FEDERAL ENERGY REGULATORY COMMISSION
OFFICE OF PIPELINE AND PRODUCER REGULATION

DOCKET NO. CP79-424

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CASE NO. U-45957

ROCKY MOUNTAIN PIPELINE PROJECT

FINAL ENVIRONMENTAL IMPACT STATEMENT

ROCKY MOUNTAIN PIPELINE COMPANY

DECEMBER 1981

The following counties would be crossed by the Rocky Mountain Pipeline Project, alternatives, and variations

CALIFORNIA

Alameda, Colusa, Contra Costa, Fresno, Inyo, Kern, Merced, Mono, San Bernardino, San Joaquin, and Stanislaus

IDAHO

Bear Lake, Caribou, Franklin, and Power

NEVADA

Clark, Esmeralda, Lincoln, Mineral, Nye, and White Pine

OREGON

Morrow, Jefferson, Klamath, and Umatilla

UTAH

Beaver, Box Elder, Cache, Garfield, Iron, Juab, Millard, Piute, Rich, Sanpete, Sevier, Summit, Tooele, Utah, Wasatch, and Washington

WYOMING

Lincoln

FERC/EIS-0024
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FEDERAL ENERGY REGULATORY COMMISSION
Office of Pipeline and Producer Regulation
Washington, D.C. 20426

BUREAU OF LAND MANAGEMENT
Environmental Impact Statement Office
Denver, Colorado 80228

Cooperating Agencies

Bureau of Indian Affairs
Fish and Wildlife Service
U.S. Forest Service
Bureau of Reclamation

ROCKY MOUNTAIN PIPELINE PROJECT

FINAL ENVIRONMENTAL IMPACT STATEMENT

Rocky Mountain Pipeline Company

FERC
Docket No.
CP79-424

BLM
Case No.
U-45957

This Final Environmental Impact Statement analyzes the environmental effects of the proposed Rocky Mountain Pipeline Project, a 610-mile long 36-inch diameter pipeline system extending from Lincoln County, Wyoming, to San Bernardino County, California. With 31,800 horsepower of compression at one station, this system is designed to transport approximately 413,000 Mcfd of natural gas west and south from the Overthrust region of Colorado, Utah, and Wyoming to California, New Mexico, Arizona, and other western markets.

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December 1981

FINAL

ENVIRONMENTAL IMPACT STATEMENT

ON THE

ROCKY MOUNTAIN PIPELINE COMPANY

NATURAL GAS PIPELINE PROJECT

PREPARED BY

BUREAU OF LAND MANAGEMENT

AND

FEDERAL ENERGY REGULATORY COMMISSION

December 1981

Robert F. Burford

DIRECTOR, BUREAU OF LAND MANAGEMENT

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PREFACE

This Environmental Impact Statement (EIS) presents facts pertaining to the construction, operation, and maintenance of the Rocky Mountain Pipeline Project and any alternatives or variations to this proposed action and analyzes environmental impacts which they **would** cause. It provides pertinent information in sufficient detail for the public to understand the project and for the decisionmaker to make a knowledgeable decision.

The EIS has been prepared according to the requirements of the National Environmental Policy Act of 1969 (NEPA) and the Council on Environmental Quality's regulations for implementing NEPA, effective July 30, 1979. In addition to **the six** chapters **in the EIS,** there are appendices containing additional material **and separate** technical reports which **support** the EIS. *Graphic Supplement*, **which was issued with the DEIS will not be reissued with the FEIS.**

The scoping document, *Public Identification of Issues for the Environmental Impact Statement,* and the technical reports can be obtained from the Bureau of Land Management, **Environmental Impact Statement Office, Third Floor East, 555 Zang Street, Denver, Colorado 80228. They are also available for review at some BLM offices in Utah, Wyoming, Nevada, and California. Technical reports were** prepared in support of the EIS **on** the following **topics:**

> **cultural resources, recreation and wilderness, socioeconomics, soils and agriculture, terrestrial and aquatic biology, threatened and endangered species, transportation networks, visual resources, and water resources**

A list of the groups and individuals receiving copies of this EIS appears in appendix A.

During the preparation of the Final Environmental Impact Statement (FEIS), information was added to the text. These additions are shown in bold type throughout the document.

SUMMARY

The Rocky Mountain Pipeline Project (RMPP) is a 610-mile long natural gas pipeline transmission system. The Rocky Mountain Pipeline Company (RMPC) proposes to construct a 583-mile long, 36-inch diameter interstate pipeline from Lincoln County, Wyoming, to the Nevada-California border in Clark County, Nevada. This pipeline would connect with a new 27-mile long, 36-inch diameter intrastate pipeline proposed by Pacific Gas and Electric Company (PG&E) and Pacific Lighting **Gas Supply** Company. The following map shows the location of the proposed facilities.

RMPC has applied to the Federal Energy Regulatory Commission (FERC) for a certificate of public convenience and necessity to construct the interstate portion of the project and to the U.S. Department of the Interior (DOI), Bureau of Land Management (BLM), for a right-of-way permit to cross **312** miles of Federal **(BLM and Forest Service (FS))** land. The California Public Utilities Commission has jurisdiction over the intrastate facilities. This **final** environmental impact statement **(FEIS)** was prepared jointly by the FERC and the BLM with cooperation from the Bureau of Indian Affairs, the Fish and **Wildlife** Service, and the Bureau of Reclamation of the DOI and the **FS**, U.S. Department of Agriculture.

In addition to the proposed project, numerous alternatives and alignment variations have been evaluated. They include the Northern Systems Alternative, the Sanpete Valley Alternative, the Central Nevada Alternative, the Sevier-Escalante Desert Alternative, the West Salt Lake Alternative, the Provo Canyon Alternative, the Thistle Creek Variation, the East Las Vegas Variation, the Fort Mojave Variation, the Mill Creek Variation, and the Daniels Canyon Variation **II, the Moapa Variation, and the West** Kamas Valley Variation.

SUBJECTS OF CONTROVERSY

Several concerns about the RMPP were raised during the public scoping meetings held in August and September 1980. In Las Vegas, the public expressed concern that the proposed route would deleteriously affect the proposed Las Vegas Wash Park, **(Clark County Wetlands Park)** and the proposed **Frenchman Mountains-Rainbow** Gardens National Natural Landmark, that the pipeline would be a safety hazard, and that the pipeline would be one more linear right-of-way in an area already heavily **used** without providing any benefits to the local populace. **(Southwest Gas Company indicated during the BLM public hearing in Las Vegas, Nevada** that it intends use the pipeline to increase its service to this area.)

The proposed action would cross the proposed Clark County Wetlands Park. However, the impacts would not be significant for several reasons. With the implementation of the Erosion Control, Restoration, and Revegetation Guidelines proposed by the RMPC, rehabilitation would occur. Also, the pipeline should be buried deep enough to avoid exposure if the currently occurring headcut erosion process continues. It would not accelerate that process. In addition, the mile wide corrdor is in the vicinity of the existing Southern Nevada Water Project pipeline.

The proposed action would cross the proposed Frenchman Mountain-Rainbow Gardens National Natural Landmark. It would affect recreation and scenic values.

The **FS** is concerned that soils impacts in areas of Soil Group 1 and Soil Group 2 would be more severe than those calculated in the EIS. The resolution of this concern is discussed under 'Issues To Be Resolved' in this summary.

Another concern **is** that the proposed pipeline would traverse agricultural land in Kamas Valley, Utah. The farmers and ranchers prefer to see the pipeline routed around the west edge of the valley. **This concern is addressed under 'Issues To Be Resolved' in this summary and by the addition of a new variation, the West Kamas Valley Variation.**

MAJOR IMPACTS

The major environmental impacts of the RMPP, alternatives, and variations summarized here are detailed in chapter 4 of this EIS and are compared in chapter 2. The impacts are summarized and compared in tables 2-11 and 2-12.

The proposed action would need a permanent right-of-way of **5,511** acres and a temporary construction use permit covering 7,395 acres plus several hundred more acres which would include sites for borrow material, temporary access roads, road, railroad, and stream crossings, and ancillary facilities. All alternatives would need permanent rights-of-way acreages varying from 824 acres for the best-case Northern Systems Alternative to 7,441 acres for the Central Nevada Alternative. The rest

ROCKY MOUNTAIN PIPELINE PROJECT
PROPOSED ACTION, ALTERNATIVES, AND VARIATIONS

of the alternatives would need between 5,405 acres and 6,516 acres for permanent rights-of-way.

Vegetation

While native vegetation would be removed within a 100-foot **wide** construction **right-of-way** along any of the pipeline routes, the impacts would be insignificant and, for the most part, temporary if a successful reclamation program were implemented. The proposed action would remove 6,330 acres of vegetation and the longest alternative, Central Nevada, would remove 9,149 acres. The Erosion Control, Revegetation, and Restoration Guidelines proposed by the RMPC and the Erosion Control, Revegetation, and Restoration Guidelines for Use **on** Federal Lands would both be implemented and should ensure successful revegetation. A few small unquantifiable areas where adequate vegetation could not be established and maintained because of unstable soils would require continuing intensive erosion control measures. **Localized areas in the Uinta and Manti-LaSal National Forests would require intensive implementation and monitoring of erosion control and revegetation measures to ensure successful revegetation. The FS believes that there would be difficulties in obtaining adequate, prompt, and lasting erosion control and revegetation in these areas in the two national forests. There FS believes that loss of vegetation, slow and inadequate revegetation efforts, and induced slides and slumping would be significant problems to the FS land managers and National Forest uses and uses.** Acres of vegetation permanently removed from production would be insignificant for all pipeline routes.

Revegetation of low rainfall areas would be more difficult, and plant community structure and density would take years to return to their original condition.

The proposed action and all alternatives except the best-case Northern Systems Alternative would cross potential habitat of Federal and/or state threatened or endangered plant species, ranging from 2 species along the worst- case Northern Systems Alternative to 16 along the Central Nevada Alternative. The proposed action would cross The Mill Creek **Variation** could also each cross potential habitat of designated plant species. These species **have been** the subject of consultation with the U.S. Fish and Wildlife Service, as required by section 7 of the Endangered Species Act.

Wildlife

The most direct construction impact on wildife along the pipeline routes would be the clearing of wildlife habitat from the pipeline right-of-way and facility sites. Human presence and activity during construction would also disturb wildlife. All impacts would be temporary, because revegetation would restore the habitat. **In the areas where revegetation could take longest, the impacts to wildlife would also last longer.** In the 25-foot widths where trees would not be allowed to regrow over the pipeline, insignificant habitat loss would occur. This would involve 372 acres along the proposed action and up to 869 acres along the Sanpete Valley Alternative. **An insignificant postive benefit would occur in some habitat types because the rigth-of-way would provide new growth for browsing and grazing species.**

Five animal species classified as threatened or endangered by either Federal or state governments could be affected by the project. An unquantifiable amount of black-footed ferret habitat and bald eagle **winter** habitat could be crossed by the proposed action and all alternatives. The Northern Systems Alternative could also cross habitat of the San Joaquin kit fox and the blunt-nosed leopard lizard. The Central Nevada Alternative could possibly cross the riparian habitat of the Railroad Valley springfish. Section 7 consultation procedures have been initiated for these species. The RMPP would bypass the federally designated critical habitat of the desert tortoise in the Beaver Dam Slope area of Utah, which should not be affected.

Soils

All pipeline routes would cross **areas** of soils which are highly susceptible to slides, high erosion hazards, and other limitations associated with project construction and restoration. Acreages would vary from 279 acres along the best-case Northern Systems Alternative to 6,157 acres along the Central Nevada Alternative. The proposed action would cross 3,056 acres of such soils. **With implementation of the Erosion Control, Revegetation, and Restoration Guidelines outlined in appendix C, all but a few localized areas which would be affected by any of the routes should be successfully stabilized within 1 to 3 years. The small unquantifiable areas especially in the Uinta and Manti-LaSal National Forests, where adequate vegetation could not be established and maintained would require continuing intensive ero-**

sion control and revegetation measures to ensure soil protection and erosion control. The FS staffs opinion is that revegetation could take 5 years or longer.

Visual Resources

For all pipeline routes, surface disturbance and removal of vegetation during construction and the addition of structures would affect the visual character of some areas seen by the public. The proposed action would cause significant visual contrasts on **1,196** acres. Alternatives would cause visual contrasts on land ranging from 15 acres for the Northern Systems Alternative, to **1,533** acres for the Central Nevada Alternative.

Recreation Resources

Impacts on the passive recreation opportunities for two proposed recreation areas in southern Nevada would be significant during pipeline construction and could diminish the quality of recreation experience over the long term along the proposed action. Impacts to two popular off-road vehicle (ORV) areas in southern Nevada along the proposed action and one ORV area along the East Las Vegas Variation could pose major safety hazards during pipeline construction. Impacts to the recreation experiences of trail and river users would generally by of low significance for all pipeline routes.

Wilderness

The Central Nevada Alternative would have to be rerouted to avoid two BLM Wilderness Study Areas, one in Utah and one in Nevada.

Agriculture, Grazing, and Forest Resources

All pipeline routes would cross agricultural and grazing lands, and require premature harvest of small amounts of fuel wood and commercial timber. However, the Erosion Control, Revegetation, and Restoration Guidelines proposed by the RMPC would successfully alleviate impacts to agricultural lands, and the amounts of forage and forest products lost would be insignificant **in most cases. Economic losses to ranchers may occur between MP 90 and MP 130) where the route would cross through the middle of allotments and management to requires fencing of the right-of-way to encourage rapid revegetation.**

Conflicts with Land Use Plan, Controls, and Constraints

The proposed action would conflict with the Utility Corridor Rule of the Draft Forest Plan for the Uinta National Forest (10/14/81). It would not follow the over 3,000-foot wide BLM corridor through the expanded Moapa Indian Reservation. The Northern Systems Alternative would not conflict with any known plans or constraints. All of the other alternatives would conflict with one to three plans or constraints; the Central Nevada Alternative would conflict with two proposed plans and one final plan.

LAS VEGAS AREA LAND USE CONFLICTS

The proposed action would cross one or more subdivisions in Henderson, Nevada, and would conflict with the future development plans of the City of Henderson. It would also conflict with the Colorado River Commission of Nevada's future development of the Eldorado Valley.

The East Las Vegas Variation could be impossibly restricted by existing developments along the narrow Sloan's Ditch rights-of-way (between approximately MP 14 and MP 21). It would also cross Nellis Air Force Base but should not cause any extreme conflicts.

Socioeconomics

Because of the short duration of construction and the small size of the work force relative to the population it would affect, no substantial detrimental effects would occur during construction of the proposed project, the Northern Systems, Sanpete Valley, Sevier-Escalante Desert, West Salt Lake, or Provo Canyon Alternatives or any of the variations. The most significant impact would be the demand for temporary housing such as hotel/motel rooms and campsites, which would be filled to capacity in some locations by construction personnel. Although this would inconvenience other travelers and campers, it would last less than 6 months.

Housing demand would be more substantial for the Central Nevada Alternative. Depending on the progress of the MX missile system and other developments in central Nevada, work camps might be required to house RMPP construction personnel. If so, the demand on local fire protection would increase, as would the demand for water and sewerage.

Balancing the inconvenience caused by the housing demand would be minor increases in retail trade and employment. Substantial long-term increases in county property tax revenues would occur in a number of the counties where the proposed or alternative facilities would be located.

The operations work force for any of the alternatives or variations would be very small compared to the population it would affect and would therefore have no significant beneficial or detrimental effects.

Cultural Resources

All pipeline routes would cross some lands containing cultural resources of high site density and high site significance. However, the magnitude of potential impact cannot be determined until a site-specific inventory and evaluation is conducted for areas delineated by the appropriate State Historic Preservation Officers. Because of compliance procedures outlined in a draft Memorandum of Agreement between the BLM, the Advisory Council on Historic Preservation, and the appropriate State Historic Preservation Officers, impacts should not be numerous or highly significant.

Geology and Topography

The geology of the region would not be affected by the proposed action or its alternatives and variations. **The FS holds a different opinion, presented in appendix M.** Although the impact of geologic hazards to the project would be significant, it generally would not coincide with populated areas. The exception would be at Nephi, Utah, where the RMPP would cross the active Wasatch fault, **or near Provo where the Provo Canyon Alternative would cross the same fault.** Safety impact would be significantly reduced if the fault-crossing technique recommended in chapter 5 were implemented.

Permanent modification of the topography would be caused by constructing portions of the proposed action **(for instance in the Manti-LaSal National Forest) and some of the alternatives and variations, notably the Provo Canyon Alternative. Topographic constraints on construction and congestion in narrow canyons would occur along the RMPP, the Provo Canyon Alternative and Sanpete Valley** Alternatives and the **Thistle Creek** Variation.

Water Resources

The only **known** water resources which would be affected by any of the pipeline routes would be streams which would be crossed. Such impacts would be minimized by proposed construction methods, and only small amounts of sediment would be transported a short distance downstream.

Air Quality

Construction of the RMPP, alternatives, or variations would temporarily increase fugitive dust and gaseous pollutants; however, no long-term impact would occur from operation of construction vehicles. Short-term violations of all national ambient air quality standards might occur. Operation of the compressor station(s) for the RMPP and alternatives would increase pollutant concentrations near the proposed and/or existing sources. However, the increase in ground-level concentrations of pollutants would not exceed the national standards.

Noise Quality

Temporary noise in excess of a **day-night** sound level of 55 dB(A) caused by construction could affect local residents along the right-of- way. These impacts would be short and occur during daylight hours. The existing noise environment adjacent to the proposed and modified compressor stations would be degraded to a minor extent.

A recommendation in this impact statement would require that the applicant design all new compressor stations so that a day-night sound pressure level of 55 dB(A) would not be exceeded at the nearest existing noise receptor. This value would be in accordance with the U.S. Environmental Protection Agency's long-term goal. A potential increase of 3 dB(A) could be expected if the horsepower at any existing compressor station was doubled using similar units. However, this increase would not be a significant impact.

Pipeline Safety

The natural gas pipeline would be designed and operated in accordance with all U.S. Department of Transporation regulations. If a pipeline ruptured, RMPC would isolate and shut in the rupture as soon as possible to minimize the potential volume of gas lost. The operation of the natural gas pipeline would not pose a significant risk to the health and safety of the public.

Energy Efficiency

The amount of energy consumed (incremental fuel) during transportation of the proposed 413,000 **thousand cubic feet per day (Mcfd)** gas volume would vary according to the alternative. The analysis comparing the efficiency of the alternatives is based on the percentage of the gas volume delivered to California versus the initial project volume. The analysis indicates the following efficiencies:

Transmission System	Energy Efficiency
RMPP, Sanpete Valley, Sevier-Escalante Desert, and Provo Canyon Alternatives, All Variations	99.3 percent
West Salt Lake Alternative	99.2 percent
Central Nevada Alternative	99.1 percent
Northern Systems Alternative (Prebuilt Western Leg)	95.9 percent
Northern System Alternative (Completed Western Leg)	93.3 percent

Because the fuel requirements to transport 90,000 Mcfd south from Sumas, Washington, to Sage, Wyoming, on Northwest's system are unavailable, the efficiencies for the RMPP and the Sanpete Valley, Central Nevada, Sevier-Escalante Desert, West Salt Lake, and Provo Canyon Alternatives reflect the most positive possibility. On the other hand, the fuel efficiency of the Northern Systems Alternative for both the prebuilt and completed Western Leg phases could improve if Canadian imports decrease after 1982 or demand for gas diminishes when gas prices are deregulated.

