC 4 or 5	1, 2
Green River Formation Laney Shale Member	middle Eocene	Chiefly oil shale, lesser algal limestone, sandstone, claystone, and tuff. Includes calcareous, dolomitic, silty shale, laminated siltstone and sandstone with occasional interbeds of marlstone and siltstone, includes Lyman Limestone: lacustrine, accumulated during renewed expansion of Lake Gosiute and Sand Butte (=Tower Sandstone): very tuffaceous siltstone and sandstone interbedded with tuff	vertebrates, invertebrates, trace fossils	Condition 3/PFYC 4 or 5	2
Green River Formation Luman Tongue	middle Eocene	Oil shale, carbonaceous shale, limestone, sandstone and mudstone. Lacustrine, accumulated in Lake Luman.	vertebrates, invertebrates, trace fossil	Condition 3/PFYC 4 or 5	3,4
Wasatch Formation Main body	early Eocene	Drab to varicolored sandstone, mudstone, coals. Terrestrial, fluvial,	vertebrates, invertebrates, plants, trace	Condition 3/PFYC 4 or 5	3, 6

Geologic Deposit	Geologic Age	Type of Deposit/ Environment of Deposition	Fossil Resources	BLM Paleontology Condition/Probable Fossil Yield	Loop Segments Present
		flood-plain, locally swamp and pond.	fossils		
Fort Union Formation	Paleocene to earliest Eocene	Drab colored sandstones, mudstones, coals. Terrestrial, pond swamp and fluvial.	vertebrates, invertebrate, plants	Condition 3/PBFY 3 or 4	6
Blair Formation	Late Cretaceous	Basal sandstone and siltstone overlain by shale and thin interbedded siltstone. Marine, near shore to offshore including submarine fans deposits.	invertebrates, trace fossils	Condition 2/PFYC 3*	5
Baxter Shale	Late Cretaceous	Shale interbedded with few thin siltstone beds. Marine nearshore to offshore	invertebrates, trace fossils	Condition 2/PFYC 3	5

which time it may have been more than 200 feet deep. Dune sand and loess of similar age accumulated along the shoreline of this lake may occur in the project area, but have not been documented.

Some of the unconsolidated or semi-consolidated sediments of Quaternary age may predate the Holocene and be Late Pleistocene in age (Mears 1987). Isolated fossil bones of Pleistocene age have been identified south of Granger, Wyoming, in the Church Buttes area, where they were found lying as lag on outcrops of the Bridger Formation by EVG (1997). During the late Pleistocene, herds of horses, camels, deer, pronghorn, bison, and mammoths roamed across Wyoming. Remains of these and other animals, including lion, great short-faced bear, grizzly bear, wolf, coyote, fox, badger, lynx, puma, skunk, black-footed ferret, shrew, mole, bat, rabbits, bighorn sheep, mountain goat, and a variety of rodents are known throughout Wyoming (Anderson 1968, 1970, 1974; Hay 1924; Hager 1972; Irwin 1962; Knight 1903; Long 1971; Zeimans and Walker 1994). Fish, reptile, and bird remains are also known from some locations. Most of these remains have been identified from well-known cave (i.e, Little Box Elder Cave, Bell Cave, Horned Owl Cave) and natural animal trap localities (Chimney Rock Animal Trap, Natural Trap Cave) scattered throughout Wyoming, but isolated finds of extinct Pleistocene mammals have been found in gravel and bentonite pits, gravel quarries, terrace gravels, fissure fills, peat bogs and ice sloughs as well as at other construction sites (Benton, 1996).

The unnamed deposits of Quaternary age underlying the proposed pipeline loops are not known to have produced scientifically significant fossils. For that reason these deposits are considered to have an undetermined, but probably low paleontologic potential.

Bridger Formation

Exposures of the Bridger Formation underlies parts of loop segment 2 and most of loop segment 1 and consist of light and medium gray to green-gray mudstone, claystone, siltstone, and sandstone with minor interbeds of light-gray and green tuff and tan to light-pink limestone and marlstone and thin lignites and coals. Pink or red sediments are present, but restricted. The Bridger Formation interfingers with the Green River Formation and is divided into an upper and lower unit by a tongue of the Laney Member. Deposits above the tongue comprise the main body of the Bridger Formation (Bridger A in part and Bridger B), and those below comprise the Bridger A or Whiskey Butte Bed (Sullivan 1980). The Bridger Formation has traditionally been subdivided stratigraphically into subunits A-E by conspicuous white layers composed of either ash, limestone, or both (Koenig 1960; Bradley 1964; Wood, 1966; McGrew and Sullivan 1970; McGrew, 1971; Bartels, 1991). Only Bridger A underlies the proposed loops.

Fossil vertebrates have been collected from the Bridger Formation for more than 120 years (Leidy 1869, 1871; West 1976; Gunnell and Bartels 1994), and collections of these specimens are housed at nearly every major paleontology museum in the world. Most known fossil specimens from the Bridger Formation have been collected from the Bridger B and above. However, major work began on the Bridger A during the 1960s when a team measured 12 sections of the unit in the Opal-Granger area and tied 35 fossil vertebrate-bearing localities to these sections. Ongoing work suggests that the Bridger A accumulated during a time of warm and humid conditions when dense forests prevailed. Information gathered from the fossils is scientifically significant in that it allows more detailed refinement of regional biostratigraphy for the early part of the Bridgerian Land Mammal Age, as well as providing information on the biota that inhabited the area, which may be critical to reconstructing the evolutionary pathway or phylogeny for extinct and extant organisms.

The Bridger Formation is well known to yield abundant fossil vertebrates of scientific significance and for that reason satisfies BLM Paleontology Condition 3 and PFYC 4, or 5, depending on outcrop exposures present.

Green River Formation: The Green River Formation underlies loop segments 2, 3, and 4 and includes the Luman Tongue and Laney members of the formation. The Luman Tongue (Bradley, 1964; Grande, 1984, 1989; Love and Christiansen, 1985; Love and others, 1993; Roehler, 1991a-b, 1992b-c, 1993a; Roehler and others, 1988) underlies most of segment 3 and parts of segment 4. The Laney Member underlies loop segment 2 from directly south of the city of Green River westward to a few miles west of the Black Fork River. The Sand Butte Bed (=Tower Sandstone) of the Laney Member occurs along loop 2 directly south of the city of Green River.

The Green River Formation is well known to yield abundant fossil vertebrates of scientific significance and for that reason satisfies BLM Paleontology Condition 3 and PFYC 4, or 5, depending on outcrop exposures present.

Laney Shale Member: The Laney Member forms the top of the Green River Formation and records in its sediments the greatest expansion of ancient Lake Gosiute followed by its final contraction and desiccation. At its peak the lake in which the Laney accumulated occupied more than 75% of the Greater Green River Basin, or about 15,000 square miles (Bucheim 1981, 1986, Bucheim et al. 1977). The Laney Shale, primarily the LaClede beds of that member underlie loop segment 2 between Green River and a few miles west of the Blacks Fork River. The LaClede beds consist primarily of oil shale (>75%) interbedded with thin sandstones, siltstones, shale, mudstones, limestone, algal-limestone, flat pebble conglomerate and zeolitic tuff. South of Little America, Brand (1999) mapped a continuous limestone bed within the Laney Shale, This unit, the Lyman Limestone, produces abundant vertebrate and invertebrate fossils of scientific importance

The Laney Shale including the Lyman Limestone are known to contain fossil vertebrates in the vicinity of proposed loop segment 2 and thus satisfies BLM Condition 3. The Sand Butte Bed (=Tower Sandstone) is known to produce wood, leaf, trace, ostracode and fish fossils on the eastern side of the Rock Springs Uplift, but none thus far on the western side. For that reason the Sand Butte Bed satisfies BLM Condition 2 and PFYC 3.

Luman Tongue: The Luman Tongue forms the base of the Green River Formation in the project area and overlies the Niland Tongue of the Wasatch Formation. The Luman is composed chiefly of organic-rich oil shales, carbonaceous shale, limestone, sands, and muds that accumulated in Lake Luman, which at its maximum extent, occupied an area of about 6,650 square miles. Surrounding the sandy lake shore of Lake Luman was a narrow area where drab-colored flood-plain deposits of the Wasatch accumulated. These deposits interfinger laterally to the north and south with varicolored (chiefly red) flood plain deposits of the Wasatch Formation

Fossils of fresh water molluscs are abundant throughout the Luman Tongue and the assemblages of fossils are commonly characterized by the large prosobranch gastropods *Goniabasis tenera* and *Viviparus* sp., and by the large unionid bivalve, *Lampsilis*. Fish, ostracod, and trace fossils are also common in the tongue (Roehler, 1991 a-b; 1992 a-c, 1993). The Luman Tongue satisfies BLM Condition 2 and PFYC 3.

Wasatch Formation*:* The Wasatch Formation traversed by the pipeline loops includes the Niland Tongue and main body of the formation. The Niland Tongue consists of drab-colored sands and muds that accumulated chiefly in smaller lakes, ponds, swamps, and flood-plains following restriction of the lake in which the Luman Tongue of the Green River accumulated. The Niland Tongue is recognized only in the same areas that the Luman is recognized. Where the Luman is absent, the Niland overlies the main body of the Wasatch and the two are indistinguishable (Roehler, 1991 et. seq.).

Fossils of plants, invertebrates and vertebrates and their tracks and traces are known from the Niland Tongue (Roehler, 1987). Plant fossils, including the imprints of leaves and stems and carbonized wood are common. Pollen and spores are pervasive in organic-rich sediments with pollen representing at least 25 genera of land plants have been identified from the Niland Tongue Invertebrates are fairly abundant, with ostracodes being the most common invertebrate fossil. They are pervasive in oil shale and limestone and are often found in association with molluscs. Fossil molluscs comprise two distinctive molluscan assemblages including a *Goniabasis, Viviparus,* and *Plesielliptio* assemblage and a *Biomphalaria, Omalodiscus, Gyraulus* assemblage. The assemblages are important environmental indicators. The *Goniabasis, Viviparus,* and *Plesielliptio* assemblage is diagnostic of onshore and offshore lake environments. Some shale intervals preserve coquina layers that are composed of chiefly of the turreted prosobranch gastropod *Goniabasis*. The *Biomphalaria, Omalodiscus, Gyraulus* assemblage is diagnostic of pond and marsh environments (Hanley, 1976).

Fossil specimens of mammals and reptiles occur as isolated bones or teeth and rarely as articulated skeletal parts in sediments accumulated in flood-plain and pond environments. Mammals described from the Niland Tongue including the remains of at least 15 different genera of insectivore, primate, rodent, carnivore, condylarth, artiodactyl, and perissodactyl. Fish fossils, including the scales and bones of teleosts, the holostean gar-pike *Leposteus*, and the freshwater ray *Heliobatis*, occur in sediments that accumulated in lake environments.

The main body of the Wasatch Formation consists chiefly of flood-plain deposits that overlie the Fort Union Formation of Paleocene age. The flood-plain deposits have two distinct color patterns. Around the basin edges the flood-plain deposits range from red to varicolored, with some shade of red dominating. The red coloration appears to be a result of oxidation of iron compounds in well-drained, well-aerated soils that formed in sediments that accumulated in areas of moderate topographic relief. In the central parts of basin these red flood plain deposits are replaced laterally by green to gray flood-plain deposits. The green to gray coloration appears to have been the result of accumulation of sediments in areas that were permanently water saturated where iron compounds were reduced. In addition to flood-plain deposits the main body of the Wasatch Formation includes some freshwater limestones that accumulated in ponds and marshes in low lying areas and some coarse-grained sands and conglomerates that accumulated along the basin margin in alluvial fan environments.

The high paleontological potential of the Wasatch Formation southern Wyoming is well known (Covert, 1994, Holroyd, 1999). In many areas of the basin, the main body of the Wasatch contains local accumulations of the fossils of vertebrates (fish, turtles, crocodiles, birds and mammals), invertebrates (snails and clams), and plants, and traces and tracks of these organisms. For this reason the Wasatch Formation satisfies BLM Condition 3 and PFYC 4 or 5 depending on outcrop exposures present.

Fort Union Formation*:* The Fort Union Formation consists of drab-colored sandstone, mudstone, limestone, shale and coal that accumulated in flood-plain, pond, and swamp environments during the Paleocene and earliest Eocene. The high potential of the Fort Union Formation produce scientifically significant fossils of vertebrates, invertebrates and plants along the east side of the Rock Spring Uplift is well documented (Rigby, 1980; Winterfeld, 1982). To date few fossils have been discovered on the western side of the uplift, in the area traversed by the pipeline loop ROW. For that reason the Fort Union on the western side of the uplift satisfies BLM Condition 3 and PFYC 3.

Blair Formation: In the Rock Spring Uplift the Mesaverde Group has been subdivided into the Almond, Ericson, Rock Springs, and Blair Formations. Of these only the Blair Formation at the base of the Mesaverde Group underlies any of the loop segments. The Blair Formation underlies the eastern ½ of loop segment 5 and consists of sands, silts, and shales that accumulated in marine environments during the lower Campanian (Roehler 1993b, Martinsen et al. 1993). The formation has been interpreted to represent variously as submarine fan and submarine channel, shelf and shoreline, prodelta and delta front deposits. Heavy minerals are concentrated in some beach sandstones.

Apparently only invertebrate and plant fossils have been reported from the Blair. Submarine channel deposits have produced mostly lag material containing small flat rounded pebbles and abundant marine fossils. Fossil molluscs include *Nucula* sp., *Inoceramus balticus*, and unidentified small gastropods, and the ammonites *Baculites* sp., *Scaphites hippocrepis*, and *Glyptoxoceras rubeyi*. Fossils of free-swimming *Uintacinus socialis* have been reported from the Blair Formation by Cobban (1995). *Ophiomorpha* and *Skolithus, Thalassinoides, Arenicolites, Corbula,* trace fossils and other unidentified burrow and worm trails are common in shallow water and shoreline sandstone.

Invertebrate fossils are known from the Blair Formation in the vicinity of the proposed route. It is unknown whether these remains are noteworthy or of much scientific significance. For that reason the formation satisfies BLM Condition 2 and PFYC 3..

Baxter Shale: The Baxter Shale underlines the western ½ of proposed loop segment 5 and consists chiefly of dark, gray, carbonaceous shale that contains sparse layers of gray-weathering limestone concretions and thin beds of very fine sandstone and siltstone that accumulated in marine environments. The Baxter Shale has produced a variety of marine invertebrates, including at least 15 genera of bivalves, scaphites and ammonites which occur abundantly in limestone concretions and thin sandy beds of the unit. Shark teeth and the remains of marine reptiles, plesiosaurs, and crocodiles are known from equivalent strata (Cody Shale, Pierre Shale, Niobrara Formation) at widely dispersed localities in eastern and northern Wyoming (Breithaupt, 1985; Weishampel, 1992) and similar remains may yet be found in the Baxter Shale

Fossil vertebrate remains are known from the Baxter and equivalent rocks at widespread locations in Wyoming, but have not been reported from the formations in the vicinity of the proposed route. For this reason the sandstone satisfies BLM Condition 2 and PFYC 3.

Recommendations: Based the results of the paleontologic resource evaluation and field survey the following mitigation is recommended:

I. Spot Checking Monitoring of Excavation: Spot checking of trench excavation is recommended in for all areas of BLM lands where pipeline excavation will occur on all six segments. Spot check includes the drive by and periodic visual examination of bedrock in spoils piles that have been excavated from the pipeline trench. Areas of spoils that show that no bedrock was penetrated need not be spot checked.

II. Discovery Contingency: If fossil materials of known or suspected scientific significance are uncovered during construction anywhere in the project area, the operator should stop work immediately and contact the authorized BLM officer. Activities should be redirected until the authorized officer can assess the situation and advise whether any mitigating measures need to be undertaken before operations can continue.

III. Curation of Specimens: Any fossil specimens of scientific significance recovered, if any, during spot check or as a result of accidental discovery should be curated into the collections of a museum repository acceptable to the Bureau of Land Management. Specimens should be prepared to the point of identification, identified, and catalogued into the permanent collections of an established institution. It is recommended that any collected specimens be curated into the Collections at the Department of Geology and Geophysics at the University of Wyoming (Laramie).

IV. Letter Report of Findings: Information on the fossils recovered, if any, and their curation during work implemented as a result of these recommendations should be incorporated into a final paleontology technical letter report prepared once the paleontologic work is completed.

The BLM can only require mitigation on public lands and some of the vertebrate fossil localities identified by this field survey occur on private lands and any mitigation conducted on these lands would be done only at the request of Enterprise or the land owner.

Sincerely,

Gustav F. Winterfeld — 18 November 2004

Gustav F. Winterfeld, PhD. — Date
Principal Scientist

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APPENDIX F
Special Status Species Table

APPENDIX F
SPECIAL STATUS SPECIES AND SPECIES OF SPECIAL CONCERN

Special Status Species	Scientific Name	Status[1]	Range and Habitat Association	Potential for Occurrence Within the Project Area	Eliminated From Further Analysis	References
MAMMALS						
Least shrew	*Cryptotis parva*	NM-T	This species has been documented in one county crossed by the proposed pipeline. In Chaves Co., this species has been found at Bitter Lake N.W.R. This species inhabits mesic and riparian habitats and in seeps, potholes, and swales.	None. No suitable habitat present within the proposed project area. Project area is outside the known range of this species.	Yes.	BISON-M 2004
Spotted bat	*Euderma maculatum*	NM-T; BLM; FS R3	This species is known to occur in Sandoval and Rio Arriba Counties and within the Rock Springs Field Office boundary. Typical habitat includes rocky areas near perennial water and other habitats including riparian, piñon-juniper woodlands, and ponderosa pine. Roost sites include crevices or cracks in cliffs or under loose rocks.	Low. This species could potentially occur within suitable habitats.	No.	BISON-M 2004
American Marten	*Martes americana origenes*	NM-T, FS R3	This species is known to occur in Sandoval and Rio Arriba Counties Habitat includes spruce-fir forests and Alpine habitat with an understory of fallen logs and stumps.	None. No suitable habitat present within the proposed project area.	Yes.	BISON-M 2004.
Black-footed ferret	*Mustela nigripes*	FE; NESL Group 2	Historically, this species was reported from all but the southernmost part of New Mexico (i.e., the area south of the Mogollon Plateau east of the Pecos Valley). The last confirmed sighting occurred in 1934. Suitable habitat consists of black-tailed prairie dog colonies or complexes (80 acres or greater) or Gunnison's prairie dog colonies or complexes (200 acres or greater). Presumed extirpated from New Mexico. This species may be present in suitable habitat in Wyoming in areas that have not been cleared.	Low. Potential occurrence would be based on the size and density of white-tailed prairie dog colonies that have been identified along the project route in portions of Wyoming. Species is presumed extirpated in New Mexico.	No.	BISON-M 2004; USFWS 2004. REF. Brian Kelly letter.
Pygmy rabbit	*Brachylagus idahoensis*	BLM; G4/S2; NSS3	This species occurs in dense sagebrush with relatively deep, loose soils. Wyoming portions of the project are within the potential range of the species.	Low. This species has not been identified within the project area.	Yes.	UDWR 2003