ISSUES TO BE RESOLVED

The FERC must determine (1) if there is a need for the proposed action, (2) if the RMPP is the preferred transportation system to deliver gas from the Rocky Mountain region to California and nearby western markets, **and (3) transportation rates.** The BLM and Forest Serivce must determine (1) what the most appropriate right-of-way for the RMPP would **on Federal lands** be if the FERC certificates a project and (2) what specific mitigation would be necessary on Federal lands.

One of the resource issues which needed to be resolved in the DEIS was the determination of how severe potential impacts would be to the mountain soils in the Unita and Manti-LaSal National Forests. Results from onsite field investigations conducted with the FS staff, evaluations of additional information concerning revegetation potential in the area and restoration methods, and observations and evidence of similar types of projects and conditions, have confirmed the following.

Implementation, monitoring, maintenance, and adequate compliance with the Erosion Control, Revegetation, and Restoration Guidelines outlined in appendix C would ensure successful revegetation and soil stabilization commensurate with preconstruction conditions. A few small localized areas would require continuing intensive erosion control measures which are provided in the monitoring and maintenance program. These difficulties in adequate prompt and lasting erosion control and revegetation would occur along the proposed action and Daniels Canyon Variation II on the Uinta National Forest and along the proposed action on the Manti-LaSal National Forest. This is to be expected, considering the variables encountered.

Final pipeline alignment could effectively used it avoid highly erodible slopes and potential landslide areas, which would reduce the potential for accelerated erosion as well as other impacts.

Two requests for additional alternative routes have been recognized and analyzed. The new West Kamas Valley Variation (Variation 8) has been analyzed to acknowledge . landowners' concerns about successful restoration of disturbed acres and effects to subsurface water movement. This variation was requested by the Kamas Valley Soil Conservation District to avoid the surface and subirrigated cropland area through Kamas Valley. Specific information is contained primarily in chapters 2, 3, and 4.

The New Moapa Variation has been analyzed for resource impacts and incorporated into this EIS. The variaion (Variation 7) basically would allow pipeline placement within the 3,000-foot wide corridor through the newly expanded Moapa Indian Reservation. This route would be compatible with the BLM policy to follow that corridor. Information on this variation can be found throughout the final EIS, with specific analyses cited in chapters 3 and 4 and the comparative analysis in chapter 2.

FERC ENVIRONMENTAL STAFF CONCLUSIONS

The RMPP and the Northern Systems Alternative are both environmentally acceptable transportation systems for delivering gas to California and nearby markets. However, although it would be less energy efficient than the RMPP, the Northern Systems Alternative is a *Significantly Superior* alternative because it would require less pipeline construction, **would** be completely constructed near or adjacent to existing pipeline rights-of-way, and **would** be constructed as the facilities are needed.

The Northern Systems Alternative is not feasible if the Western Leg of the Alaska Natural Gas Transportation System (south of Stanfield, Oregon) is not completed or if the Western Leg cannot be prebuilt and the RMPP gas volumes become available earlier. The RMPC does not have sufficient gas supply to proceed with its original operation target of late 1982. Construction of the Western Leg is anticipated to begin as early as 1984 or 1985.

DEPARTMENT OF THE INTERIOR PREFERRED ALTERNATIVE

The Federal land managing agencies are responsible for assessing environmental impacts which could occur as a result of implementing the proposed action or any of the alternate routes, and granting rights-of-way across the Federal lands after the Secretary has made a decision on the right-of-way application. The DOI agency preferred alternative which is required by the Council on Environmental Qulaity regulations is based upon environmental, social, economic, political, and other considerations. It will not necessarily be selected by the decision-maker at the decision stage, but it will be among the options for selection.

Based on the assessment of all routes and other considerations including the needs of the applicant and the public, the DOI land managing agencies have found the proposed action, with the inclusions of the following variations, to be the preferred alternative.

- West Kamas Valley Variation (Variation 8).

- Mill Creek Variation (Variation 5). Any one of the four possible routes included within the Mill Creek Variation is acceptable. The final selection will be made by the Forest Service (FS) after a site-specific environmental assessment.

- Daniels Canyon Variation II (Variation 6-II).

Moapa Variation (Variation 7)

East Las Vegas (Variation 3)

FOREST SERVICE ENVIRONMENTALLY PREFERRED ALTERNATIVE

The FS, Department of Agriculture, finds that the Northern Systems Alternative (Alternative A) is environmentally preferable. However, if the proposed corridor is selected in the decision process, the FS prefers that the following variations on National Forest land be included in the project.

-Mill Creek Variation (Variation 5). After preparation of a site-specific environmental assessment, the FS would select one of the four possible routes included in this variation, the original route or one of three shorter versions.

-Daniels Canyon Variation II (Variation 6-II).

-Other Variations. The FS concurs with the DOI land managing agencies preferences for the West Kamas Valley and Moapa Variations.

CHAPTER 1

PURPOSE OF AND NEED FOR PROPOSED ACTION

The Rocky Mountain Pipeline Project (RMPP) is a proposed interstate natural gas transmission system which would extend 583 miles from the vicinity of Sage, Wyoming, through Utah to near Searchlight, Nevada. The pipeline would be owned and operated by the Rocky Mountain Pipeline Company (RMPC) for the sole purpose of transporting natural gas. It would have a proposed minimum useful life of 20 years. The RMPC would be a general partnership cosponsored by Pacific Gas Transmission Company (PGT), El Paso Natural Gas Company (El Paso), Pacific Interstate Transmission Company (PIT), and Northwest Pipeline Corporation (Northwest), with the partners owning 35-, 30-, 25-, and 10-percent interests, respectively. (See appendix **B** for more detailed information on the corporate structure.) At the Nevada-California border, the RMPP would connect with 27 miles of intrastate facilities to be constructed **and operated by a partnership composed of Pacific Lighting Gas Supply Company (PLGS) and** Pacific Gas and Electric Company (PG&E), which would deliver the gas to the existing transmission systems of PG&E, Southern California Gas Company (SoCal), and Pacific Lighting Service Company (PLS) in California. Consequently, a total of about 610 miles of pipeline would be required to implement the proposed project.

The primary purpose of the project is to transport natural gas and to provide gas consumers in California and the southwestern United States with direct and economical new supplies of natural gas from the central Rocky Mountain region. The proposed project could also provide natural gas to communities along the pipeline route in Utah and Nevada and stimulate new exploration and development of gas reserves. The RMPP would provide a system for supplying natural gas to U.S. consumers from the Overthrust Belt and other producing areas in the Rocky Mountains, the Hingeline area of central and southern Utah, and other sources of supply that may be developed, such as those in Canada.

Gas exploration and development in the Rocky Mountains, particularly in the Overthrust Belt near the northern end of the proposed project, have increased significantly in recent years. In 1981, the U.S. Geological Survey (USGS) estimated that the undiscovered recoverable gas resources in the Rocky Mountains and northern Great Plains range from 29.6 to 69 trillion cubic feet of gas **(USGS 1981).** The applicant has indicated that the Potential Gas Agency, a private organization, estimated probable, possible, and speculative gas supply from the Overthrust Belt as 23, 45, and 49 trillion cubic feet, respectively.

The RMPC would not own the natural gas it transports. It proposes only to transport natural gas for the project sponsors but would also consider transportation of gas for other shippers. El Paso, Pacific Transmission Supply Company (PTS), a subsidiary of PGT, and Natural Gas Corporation of California (NGC), a subsidiary of PG&E, are exploring for and developing new gas supplies. They would contract to transport their Rocky Mountain gas through the proposed pipeline. El Paso would **use** the proposed facility to obtain additional gas supply, while Northwest initially plans to **use** it deliver gas from its existing system supply for sale to unspecified customers.

NGC, PTS, and El Paso have developed proved supplies, working interests, and rights to purchase gas in Montana, Wyoming, Utah, Idaho, and Colorado. At this time, Northwest intends to sell 30,000 thousand cubic feet per day (Mcfd) from its system supply to one of the other project sponsors for shipment through the RMPP; El Paso intends to commit 60,000 Mcfd to the project through 1989 from Canadian gas supplies that it is seeking to acquire. The applicant has not identified any other gas supply commitments to support the proposed 413,000-Mcfd project, and no gas supply is under formal contract.

Northwest, PGT, NGC, and PTS have also concluded a letter of agreement that would allow Northwest to transport 100,000 Mcfd until the RMPP had built up sufficient gas transportation contracts to justify its construction. This agreement would allow gas that is currently available to be moved to market and should help to stimulate continued exploration and development of gas reserves in the region. Northwest would have to deliver the 100,000 Mcfd to PGT and/or El Paso for transportation to California markets. A similar transportation agreement may have to be obtained from El Paso before the Northwest-PGT-NGC-PTS interim transportation arrangement could be used. El Paso has indicated that it can transport additional volumes of Rocky Mountain gas on a best-efforts basis. If completed, this transportation arrangement would continue to be used even if the proposed project is authorized.

PG&E, SoCal, and El Paso have indicated that their gas supplies from traditional sources are declining and that they need new sources of supply. The Rocky Mountain gas could help satisfy this need and reduce future curtailment on their systems. Table 1-1 summarizes these companies' projected need for new gas supplies. The **companies** allege that natural gas sources within California are being depleted. El Paso, which supplies approximately 50 percent of the gas used in California, has curtailed service to its customers almost continually since 1972. Canadian gas supplies for consumers in California are subject to export permits which contain expiration dates. Consequently, RMPC states that new sources of gas supply are needed to meet the energy needs of PG&E's 2.7 million gas customers, SoCal's 3.7 million customers, and El Paso's market east of California. All of these markets currently have unsatisfied demand (PG&E *et al.* 1979). See appendix B for information on how the total natural gas reserves within the United States have been declining.

In addition to the proposed project, PG&E and SoCal are actively seeking to purchase additional gas supplies for California from other gas producing regions of the United States and Indonesia. Pacific Alaska LNG Associates and Western LNG Terminal Associates have proposed liquefied natural gas (LNG) projects that could initially deliver 400,000 and 500,000 Mcfd of gas, respectively, to California if they become operational (FERC Docket Nos. CP75- 140 *et al.* and CP74-160 *et al.*). PGT and PG&E have also been designated by President Carter to construct and operate the Western Leg of the Alaska Natural Gas Transportation System (ANGTS). This Alaskan pipeline system, when completed, will provide California and other western markets with access to new supplies of gas from Alaska's North Slope (about 640,000 Mcfd). **If it is completed** before Alaskan gas is available, the Western Leg **south of Stanfield, Oregon** may transport Canadian gas for a limited time. Synthetic natural gas from coal and methanization of animal waste and garbage are also potential sources of gas supply. All of these options could provide California with additional sources of supply which would help to meet the energy needs of the region.

Furthermore, the Federal Energy Regulatory Commission (FERC) environmental staff notes that if the RMPP delivers additional supplies of natural gas to California, this cleaner burning energy could be used instead of oil or other hydrocarbon fuels. (One thousand cubic feet of gas is equivalent to about 7.194 gallons of No. 2 fuel oil.) Natural gas supplies

TABLE 1-1

ANNUAL CURTAILMENT FORECAST FOR AVERAGE TEMPERATURE YEARS

Year	[a]PG&E		[b]SoCal & PLS		[c]El Paso	
	[d]Percent	[e]Billion cubic feet	Percent	Billion cubic feet	Percent	Billion cubic feet
1979[f]	15.7	158	66	443	26.0	93
1980	12.7	122	68	418	18.4	[g]59
1981	14.6	136	74	345	19.4	60
1982	17.0	151	71	369	31.1	100
1983	15.5	133	70	369	31.2	99
1984	14.2	118	67	419	35.1	112
1985	14.9	125	61	519	38.5	124
1986	23.5	204	67	445	43.0	138
1987	26.8	237	69	421	55.4	178
1988	37.2	334	62	530	65.0	208
1989	45.3	403	60	571	68.5	222
1990	52.9	459	57	608	71.9	230

Source: Exhibit I, FERC Docket No. CP79-424-001.

[a]PG&E estimates are based on the assumption that only traditional sources of gas are available.

[b]SoCal and PLS estimates are based on systemwide growth requirements along with decline of traditional sources and ongoing efforts to procure new gas supplies.

[c]El Paso estimates for markets east of California do not include supplies from the RMPP. El Paso also provides PG&E, SoCal, and other gas companies with gas and would curtail their purchases.

[d]This percentage represents the amount of gas that is not available on the system.

[e]Actual amount of gas that could have been used if it had been available--i.e., the amount by which demand exceeded supply.

[f]Actual curtailment level experienced on all systems.

[g]Reflects 6 months of actual data and 6 months of forecast data on El Paso's System.

from the Rocky Mountain area delivered to California and the Southwest could displace potential oil imports and reduce reliance on alternative fuels.

The main source of gas for the RMPP would be the Rocky Mountain area. Several projects have been proposed to move Rocky Mountain area gas to eastern and western markets. Among these were the Cities Service Gas Company (Cities) proposal (FERC Docket No. CP76-500) and the Wyoming Interstate Natural Gas System (WINGS) proposal (FERC Docket No. CP78-99). Cities has been authorized by the FERC to operate a 613-mile long pipeline from Sweetwater County, Wyoming, to Harvey County, Kansas. The maximum capacity of this recently constructed pipeline is 185,000 Mcfd.

Although the Cities proposal was approved, it was conditioned so that the company, not the ratepayers, will bear the cost if projected gas supply does not materialize. The original WINGS proposal was modified, eliminating all proposed facilities in favor of using the existing Colorado Interstate Gas Company (CIG) system. The FERC certificate provides for transportation services between Northwest and CIG and between Michigan-Wisconsin Pipeline Company and CIG. Initial deliveries, using the spare capacity of the existing systems to move the gas, would range up to 25,000 Mcfd. New facilities would be constructed as needed. New gas supplies remote from one company's transmission systems could be moved immediately by a shipper company with existing facilities in the area. In addition, CIG has received certification increasing the capacity of a portion of its system east of Rock Springs, Wyoming, by 161,365 Mcfd (FERC Docket No. CP80-40).

Trailblazer Pipeline Company *et al.* proposes to transport 617,400 Mcfd of gas to markets in the West, Midwest, and East using connections with other transmission systems (FERC Docket No. CP79-80, *et al.).* The Trailblazer Project is the subject of an FERC final environmental impact statement (FEIS) published in September 1980. The Trailblazer system has not been considered as an environmental alternative to the RMPP because it would serve a different market and the applicants for both projects claim that different sources of supply would be tapped. If this assertion should prove invalid and/or gas supply data should show that only one of these major projects can be supported, these proposals might become alternatives to each other for transporting gas from the Rocky Mountain region.

Another project, related in that Overthrust area gas could be involved, is the Trans-Anadarko Pipeline System (Trans-Anadarko) proposal (FERC Docket No. CP80-17-002). According to this proposal, Trans-Anadarko could receive up to 285,000 Mcfd of gas from the Overthrust Belt through the CIG, Mountain Fuel Supply Company (Mountain Fuel) and other transmission systems. On September 4, 1980, the FERC issued a Notice of Intent to Prepare an EIS on the Trans-Anadarko Project and requested comments on its scope.

In addition, on April 24, 1981, the American Natural Rocky Mountain Company filed a proposal (FERC Docket No. CP81-301-000) to transport 175,000 Mcfd; and on May 11, 1981, CIG filed an application (FERC Docket No. CP81- 328-000) to increase its transmission system's capacity by about 170,000 Mcfd.

Numerous companies are competing for gas supplies in the Rocky Mountain region and have either increased the capacity of their existing transmission systems, proposed to expand their systems, or proposed new pipelines to transport gas from the region. This will affect the ability of the RMPC to obtain enough gas transportation agreements to support its project. As with these other projects, the need for the proposed facilities, market for the gas supply, gas supply issues, and other matters related to the public convenience and necessity are being fully examined by other technical staff members of the FERC and will be the subject of formal FERC proceedings. Under section 7(c) of the Natural Gas Act and its implementing regulations, the FERC has sole responsibility for determining that interstate natural gas transportation facilities are in the public interest. If the FERC determines that there is or will be a need for a proposed service, it will issue a certificate of public convenience and necessity that authorizes the RMPP. Until the FERC makes a decision based on a fully developed record, the need for the proposed project has not been established.

Chapter 2

Proposed Action and Alternatives

BACKGROUND

On July 31, 1979, PGT filed an application with the FERC under section 7 of the Natural Gas Act (Docket No. CP79-424) for a certificate of public convenience and necessity authorizing the construction and operation of the RMPP, a 694.8-mile long interstate pipeline transmission system. This pipeline, which would have connected with Northwest's existing pipeline system at two locations in the central Rocky Mountains, would transport natural gas to PG&E in California. PG&E would have had to construct 40 miles of pipeline to connect the RMPP with its existing intrastate facilities in California. (All facilities within California are considered intrastate facilities under the jurisdiction of the California Public Utilities Commission (CPUC) and not under the jurisdiction of the FERC.)

On June 6, 1980, PGT and PG&E filed a consolidation application with the Secretary of the Department of the Interior (DOI) pursuant to section 28 of the Mineral Leasing Act of 1920, as amended, for grants of right-of-way for the proposed facilities on Federal lands. This application was assigned Case No. U-45957.

On September 8, 1980, RMPC filed an amendment to PGT's application in Docket No. CP79-424 and to the PGT filing for a right-of-way grant with the DOI, Case No. U-45957. With this amendment, RMPC now proposes to construct and operate a 583-mile long interstate pipeline transmission system from Sage, Wyoming, through Utah and Nevada, to the Nevada-California border near Searchlight, Nevada. At this point, the RMPP would connect with a 27-mile long intrastate pipeline to be constructed **and operated by a partnership composed of PLGS and PG&E, which would deliver the gas to the existing transmission systems of PG&E, SoCal, and PLS in California.**

PG&E and **PLGS** would jointly own the pipeline and will submit a separate filing to the CPUC for the 27-mile long segment. Approximately 12 of these 27 miles **in California** are already part of a pipeline right-of- way grant to SoCal from the **Bureau of Land Management (BLM), DOI** issued June 4, 1980. (This right-of-way extends between the North and South Needles Compressor Stations.) These intrastate facilities would cost about $25,550,000 (June 1980 dollars).

The RMPC proposes to transport volumes of natural gas tendered by shippers on a contract basis. Under the proposal, the applicant would provide only a transportation service with its facilities; it would not own any of the gas that it **transports.**

The RMPP would have a capacity of 413,000 Mcfd on an annual average day basis. (Figure 2-1 shows the design of the proposed facilities.) RMPC facilities would cost about $514,908,000 (second quarter 1980 dollars). The applicant has also indicated that the proposed project could be expanded to an optimized capacity of 800,000 Mcfd, but it has no plans to do so at this time. **The applicant's November 13, 1980, response to an FERC request for information states:**

> **The certificate of public convenience applied for by RMP is for facilities and authorization to transport 413 MMcf/d. The proposed design of the project allows for expansion to an ultimate optimum capacity of 800 MMcf/d by adding, subject to regulatory approval, additional compressors.**
>
> **As set forth in Exhibit N of the amendment to the application, schedule 3 provides an *illustrative* showing assuming an ultimate volume through put of 800 MMcf/d. Authority is not requested at this time for the facilities necessary to accommodate such increased volumes, nor has a specific source or field been identified as the source or field from which the gas will be produced.**

To complete this transportation system, Northwest would have to construct and operate facilities to interconnect its existing facilities to those of the RMPC. One meter station and 0.18 mile of 36-inch diameter pipeline would be necessary to accomplish this. (See figure 2-1 for these facilities.)

Therefore, a total of 610.18 miles of pipeline would be constructed. Map 2-1 and the maps in the *Graphic Supplement* identify the location of the proposed facilities. This EIS analyzes the entire pipeline system; it will identify the system as the RMPP.

On March 6, 1980, the FERC published a notice in the *Federal Register* indicating that it was preparing an EIS evaluating the proposed RMPP and asked for comments on the scope of the EIS. Four individuals and 10 state and Federal agencies responded.

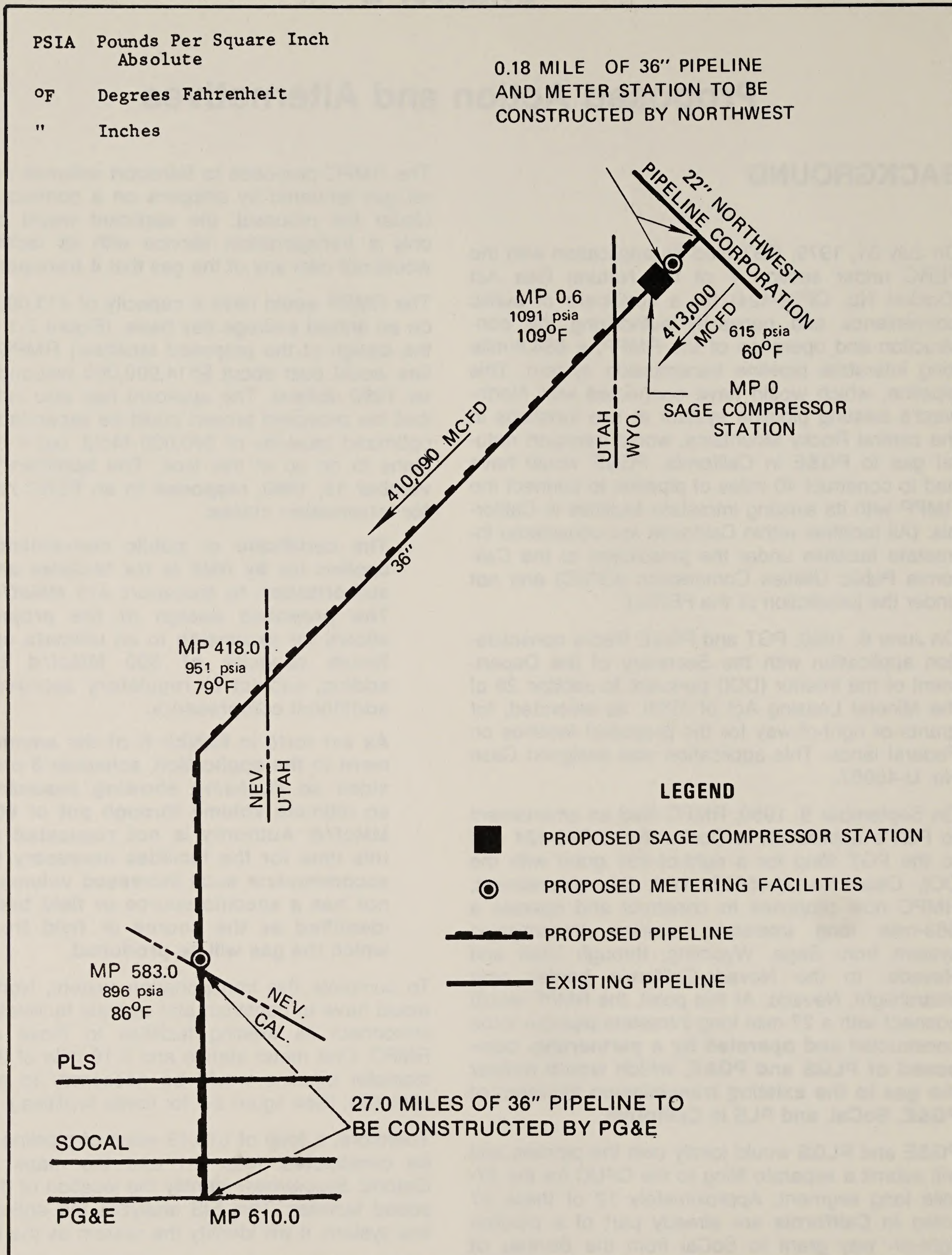
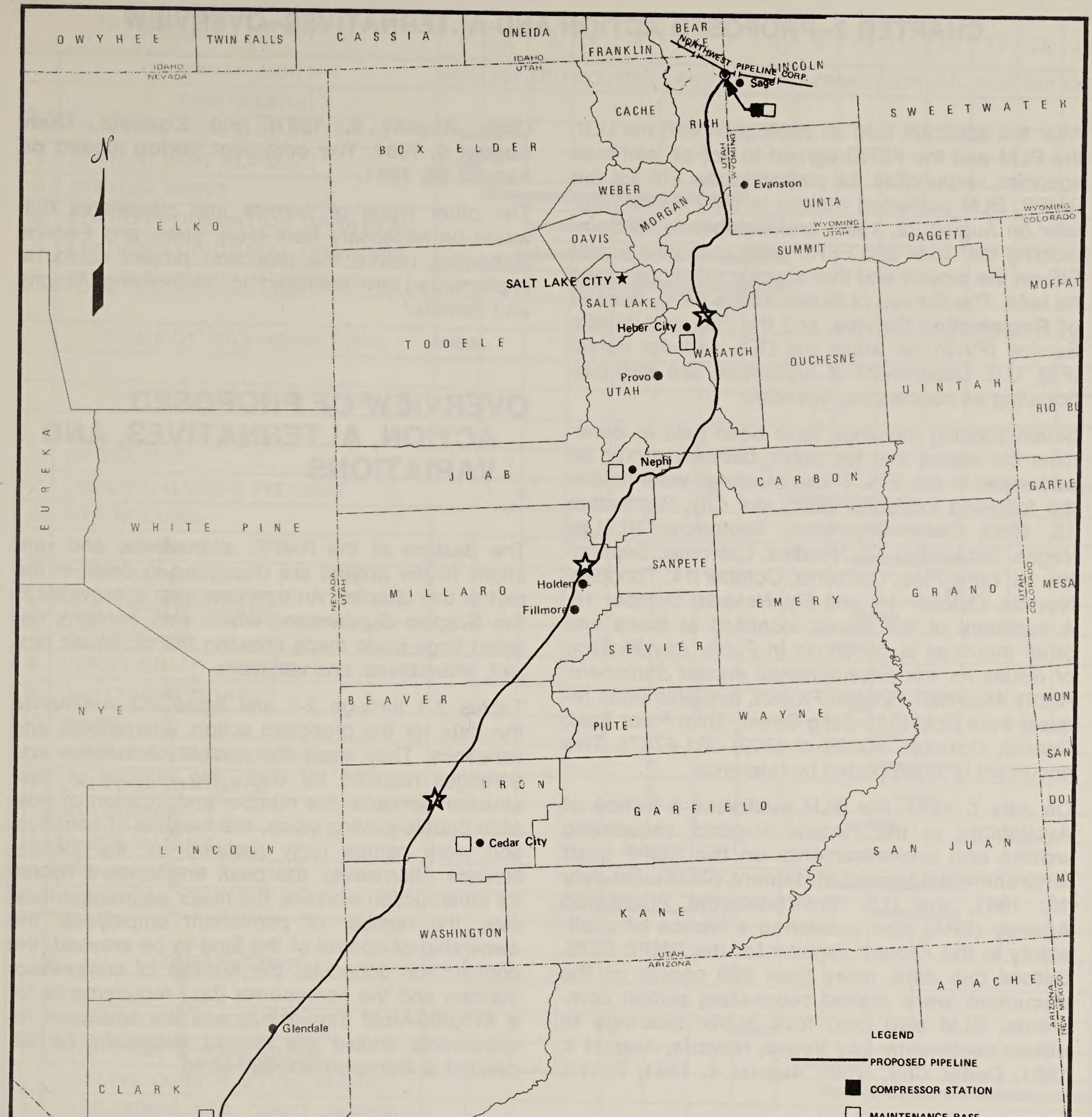


FIGURE 2-1. FLOW DIAGRAM FOR THE PROPOSED PROJECT



MAP 2-1. LOCATION OF PROPOSED FACILITIES

After the applicant filed an application with the DOI, the BLM and the FERC agreed to act as joint lead agencies responsible for preparing the EIS for the RMPP. BLM published notices in the *Federal Register* on August 22, 1980, and October 5, 1980, indicating that BLM and FERC were preparing a joint EIS on the project and that scoping meetings would be held. The Bureau of Indian Affairs (BIA), **Bureau of Reclamation Service,** and the Fish and Wildlife Service (FWS), all within the DOI, and the Forest (FS), U.S. Department of Agriculture, are also participating as cooperating agencies.

Seven scoping meetings have been held to determine the issues that the public believes should be addressed in this EIS. These meetings were held in the following locations: Salt Lake City, September 15, 1980; Cedar City, Utah, September 16; Las Vegas, September 17; Needles, California, September 18; Lone Pine, California, October 14; Tonopah, Nevada, October 15; and Ely, Nevada, October 16. A summary of the issues identified at these and other meetings is contained in *Public Identification of Issues for the Environmental Impact Statement: Rocky Mountain Pipeline Project*, available upon request from BLM (555 Zang Street, Third Floor East, Denver, Colorado 80228 or (303) 234-6737). This document is incorporated by reference.

On July 7, 1981, the BLM published a Notice of Availability in the *Federal Register* requesting written and oral comments on the RMPP draft environmental impact statement (DEIS). On July 10, 1981, the U.S. Environmental Protection Agency (EPA) also published a Notice of availability in the *Federal Register* for the RMPP DEIS. Before this date, more than 900 copies of the document were mailed requesting public comments. BLM also held four public hearings to obtain comments: Las Vegas, Nevada, August 3, 1981; Cedar City, Utah, August 4, 1981; Provo, Utah, August 5, 1981; and Coalville, Utah, August 6, 1981. The comment period closed on August 24, 1981.

The other types of permits and clearances that would be necessary from local, state, and Federal authorities before the proposed project could be implemented are identified in 'Authorizing Actions and Permits.'

OVERVIEW OF PROPOSED ACTION, ALTERNATIVES, AND VARIATIONS

The designs of the RMPP, alternatives, and variations to the project are discussed in detail in the rest of this chapter. An overview map is provided in the *Graphic Supplement*, which also contains detailed large-scale maps showing the proposed project, alternatives, and variations.

Tables 2-1 through 2-7 and figure 2-2 summarize the data for the proposed action, alternatives, and variations. They show the number of facilities and acreages required for each, the number of construction spreads, the number and location of possible double-jointing yards, the location of construction work camps (only required for the Central Nevada Alternative), the peak employment figures for construction workers, the major permanent facilities, the number of permanent employees, the ownership or control of the land to be crossed, the construction schedule, the number of compressor stations and the horsepower (hp.) requirements for a 413,000-Mcfd throughput, and the additional requirements should the system eventually be expanded to transport 800,000 Mcfd.

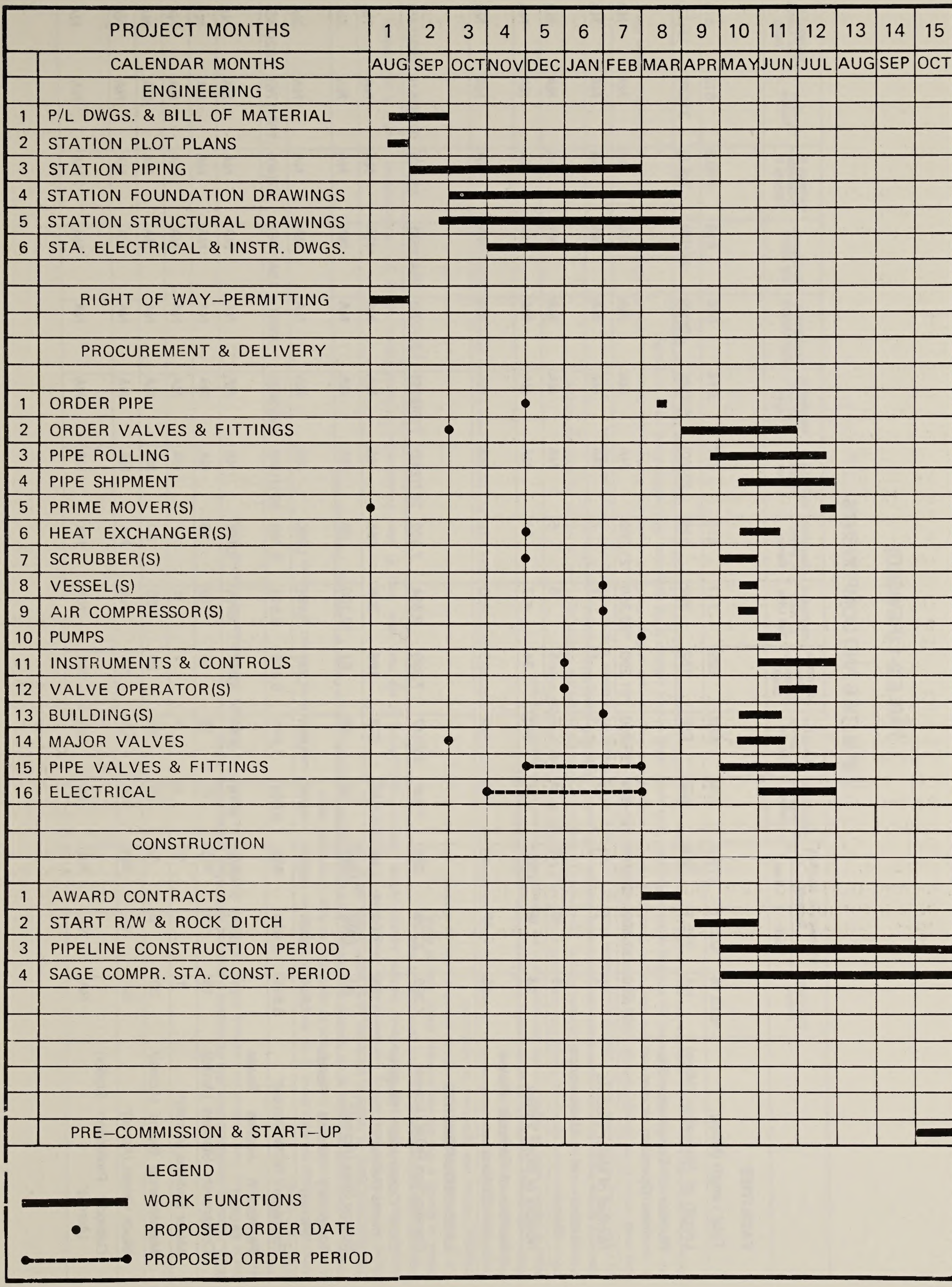


FIGURE 2-2. PROPOSED PROJECT CONSTRUCTION SCHEDULE

TABLE 2-1 (REVISED)

FACILITIES AND COMPONENTS

	Proposed Action	Alternative A, Northern Systems		Alternative B, Sanpete Valley	Alternative C, Central Nevada	Alternative D, Sevier-Escalante Desert	Alternative E, West Salt Lake	Alternative F, Provo Canyon	Variation 2, Thistle Creek	Variation 3, East Las Vegas	Variation 4, Fort Mojave	Variation 5, Mill Creek	Variation 6-II, Daniels Canyon II	Variation 7, Moapa	Variation 8, West Kamas Valley
		Worst	Best												
FACILITIES															
Total Length (Miles)	[a]610.18	[a]225.1	[a]76.8	630	862	622	747	619	617	614	610	618	610.5	612	613
Length of Alternative (Miles)	NA	225.1	76.8	200	666	182	392	115	27(20)	59(56)	10(10)	21(13)	7(6.5)	31(29)	15(12)
Number of Compressor Stations/Operating Horsepower	[b]21,200	[c]21,600	[c]21,600	[b]21,200	[b]25,650	[b]21,200	[d]23,350	[b]21,200	NA	NA	NA	NA	NA	NA	NA
Number of Meter Stations	2	2	1	2	2	2	2	2	NA	NA	NA	NA	NA	NA	NA
Number of Maintenance Bases	5	[e]0	[e]0	5	7	5	5	5	NA	NA	NA	NA	NA	NA	NA
Number of Block Valves	34	[f]6	[f]UNK	34	[g]43	34	[g]37	34	NA	NA	NA	NA	NA	NA	NA
Number of Cathodic Protection Stations	15	[h]7	[h]3	15	[h]19	15	[i]50	15	NA	NA	NA	NA	NA	NA	NA
LAND REQUIREMENTS															
Construction ROW (Acres)[j]	7,395	2,728	931	7,636	10,447	7,539	9,054	7,502	327(242)	715(679)	121(121)	254(158)	85(79)	376(351)	182(145)
Extra Construction Requirements (Acres)[k]	185	[l]100	[l]60	186	272	186	236	185	NA	NA	NA	NA	NA	NA	NA
Borrow Sites (Acres)[m]	60	UNK	UNK	60	85	61	[n]2,100	60	NA	NA	NA	NA	NA	NA	NA
Temporary Access Roads (Acres)	UNK	UNK	UNK	UNK	UNK	UNK	UNK	UNK	NA	NA	NA	NA	NA	NA	NA
Permanent ROW (Acres)[o]	5,511	2,619	822	5,635	7,441	5,405	6,516	5,750	291(199)	485(362)	73(61)	164(148)	42(40)	188(176)	182(145)
Permanent Access Roads (Acres)	21	UNK	UNK	UNK	UNK	UNK	UNK	UNK	NA	NA	NA	NA	NA	NA	NA
Compressor Stations (Acres)	15	[p]15	[p]15	15	15	15	15	15	NA	NA	NA	NA	NA	NA	NA
Meter Stations (Acres)[q]	1	[r]1	[r]0	1	1	1	[s]1	1	NA	NA	NA	NA	NA	NA	NA
Maintenance Bases (Acres)[t]	20	[e]0	[e]0	20	30	20	20	20	NA	NA	NA	NA	NA	NA	NA
Block Valves (Acres)[u]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cathodic Protection Station (Acres)[v]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTE: Figures in parentheses show data for segment of proposed action which variation would replace.
Due to the relatively short length of the variations, all other facility and land requirements would be essentially the same as the proposed action.

NA--Not Applicable

UNK--Unknown

ROW--Right-of-way

[a]Although the mileage has been shown to the decimal point, this number has been rounded for calculating acres of impact to resources.

[b]A 10,600-hp. spare compressor unit would also be installed at the Sage Compressor Station.