Special Status Species	Scientific Name	Status[1]	Range and Habitat Association	Potential for Occurrence Within the Project Area	Eliminated From Further Analysis	References
Pronghorn	*Antilocarpa americana*	NESL Group 3	This species occurs throughout the western United States including Wyoming, Colorado, Utah, Idaho, Nevada, Arizona, Texas, and New Mexico. General habitat associations include Great Basin and semidesert grasslands. This species prefer rolling or dissected hills or mesas. Pronghorn are highly mobile game species.	High. This species is present along all of the Wyoming Segments. Species is likely to be throughout much of the project area in New Mexico. Potential disturbance to species is temporary and localized.	Yes.	BISON-M 2004. O&G 2004.
Black-tailed prairie dog	*Cynomys ludovicianus*	NM	Within the project area, this species is only present in Chaves County. This species Inhabits shortgrass or mixed grasslands that contain suitable upland soil types for constructing burrow systems.	High. One black-tailed prairie dog colony is present near the Mesa Pump Station.	No.	BISON-M 2004. O&G 2004.
Arizona black-tailed prairie dog	*Cynomys ludovicianus arizonensis*	FS R3; BLM; NM	The range of this subspecies overlaps with that of *C. l. ludovicianus* in Torrance, Chaves, and Lincoln Cos. Broadly defined, this subspecies occurs in the southeastern part of the state.	None. Species was not identified within the project area.	Yes.	BISON-M 2004. O&G 2004.
Gunnison's prairie dog	*Cynomis Gunnisoni*	NM-SN	This species is known to occur throughout much of western New Mexico.	None. Species is not present within the project area.	Yes.	BISON-M 2004. O&G 2004.
White-tailed prairie dog	*Cynomis leucurus*	BLM; G4/S2S3; NSS3	This species is a common resident within the Green River and Great Divide Basins. The species is known to inhabit desert grasslands and shrub grasslands.	High. This species is present along many segments of the proposed pipeline.	No.	O&G 2004
New Mexican meadow jumping mouse	*Zapus hudsonius luteus*	NM-T; FWS; BLM; FS R3	This species has been identified as occurring in Sandoval and Rio Arriba Counties. This subspecies inhabits narrow grass-forb-willow streamside riparian habitat along permanent waterways and wet meadows in river floodplains.	None. This habitat type is not present within the proposed project area.	Yes.	BISON-M 2004; O&G 2004
Western red bat	*Lasiurus blossevillii*	FWS	This species is known to occur in Chaves County. Typical roost sites are in dense clumps of foliage in riparian or other wooded areas. They are typically found between 4,000 and 8,000 feet in elevation.	None. This species is not known to occur in the project area.	Yes.	AGFD 1993; BISON-M 2000; Findley et al. 1975; Harvey et al. 1999.
Eastern Red Bat	*Lasiurus borealis*	NM-S FS R3	This species is known to occur in Chaves County. Typical habitat in New Mexico includes deciduous riparian forest.	None. Suitable habitat for this species is not present within the project area.	Yes.	BISON-M 2004.

Special Status Species	Scientific Name	Status[1]	Range and Habitat Association	Potential for Occurrence Within the Project Area	Eliminated From Further Analysis	References
Western small-footed myotis	*Myotis ciliolabrum melanorhinus*	FWS; BLM	In New Mexico, this subspecies is known to occur throughout much of the state. This species is found in woodlands, forests, and desert communities. It is known to roost in caves, abandoned buildings, under rocks, in crevices, and under pine bark. This subspecies occurs at elevations between 5,200 and 7,050 feet.	Moderate. This species is expected to occur along the proposed route.	No.	BISON-M 2004
Little Brown Myotis	*Myotis lucifugus carissima*	NM-S	This species is known to occur in Sandoval County. Known roost sites have been in buildings.	Low. This species may occur in buildings near the proposed route.	Yes.	BISON-M 2004
Long-eared myotis	*Myotis evotis*	FWS; BLM	Within counties crossed by the project, this species is distributed mainly within western New Mexico and throughout Wyoming. This subspecies uses piñon-juniper woodlands and coniferous forests and roosts in caves, and buildings generally above 6,700 feet.	Moderate. This species could occur within suitable habitats along the proposed route.	No.	BISON-M 2004
Occult little brown bat	*Myotis lucifugus occultus*	FWS; BLM	This subspecies is widely distributed throughout western and central New Mexico. Along the proposed route, the species is known to occur in McKinley and Sandoval Counties. It uses riparian habitats associated with permanent water sources such as streams, drainage ditches, and lakes. They also are known to roost in man-made structures, caves, tunnels, and hollow trees including piñon-juniper, ponderosa pine and mixed conifer forests. This bat is most common at higher elevations between 6,000 and 9,000 feet in elevation.	Moderate. This species could occur within suitable habitats the proposed route.	No.	BISON-M 2004
Fringed myotis	*Myotis thysanodes*	FWS; BLM	This species is distributed throughout New Mexico except for the eastern portion of the state. It is also found within the Rock Springs and Rawlins Field boundaries. This species occurs in a wide variety of vegetation types including mixed shrub, grassland, sagebrush, piñon-juniper woodland, pine and mixed conifer forests, riparian woodlands, and cropland. They are known to roost in caves, mines, and buildings.	Moderate. This species could occur within suitable habitats the proposed route.	No.	BISON-M 2004
Cave myotis	*Myotis velifer*	FWS; BLM	This species is known to occur in Chaves and Lea Counties. This species is a desert and grassland bat that frequents watercourses. They roost primarily in caves and some man-made structures including buildings and under bridges. This species is found at elevations up to approximately 5,200 feet.	Low. This species could occur within suitable habitats the proposed route.	No.	BISON-M 2004
Long-legged myotis	*Myotis volans interior*	BLM; NM-S	This species is known to occur throughout New Mexico. Habitat is usually ponderosa pine and higher elevations.	Low. While this species migrates through lower elevations, preferred habitats are not present.	Yes.	BISON-M 2004

Special Status Species	Scientific Name	Status[1]	Range and Habitat Association	Potential for Occurrence Within the Project Area	Eliminated From Further Analysis	References
Yuma myotis	*Myotis yumanensis*	FWS; BLM	This species is known to occur in Sandoval, Rio Arriba, and Chaves Counties. This species is an uncommon seasonal visitor to desert, grassland, woodland, and riparian areas from 4,000 to 7,000 feet. They are known to roost in buildings, caves, and crevices.	Low. This species could occur within suitable habitats the proposed route.	No.	BISON-M 2004
Townsend's big-eared bat	*Plecotus townsendii*	FWS; BLM	This subspecies is fairly common in New Mexico and is known to occur in Sandoval, Rio Arriba, and Chaves Counties. It is also known to occur within the RSFO and RFO in Wyoming. this subspecies is primarily a cave dweller and is the bat most dependent upon inactive mines in the southwest. They can be found in desert shrublands, piñon-juniper woodlands, coniferous forests and mixed grass prairies. They will roost in trees, caves, or man-made structures. This is the only subspecies of bat commonly found in New Mexico during winter.	Low. This species could occur within suitable habitats the proposed route.	No.	BISON-M 2004
Big free-tailed bat	*Nyctinomops macrotis*	FWS; BLM	This species is known to occur in Sandoval and Rio Arriba Counties. This species is a summer resident that prefers coniferous and mixed woods and depends on rocky cliffs for roosting. They can be found in piñon-juniper woodland, pine and mixed coniferous forests, desert grassland, and other desert communities. In addition to roosting on rocky cliffs, they also may roost in caves, rock fissures, bridges, and buildings.	Low. This species could occur within suitable habitats the proposed route.	No.	BISON-M 2004
Swift fox	*Vulpes velox*	BLM; FWS; FS	The swift fox is mainly a Great Plains species that does not typically occur west of the Pecos River. The species is known to occur in Chaves, Lea and DeBaca Counties as well as within the RSFO and RFO in Wyoming. The swift fox is found in short-, mid- and mixed-grass prairies with gently rolling hills. They prefer habitat with sparse vegetation and where soft soils support a large population of rodent prey.	Low. This species exploits a wide variety of habitats. Potential impacts would be temporary and localized.	Yes.	BISON-M 2004
White-tailed Jackrabbit	*Lepus townsendii campanius*	NM-S	This species is known to occur in Rio Arriba County. Habitats include sagebrush dominated plains and open parkland on mountains. The species is very common in Colorado and other western states.	High. This species is very common in Wyoming, Colorado, and Utah. New Mexico population is on the fringe of the species range.	Yes.	BISON-M 2004
Desert pocket gopher	*Geomys arenarius brevirostris*	FWS	This subspecies is known to occur in Torrance County. Habitat for this subspecies consists of Barren lands indicative of sandy or loamy soils.	None. Suitable habitat for this species is not present in the project area.	Yes.	BISON-M 2004
Wyoming pocket gopher	*Thomomys clusius*	BLM; NSS4; FS R2	This species is known to inhabit dry ridgetops; gravelly, loose soil and low lands with greasewood within lands administered by BLM RSFO and RFO.	Low. These habitat types are limited within the project.	Yes.	WYNDD 2004

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Idaho pocket gopher	*Thomomys idahoensis*	BLM; G2/S1/S2; FS R2	This species is known to inhabit areas with shallow stony soils within the RSFO and KFO boundaries.	Moderate. Suitable habitat for this species is likely to occur within the project area.	No.	BLM 2002.
Heather vole	*Phenacomys intermedius intermedius*	NM- S	This species is known to occur in the Sangre de Cristo and San Juan Mountains at high elevations.	None. Suitable habitat for this species is not present in the project area.	Yes.	BISON-M 2004
Navajo mogollon vole	*Microtus mogollonen-sis navaho*	NESL Group 4	This species range is restricted to Navajo Mountain.	None. Project area is outside of species range	Yes.	BISON-M 2004
Red fox	*Vulpes vulpes*	NM-S	This species may be present in open woodlands, riparian, agricultural, and pasturelands.	Low. This species exploits a wide variety of habitats. Potential impacts would be temporary and localized.	Yes.	BISON-M 2004
Ringtail	*Bassariscus astutus*	FS R3; NM-S	This species is known to occur in rocky areas and cliffs in grasslands and open woodlands.	None. Suitable habitat for this species is not present in the project area.	Yes.	BISON-M 2004
Pecos River muskrat	*Ondatra zibethicus ripensis*	FWS; BLM	Within New Mexico, this subspecies is confined to the Pecos River drainage and its tributaries. They occur along permanent rivers, streams, irrigation ditches, and marshes where the water is calm and aquatic vegetation is abundant.	None. Suitable habitat for this species is not present in the project area.	Yes.	BISON-M 2004
Western spotted skunk	*Spilogale gracilis*	NM-S	This species is likely to inhabit coniferous and mixed woodlands.	Low. Suitable habitat for this species is present within the project area. Disturbance to habitat is expected to be temporary and confined to the construction ROW.	Yes.	BISON-M 2004
Common hog-nosed skunk	*Conepatus mesoleucus*	NM-S	This species is known to occur in creosote desert to open woodlands in Chaves and Torrance Counties.	Low. Suitable habitat is present along proposed route. . Disturbance to habitat is expected to be temporary and confined to the construction ROW.	Yes.	BISON-M 2004
Sandhill white-tailed deer	*Odocoileus virginianus texana*	NM-S M	This species is known to occur in Chaves and Lea Counties. Habitat includes sandhill country east of Roswell.	None. Suitable habitat for the species is not present within the project area.	Yes.	BISON-M 2004

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Rocky Mountain bighorn sheep	*Ovis canadensis canidensis*	FS R3; NM-M	This species was previously extirpated from the state and reintroduced. The species typically inhabits high elevation mountain areas.	None. Suitable habitat for this species is not present in the project area.	Yes.	BISON-M 2004
Goat Peak Pika	*Ochotona princeps nigrescens*	FWS; BLM; FS R3; FWS	This subpecies is confined to the Jemez Mtns. in Sandoval Co. It is restricted to patches of large talus (lava) slopes and boulder fields in alpine and sub-alpine zones above 9,000 feet elevation.	None. Project is outside of species range.	Yes.	BISON-M 2004
Yellow-bellied marmot	*Marmot flaviventris*	NM-S	This species is known to occur in Spruce-Fir forest from approximately 11,000 feet to well above tree-line.	None. Project is outside of species elevational range.	Yes.	BISON-M 2004
BIRDS						
Clark's grebe	*Aechmo-phorus clarkii*	FS R3	This species is known as a rare transient in Rio Arriba County.	None. Project is outside of species range.	Yes.	BISON-M 2004
Brown Pelican	*Pelecanus occidentalis carolinensis*	FS R3; FE; NM-E ; BLM	This subspecies breeds along sea coasts from southern California and North Carolina to South America and is considered an occasional visitor to New Mexico; averaging three individuals per year, primarily associated with large lakes and major rivers including the San Juan, Gila, Rio Grande, and Pecos drainages.	Low. This subspecies could potentially occur as a rare visitor along portions of the Rio Grande.	Yes.	BISON-M 2004.
Neotropic cormorant	*Phalacro-corax brasilianus*	NM-T	This species is a widespread waterbird of Central and South America. Nesting is known to occur in the middle Rio Grande Valley at Elephant Butte and Caballo lakes, and at the Bosque del Apache N.W.R. Nonbreeders have been recorded north from Bernalillo Co. and east to the Tularosa Basin and lower Pecos Valley. Nesting occurs in stands of trees or shrubs in or near water in areas that are free from human disturbance.	None. This species is not known to occur within the project area. Existing disturbance levels from casino construction and tamarisk removal projects would likely discourage nesting in this area.	Yes.	BISON-M 2004; O&G 2004
American bittern	*Botaurus lentigunosus*	FS R3	This species is known to occur in Chaves, Rio Arriba, and McKinley Counties. Typical habitat includes marshy areas and riparian habitat.	None. Suitable habitat for this species is not present within the project area.	Yes.	BISON-M 2004.
Least Bittern	*Ixobrychus exilis exilis*	FS R3	This species is known to summer in the middle and lower Rio Grande.	None. Project area is outside of the species known range.	Yes.	BISON-M 2004.
Great egret	*Ardea alba egretta*	FS R3	This species is a migrant known to occur throughout the state in wetlands.	None. Suitable habitat for this species is not present within the project area.	Yes.	BISON-M 2004.
Snowy Egret	*Egretta thula brewsteri*	FS R3	This species is a migrant known to occur throughout the state in wetlands.	None. Suitable habitat for this species is not present within the project area.	Yes.	BISON-M 2004.

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Green heron	*Butorides virescens*	FS R3	This species is a migrant known to occur in the Rio Grand Valley. Typical habitat includes wooded riparian areas and lowlands.	Low. This species is not known to occur within the project area. Existing disturbance levels from casino construction and tamarisk removal projects would likely discourage nesting in this area.	Yes.	BISON-M 2004. O&G 2004.
Black-crowned night-heron	*Nycticorax nycticorax hoactli*	FS R3	This species is a migrant known to occur in the Rio Grand Valley. Typical habitat includes wooded riparian areas and lowlands.	Low. This species is not known to occur within the project area. Existing disturbance levels from casino construction and tamarisk removal projects would likely discourage nesting in this area.	Yes.	BISON-M 2004.
Osprey	*Pandion haliaetus carolinensis*	FS R3	This raptor species is a rare resident and more commonly a transient or migrant in Counties crossed by the proposed project. Habitat includes riparian forest near productive fisheries.	Low. Potential habitat for this species exists along the proposed Rio Grande Crossing.	No.	BISON-M 2004. O&G 2004.
White-tailed Kite	*Elanus caeruleus majusculus*	FS R3	This species is known only as migrant or transient within New Mexico.	None. Project area is outside of species known range.	Yes.	BISON-M 2004.
Mississippi kite	*Ictinia mississip-piensis*	FS R3	This species is known to summer on golf courses and air force bases in the Roswell and Hobbs area.	None. Preferred habitats for this species are not present within the project area.	Yes.	BISON-M 2004.
Golden eagle	*Aquila chrysaetos*	NESL Group 3	Throughout the project area, these eagles are residents and migrants. This species inhabits shrubland, grassland, tundra, coniferous forests, and woodlands. Nesting typically occurs on rock cliffs, mesas, or canyon walls near open to semi- open areas between 4,000 to 10,000 feet in elevation.	High. This species has been documented nesting within 1/2 – mile of the project area in Wyoming. Potentially suitable habitat is present along the project route.	No.	BISON-M 2004; O&G 2004.
Ferruginous hawk	*Buteo regalis*	FWS; BLM; USFS; NESL Group 3	In Wyoming this species is common and likely to be present. In New Mexico, this species occurs primarily as a rare to uncommon transient and winter migrant statewide. Breeding by this species is less common in New Mexico. Nest sites include trees, ledges, large rock outcrops, and low cliffs in sagebrush valleys and rolling grasslands.	High. Suitable habitat is present near several pump stations and pipeline segments.	No.	BISON-M 2004; O&G 2004.
Swainson's hawk	*Buteo swainsoni*	NESL Group 3; BLM; FS R3	This species is known to occur throughout the entire project area. This species prefers mixed to short-grass habitats with scattered trees and nest in isolated trees, often associated with riparian woodlands.	High. This species was observed nesting near pipeline segments in New Mexico.	No.	BISON-M 2004; O&G 2004