[c]This compression would be located at the Stanfield, Ione, Madras, Bonanza, and Delevan Compressor Stations instead of at the Sage Compressor Station.

[d]This compressor would be located at Montpelier Compresssor Station, not at Sage.

[e]Based on the assumption that existing maintenance bases could be used for this alternative.

[f]Includes block valve requirements on Brentwood-Panoche Junction pipeline based on valve spacing of one block valve every 20 miles. Information on Northwest pipeline looping and Hinkley-Adelanto pipeline is not available.

[g]Based on block valve spacing of one block valve every 20 miles.

[h]Based on spacing of one cathodic protection station every 45 miles.

[i]For West Salt Lake Alternative, extra cathodic protection would be required.

[j]Assuming 100-foot wide right-of-way for construction.

[k]Includes construction acreage requirements for double jointing yards and known road, railroad, and stream crossings. Additional acreages could be needed as more is known about requirements.

[l]Requirements for double-jointing yards only.

[m]Borrow site acreage assumed to be proportional to total pipeline length unless stated otherwise.

[n]More fill material would be required on this alternative due to the extreme instability and saline nature of the soil.

[o]100-foot wide permanent right-of-way across state and private lands; 50-foot wide right-of-way across Federal lands.

[p]Fifteen acres for new compressor station at Stanfield, Oregon. Compression increase at four additional compressor stations would use the site for any additional facilities.

[q]One acre for the Nevada/California meter station. Northwest's meter station would be at the Sage Compressor Station, unless noted otherwise.

[r]One acre for the Hinkley Meter Station. Stanfield Meter Station would be located either at the existing meter station or at the new Stanfield Compressor Station.

[s]One meter station at the Nevada/California border and one at Montpelier Compressor Station.

[t]5 acres each for maintenance bases at Heber City, Nephi, Cedar City, and Las Vegas. The maintenace base at Sage would not require any additional land because it would be located on the proposed compressor station site.

[u]10- by 20-foot fenced site for each block valve, not including access roads. Since block valves would be in or adjacent to the right-of-way, little additional land would be required.

[v]20 feet by 20 feet for each cathodic protection site, not including access roads. Since sites would be located on or adjacent to the right-of-way, little additional land would be required.

TABLE 2-2 (REVISED)

PIPELINE SPREADS AND CONSTRUCTION WORK CAMPS

	Proposed Action	Alternative A, Northern Systems	Alternative B, Sanpete Valley	Alternative C, Central Nevada	Alternative D, Sevier-Escalante Desert	Alternative E, West Salt Lake	Alternative F, Provo Canyon
Spreads Number and Location	1 MP 0-100 2 100 3 180-300 4 300-400 5 400-500 6 500-583 7 583-610	[a]*0-22* 1 [a]*34-41* 1 [a]*66-89* 1 [a]*143-168* 2 [a]*0-120* 2 [b]*0-28.3*	1 MP 0-100 2 100-176 3 *0-100* 4 *100-356* 5 *356-400* 6 400-500 7 500-583 8 538-610	1 MP 0-100 2 100-196 3 *0-100* 4 *110-220* 5 *220-330* 6 *330-444* 7 *444-564* 8 *564-666*	1 MP 0-100 2 100-196 3 *0-100* 4 *100-180* 5 *180-400* 6 400-500 7 500-583 8 583-610	1 [a]MP *0-22* 1 [a]*34-41* 1 *0-80* 2 *80-200* 3 *200-300* 4 *300-280* 5 280-400 6 400-500 7 500-583 8 583-610	1 MP 0-100 2 00-110* 3 *110-300* 4 300-400 5 400-500 6 500-583 7 583-610
Double Jointing Yard Number and Location	1 Evanston, WY 2 Provo, UT 3 Nephi, UT 4 Fillmore, UT 5 Cedar City, UT 6 Las Vegas, NV 7 Boulder City, NV 8 Needles, CA	1 Kemmerer, WY 2 Soda Springs, ID 3 Pocatello, ID 4 Antioch, CA 5 Volta, CA	1 Evanston, WY 2 Provo, UT 3 Nephi, UT 4 Richfield, UT 5 Cedar City, NV 6 Las Vegas, NV 7 Boulder City, NV 8 Needles, CA	1 Evanston, WY 2 Provo, UT 3 Nephi, UT 4 Ely, NV 5 Currant, NV 6 Tonopah, NV 7 Benton, NV 8 Big Pine, CA 9 Lone Pine, CA 10 Inyokern, CA 11 Adelanto, CA	1 Evanston, WY 2 Provo, UT 3 Nephi, UT 4 Milford, UT 5 Cedar City, UT 6 Las Vegas, NV 7 Boulder City, NV 8 Needles, CA	1 Montpelier, ID WY 2 Tremonton, UT 3 Lucin, UT 4 Knolls, UT 5 Delta, UT 6 Cedar City, UT 7 Las Vegas, NV 8 Boulder City, NV 9 Needles, CA	2 Provo, UT 3 Nephi, UT 4 Fillmore, UT 5 Cedar City, UT 6 Las Vegas, NV 7 Boulder City, NV 8 Needles, CA
Construction Work Camp	N.A.	N.A.	N.A.	1 Delta, UT 2 Ely, NV 3 Currant, NV 4 Tonopah, NV 5 Bishop, CA 6 Inyokern, CA	N.A.	N.A.	N.A.

N.A. - Not Applicable

* - For the alternatives; spreads are located using a combination of proposed action mileposts and alternative mileposts. Mileposts preceded or followed by asterisks are mileposts along alternatives which are numbered from 0 at the point where the alternative leaves the proposed action see the *Graphics Supplement* for routes and mileposts.

[a]Northern Systems Alternative Spread No. 1

[b]Northern Sytems Alternative Spread No. 2

TABLE 2-3 (REVISED)

CONSTRUCTION PEAK EMPLOYMENT (Number of Workers)

	Proposed Action	Alternative A, Northern Systems	Alternative B, Sanpete Valley	Alternative C, Central Nevada	Alternative D, Sevier-Escalante Desert	Alternative E, West Salt Lake	Alternative F, Provo Canyon
Compressor Station	100	[a]300	100	100	100	100	100
Pipeline Spread 1	320	320	320	320	320	320	320
Pipeline Spread 2	320	290	320	320	320	290	320
Pipeline Spread 3	320	NA	320	320	320	290	320
Pipeline Spread 4	320	NA	320	320	320	290	320
Pipeline Spread 5	320	NA	320	320	320	320	320
Pipeline Spread 6	320	NA	320	290	320	320	320
Pipeline Spread 7	290	NA	390	290	390	320	290
Pipeline Spread 8	NA	NA	290	290	NA	290	NA
Total	2,310	910	2,310	2,570	2,310	2,540	2,310

Double Jointing Yards: 67 persons per yard; each pipeline spread would have at least one double jointing yard.

NA - Not Applicable

[a]Five compressor stations at Stanfield, Ione, Madras, and Bonanza, Oregon, and Delevan, California. Construction would occur over an unknown period of time.

TABLE 2-4 (REVISED)

MAJOR NEW ABOVEGROUND FACILITIES

Proposed Action	Alternative A, Northern Systems	Alternative B, Sanpete Valley	Alternative C, Central Nevada	Alternative D, Sevier-Escalante Desert	Alternative E, West Salt Lake	Alternative F, Provo Canyon
Salt Lake City Headquarters	[1]NONE	Salt Lake City Headquarters	Salt Lake City Headquarters	Salt Lake City Headquarters	Salt Lake City Headquarters	Salt Lake City Headquarters
Sage Compressor Station, Maintanance Base, and Meter Station	Stanfield Compressor Station and Meter Station	Sage Compressor Station, Maintenance Base, and Meter Station	Sage Compressor Station, Maintenance Base, and Meter Station	Sage Compressor Station, Maintenance Base, and Meter Station,	Montpelier Compressor Station, Maintenance Base, and Meter Station	Sage Compressor Station, Maintenance Base, and Meter Station
Heber City Maintenance Base	Hinkley Meter Station	Heber City Maintenance Base	Heber City Maintenance Base	Heber City Maintenance Base	Lucin Maintenance Base	Heber City Maintenance Base
Nephi Maintenance Base	Hinkley Meter Station	Nephi Maintenance Base	Nephi Maintenance Base	Nephi Maintenance Base	Dugway Maintenance Base	Nephi Maintenance Base
Cedar City Maintenance Base		Cedar City Maintenance Base	Ely Maintenance Base	Cedar City Maintenance Base	Cedar City Maintenance Base	Cedar City Maintenance Base
Las Vegas Maintenance Base		Las Vegas Maintenance Base	Nevada/California Stateline Meter Station	Las Vegas Maintenance Base	Las Vegas Maintenance Base	Las Vegas Maintenance Base
Nevada/California Stateline Meter Station		Nevada/California Stateline Meter Station	Tonopah Maintenance Base Bishop Maintenance Base Inyokern Maintenance Base	Nevada/California Stateline Meter Station	Nevada/California Stateline Meter Station	Nevada/California Stateline Meter Station

[1]There would be no new operating headquarters for the Northern Systems Alternative; existing maintenance bases would be used.

TABLE 2-5 (REVISED)

PERMANENT EMPLOYMENT (Number of Workers)

Route	Facilities Required	Number of Employees
Proposed Action	Salt Lake City (Headquarters)	27
	Sage Compressor Station and Maintenance Base	12
	Heber City Maintenance Base	7
	Nephi Maintenance Base	7
	Cedar City Maintenance Base	8
	Las Vegas Maintenance Base	7
	TOTAL	68
Alternative A, Northern Systems	Stanfield Compressor Station	5
	TOTAL	5
Alternative B, Sanpete Valley	Salt Lake City (Headquarters)	27
	Sage Compressor Station and Maintenance Base	12
	Heber City Maintenance Base	7
	Nephi Maintenance Base	7
	Cedar City Maintenance Base	8
	Las Vegas Maintenance Base	7
	TOTAL	68
Alternative C, Central Nevada	Salt Lake City (Headquarters)	27
	Sage Compressor Station and Maintenance Base	12
	Heber City Maintenance Base	7
	Nephi Maintenance Base	7
	Ely Maintenance Base	7
	Tonopah Maintenance Base	7
	Bishop Maintenance Base	7
	Inyokern Maintenance Base	7
	TOTAL	81
Alternative D, Sevier-Escalante Desert	Salt Lake City (Headquarters)	27
	Sage Compressor Station and Maintenance Base	12
	Heber City Maintenance Base	7
	Nephi Maintenance Base	7
	Cedar City Maintenance Base	8
	Las Vegas Maintenance Base	7
	TOTAL	68
Alternative E, West Salt Lake	Salt Lake City (Headquarters)	27
	Montpelier Compressor Station and Maintenance Base	12
	Lucin Maintenance Base	7
	Dugway Maintenance Base	7
	Cedar City Maintenance Base	8
	Las Vegas Maintenance Base	7
	TOTAL	68
Alternative F, Provo Canyon	Salt Lake City (Headquarters)	27
	Sage Compressor Station and Maintenance Base	12
	Heber City Maintenance Base	7
	Nephi Maintenance Base	7
	Cedar City Maintenance Base	8
	Las Vegas Maintenance Base	7
	TOTAL	68

TABLE 2-6 (REVISED)

LAND STATUS (Miles of Land Crossed)

	Proposed Action	Alternative A, Northern Systems		Alternative B, Sanpete Valley	Alternative C, Central Nevada	Alternative D, Sevier-Escalante Desert	Alternative E, West Salt Lake	Alternative F, Provo Canyon	Variation 2, Thistle Creek	Variation 3, East Las Vegas	Variation 4, Fort Mojave	Variation 5, Mill Creek	Variation 6-II, Daniels Canyon II	Variation 7, Moapa	Variation 8, West Kamas Valley
		Best	Worst												
Wyoming															
BLM	0	13	13	0	0	0	7	0	0	0	0	0	0	0	0
FS	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
State	0	1	1	0	0	0	7	0	0	0	0	0	0	0	0
Private	0.8	2	2	0.8	0.8	0.8	0	0.8	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Utah															
BLM	103	0	0	104	105	126	249	106	0	0	0	0	0	0	0
FS	50	0	0	49	32	49	17	17	6	0	0	15	7	0	0
State	12	2	2	10	10	25	25	19	1	0	0	0	0	0	0
Private	236	3	3	268	171	213	189	279	21	0	0	6	0	0	15
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BR[a]	19	0	0	9	19	19	0	8	0	0	0	0	0	0	0
Nevada															
BLM	150	0	0	150	218	150	150	150	0	38	0	0	0	31	0
FS	0	0	0	0	31	0	0	0	0	0	0	0	0	0	0
State	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0
Private	5	0	0	0	41	5	5	5	0	20	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
BR	1	0	0	1	0	1	1	1	0	0	0	0	0	0	0
BIA[b]	7	0	0	7	0	7	7	7	0	0	0	0	0	0	0
California															
BLM	9	0	0	9	93	9	9	9	0	0	8	0	0	0	0
FS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
State	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Private	14	0	148	14	142	14	14	14	0	0	2	0	0	0	0
BIA	4	0	0	4	0	4	4	4	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Idaho															
BLM	0	5	5	0	0	0	3	0	0	0	0	0	0	0	0
FS	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0
State	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Private	0	48	48	0	0	0	48	0	0	0	0	0	0	0	0
BIA	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	610.8	77	225	630	862	622	747	619	27	59	10	21	7	31	15

NOTE: This table provides a guide to the general land ownership along the routes. Land ownership has been rounded off and could include a three percent differential. The totals have also been rounded. The exact land ownership cannot be determined because the route is defined as a corridor.

[a]Includes lands around Strawberry Reservoir withdrawn from FS to Bureau of Reclamation (BR), but which are still under overall FS administration.

[b]Nevada total of BIA includes Moapa Indian lands even though maps do not show them.

TABLE 2-7 (REVISED)

COMPRESSOR STATIONS AND HORSEPOWER REQUIRED FOR TWO PIPELINE CAPACITIES, PROPOSED AND POTENTIAL EXPANSION

	413,000 Mcfd	HP	800,000 Mcfd	HP
Proposed Action	Sage Compressor Station	21,200	Sage Compressor Station	53,000
			MP 104.1	10,600
			MP 229.5	10,600
			MP 349.5	10,600
Alternative A, Northern Systems	Stanfield Compressor Station	400	Stanfield Compressor Station	4,450
	Ione Compressor Station	8,925	Lava Hot Springs Compressor Station	2,100
	Madras Compressor Station	1,450	Burley Compressor Station	1,950
	Bonanza Compressor Station	2,375	Mountain Home Compressor Station	400
	Delevan Compressor Station	8,450	Ione Compressor Station	24,500

TABLE 2-7 (REVISED) —Continued

	413,000 Mcfd	HP	800,000 Mcfd	HP
Alternative A, Northern Systems		....	Kent Compressor Station	7,250
		....	Madras Compressor Station	14,650
		....	Paulina Compressor Station	11,200
		....	Diamond Junction Compressor Station	8,000
		....	Bonanza Compressor Station	18,420
		....	Tionesta Compressor Station	5,250
		....	Burney Compressor Station	7,250
		....	Gerber Compressor Station	9,450
		....	Delevan Compressor Station	18,980
Alternative B, Sanpete Valley	Sage Compressor Station	[b]21,200	[a]NA	
Alternative C, Central Nevada	Sage Compressor Station	25,650	Sage Compressor Station	52,400
		....	MP 210.0	22,850
		....	MP 420.0	25,650
		....	MP 614.0	19,300
Alternative D, Sevier-Escalante Desert	Sage Compressor Station	[b]21,200	[a]NA	
Alternative E, West Salt Lake	Montpelier Compressor Station	23,350	Montpelier Compressor Station	52,400
		....	MP 190.2	18,800
		....	MP 380.2	19,200
		....	MP 570.2	9,050
Alternative F, Provo Canyon	Sage Compressor Station	21,200	[a]NA	

Variations 2 through 6 would be similar to the proposed action.

NA--Not Available

[a]Although data is not available, requirements should be similar to those of the proposed action

[b]One additional 10,600 horsepower spare compressor unit would be installed.

PROPOSED ACTION

Facilities

COMPONENTS

The major components of the proposed pipeline system would be segments of 36-inch diameter pipeline totalling 610.18 miles, one 31,800-hp. compressor station, 2 meter stations, 5 maintenance bases, 34 block valves, **approximately** 15 cathodic protection stations, and a communication system. (See map 2-1 for the general location of these facilities. The *Graphic Supplement* provides detailed maps of the proposed project.) The RMPC headquarters and facility for the remote control of the system would be located in Salt Lake City. Table 2-1 lists the permanent and temporary land requirements of the project.

Northwest would construct 0.18 mile of 36-inch diameter pipeline from its existing transmission system in Lincoln County, Wyoming, south to RMPC's proposed Sage Compressor Station in Wyoming. It would construct and own a meter station within the compressor station site and then connect its pipeline to RMPC's proposed facilities. From the Sage Compressor Station, the proposed RMPP would extend 583 miles to the Nevada-California border near Searchlight, Nevada, with 0.6 mile of pipeline in Wyoming, 418.3 miles of pipeline in Utah, and 164.1 miles of pipeline in Nevada. An RMPC meter station would be located in Nevada at MP 583.

The RMPP would then connect to a new 27-mile long pipeline to be jointly owned by PG&E and PLS. The proposed pipeline system would have a maximum operating pressure of 1,235 pounds per square inch gauge.