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Common Black-hawk	*Buteogallus anthracinus anthracinus*	NM-T; FWS; FS R3	This subspecies occurs primarily at lower elevations in southwestern New Mexico. However, individuals have been recorded in the middle Rio Grande Valley and have bred northward to Bernalillo Co. Nesting occurs in mature, well-developed riparian trees that are located near permanent streams.	Low. This species could nest within potentially suitable habitat along portions of existing pipeline ROW the Rio Grande (Sandoval Co.) Existing disturbance levels from casino construction and tamarisk removal projects would likely discourage nesting in this area.	Yes.	BISON-M 2004
Zone-tailed hawk	*Buteo albonotatus*	FS R3	Most reports of this species within New Mexico are within riparian and montane habitats.	Low. This species is not known to occur along the portion of the Rio Grand River crossed by the pipeline. Suitable habitat for the species is not present in other project areas.	Yes.	BISON-M 2004
Bald eagle	*Haliaeetus leuco-cephalus*	FT2; NM-T; NESL Group 3	Throughout the project area, bald eagles may be present as migrants or wintering birds. While no known nesting sites have been identified within the project area, potential nesting habitat is limited to riparian habitat along the Rio Grande. Riparian areas and wetlands are primary habitat for winter roost areas and during migration.	Low. Potential habitat for this species exists along the proposed Rio Grande Crossing.	No.	BISON-M 2004; O&G 2004.
Northern aplomado falcon	*Falco femoralis septen-trionalis*	FE; NM-E	Prior to the 1960s, this subspecies was at best only accidental in New Mexico. The last documented nesting by this subspecies in the state was in 1952. Since then, increased numbers of observations have been reported in New Mexico including sightings in Eddy, Otero and Lea Cos. This subspecies inhabits open plains with grasses, mesquite, cactus, and yucca. Nesting occurs in low trees or yucca.	Low. This rare falcon could occur as a rare migrant or transient in Lea County. No falcon nests have been identified near the project area. Occurrence of this species within the project area would be highly unlikely.	Yes.	BISON-M 2004; O&G 2004.
American peregrine falcon	*Falco peregrinus anatum*	NM-T; FWS; BLM; NESL Group 4	In New Mexico and Wyoming, this subspecies breeds locally in mountain areas and migrates statewide. Nests are often located on cliff faces with overhanging ledges or rock outcrop.	Low. No falcon nest sites have been identified as occurring within the vicinity of the project route. Suitable nesting habitat is not present within the project area.	Yes.	BISON-M 2003; O&G 2004.

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Arctic peregrine falcon	*Falco peregrinus tundrius*	NM-T; FWS; BLM; NESL Group 3	This subspecies is a very rare migrant through New Mexico and Texas.	Low. This migrant subspecies could potentially forage within suitable habitat along the project route.	Yes.	BISON-M 2003; O&G 2004
White-tailed ptarmigan	*Lagopus leucurus altipetens*	NM-E	In New Mexico, this subspecies is limited to alpine habitats within the Sangre de Cristo Mtns. From the vicinity of Santa Fe Baldy and Pecos Baldy northward to the Colorado line.	None. No suitable habitat is present within the project area.	Yes.	BISON-M 2004.
Greater sage grouse	*Centrocercus urophasianus*	BLM; FPET	This species is known to occur throughout Wyoming. Typical habitat includes sagebrush steppe.	High. Species is known to occur on or near segments in Wyoming.	No.	BLM 2004
Columbian sharp-tailed grouse	*Tympanuchus phasianellus columbianus*	BLM; FS R2	This species is listed as occurring within the boundaries of the BLM Rawlins Field Office. The species is generally found in the eastern portion of Wyoming.	None. Species is not known to occur in the project area.	Yes.	BLM 2004
Lesser prairie chicken	*Tympanuchus pallidicinctus*	FC; BLM	In New Mexico, this species is a resident of eastern plains and is known to occur in Chaves, Eddy, and Lea Cos. This species occurs in short- and tall-grass prairie and shrubsteppe with sagebrush and yucca components. Breeding occurs on lek sites (or strutting grounds) that are typically located on sparsely vegetated elevated areas, ridgelines, or hilltops.	High. Lek sites for this species are likely to occur near the project area.	No.	BISON-M 2004
Sora	*Porzana carolina*	FS R3	This species is dependent on riparian and associated aquatic habitats.	None. Suitable habitat for this species is not present within the project area.	Yes.	BISON-M 2004
Whooping crane	*Grus americana*	FE, EXPN, mg; NM-E; FS R3	This species is known to migrate throughout New Mexico. Typical habitat includes marsh and wetland areas.	None. Suitable habitat for this species is not present within the project area.	Yes.	BISON-M 2004
Western snowy plover	*Charadruis alexandrinus nivosus*	FS R3	This species is known to migrate and breed in New Mexico. Preferred habitats include lake shores and playas.	None. Suitable habitat for this species is not present within the project area.	Yes.	BISON-M 2004
Mountain plover	*Charadrius montanus*	FW R3; BLM; NESL Group 4	This species is known to occur in most counties crossed by the proposed pipeline. This species inhabits flat, short-grass prairie in areas often grazed by livestock and in areas occupied by prairie dog colonies.	Low to moderate. This species could potentially nest within potentially suitable habitat along portions of existing and new build pipeline ROW.	No.	BISON-M 2004. O&G 2004
Black-necked stilt	*Himantopus mexicanus*	FS R3	This species is a rare to uncommon migrant and occasional nester. Preferred habitats include riparian, wetland, and aquatic.	Low. Preferred habitat types are not present within the project area.	Yes.	BISON-M 2004

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Upland sandpiper	*Bartramia longicauda*	FS R3	This species is a common migrant throughout New Mexico. Preferred habitats include hayfields, agricultural lands, and open areas.	Low. Species could be encountered during migration.	Yes.	BISON-M 2004
Long-billed curlew	*Numenius americanus*	BLM; FS R3	This species is an uncommon breeder and fairly uncommon migrant throughout the project area.	Low. Species could be encountered during migration.	Yes.	BISON-M 2004
Common snipe	*Gallinago gallinago*	NESL Group 3	In New Mexico, this species migrates throughout the state and winters statewide. It is a rare resident throughout much of the state. This species occupies shallow wetlands associated with riverine and palustrine areas.	None. Potential habitat for this species is not present within the project area.	Yes.	BISON-M 2004. O&G 2004.
Interior least tern	*Sterna antillarum athalassos*	FE; NM-E	This subspecies is not known to occur within the project area. It is a summer resident in other parts of New Mexico and in eastern Wyoming. The nearest nesting location for the species is in the Bitter Lake N.W.R. Nests are typically found in open, sandy beaches and on sand and gravel bars in wide river channels.	None. The project area is outside of species known range. Preferred habitats are not present within the project area.	Yes.	BISON-M 2004; O&G 2004.
Common ground dove	*Columbina passerina pallescens*	NM-E	Southern New Mexico is on the northern fringe of this subspecies range. This subspecies may be present in agricultural and undeveloped areas at elevations below 5,400 feet in the southeastern part of the state. No nesting by this subspecies has been reported in New Mexico. The species status is secure in other states and throughout its range.	None. The project area is not within the range of this species.	Yes.	BISON-M 2004
Yellow-billed cuckoo	*Coccyzus americanus*	FC; BLM; NESL Group 3	This species is known to occur throughout Wyoming and New Mexico. Potential habitat for this species is defined as open woodlands, streamside willow and alder groves. The mature riparian woodlands along the Rio Grande may provide suitable habitat.	Low. This species could potentially nest in habitat along the Rio Grande (Sandoval Co.) Existing disturbance levels from casino construction and tamarisk removal projects would likely inhibit the species from nesting in this area.	No.	BISON-M 2004
Flam-mulated owl	*Otus flammeolus*	FS R3	This species is expected to occur in all mid-elevation pine forests west of the Black Hills.	Low. This species may be present within wooded areas along the pipeline.	No.	BISON-M 2004
Boreal owl	*Aegolius funereus*	NM-T; FS R3	This species occurs in the San Juan, Sangre de Cristo, and Jemez Mtns. in northern New Mexico. It inhabits spruce-fir forests.	None. Suitable habitat for this species is not present within the project area.	Yes.	BISON-M 2004
Black swift	*Cupseloides niger borealis*	NM-S	This species typically nests in shallow caves in steep canyons near waterfalls.	None. Suitable habitat for this species is not present within the project area.	Yes.	BISON-M 2004

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Mexican spotted owl	*Strix occidentalis lucida*	FT; NESL Group 3	In New Mexico, this subspecies has been reported in a number of counties including San Juan, Sandoval, McKinley, Bernalillo, Torrance, Lincoln, and Eddy Cos. This subspecies is found primarily in canyons, mixed conifer forests, pine-oak woodlands and riparian areas. This subspecies nests on platforms and large cavities in trees, on ledges, and in caves.	None. Suitable habitat for this species is not present within the project area.	Yes.	BISON-M 2004O&G 2004.
Broad-billed hummingbird	*Cynanthus latirostris magicus*	NM-T; FS R3	In New Mexico, this subspecies is a regular summer resident only in Guadalupe Canyon of southwestern NM (Hidalgo Co.). Habitats used by this subspecies are varied; nesting habitat is typically riparian woodland with cottonwoods, hackberry, and sycamore at low to middle elevations.	None. Suitable habitat for this species is not present within the project area.	Yes.	BISON-M 2004; O&G 2004
Blue-throated hummingbird	*Lampornis clemenciae bessophilus*	FS R3	This species is mainly known to occur in the lower Rio Grande Valley within New Mexico.	None. The project area is outside of the species known range.	Yes.	BISON-M 2004
Belted kingfisher	*Ceryle alcyon*	FS R3	This species is known to occur along the middle Rio Grande. Where banks that are suitable for nesting and riparian habitats are present.	Low. Suitable habitat for the species may be present along the Rio Grande. The species is not known to occur within the project area.	Yes.	BISON-M 2004
South-western willow flycatcher	*Empidonax traillii extimus*	FE; NM-E; NESL Group 2	This subspecies breeds primarily in New Mexico, Arizona, and southern California. Most records in New Mexico are from the Rio Grande Valley and westward with the largest colony on the Gila River. Nesting habitat includes shrubs and trees in willow thickets, shrubby mountain meadows, and deciduous woodlands along streams, lakes, and bogs.	Low. This species could potentially nest in habitat along the Rio Grande. Existing disturbance levels from casino construction and tamarisk removal projects would likely inhibit the species from nesting in this area.	No.	BISON-M 2004; O&G 2004
Bell's vireo	*Vireo bellii*	NM-T; FWS; FS R3	This species regularly breeds in the southernmost portion of New Mexico. Known locations include the lower Rio Grande drainage. Primary habitat is mainly shrub and woodlands along lowland streams. Other habitats used include desert scrub, annual grasslands, and agricultural areas.	Low. Project area is outside of the species known range.	Yes.	BISON-M 2004; O&G 2004.