The Sage Compressor Station, to be located on a 15-acre site, would house three 10,600-hp. gas turbine compressor units, a microwave tower, equipment building, a gas-fired standby onsite power generation unit, a 210-barrel lube oil storage tank, a 1,000-barrel raw water storage tank, water treatment facilities, a 65-barrel hydrocarbon storage tank, gas cleaning and cooling facilities, and two compressor buildings, a utility building, and a control building. (Figures 2-3 and 2-4 show a profile

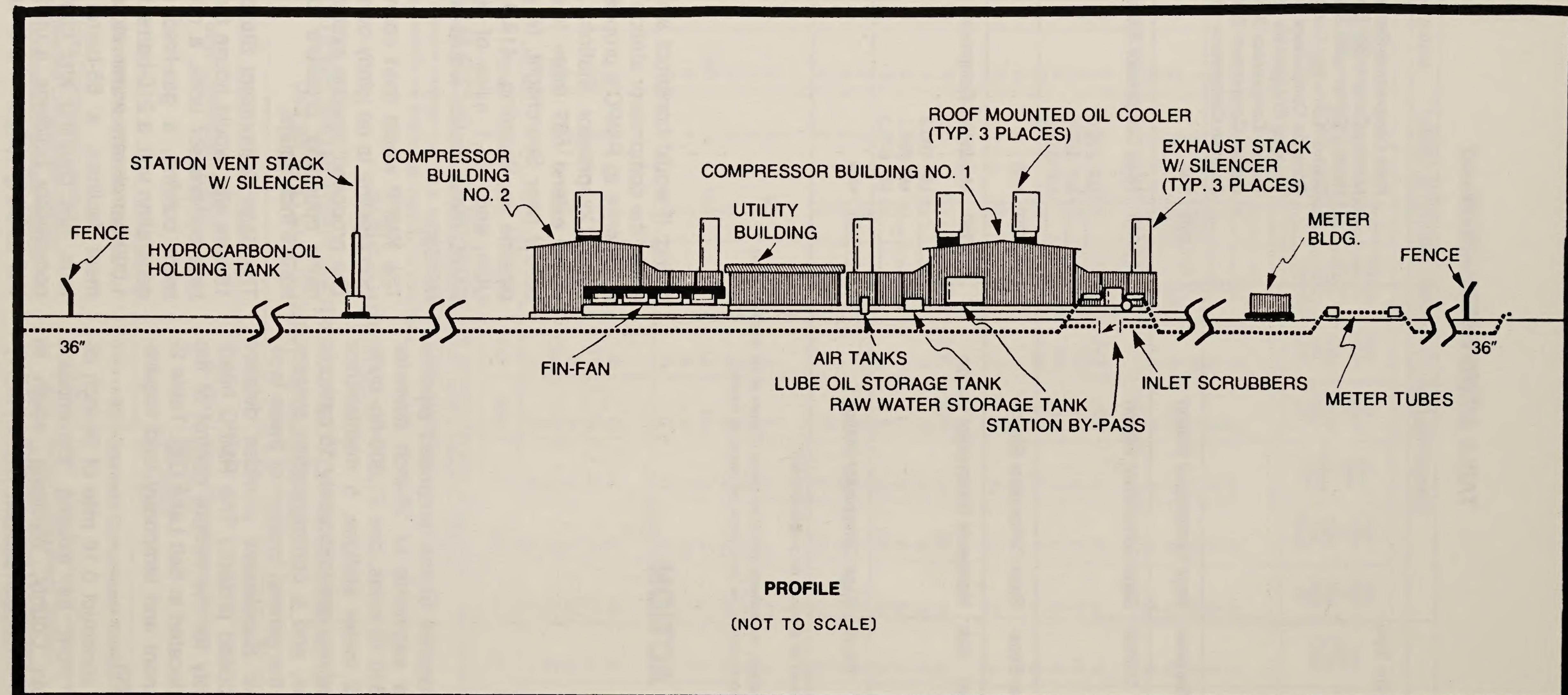


FIGURE 2-3. SAGE COMPRESSOR STATION

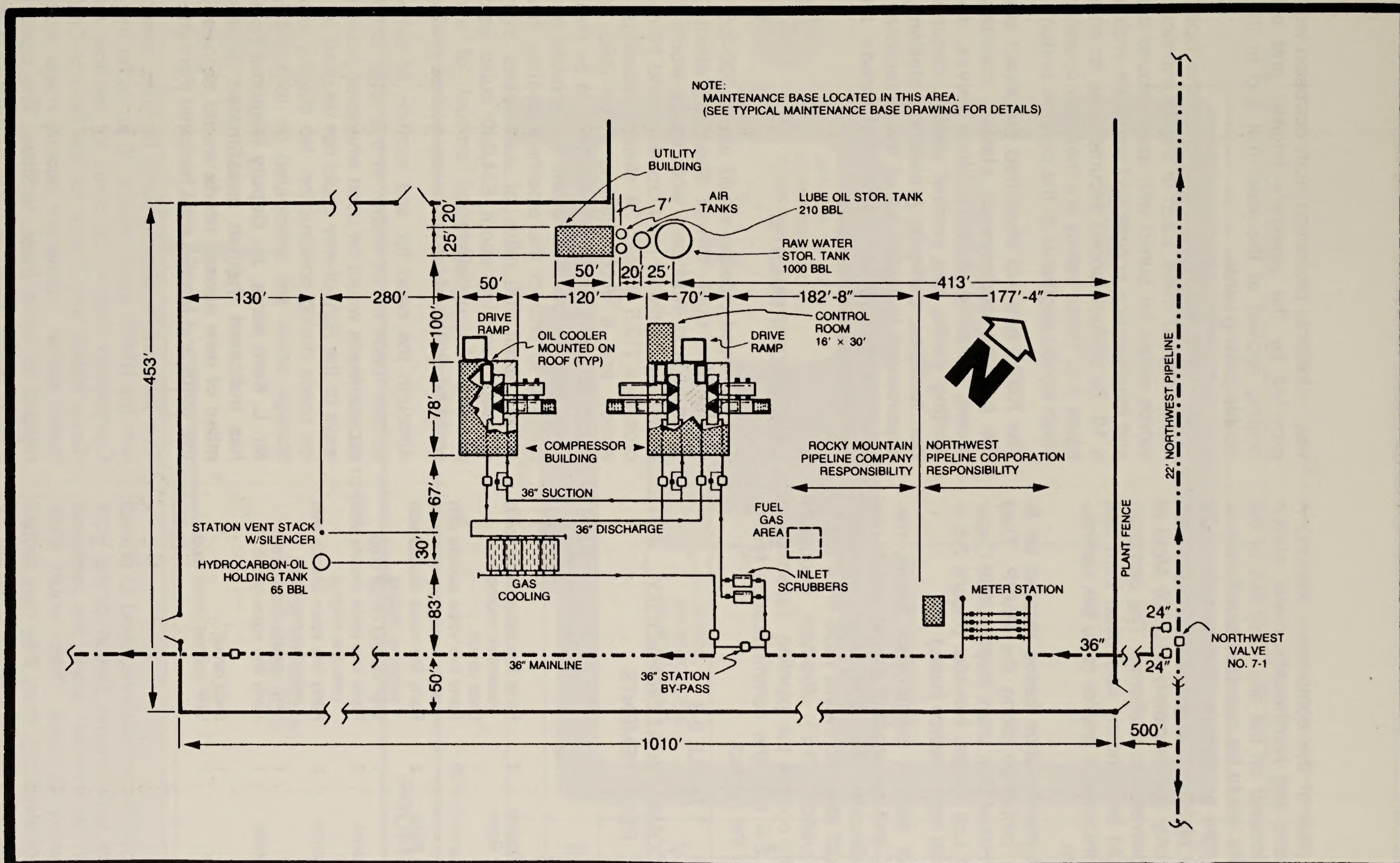


FIGURE 2-4. PLOT PLAN OF SAGE COMPRESSOR STATION

view and plot plan of the compressor station.) A maintenance base and Northwest's meter station would also be located on the site. Only two of the compressor units would be operated simultaneously, leaving the third as a spare. These units would consume 2,910 Mcfd of fuel gas from the pipeline. Consequently, only approximately 410,000 Mcfd of gas would be delivered to California. The compressor station would be remotely controlled from Salt Lake City by a microwave and/or radio link communications system.

Four additional maintenance bases located on 5-acre sites are proposed along the RMPP. They would be near Heber City, Utah; Nephi, Utah; Cedar City, Utah; and Las Vegas, Nevada. (Figure 2-5 illustrates a typical maintenance base.)

The compressor station, maintenance bases, metering facilities, and gas control center would **use** existing communication facilities where possible. The RMPP would **use** microwave radio links and a very high frequency (VHF) ultra-high frequency radio system to control the pipeline transmission system. Table 2-8 lists the communication facility requirements of the project.

TABLE 2-8

RMPP COMMUNICATION FACILITY REQUIREMENTS

Location	Circuits	Function
Sage Compressor Station and Maintenance Base	2	Party line voice circuits with selective ringing
	1	Data circuit
Heber City Maintenance Base	2	Party line voice circuits with selective ringing
Nephi Maintenance Base	2	Party line voice circuits with selective ringing
	1	VHF control circuit drop
Cedar City Maintenance Base	2	Party line voice circuits with selective ringing
Las Vegas Maintenance Base	2	Party line voice circuits with selective ringing
	1	VHF control circuit drop
Nevada-California Meter Station	1	Party line voice circuit
	1	Data circuit
	1	VHF control circuit drop

Fifteen cathodic protection stations, used to protect the pipeline and underground station piping from corrosion, would be installed along the proposed pipeline about every 45 miles. These would each need a source of electricity; thus, they may require unknown lengths of electric powerline to be installed. One of the stations would be located on the Sage Compressor Station site. These stations, located within a 20- by 20-foot unfenced area, would be on or adjacent to the permanent right-of-way. Additional protection from corrosion would be provided by the pipeline's internal and external coating applied at the steel mill and in the field double-jointing yards.

Block valves would be installed on the pipeline at least every 20 miles. Each of the 34 mainline block valves would be buried with aboveground controls and maintenance access and would be enclosed in a 10- by 20-foot fenced security area, as shown in figure 2-6. These valves are manually operated and could isolate segments of the pipeline system.

The RMPC has not identified the exact sites of the pipeline compressor station, maintenance bases, metering stations, block valves, double-jointing yards, gas control center, communication facilities, cathodic protection stations, and appartenant facilities. All of these facilities may need temporary or permanent roads and/or electrical supply facilities.

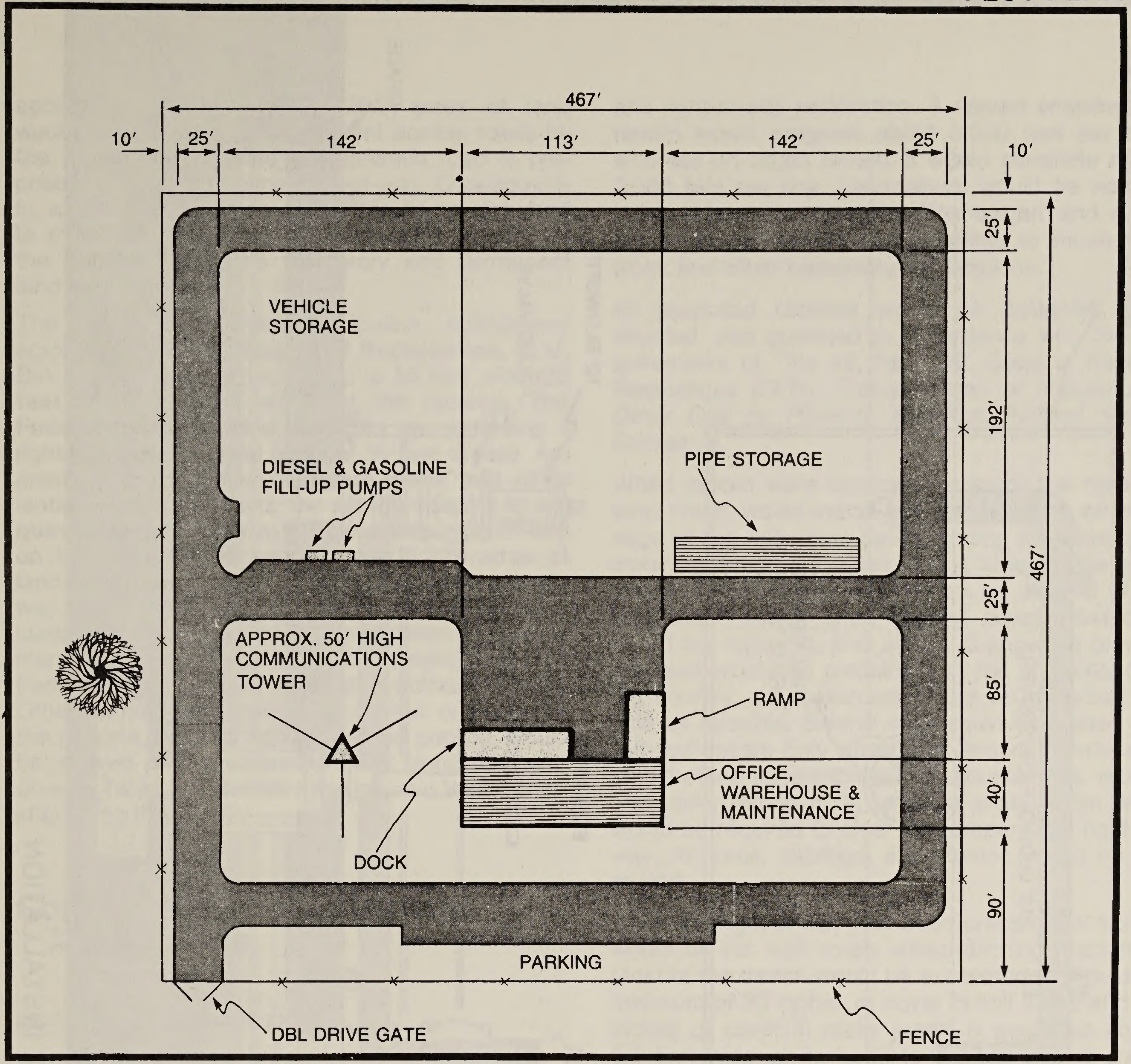
LAND REQUIREMENTS

The proposed pipeline would **use** a 100-foot wide construction right- of-way disturbing about 7,395 acres of land. Additional work space would be required at 33 primary road crossings and 10 railroad crossings (12.5 acres), 38 stream crossings (12.4 acres), and 8 double-jointing yards (160 acres). About 60 acres of land would have to be disturbed if existing borrow sites could not provide padding material to protect the pipeline's coating in rocky areas. About 200 miles of such areas might be crossed, requiring about 534,000 cubic yards of padding. An undetermined amount of acreage could be disturbed for temporary access roads.

Although the need for and location of temporary access roads is not known at this time, temporary access roads would be used whenever public roadways or the right-of-way could not be used as service roads during construction. No staging areas or storage areas are anticipated on forested lands. **Mr. L. Kent Mays, Jr., Deputy Regional Forester, has indicated that an unestimated number of miles of new access roads would be needed in the Uinta and Manti-LaSal National Forests.**

The permanent aboveground facilities associated with the RMPP would require 15 acres for the Sage Compressor Station, 20 acres for the four maintenance bases, and 1 acre for the Nevada-California meter station. Permanent access roads would be needed to serve these facilities. The compressor station would require a road 0.5 mile long and 20 feet wide. The meter station road would be 3 miles long and 12 feet wide. Some of the block valves could not be reached by existing roads; a total of 7 miles of 18-foot wide road would be necessary to

PLOT PLAN



PROFILE VIEW

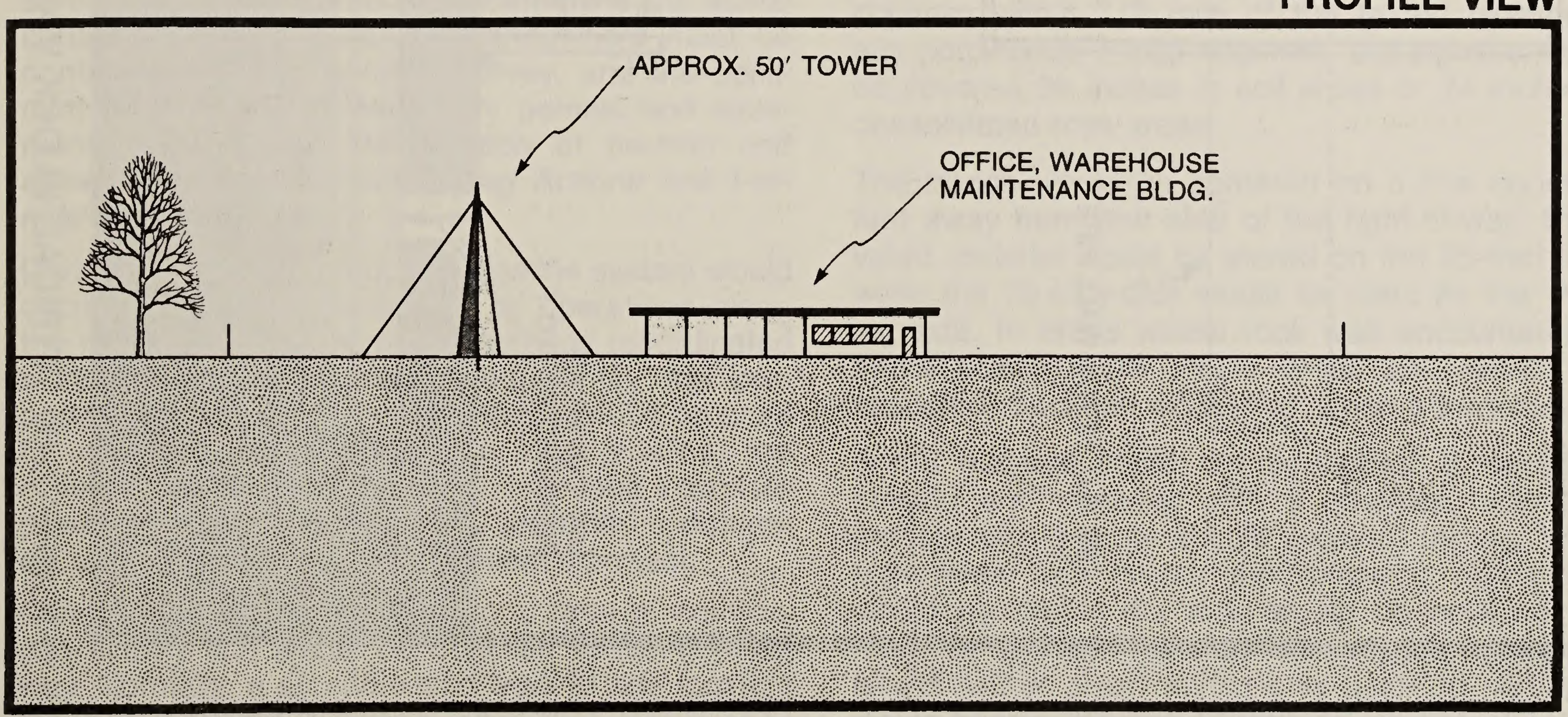


FIGURE 2-5. TYPICAL MAINTENANCE BASE

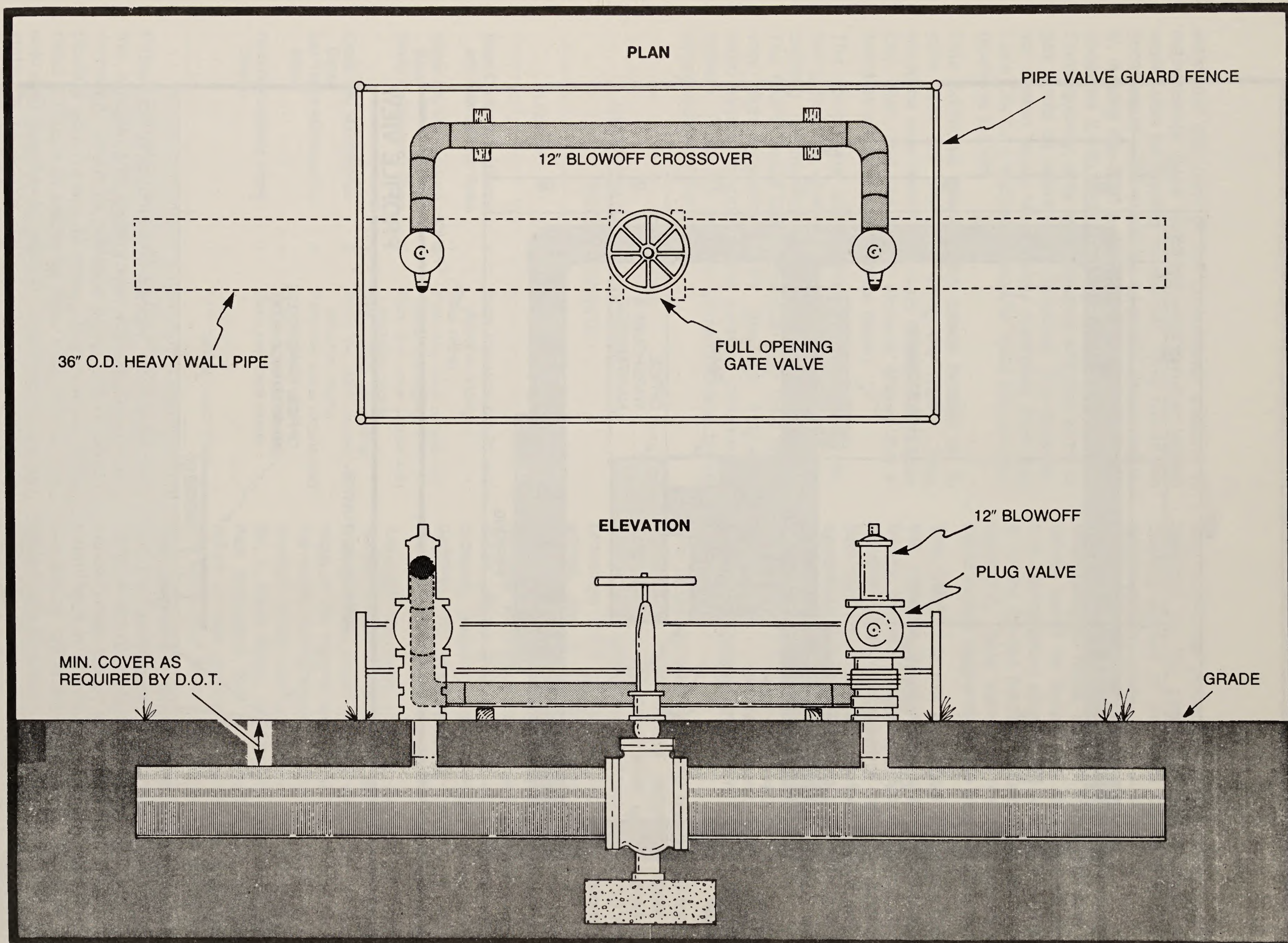


FIGURE 2-6. TYPICAL BLOCK VALVE INSTALLATION

accomplish this. Therefore, 20.9 acres of land would be converted to permanent access roads by the project. No pipeline maintenance road is proposed within the pipeline right-of-way. Consequently, at least 7,697 acres of land could be disturbed to install the proposed pipeline. Table 2-1 shows the proposed project's temporary and permanent land requirements.

The **RMPC's** permanent pipeline right-of-way across 343 miles of **Bureau of Reclamation,** BLM, BIA, and FS lands would be up to **53** feet wide **(50 feet wide plus the width of the facility). The Federal land managing agencies are analyzing** a right-of-way on Federal lands of 50 feet or less. Approximately 268 miles of private, state, and other lands would be crossed; the applicant wants to **acquire easements for** a 100- foot wide right-of-way on this land. Consequently, about **5,327** acres of land would be committed to the pipeline right-of-way, and a total **5,374** acres of land would be associated with the proposed pipeline system for a minimum of 20 years. Approval of the right-of-way on Federal lands is subject to existing authorized uses. Other surface land **uses** that do not conflict with the pipeline, such as agriculture and grazing, would be allowed on the unfenced areas along the right-of-way. Table 2-6 identifies the general land ownership along the RMPP.

Construction, Operation, and Maintenance

PIPELINE CONSTRUCTION

Before construction can begin, the applicant must survey and stake the route to determine the actual construction right-of-way. All landowners must be contacted for permission to survey, and the applicant must secure all necessary permits and easements. (For further identification of permits and easements, refer to 'Authorizing Actions and Permits' and appendix D.)

Construction of the proposed pipeline system would occur in a planned sequence of operations along the route. Seven construction spreads (coordinated work groups) would simultaneously lay the proposed pipeline. Six of these spreads would be used to construct RMPC's 583-mile long pipeline; the seventh would construct the 27-mile long intrastate pipeline in California. Table 2-2 identifies hypothetical spread locations for the proposed project.

Construction would occur along a zone of continuous activity and would be confined to the right-of-way. Normally, a spread would work at one location for 6 to 8 weeks between initial land disturbance and right-of-way restoration. A spread crossing flat terrain would progress about 5,000 feet per day, whereas on rough terrain, it would complete about 2,500 feet per day. Landowners would be notified in advance before construction **began** and given assistance in making arrangements to move livestock and other necessary preparations.

All proposed facilities would be designed, constructed, and operated in accordance with the requirements of Title 49, Part 192, Code of Federal Regulations (CFR), *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards*.

When fences were encountered along the right-of-way, crews would install adequate bracing at each edge of the easement before cutting the wires and installing temporary gates. The 100-foot wide construction right-of-way would then be cleared of all vegetation except short ground cover, obstacles would be removed, and abrupt changes in ground contours would be smoothed. In flat or gently rolling country, the easement would be disturbed as little as possible. Sidehill cuts would be bladed out with bulldozers only enough to ensure a safe and stable plane for equipment. In mountainous, rough, and rocky terrain or in forested areas, more work would be required to clear and prepare the right-of-way. All trees, saplings, and stumps would be removed.

Once the right-of-way had been prepared, a trench would be cut with rotary wheel-ditching machines. Most of the trench would be excavated to provide a minimum of 30 inches of cover in soil areas and 18 inches of cover in rocky areas; it would be about 5.5 feet wide at its bottom. In areas where there the more than 10 buildings intended for human occupancy within 1/8 mile of the buried pipeline in any continuous 1-mile segment, the pipeline would be covered 36 inches in soil areas or 24 inches in consolidated rock areas.

The trench would be centered on a line about 25 feet away from one side of the right-of-way. Excavated material would be stored on the 25-foot side, while the 75-foot side would be used as the working side. In areas where rock was encountered, a tractor-drawn ripper would break and loosen the section. A backhoe would then open a trench.

If the material could not be ripped, it would be blasted and removed with a backhoe. About 30 percent of the route should require blasting. When explosives were used, the following precautions would be taken: the area would be covered with mats to prevent scatter, if necessary; flagmen would halt or divert traffic; only qualified personnel would handle blasting operations; and blasting procedures would comply with all regulatory requirements.

In agricultural areas, the applicant would **use** double-ditching to conserve topsoil if requested by the landowner. Cultivated land compacted during construction would be loosened and restored to its preconstruction condition. Landowners would be compensated for any loss of crops or other damages.

An exception to mechanical excavation would be hand digging to locate underground utilities. Where irrigation or other underground structures exist, the pipeline would be buried to provide 12 inches minimum clearance between the pipe and the structure.

Pipe would be delivered to a railhead location near the proposed pipeline route. It would then be either stockpiled at a double-jointing yard or delivered directly to the construction site by tractor-trailer trucks. On steep terrain, the pipe would be carried up the slope and positioned in place one joint at a time using a side boom tractor. Other material required for construction such as valves, fittings, and supporting equipment would be delivered by truck.

After the trench had been readied, pipe would be moved from the double-jointing yards and 'strung' along the right-of-way by trucks and side boom tractors. Gaps would be left between pipe segments to allow passage of farm stock and equipment and to provide drainage. The pipe would be bent to conform to the trench contour, aligned, welded together, and placed on temporary supports as a continuous pipeline along the side of the trench. **Welds** would be visually and radiographically inspected in accordance with 49 CFR 192. The pipe joints would then be coated, and the pipe would be lowered directly into the trench.

Areas with high ground water or where periodic inundation occurs would require anchoring for negative buoyancy; this can be provided by concrete coating, weights, or mechanical means. Water could be pumped from the trench, or the pipeline could be floated into the ditch. The pipeline would have a minimum of 60 inches of covering material when laid under streambeds or within floodplains. If the bottom of the trench were rocky, padding material would be placed on the trench floor. The pipeline might also be wrapped with an outer shield of asphalt and fiber rockshield to prevent damage to the pipe and its coating.

After the pipeline had been placed in the trench and inspected, the excavated material would be put back in the trench. Any excess material would be spread over the right-of-way. The right-of-way surface would be graded to conform to original contours except for the berm over the filled trench, which would be allowed to settle naturally. Any excessive settlement or erosion would be filled during operation and maintenance of the transmission system. No large rocks would be backfilled immediately adjacent to the pipe. Padding material from borrow pits or foam padding would also cover and protect the pipeline in rocky areas.

Usually the backfill is compacted and a crown tapering outward from the center is left over the ditch to compensate for normal subsidence. The initial height of the berm is determined by the characteristics of the material used as backfill. Typically, a crown 12 inches high with a 20-foot wide base is necessary.

Erosion control devices or structures used would depend on the site-specific situation. These measures might include French drains, terrace ditches, sandbag ditch breakers, check dams, cross ditches, riprap, fencing, or combinations of these methods. Unconsolidated soils might be mulched to enhance the staying capacity of the soil and improve conditions for revegetation. After construction, the disturbed surface would be contoured to approximate the preconstruction grade.

Right-of-way across croplands irrigated by circular traveling sprinkler systems would be restored by waterpacking the ditch line or by special compaction or soil bagging where the ditch line intersected the sprinkler wheel line. In croplands leveled for surface flood irrigation, the backfill would be waterflooded to compact the soil to its natural consistency.

Following backfilling, all surplus excavated material, trash, debris, and equipment would be removed from the right-of-way and disposed at approved disposal sites or burned at an approved location with appropriate permits. The temporary fences and gates would be removed and replaced with permanent fencing.

Revegetation along the right-of-way and on streambanks would be accomplished using appropriate materials and methods for each particular area, in accordance with the right-of-way agreements. Landowners would be contacted to ensure their satisfaction and approval of the final restoration. In erosion-prone areas, the applicant would **use** mulch and supplemental fertilizers as necessary. Restoration of the right-of-way normally includes the natural reestablishment of native grasses. The U.S. Soil Conservation Service and other knowledgeable agencies would be consulted to determine specific seed mixtures, **fertilizer, and mulch recommendations.**

The pipeline would be hydrostatically tested to ensure its integrity. This procedure consists of filling incremental segments of the pipeline with water and pressurizing the pipe to a predetermined level to verify its integrity in accordance with 49 CFR 192. The pipeline, tested in lengths dictated by elevation differentials, would require about 279,210 gallons of water per test segment mile. Test water would be pumped to succeeding segments to be reused as many times as practical before discharge.

Test water sources would include streams, rivers, wells, and canals. The water would be withdrawn and discharged in accordance with all applicable state and Federal regulations. **Appendix C identifies some additional precautions RMPC would take when water is withdrawn from streams.**

The conventional lay method would be used to construct all stream and drainage crossings if the waterways were dry at the time of construction. Low flow construction is proposed to the extent it is compatible with the construction schedule.

In flowing streams, combination equipment capable of performing as backhoe, dragline, clamshell, and crane would be used to open a trench. Water flow would be maintained during construction. The pipeline would be buried a minimum of 5 feet below streambeds. No blasting in streambeds is presently proposed.

Either the diverting method or wet method of construction would be used. Most small and wide shallow streams could be diverted to complete construction. The wet method would be used in continuously flowing one-channel streams. For wet construction, the pipe would be welded, inspected, tested, coated, and weighted on land before it was floated or dragged into the stream's trench. Concrete coating or thicker wall steel pipe would ensure negative buoyancy at river crossings and high ground water areas. Material excavated from the trench would be stored on the streambanks and used as backfill.

To minimize the time required to construct the stream crossings, the right-of-way on either side of the stream would be prepared before the crossing was constructed. Tree removal on streambanks would be limited to preserve aesthetic value, and temporary erosion control measures would be used. Streambeds would be returned to their original contours; streambanks would be cleared of all stored and introduced materials and obstructions, stabilized, and seeded to prevent erosion. In addition to these erosion control techniques, the applicant **might** use cofferdams or retaining walls (riprap) to control bank erosion. Figure 2-7 illustrates a typical stream crossing.

In excavation areas where the water table is near the surface or where runoff from snow or rainfall accumulates, the water would normally be contained within limited lengths of trench. Earth plugs or untrenched sections could be used to isolate and limit the length of the water-affected sections.

Pipe installation does not normally require removing water from the trench, since work such as welding and coating is done beside the trench and does not require workers to enter the trench. At locations such as road crossings, mainline valves, and tie-in points, workers may be required to enter the excavation. In these locations, the water would be removed by a small portable pump. Depending upon its volume, the water would either be ponded for percolation into the soil or directed to the nearest drainage outfall. Normal surface water channels and ditches would be used to carry away the water without erosion or affecting ground water supply or water quality.

Where possible, the applicant intends to avoid sidehill construction in areas with side slopes greater than 20 percent. To do this, the pipeline would be routed up or down a hillside until it reached a ridge line or other acceptable location. RMPC would try to limit construction on slopes greater than 20 percent to segments less than 1,000 feet long.

Sidehill construction usually requires that the pipeline be buried in a trench cut through undisturbed soil. The track mounted construction equipment requires an essentially flat work area parallel to the trench. The split-level or two-toning sidehill construction method, which RMPC would employ to minimize cuts and high walls, **uses** two step-like work planes to move equipment, bring up additional pipe by tractor, and provide a trench and a pipe fabrication/holding area. Pipe is usually laid from the same side for the length of the spread. If necessary, equipment can be moved to the opposite side of the trench to lay the pipe.

Cut and fill using some of the excavated material from the sidehill cut would provide a portion of the level work plane for the construction equipment. The remainder of the excavated material would be stored on the construction right-of-way downhill from the work planes or hauled to an approved storage site. The down-slope storage area, consisting of a mounded windrow of material, would not be graded level.

Following pipe fabrication and lowering into the trench, the excavated material would be used to fill the two-toning cuts. RMPC would restore the area as nearly as possible to its previous grade. Excess material would be incorporated into the berm to compensate for natural compaction. Slope restoration, revegetation, and rehabilitation measures would include precautions to ensure adequate access to the pipeline, to maintain slope stability, and to control surface and subsurface drainage.

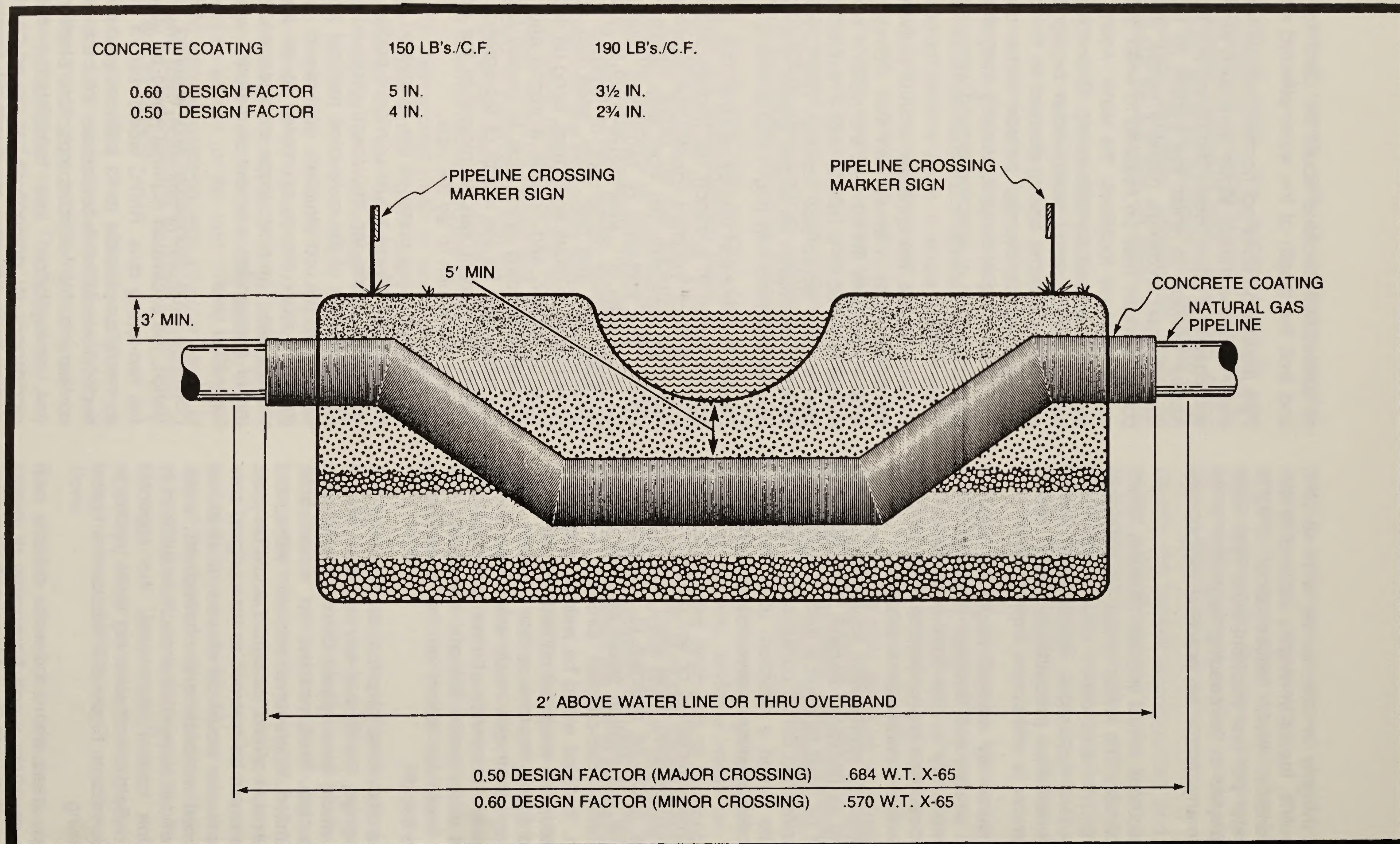


FIGURE 2-7. TYPICAL STREAM CROSSING

Highways and railroads would be bored or cut as required by permitting authorities. Boring requires cutting a hole for the pipe through a casing under the facility. In some crossings, the casing would be left and the pipeline installed within the sealed casing. (Figure 2-8 shows road crossing techniques.) Secondary farm and county roads would be cut during construction. The applicant would ensure temporary passage of traffic by a detour, temporary bridging, excavation of only half of the crossing at a time, or a combination of these methods. All crossings would meet the specifications of the owners of the facilities to be crossed.

Temporary access roads would be constructed by the pipeline contractors in each spread before or in conjunction with the pipe stringing operation; they would be restored in a manner similar to the right-of-way during cleanup operations, unless requested otherwise by the landowners. Temporary access roads would be constructed where the terrain prevented using the right-of-way during construction. Until the right-of-way is established, the exact location of these roads cannot be designated.

All sites for temporary construction facilities--including new borrow pits, evaporation ponds for hydrostatic test water, and temporary access roads--would be restored. Compacted soils would be **ripped,** debris removed, and the sites graded to conform with adjacent terrain and revegetated. Additional RMPC mitigation and restoration measures which are part of the proposed project are identified in appendix C.