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Gray vireo	*Vireo vicinior*	NM-T	This neotropical migrant breeds only within portions of the southwestern states. In New Mexico, the species has been recorded in the Guadalupe and San Andres Mtns., the San Juan River Valley, Navajo lake, and around Santa Fe. Records for the Sandia and Manzano Mtns. are for rare transients only. The species uses upland habitats in canyons, foothills, and open woodlands. Most use is within fairly open woodland savannahs.	None. Project area is outside of the species known range. Disturbance to potential habitat would be temporary and localized.	Yes	BISON-M 2004; O&G 2004
Gray catbird	*Dumetella carolinensis ruficrissa*	FS R3	This species is known to inhabit the lower and possibly the middle Rio Grande Valley.	Low. This species may occur in small numbers as far north as the proposed crossing location of the Rio Grande. Existing disturbance levels from casino construction and tamarisk removal projects would likely inhibit the species from nesting in this area.	Yes.	BISON-M 2004; O&G 2004
Sprague's pipit	*Anthus spragueii*	FS R3	This grassland species breeds in short-grass prairies. It is known as a common migrant and less common breeder in New Mexico.	Low. This species may be encountered as a migrant and is not likely to be encountered nesting.	Yes.	BISON-M 2004; O&G 2004
American redstart	*Setophaga ruticilla tricolora*	FS R3	This neotropical migrant over-winters in mature tropical forests. They migrate thorugh New Mexico and may nest in undisturbed woodlands. The species tends to shun disturbed areas and is not likely to occur along the existing pipeline route.	Low. Preferred undisturbed woodland habitat is not present within the project area.	Yes.	BISON-M 2004; O&G 2004
Baird's sparrow	*Ammo-dramus bairdii*	NM-T; FWS; BLM	This grassland bird breeds in the northern Great Plains and winters in southeastern Arizona to southwestern Texas. In New Mexico and Wyoming, it is primarily a migrant. This species utilizes short-grass prairie, grasslands, and weedy fields.	Low. This winter migrant could potentially occur along the project route within suitable habitat. Disturbance to potential habitat would be temporary and localized.	Yes.	BISON-M 2004; O&G 2004
McCown's longspur	*Calcarius mccownii*	FS R3	This species is known as a migrant throughout the state. It is known to occasionally inhabit grasslands in the southwestern portion of the state.	Low. This species may be encountered during migration.	Yes.	BISON-M 2004

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White-faced ibis	*Plegadis chihi*	BLM	This species is a statewide migrant in both Wyoming and New Mexico. It is considered to be rare to uncommon throughout most of the project. Breeding is known to occur in Rio Arriba County. This species Inhabits shoreline and marsh habitats that border open water; desert riparian; deciduous woodland-marsh; and grassland and agricultural lands.	None. Preferred habitats for this species are not present within the project area.	Yes.	BISON-M 2004.
Trumpeter swan	*Cygnus buccinator*	BLM; FS R2	This species is known to occur in lakes, ponds and rivers throughout Wyoming during migration.	None. Suitable habitat for this species is not present within the project area.	Yes.	BLM 2002
Northern goshawk	*Accipiter gentilis*	FWS; BLM; FS	Goshawks are permanent residents of most mountain ranges in New Mexico and Wyoming. Goshawks prefer mature, closed canopied coniferous forests of mountains and mesas. They are typically found in ponderosa pine, mixed-conifer, and spruce-fir forests. Nest sites are located in large trees in aged forests.	None. Suitable habitat for this species is not present within the project area.	Yes.	BISON-M 2004; O&G 2004
Black tern	*Chlidonias niger surinamensis*	FWS; BLM	Black terns are known to occur along the Rio Grande Valley among other places., The subspecies is a seasonal resident throughout New Mexico in riparian, marsh, and open water habitats. They are found at lower and middle elevations between 2,800 and 7,500 feet. Successful breeding depends on steady water levels.	Low. This subspecies could occur along the project route at the Rio Grande.	No.	BISON-M 2004.
Western burrowing owl	*Athene cunicularia hypugea*	FWS; BLM; FS	Burrowing owls are summer residents in Wyoming and New Mexico. They typically nest in abandoned burrows of prairie dogs, ground squirrels, foxes, and badgers in grassland, open shrubland, and woodland communities.	High. Burrowing owls have been observed along existing ROWs within the project area.	No.	BISON-M 2004; O&G 2004
Sage Thrasher	*Oreoscoptes montanus*	BLM	This species is known to inhabit basin prairie scrub and mountain foothill shrub habitats in Wyoming.	Moderate. Habitat for this species is present within the project area.	No.	BLM 2002
Loggerhead shrike	*Lanius ludovicianus*	FWS; BLM	This species is a widespread summer resident in New Mexico and Wyoming. They are known to occur throughout the state. Their primary habitat is open country interspersed with pastures, grasslands, and hedgerows below 9,000 feet. Nesting habitat includes sagebrush areas, desert scrub, piñon-juniper woodlands, and woodland edges.	Moderate. This species could nest within potentially suitable habitat along the entire project route within appropriate shrub and woodland habitats.	No.	BISON-M 2000; BLM 1995.
Brewer's sparrow	*Spizella breweri*	BLM	This species is known to inhabit basin prairie scrub habitats.	Moderate. Habitat for this species is present within the project area.	No.	BLM 2002

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Sage sparrow	*Amphispiza belli*	BLM	This species is known to inhabit basin prairie scrub and mountain foothill shrub habitats in Wyoming.	Moderate. Habitat for this species is present within the project area.	No.	BLM 2002
REPTILES						
Texas horned lizard	*Phrynosoma cornutum*	FS R3; BLM	This species ranges from Kansas to Mexico. In New Mexico, it ranges throughout the southern counties extending northward in to the Rio Grande Valley to Socorro Co. Specimens from the Albuquerque area are probably escaped pets. This is a species of open deserts and grasslands with sparse vegetation. Sometimes associated with prairie dog towns. Individuals may bury themselves in loose soils that are sandy, loamy or rocky and will hide under rocks.	Moderate. This species may occur along portions of existing ROW in Chaves and Lea Counties.	No.	BISON-M 2004
Sand dunes lizard	*Sceloporus arenicolus*	FC; NM-T; BLM	This species is endemic to southeast New Mexico and Texas. In New Mexico it may be found in disjunct populations within Chaves, and Lea Counties. In southeastern New Mexico, they are mainly found on the Mescalero Sands from Chaves to Lea Counties. The species depends on unstable sand dunes with sparse stands of low vegetation, especially shinnery oak, mesquite, sand sagebrush, and yucca.	Low. Preferred habitat for this species is not present in the project area.	Yes.	BISON-M 2004; O&G 2004.
White Sands Prairie Lizard	*Sceloporus undulates cowlesi*	NM-SN	Known only to inhabit the dune fields at White Sands National Monument.	None. Project area is outside of species range.	Yes	BISON-M 2004
Midget faded rattlesnake	*Crotalus viridus concolor*	BLM	This species is listed as potentially occurring within the boundary of BLM RSFO. The species is known to inhabit mountain foothills shrub habitats and rocky outcrops.	Low. This species has not been identified as occurring within the project area.	Yes.	BLM 2002
Desert Kingsnake	*Lampro-peltis getula splendida*	FS R3	Likely to occur in grassland flats. May occur in Riparian areas and mesquite dominated bajada.	Moderate. Suitable habitat for this species is present throughout much of the project area in New Mexico and Utah.	No	BISON-M 2004
Arid land ribbon snake	*Thamnophis proximus diabolicus*	NM-T; FS R3	In New Mexico, this subspecies is known from scattered localities in the eastern third of the state. Records include occurrences in the lower Pecos River drainage near Artesia, Roswell and Carlsbad. This subspecies inhabits streams, ponds, marshes, and occasionally stock tanks with associated riparian and emergent vegetation.	None. Preferred habitat for this species is not present in the project area.	Yes.	BISON-M 2004; O&G 2004