Preconstruction activities and actual pipeline construction would require about 15 months. (See figure 2-2 for the applicant's proposed detailed construction schedule.) Pipeline construction is proposed to occur from April through October 1982. No temporary work camps are proposed. RMPC would not provide temporary housing for the pipeline construction personnel. These workers would **use** temporary housing accommodations in the surrounding area. The peak work force requirements are shown in table 2-3.

CONSTRUCTION OF COMPRESSOR STATION AND MAINTENANCE BASES

The Sage Compressor Station and maintenance base would be constructed during the same 6-month period as the pipeline. A work force varying from 60 to 100 workers would be used. Each of the other four maintenance bases would require 4 months to construct, using a peak force of 20. These workers would also **use** temporary housing in the surrounding area.

Construction of the Sage Compressor Station, maintenance bases, meter stations, block valves, and pipeline would require the construction or improvement of temporary and permanent access roads. Each permanent access road would be constructed with adequate base, crown, and drainage to prevent erosion and provide ingress and egress from existing roads.

Electricity would be supplied by the local electric utility company to the compressor station, maintenance bases, communication facilities, cathodic protection sites, and meter stations. The Sage Compressor Station would require a 2.8-mile long extension from the nearest Utah Power and Light Company transmission line. The applicant has not identified the right-of-way and specific equipment requirements of the electric power lines such as underground cable or poles--for any of the other sites requiring power supply. The RMPC would apply to the local power company for service, and that utility company would be responsible for obtaining the required authorizations for the number and lengths of rights-of-way.

After any necessary site grading, equipment and building foundations would be excavated and the concrete for the foundations poured. Construction of the compressor buildings, maintenance base buildings, microwave facilities, meter station buildings, and auxiliary systems would then occur. Security fencing would be installed around all of these aboveground facilities. After the construction had been completed, trash and debris would be removed and disposed **of** in approved areas.

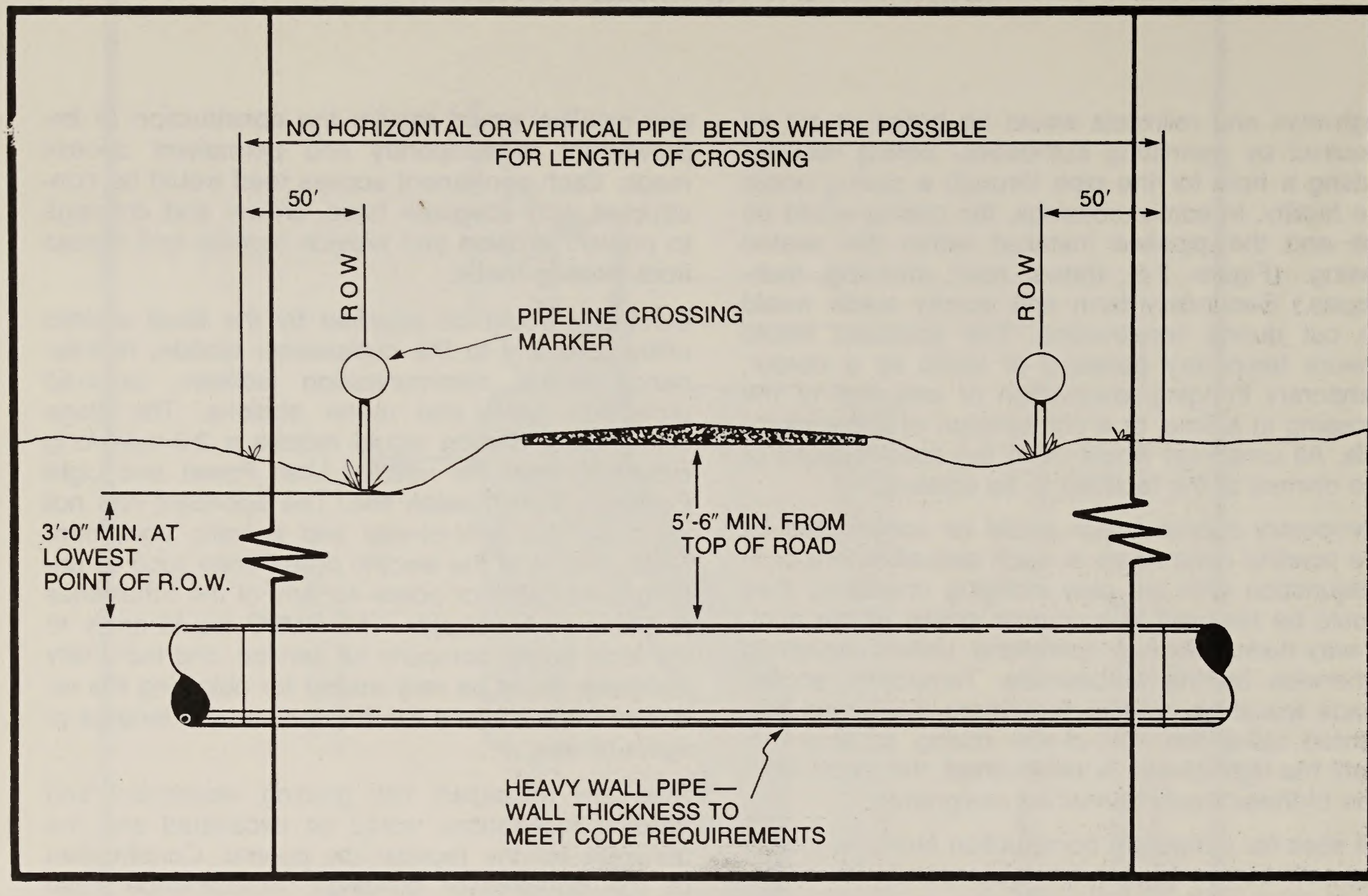
The construction work force requirements for the Sage meter station, Nevada-California meter station, and RMPC operating headquarters have not been provided. The operating headquarters near Salt Lake City would **use** either a new building or an existing structure modified to handle company operations.

OPERATION AND MAINTENANCE

RMPC operating and maintenance manuals would be made available to all operating personnel. These manuals would comply with all applicable regulations, such as U.S. Department of Transportation (DOT) safety regulations for pipelines and all regulations of the Occupational Safety and Health Act. **The California facilities will be operated and maintained in accordance with CPUC's general Order No. 112D.**

The RMPP system would be operated by a permanent staff of trained personnel fully acquainted with the proposed system. The RMPC would employ 68 individuals; 41 would work out of the five maintenance bases, and 27 would work at the operating headquarters. Table 2-5 indicates where all of

TYPICAL UNCASED CROSSING



TYPICAL CASED CROSSING

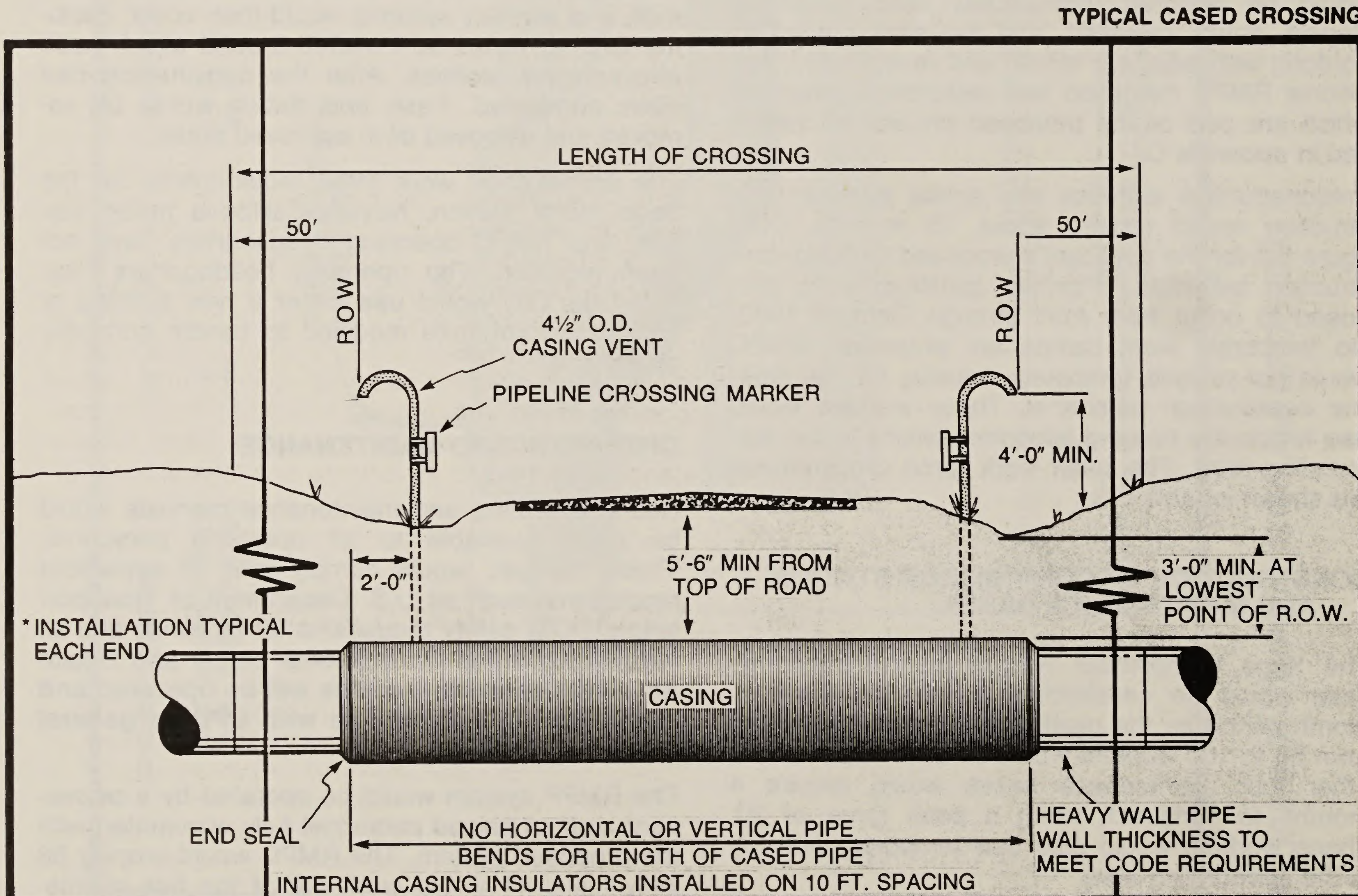


FIGURE 2-8. TYPICAL CASED AND UNCASED ROAD CROSSINGS

these individuals would be employed. Each maintenance base would be equipped to provide routine maintenance and respond to emergencies. Using the data communications facilities between the compressor station and meter station at the California-Nevada border, the gas control center near Salt Lake City would monitor and control the RMPP 24 hours a day.

Periodic aerial and ground inspections would check for erosion, dead vegetation that might indicate a leak in the line, conditions of the right-of- way, pipe exposure, unauthorized encroachment on RMPC's right-of-way such as a building, and other situations that could cause a safety hazard or require preventive maintenance. **Restoration measures would be taken where necessary.**

The pipeline would be aerially inspected once a month, or more often if necessary. Ground inspection, either on foot or in a vehicle (access permitting), would occur with a maximum interval of 1 year. The pipeline block valves would be periodically inspected and serviced to ensure their operative condition. Human activities which might encroach on the right-of-way and endanger the pipeline would be investigated immediately by maintenance personnel. Changes in population density and proximity to the pipeline would be monitored; if the class locations, defined by DOT, change, remedial action would be taken.

Periodic inspections of the pipeline's cathodic protection system would be made, and records would be maintained to monitor the status of the protection system. The pipeline must be tested at least once each calendar year, but with intervals not exceeding 15 months, to determine that the cathodic protection system is providing the proper level of corrosion control.

The right-of-way would provide access to inspect and maintain the pipeline. **No** trees or deep-rooted shrubs that would damage the pipeline's protective coating or prevent periodic surveillance would be allowed within 10 feet of either side of the pipeline. The right-of-way would be allowed to revegetate; however, large brush and trees over 2 inches in diameter would be periodically removed. The frequency of removal would depend on vegetation growth rate. The selective slash cuttings would be reduced by chipping or disposed **of** in accordance with the **use** permits. Herbicides would be used for total vegetation control only at block valve locations and at the Sage Compressor Station. The type of herbicides used and method and rate of their application would depend upon the products available in the marketplace and restrictions placed on their **use** by permitting authorities. Access roads would be maintained as required to provide safe access for routing and emergency situations. All of the aboveground facility sites would be maintained by pipeline company personnel.

Environmental and Safety Controls

In addition to corrosion inhibitor coatings inside and outside the pipe, cathodic protection would be applied to the pipe and underground station piping to minimize corrosion and prevent a possible pipe failure. This is done by impressing an electrical current in the pipeline and discharging it through a ground bed. The system would be continuously monitored to assure that corrosion was held to acceptable levels.

The pipeline would also be clearly marked at line-of-sight intervals and at crossings of public roads, railroads, and other key points. The markers would identify the RMPC and give a telephone number where a representative could be reached.

The compressor station, designed for automatic and unattended supervisory operation, could be controlled locally by switching from remote control to local control. It would be equipped with hazardous gas and ultraviolet fire detection alarm systems, a fire protection system, and an emergency shutdown system. A gas detection system would be activated at 25 percent of the lower explosive limit. Automatic emergency shutdown of the compressor units, evacuation of gas from the station piping, and isolation of the station from the mainline would occur following a fire detection alarm or the detection of a 50-percent lower explosive limit inside the station. The compressor station would also be equipped with relief valves to protect the station piping from overpressure if station or unit control systems failed. Alarms telemetered to the gas control headquarters would require the Sage maintenance personnel to investigate and take proper corrective action.

Future Plans and Abandonment

There are currently no definite plans to increase the capacity of the proposed project; however, RMPC has indicated that the proposed design of the RMPP allows for expansion to 800,000 Mcfd, the most economic and fuel efficient throughput level. The capacity of the 36-inch diameter pipeline could be expanded to this level by constructing three additional 10,600-hp. compressor stations at MP 104.5 (Summit County, Utah), MP 229.5 (Millard

County, Utah), and MP 349.5 (Iron County, Utah), installing two additional 10,600-hp. compressor units at the Sage Compressor Station, and operating all of the units simultaneously. (See the *Graphic Supplement* for maps identifying these locations.) Each of the new compressor stations would be located on a 15-acre tract of land. An expanded project would **use** about 12,000 Mcfd of fuel gas to deliver 788,000 Mcfd to California. No additional facilities would be required by the RMPC.

Northwest might also have to add about 80 miles of pipeline and 16,000 **horsepower** of compression to its existing transmission system. The fuel **use** on Northwest's system has not been estimated. Consequently, a total of 690 miles of pipeline might be required to deliver 788,000 Mcfd.

The specific location of the gas supply for the proposed project is not known. Without this information, it is not possible to determine whether Northwest would require additional facilities to deliver either 413,000 or 800,000 Mcfd of gas to Sage, Wyoming. Since it is impractical to speculate on actions the applicant might take in the future or to analyze unreasonably hypothetical situations, this EIS has limited its evaluation to the environmental impact of the facilities actually proposed. However, in analyzing alternatives, the facilities and fuel **use** requirements for expanding the RMPP to 800,000 Mcfd have been considered. This speculation on future facility requirements is necessary to assure that only technically feasible alternatives are retained as 'reasonable' alternatives.

If additional facilities are eventually proposed to expand the capacity of an existing transmission system, the applicant(s) will have to seek additional governmental authorizations and meet the requirements of the National Environmental Policy Act (NEPA) before any facilities can be constructed. An environmental evaluation of such expansion would be required before the proposal could be implemented.

The RMPP is projected to have a 20-year minimum useful life; however, the supply of gas is the major factor affecting this determination. Should additional gas supplies become available, the life of the facilities and/or the capacity could be increased.

At the end of the pipeline's useful life, RMPC must obtain authorization from the FERC to abandon its facilities. The applicant has indicated that, in this event, it would purge all natural gas from the pipeline, seal and abandon the pipeline in place, remove all aboveground facilities and foundations, dispose of all unsalvageable materials at authorized sites, and regrade and revegetate disturbed land areas, as necessary. The FERC and land managing agencies could place conditions upon the abandonment if they are needed. In addition, the abandoned right-of-way would revert to the private landowner's or agency's control.

AUTHORIZING ACTIONS AND PERMITS

Federal Authorizing Actions

To implement the RMPP, the following authorizing actions would be required by certain Federal agencies.

FERC
- Certificates of public convenience and necessity

BLM

Right-of-way grant (gas pipeline)
- **Temporary use** permit Sale of mineral materials
- Right-of-way grant (electrical power transmission lines)
- Recommendations for antiquities permits

BIA
- Right-of-way grant (Moapa and Fort Mojave Indian Reservations)

FS
- Roads and trail permits Temporary special **use** permits Mineral materials permit Timber sale contracts or permits Antiquities permits Special **use** permits

U.S. Army Corps of Engineers
- Nationwide 404 permit for stream crossings Individual 404 permit for stream crossings (depending upon construction techniques)

National Park Service
- Antiquities permits for public lands administered by BLM

Federal Communication Commission
- Licenses to operate repeater stations

Bureau of Reclamation
- Licenses for construction and operation across lands purchased or withdrawn (3)

EPA
- National Pollutant Discharge Elimination System (NPDES) permits for Utah

U.S. Fish and Wildlife Service
- Review of Army Corps of Engineers section 404 permits for stream crossings

State, County, and Local Aurhorizing Actions

Wyoming

Permits for wastewater disposal facilities NPDES permits Construction permit for a new air quality source Permit for a landfill Permits to appropriate ground water from both the Department of Environmental Quality, Land Quality Division, and the State Engineer's Office.