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Amphibians						
Jemez Mountain salamander	*Plethodon neo-mexicanus*	NM-T	Jemez Mountains in mixed conifer habitat with abundant rotted logs and surface rocks at elevations between 7,200 and 9,550 feet.	None. Project area is outside of species range.	Yes.	NMDGF 2000.
Western boreal toad	*Bufo boreas boreas*	BLM; FC; NM-E; FS R3	This species is only known to occur in high elevation aquatic and semi-aquatic habitats.	None. Suitable habitat for this species is not present within the project area.	Yes.	BISON-M 2004; O&G 2004
Great Basin spadefoot	*Spea inter-montana*	BLM	This species is known to occur in springs, seeps, permanent, and temporary waters.	Low. Suitable habitat for this species is only present along the Rio Grande and Blacks Fork River. Habitat for this species would be avoided with HDD.	Yes.	BLM 2002
Spotted frog	*Ranus pretiosa*	BLM	This species is known to inhabit ponds, sloughs, and small streams.	Low. Suitable habitat for this species is only present along the Rio Grande and Blacks Fork River. Habitat for this species would be avoided with HDD.	Yes.	BLM 2002
Northern leopard frog	*Rana pipiens*	BLM; NESL Group 2; FS R3	This species inhabits ponds, wetland areas, riparian, and other semi-aquatic environments.	Low. Suitable habitat for this species is only present along the Rio Grande and Blacks Fork River. Habitat for this species would be avoided with HDD.	Yes.	BISON-M 2004; O&G 2004
FISH						
Rio Grande silvery minnow	*Hybognathus amarus*	FE; NM-E; FS R3	Variety of habitats in the Rio Grande with shifting sand or silty bottoms. Perennial stretches of the river between the Santo Domingo Pueblo (Sandoval Co.) and Socorro are important habitat for the species.	High. This species, while rare, has known populations in vicinity of the project area within the Rio Grande.	No.	BISON-M 2004.
Pecos bluntnose shiner	*Notropis simus pecosensis*	FT; NM-T	Main channel areas with low velocity water and a sandy substrate in the Pecos River.	None. Project is not within the species known range.	Yes.	BISON-M 2004.
Pecos pupfish	*Cyprinodon pecosensis*	FWS; NM-T; FS	Variety of habitats associated with the Pecos River from saline springs and gypsum sinkholes to desert streams with highly fluctuating conditions.	None. Project is not within the species known range.	Yes.	BISON-M 2004.
Colorado pikeminnow	*Ptychocheilus lucius*	FE; NM-E; NESL Group 2	Present in the Colorado River Watershed and the San Juan River from Lake Powell upstream to Farmington, New Mexico.	None. Project is not within the species known range.	No.	BISON-M 2004.

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Razorback sucker	*Xyrauchen texanus*	FE; NM-S; NESL Group 2	Present in the Colorado River watershed and historically present in the San Juan River.	None. Project is not within the species known range.	No.	BISON-M 2004.
Zuni bluehead sucker	*Catostomus discobolus yarrowi*	FC; NM-E; BLM; FS	Currently is limited to the Rio Nutria drainage in eastern New Mexico.	None. Project is not within the species known range.	Yes	BISON-M 2004.
Flannelmouth sucker	*Catostomus latipinnis*	BLM	This species is known to occur within the Colorado River drainage, large rivers, and lakes.	None. Project activities will not affect the Colorado River drainage.	Yes.	BLM 2002
Colorado River cutthroat trout	*Oncor-hynchus clarki pleuriticus*	BLM	This species is known to occur within the Colorado River drainage and clear mountain streams.	None. Project activities will not affect the Colorado River drainage or mountain streams.	Yes.	BLM 2002
Bonneville cutthroat trout	*Onco-rhynchus clarki utah*	BLM	This species is listed as potentially occurring within the boundary of the BLM KFO and is known to occur within the Bear River drainage.	None. Project is not within the species known range.	Yes.	BLM 2002
Tine-spotted Snake River cutthroat trout	*Oncor-hynchus clarki* spp	BLM	This species is listed as potentially occurring within the boundary of the BLM KFO and is known to occur within the Snake River drainage.	None. Project is not within the species known range.	Yes.	BLM 2002
Mexican tetra	*Astyanax mexicanus*	NM-T	Pools and below swift areas in eddies, especially in habitats with spring-fed flows.	None. Suitable habitat for this species is not present in the project area.	Yes.	BISON-M 2004.
Roundtail chub	*Gila robusta*	NM-E; BLM; FWS; NESL Group 2	Present in the San Juan River.	None. Project is not within the species known range.	Yes.	BISON-M 2004.
Greenthroat darter	*Etheostoma lepidum*	NM-T; FWS; FS	Riffles in the Pecos River, springs, spring runs, and small impoundments with dense vegetation and sand, gravel, or cobble substrates.	None. Project is not within the species known range.	Yes.	BISON-M 2004.
Bigscale logperch	*Percina macrolepida*	NM-T	Rare in the Pecos River between Fort Sumner and Artesia; usually found in fast-flowing water.	None. Project is not within the species known range.	Yes.	BISON-M 2004.
Gray redhorse	*Moxostoma congestum*	NM-T; FS	No longer present in the Rio Grande; rare in the lower Pecos River from Carlsbad downstream to the New Mexico/Texas state line.	None. Suitable habitat for this species is not present in the project area.	Yes.	BISON-M 2004.

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Sucker-mouth minnow	*Phenacobius mirabilis*	NM-T	Riffles in small to moderate-sized clear water to moderately turbid streams such as the Pecos River with substrates ranging from sand and gravel to large boulders.	None. Project is not within the species known range.	Yes.	BISON-M 2004.
Rio Grande cutthroat trout	*Oncorhynchus clarki virginalis*	FWS	This subspecies currently inhabits headwater areas in the Rio Grande and Pecos drainages.	None. Project is not within the species known range.	Yes.	BISON-M 2004.
Rio Grande sucker	*Catostomus plebeius*	FWS; FS R3	This species currently inhabits the northern portion of the Rio Grande and its tributaries.	Low. This species potentially occurs along the portion of the Rio Grande that is crossed by the existing pipeline.	No.	BISON-M 2002.
Headwater catfish	*Ictalurus lupus*	FWS; FS R3	This species occurs in the middle Rio Grande.	None. This species is not known to occur in the section of the Rio Grande that is crossed by the pipeline.	Yes.	BISON-M 2004.
Rio Grande shiner	*Notropis jemezanus*	FWS; BLM; FS R3	This species is currently limited to the Pecos River. Habitat consists of larger streams with gravel, sand, or rubble substrate with minimal vegetation.	None. Project is not within the species known range.	Yes.	BISON-M 2004.
Flathead chub	*Platygobio gracilis*	BLM	Rio Grande.	Low to Moderate. Known to occur in the Rio Grande at or downstream of the existing pipeline crossing.	No.	BISON-M 2004.
Rio Grande chub	*Gila pandora*	FS R3; NM-S	Historically, this species occurred in Rio Grande and Pecos Rivers.	None. This species is not known to occur in the section of the Rio Grande that is crossed by the pipeline.	Yes.	BISON-M 2004.
INVERTEBRATES						
Pecos assiminea snail	*Assiminea pecos*	PE; NM-E; FS	Terrestrial snail known to occur in Chaves County that lives on moist substrates adjacent to wetlands or streams.	None. Suitable habitat for this species is not present within the project area in Chaves County.	Yes.	BISON-M 2004
Koster's tyronia snail	*Tyronia kosteri*	PE; NM-E; FS	Slow-velocity water in springs and streams at one spring in Roswell Country Club and four springs in the Bitter Lake N.W.R.	None. This species is not known to occur within the project area.	Yes.	BISON-M 2004
Wrinkled marshsnail	*Stagnicola caperatus*	NM-E	This species is known from two isolated populations in wetlands in the Bitter Lake N.W.R. and Jemez Mountains.	None. This species is not known to occur within the project area.	Yes.	BISON-M 2004
Roswell pyrg snail (springsnail)	*Pyrgulopsis roswellensis*	PE; NM-E; FS	Thermal springs near Roswell and the Bitter Lake N.W.R.	None. Suitable habitat for this species is not present within the project area.	Yes.	BISON-M 2004

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Noel's amphipod	*Gammarus desperatus*	PE; NM-E; BLM; FS	Springs derived from marine sediments in the Roswell Country Club and the Lost River in the Bitter lake N.W.R.	None. This species is not known to occur within the project area.	Yes.	BISON-M 2004
PLANTS						
Laramie columbine	*Aquilegia laramiensis*	BLM	This species is listed as occurring within the BLM RFO. Typical habitat includes crevices of granite boulders and cliffs between 6400 and 8000 feet.	None. Suitable habitat for this species is not present within the project area.	Yes.	BLM 2002
Nelson's milkvetch	*Astragalus nelsonianus*	BLM	This species is listed as occurring within the BLM RFO. Habitats include alkaline clay flats, pebbly slopes, and volcanic cinders in sparsely vegetated sagebrush, juniper, and cushion plant communities between 5200 and 7600 feet.	Moderate. This species has been identified near the project area in RSFO and KFO.	No.	BLM 2004
Cedar Rim thistle	*Cirsium aridum*	BLM	This species is listed as occurring within the BLM RFO. This species is known to inhabit barren, chalky hills, gravelly slopes, and fine textured, sandy-shaley draws.	Moderate. This species has been identified near the project area in RSFO and KFO.	No.	BLM 2004
Weber's scarlet gilia	*Ipomopsis aggregate ssp.*	BLM	This species is listed as occurring within the BLM RFO. This species is known to inhabit openings in coniferous forests and scrub oak woodlands.	None. Suitable habitat for this species is not present within the project area.	Yes.	BLM 2002
Gibbens beardtongue	*Penstemon gibbensii*	BLM	This species is listed as occurring within the BLM RFO. This species is known to inhabit sparsely vegetated sandy, shale, or clay slopes.	None. Suitable habitat for this species is not present within the project area.	Yes.	BLM 2002
Persistent sepal yellowcress	*Roripa calycina*	BLM	This species is listed as occurring within the BLM RFO. This species is known to inhabit riverbanks and shorelines near high water mark.	None. Suitable habitat for this species is not present within the project area.	Yes.	BLM 2002
Laramie false sagebrush	*Sphaero-meria simplex*	BLM	This species is listed as occurring within the BLM RFO. This species is known to inhabit cushion plant communities on rocky limestone ridges between 7500 and 8600 feet.	None. Suitable habitat for this species is not present within the project area.	Yes	BLM 2002
Ownbey's thistle	*Cirsium ownbey*	BLM	This species is known to occur in sparsely vegetated shaley slopes in sage and juniper communities between 6440 and 8400 feet.	Moderate. This species has been identified near the project area in RSFO and KFO.	No	BLM 2004
Wyoming tansy-mustard	*Descurainia torulosa*	BLM	This species is known to inhabit sparsely vegetated sandy slopes at base of cliffs or volcanic breccia or sandstone 8300 to 10000 feet.	Moderate. This species has been identified near the project area in RSFO and KFO.	No.	BLM 2004

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Green River greenthread	*Thelesperma caespitosum*	BLM	This species is known to occur on white shale slopes and ridges of the Green River Formation at 6300 feet	Moderate. This species has been identified near the project area in RSFO and KFO.	No.	BLM 2004
Goodding's onion	*Allium gooddingii*	FWS; NESL Group 3	McKinley County.-Understory of mature conifer woodlands; steep rocky slopes. Known from to occur above 8,000 feet in elevation.	None. Suitable habitat for this species is not present within the project area.	Yes.	USFWS 2002; NESL 2002.
Naturita milkvetch	*Astragalus naturitensis*	NESL Group 4	San Juan and McKinley Cos.-Sandstone ledges and rimrock along canyons in piñon-juniper woodland at elevations from 5,400 to 6,200 feet.	None. Suitable habitat for this species is not present within the project area.	Yes.	NESL 2002; NMRPC 2002.
Kuenzler hedgehog cactus	*Echino-cereus fendleri var. kuenzleri*	FE; NM-SL1	Chaves, Eddy, and Lincoln Cos. Plains and Great Basin grassland at elevations below 7,500 feet; mostly short-grass plains of grama, wheatgrass, three-awn, and muhly, galleta.	None. This species has not been identified within the project area. Mapped locations of this species are many miles southwest of the project area.	Yes.	USFWS 2002; NMRPTC, 1999
Acoma fleabane	*Erigeron acomanus*	FWS; BLM; NESL Group 3	McKinley Co. -Endemic to New Mexico, occurs on sandstone or dolomite substrate in piñon pine and juniper woodlands.	None. Suitable habitat for this species is not present within the project area.	Yes.	USFWS 2002; NESL 2002.
Zuni fleabane	*Erigeron rhizomatus*	FT; BLM; NM-E; NESL Group 2	McKinley Co. -Nearly barren detrital clay hillsides with soils derived from shales ; most often found on north or east-facing slopes in open piñon-juniper woodlands at elevations from 7,300 to 8,000 feet.	None. Suitable habitat for this species is not present within the project area.	Yes.	NMRPTC 1999; NESL 2002,
Sivinski's fleabane	*Erigeron sivinskii*	FWS; BLM; FS-S; NM; NESL Group 4	McKinley Co. -Chinle shale substrate in Great Basin conifer and piñon-juniper woodlands at elevations between 6,100 and 7,500 feet.	None. Suitable habitat for this species is not present within the project area.	Yes.	NMRPTC 1999; NESL 2002,
Pecos (puzzle) sunflower	*Helianthus paradoxus*	FT; NM-SL1	Chaves County.-Requires saturated saline soils of desert wetlands; usually associated with cienegas or wetlands created from modifying desert springs at elevations from 3,300 to 6,600 feet.	None. Wetlands and other moist habitats were not encountered in Chaves County along the proposed route.	Yes.	NMRPTC 1999; O&G 2004
Grama grass cactus	*Pediocactus papyra-canthus*	BLM; NESL-Group 4	McKinley and Sandoval Counties in piñon-juniper woodland and desert grassland. Almost always associated with grama grasses, especially blue grama.	Moderate. Suitable habitat is crossed by the proposed pipeline.	No.	BLM 2002; NESL 2002.

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Knowlton cactus	*Pediocactus knowltonii*	FE; NM-E	San Juan Co. (near Los Piños River)-On rolling, gravelly hills in piñon-juniper-sagebrush community at elevations from 6,200 to 6,300 feet; (Restricted to a 20-acre plot on the Colorado-New Mexico border).	None. This species has not been identified within the project area. Mapped locations of this species are many miles northwest of the project area in northwest San Juan County.	Yes.	NMRPTC 1999; O&G 2004
Parish's alkali grass	*Puccinellia parishii*	FWS; BLM; FS-S; NM-E; NESL Group 2	McKinley and Sandoval Counties. Habitat includes alkaline springs, seeps, and seasonally wet areas (cienegas) that occur at the head of drainages or on gentle slopes at elevations from 2,600 to 7,200 feet; requires continuously damp soils during its late winter to spring growing season.	None. Suitable moist habitat for this species is not present within the project area.	Yes.	NMRPTC 1999; O&G 2004
Dwarf milkweed	*Asclepias uncialis var. uncialis*	FWS; BLM; FS	Torrance Co.- shortgrass prairie, often on sandstone-derived soils and gravelly or rocky slopes at elevations from 4,000 to 6,500 feet.	Low. Potential suitable habitat in grasslands of central Torrance Co.	No.	USFWS 2002; BLM 2002
Zuni milkvetch	*Astragalus accumbens*	FS	McKinnley Co. (Southern)-Gravelly clay banks and knolls, in dry, alkaline soils derived from sandstone, in pinyon-juniper woodlands at elevations from 6,200 to 7,900 feet	None. Project area is outside of species known range	Yes.	USFS 2002.
Knight's milkvetch	*Astragalus knightii*	FWS; BLM	Sandoval Co. (Mesa Prieta)-Rimrock ledges of Dakota Formation sandstone substrate in Great Basin conifer and pinyon-juniper woodlands and at elevations between 5,500 and 7,500 feet.	None. Project area is outside of species known range.	Yes.	NMRPTC 1999; O&G 2004
Wright's marsh thistle	*Cirsium wrightii*	FWS	This species is known to occur in Chaves County.- Habitat includes Wet, alkaline soils in springs and seeps and marshy edges of streams and ponds at elevations from 3,450 to 8,500 feet.	None. Wetlands and other moist habitats were not encountered in Chaves County along the proposed route.	Yes.	USFS 2002; NMRPC 1999.
Plank's campion (or Plank's catchfly)	*Silene plankii*	BLM	Sandoval and Torrance Counties. Habitat includes Igneous cliffs and rocky outcrops at elevations from (5,000-8,000 feet; restricted to mountains near the Rio Grande.	None. Suitable habitat for this species is not present within the project area.	Yes.	NMRPC 1999.
Gypsum townsendia	*Townsendia gypsophila*	FWS; BLM	Sandoval Co.-Weathered gypsum outcrops and gypsiferous and pure gypsum soils in Great Basin conifer woodland at elevations between 5,500 and 7,500 feet and Great Basin desert scrub. This species is highly habitat specific.	Low. The route may cross this habitat from Bernalillo to San Ysidro. Species is known to occur near proposed pipeline.	No.	NMRPC 1999.

[1] Status:
FE = Federally listed as threatened.
FTwCH = Federally listed as threatened with critical habitat.
FC = Federal candidate.
PE = Proposed to be listed as federally endangered.

PT =	Proposed to be listed as federally threatened.
PET =	Petitioned to be listed.
FWS =	USFWS species of concern.
NM-E =	State-listed as endangered in New Mexico.
NM-T =	State-listed as threatened in New Mexico.
NM-SL1=	State Endangered List 1.
BLM =	BLM sensitive.
USFS =	Forest Service sensitive.
NESL =	Navajo Endangered Species List:
Group 2 =	Any species or subspecies that is in danger of being eliminated from all or a significant portion of its range on the Navajo Nation.
Group 3 =	Any species or subspecies that is likely to become an endangered species, within the foreseeable future, throughout all or a significant portion of its range on the Navajo Nation.
Group 4 =	Any species or subspecies for which the Navajo Fish and Wildlife Department (NF&WD) does not currently have sufficient information to support its being listed in Group 2 or Group 3, but has reason to consider it. The NF&WD will actively seek information on these species to determine if they warrant inclusion in a different group or removal from the list. Species in Group 4 have no legal protection under 17 NTC S 507.