Utah

Verbal permission to survey on any state lands Right-of-way grant to cross any state lands, including Rockport Lake State Recreation Area Encroachment **and occupancy permits** Archaeological and historical survey permits Construction permits to cross streams Air quality permits (depending upon construction techniques) Conditional **use** permit **(Utah County) Written approval from State Engineer for any stream alteration**

Nevada

Permit to package sewage treatment or septic tanks, if needed Land clearing permits Waste water discharge permits Revocable or encroachment **and occupancy** permits to cross or **use** st highway rights-of-way Archaeological and historical clearance survey permits Conditional **use** permit (Clark County Board of Commissioners) **Watering permit (Clark County Health District)** Conditional **use** permit (City of Henderson City Council) **Conditional use** permit (City of Boulder City zoning) **Permit to cross certain lands in Eldorado Valley (Colorado River Commission of Nevada)**

California

Certificate of Public Convenience and Necessity (CPUC) Safety standard construction permits Highway **enroachment** permits Archaeological and historical **survey permits** Water discharge permits Burning permits County easements to cross county drainages Excavation permits to cross county roads Easements issued by the Water Conservation Districts Permits to cross ditches issued by the Irrigation Districts

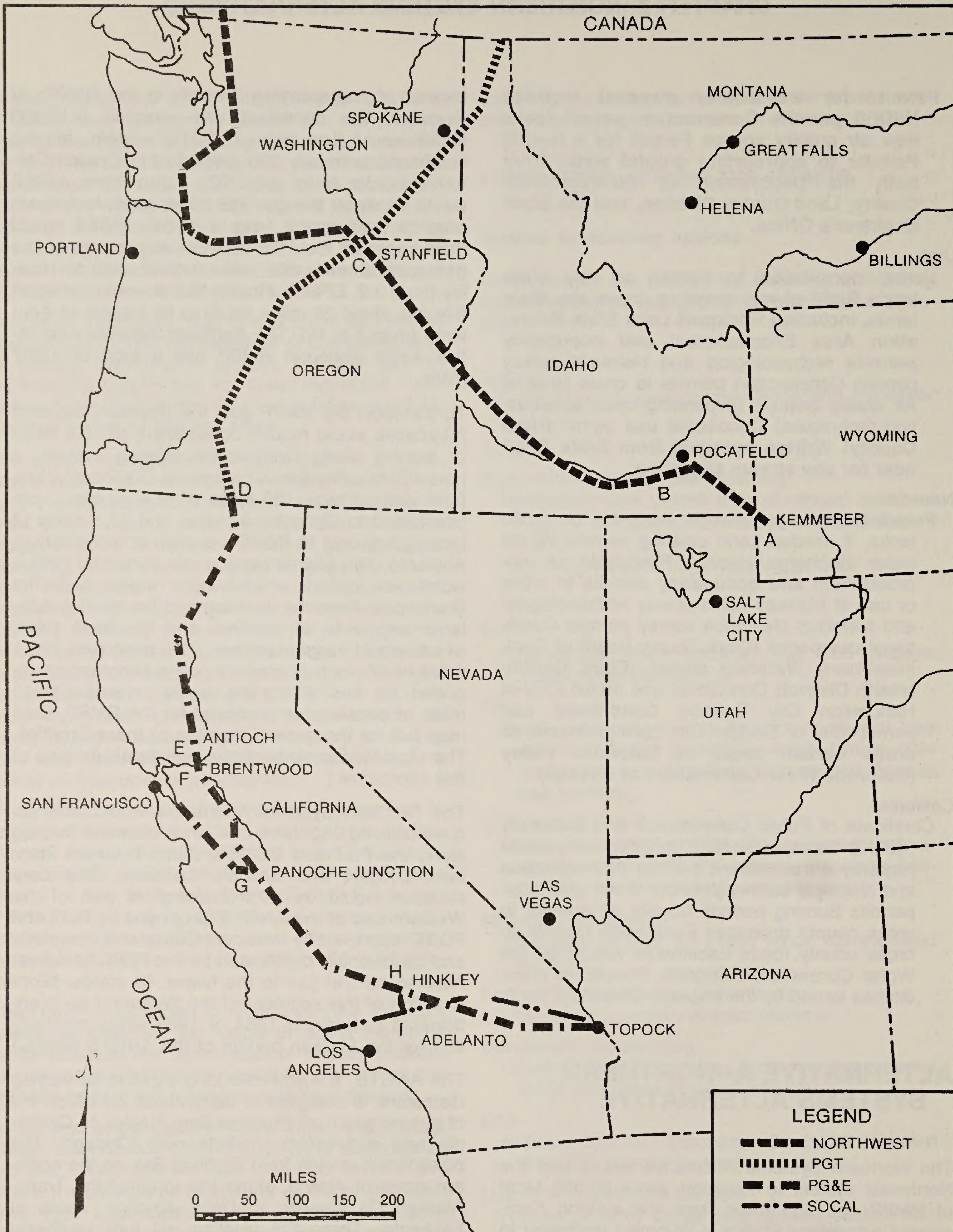
ALTERNATIVE A--NORTHERN SYSTEMS ALTERNATIVE

The Northern Systems Alternative would **use** the Northwest system to transport about 83,000 Mcfd of RMPP gas 583 miles from the existing Kemmerer Compressor Station in Wyoming northwest to Stanfield, Oregon (map 2-2, ABC). Northwest would exchange 240,000 Mcfd of RMPP's Rocky Mountain gas for 240,000 Mcfd of **PIT's** Pan Alberta gas at Stanfield. **El Paso and** Northwest would also deliver to Stanfield 90,000 Mcfd of gas from Canada instead of **transporting** it south to the RMPP. At Stanfield, the combined gas volumes (413,000 Mcfd) would flow through PGT's system, moving south approximately 335 miles to the Oregon-California border (map 2-2, CD). From there, PG&E would transport the gas **299** miles south to Antioch near its load center (map 2-2, DE). PG&E would then transport the PLS and SoCal portions of the gas approximately 361 miles farther south to Hinkley (map 2-2, EFGH). Finally, SoCal would transport this gas about 28 miles south to its system at Adelanto (map 2-2, HI). The Northern Systems Alternative would transport RMPP gas a total of **1,607** miles.

To transport the RMPP gas, the Northern Systems Alternative would require construction of 76.8 miles of looping along Northwest's existing system, a new 400-hp. Stanfield Compressor Station at Stanfield, and perhaps 120 miles of new pipeline from Brentwood to Panoche Junction and 28.3 miles of looping adjacent to PG&E's system from Hinkley to Adelanto. The alternative analysis considers both a worst-case option, which would require both the Brentwood- Panoche Junction and the Hinkley-Adelanto segments of pipeline, and the **best case,** which would require neither. The maximum 225.1 miles of 36- inch diameter pipeline construction required for this alternative would replace 610.18 miles of construction proposed for the RMPP. (See map 2-2 for the general location of these facilities. The *Graphic Supplement* provides detailed maps of this alternative.)

The Northern Systems Alternative would also require building 380 miles of 42-inch diameter looping along the PGT and PG&E systems between Stanfield, Oregon, and Antioch, California. This construction would be a 'prebuilding' of part of the Western Leg of the ANGTS, proposed by PGT and PG&E, approved by President Carter and Congress, and conditionally certificated by the FERC to deliver Alaskan natural gas to the **lower** 48 states. (Construction of this segment of the Western Leg is anticipated to begin in 1984 or 1985 when construction for the Alaskan portion of the ANGTS begins.)

The ANGTS, a 4,800-mile long pipeline of varying diameters, is designed to carry about 2.4 billion cfd of natural gas from Prudhoe Bay, Alaska, to California and midwestern markets near Chicago. The pipeline will stretch from Prudhoe Bay on the northern coast of Alaska, along the route of the Trans-Alaskan Oil Pipeline to Delta Junction, south of Fairbanks. There the pipeline will turn southeast and continue into Canada, generally following the Alaskan-Canadian Highway. Just north of Calgary, Alberta, it will split into two sections--the Western Leg to Antioch, California, and the Eastern Leg to the Midwest. On January 19, 1981, the Secretary of



MAP 2-2.NORTHERN SYSTEMS ALTERNATIVE

the Department of Energy authorized a 42-inch diameter pipe for the Western Leg south of Stanfield.

The CPUC has jurisdiction over PG&E's Western Leg Facilities in California. The environmental impact of the entire 917 miles of the Western Leg has been analyzed in an FEIS issued by the DOI in March 1976. (This analysis appears in the *Alaskan Natural Gas Transportation System: FEIS--San Francisco*, which refers to the Western Leg as the "San Francisco pipeline.") This EIS adopts by reference that document's environmental analysis of the 380 miles of looping which would be 'prebuilt' if the Northern Systems Alternative were adopted (DOI 1976). No additional discussion of the environmental impact of this part of the alternative is necessary. Furthermore, since the Western Leg will be constructed regardless of the fate of the Northern Systems Alternative, the Western Leg facilities required to transport RMPP gas are not considered in this analysis.

By constructing 76.8 miles of looping and one compressor station along Northwest's existing system, 380 miles of the Western Leg, 120 miles of new pipeline from Brentwood to Panoche Junction, and 28.3 miles of looping from Hinkley to Adelanto, the Northern Systems Alternative could transport the RMPP gas to its markets. By prebuilding a part of the Western Leg, this alternative would consume about 17,160 Mcfd of gas to deliver 395,840 Mcfd of gas to Antioch. (The amount of gas needed to transport the gas south from Antioch was not analyzed for this alternative.) However, when Alaskan gas begins to flow through the completed Western Leg in 1986, additional compression would be required to transport both the 413,000 Mcfd of RMPP gas and the 640,000 Mcfd of Alaskan gas. Four existing compressor stations along the Western Leg would require a total of 21,200 additional horsepower to provide sufficient capacity. Table 2-7 identifies the compression; table 2-9 identifies the locations. This additional compression is considered in the analysis of the Northern Systems Alternative. Following completion of the Western Leg, this alternative would **use** about 27,780 Mcfd of gas to deliver 385,220 Mcfd of gas to Antioch.

TABLE 2-9

LOCATIONS OF COMPRESSOR STATIONS AND COMPRESSION FOR THE 800,000-MCFD LEVEL

System	Compressor Station	Location	Compression Increase (Horsepower)
Northwest	Lava Hot Springs	Bannock County Idaho	2,100
	Burley	Cassia County Idaho	1,950
	Mountain Home	Elmore County Idaho	400
	Stanfield	Umatilla County Oregon	4,450
PGT	Ione	Morrow County Oregon	24,500
	Kent	Sherman County Oregon	7,250
	Madras	Jefferson County Oregon	14,650
	Paulina	Deschutes County Oregon	11,200
	Diamond Junction	Klamath County Oregon	8,000
	Bonanza	Klamath County Oregon	18,420
PG&E	Tionesta	Modoc County California	5,250
	Burney	Shasta County California	7,250
	Gerber	Tehama County California	9,450
	Delevan	Colusa County California	18,980

Facilities

COMPONENTS

The major components of the Northern Systems Alternative include 225.1 miles of 36-inch diameter pipeline, one new 400-hp. compressor station, and an increase of 21,200 **horsepower** at four existing compressor stations. Table 2-1 lists the facility and land requirements for this alternative.

To transport 83,000 Mcfd of gas north from Northwest's Kemmerer Compressor Station, 76.8 miles of 36-inch diameter pipeline looping, owned by Northwest, would be constructed adjacent to Northwest's existing system in Wyoming, Utah, and Idaho. The four loops--Kemmerer, Pegram, Soda Springs, and Pocatello--would be constructed between the compressor stations on Northwest's existing system. (See map 2-2, AB, and the *Graphic Supplement* for these locations.)

The Kemmerer Loop would require 21.7 miles of pipeline construction north of the Kemmerer Compressor Station. It would traverse Lincoln County, Wyoming, and Rich County, Utah. The remaining three loops would be constructed in Idaho. The Pegram Loop would consist of 7 miles of looping north of the Pegram Compressor Station in Bear Lake County. The Soda Springs Loop would require 22.8 miles of pipeline construction north of the Soda Springs Compressor Station in Bear Lake and Caribou Counties. Finally, the Pocatello Loop would require 25.3 miles of pipeline to be constructed west of the Pocatello Compressor Station in Power County.

In addition to pipeline, this alternative would require that Northwest construct a new 400-hp. Stanfield Compressor Station at the connection of its pipeline to the PGT system near Stanfield in Umatilla County, Oregon. This site is approximately 0.5 mile northeast of Stanfield, between Despain Gulch and Stage Gulch. Appendix E provides more detailed engineering information about the need for compression on this alternative.

Specific information for additional facility requirements such as maintenance bases, communications, block valves, and meter stations along the Northwest system is lacking. However, since this alternative would be constructed parallel to Northwest's existing transmission system, it is reasonable to assume that the maintenance bases and communication facilities of the existing system could also be used to maintain and control/monitor the facilities required for the Northern Systems Alternative. A few additional block valves would be required if the looping segments bypassed any existing valves. In addition, the existing meter station at the connection between Northwest's system and PGT's system near Stanfield would probably have to be modified. Any necessary modifications could be installed at either the existing meter station or at the new Stanfield Compressor Station.

To transport an unspecified volume of gas beyond Antioch, California, PG&E might be required to construct 120 miles of 36-inch diameter pipeline to connect Brentwood to Panoche Junction. (See map 2-2, FG, and the *Graphic Supplement* for these locations.) This 120 miles of pipeline would be constructed parallel to the existing Standard Pacific Gas Lines Incorporated pipeline between Brentwood and Panoche Junction. It would cross portions of Contra Costa, Alameda, San Joaquin, Stanislaus, Merced, and Fresno Counties in California. From Brentwood, the route would proceed to the southeast. West of the town of Tracy, it would cross Interstate 580 east of its interchange with Interstate 5. The pipeline would continue in a southeastern direction, cross back to the east of Interstate 5, and proceed southeasterly for about 5 miles, terminating at Panoche Junction. At this location, the new pipeline would connect with PG&E's existing, dual 34-inch diameter pipeline system to transport gas farther south in California.

RMPC has not indicated if any additional maintenance or monitoring/control facilities would be required for the Brentwood-Panoche Junction pipeline. However, it appears that the maintenance bases and communication facilities along PG&E's existing transmission system could also be used for the new Brentwood-Panoche Junction pipeline. Block valves would be required on the pipeline; at least six mainline block valves would be necessary. These valves would probably be enclosed in a 10- by 20-foot fenced security area, similar to the procedure proposed for the RMPP. At the present time, it is not known if flow controlling facilities would be required for this 120-mile long pipeline segment.

In addition to the 120 miles of new pipeline, 28.3 miles of 36-inch diameter looping might be necessary between Hinkley and Adelanto to connect PG&E's dual 34-inch diameter system near Hinkley with SoCal's system near Adelanto. (See map 2-2, HI, and the *Graphic Supplement* for these locations.) This looping, constructed in San Bernardino County, would generally parallel an existing 12-inch diameter pipeline owned by PG&E. The looping would begin about 3 miles southeast of Hinkley and proceed southwest to SoCal's system approximately 4 miles southeast of Adelanto.

The alternative analysis assumes that SoCal's existing maintenance bases and communications facilities could be used for this looping. A new meter station would be required at the connection between PG&E's and SoCal's systems near Hinkley.

The RMPC has not definitely stated that the Brentwood-Panoche Junction pipeline or the Hinkley-Adelanto looping would be required to transport gas south from Antioch. The applicant's November 12, 1980, response to the FERC request for information on these facilities was as follows:

> If Rocky Mountain gas is delivered to the PG&E system at Brentwood, then whether, and the extent to which, facilities are required south of Brentwood to enable PG&E to deliver gas to SoCal and PLS is a function of the quantity of gas that must be delivered to SoCal and the supplies available to PG&E's integrated southern transmission and distribution system. If sufficient supplies are available to PG&E's

> southern system only minor modifications to the PG&E system south of Brentwood would be necessary, and the Rocky Mountain gas could be delivered to SoCal and PLS by exchange. If, on the other hand, sufficient sources of supply are not available in the south, then reinforcement of the PG&E southern system would be necessary in order to deliver the gas to the SoCal and PLS systems. These facilities may include the installation of as much as approximately 120 miles of 36-inch pipeline from Brentwood to PG&E's dual 34-inch diameter lines at Panoche and rearrangement of station piping . . . . In addition, SoCal may have to construct approximately 28.3 miles of new 36-inch diameter pipeline between Hinkley and Adelanto to receive gas.

Since the RMPC is uncertain of the need for facilities south of Antioch, this analysis examines both the minimum facility requirements (i.e., no pipeline construction south of Antioch) and the worst-case possibility (construction of 148.3 miles of pipeline south of Antioch).

In order to transport both the proposed volumes and the Alaskan gas volumes along the Western Leg in about 1986, 21,200 **horsepower** of additional compression would be added at four existing compressor stations on PGT's and PG&E's transmission systems. Additional compression would be required on PGT's system in the following amounts: an 8,925-hp. increase at the Ione Compressor Station in Morrow County, Oregon; a 1,450-hp. increase at the Madras Compressor Station in Jefferson County, Oregon; and a 2,375-hp. increase at the Bonanza Compressor Station in Kalamath County, Oregon. Finally, an 8,450-hp. increase would be required at PG&E's existing Delevan Compressor Station in Colusa County, California.

This EIS refers to the 'best case' of the Northern Systems Alternative as requiring only 76.8 miles of pipeline on Northwest's system and the Stanfield, Ione, Madras, Bonanza, and Delevan Compressor Stations. The 'worst case' includes all of the best-case facilities plus the 148.3 miles of pipeline within California.

LAND REQUIREMENTS

The Northern Systems Alternative would **use** a 100-foot wide construction right-of-way and could disturb up to 2,728 acres of land if the maximum length of pipeline were required. This total includes 930.8, 1,454.4, and 343 acres required to construct the Northwest pipeline looping, the Brentwood-Panoche Junction pipeline, and the Hinkley-Adelanto pipeline, respectively. Land would also be required to construct one meter station (1 acre) and seven cathodic protection stations. Additional work space (100 acres) might also be required at five double-jointing yards and at road, railroad, and stream crossings. In addition, an undetermined amount of acreage could be disturbed for temporary access roads used for service roads during construction. However, because this alternative would require pipeline looping along existing pipeline corridors, it is possible that some existing maintenance access roads could be used to support construction and maintenance. Table 2-1 shows the Northern Systems Alternative's temporary and permanent land requirements.

The permanent pipeline right-of-way across BLM lands would be 50 feet wide; on all other land, the permanent right-of-way would be 100 feet wide. In addition, the new Stanfield Compressor Station would require a 15-acre site. Although the need for and location of meter stations are not known at this time, only one meter station, requiring 1 acre, should be necessary.

Consequently, about **2,619** acres of land would be committed to the pipeline right-of-way, and a total of **2,635** acres of land would be associated with this alternative for a minimum of 20 years. Table 2-6 identifies the general land ownership along the Northern Systems Alternative.

Land affected by the minimum facility level (best case) would include 931 acres disturbed by construction of the Northwest pipeline looping, 15 acres for the new Stanfield Compressor Station, and 60 acres for the three double-jointing yards. Therefore, a total of about 1,006 acres would be temporarily required; a total of **837** acres of land would be associated with the minimum alternative facilities for a minimum of 20 years.

Construction, Operation, and Maintenance

Only two construction spreads would be required to lay the pipeline for the worst-case Northern Systems Alternative. One spread would construct the 76.8 miles of looping on Northwest's system (best case); the other would construct the **148.3** miles of pipeline in California from Brentwood to Panoche Junction and from Hinkley to Adelanto. See table 2-3 for the labor requirements of the Northern Systems Alternative. If the pipeline facilities in California were not required, the labor requirements would be reduced by one construction spread.

The pipeline construction procedures for this alternative would be the same as those described for the RMPP. The construction requirements of the Stanfield Compressor Station would be similar to those of the Sage Compressor Station.

This analysis assumes that the construction schedule for the RMPP would be followed to construct the facilities for the Northern Systems Alternative.

Operation and maintenance of the Northern Systems Alternative would comply with all applicable regulations.

This alternative would employ five individuals to operate the Stanfield Compressor Station. (Table 2-5 identifies these workers.) Because the facilities for the Northern Systems Alternative would be constructed adjacent to or in proximity to the existing systems of Northwest, PGT, PG&E, and SoCal, personnel required to maintain and operate these existing transmission systems could also be used to maintain and operate the alternative. The inspection and maintenance procedures for the Northern Systems Alternative right-of-way would be similar to the procedures described for the proposed project. In addition, equivalent environmental and safety controls would be used.

Future Plans and Abandonment

There are currently no definite plans to increase the capacity of the proposed project; however, RMPC has indicated that the proposed design of the RMPP allows for expansion to 800,000 Mcfd. The capacity for the Northern Systems Alternative could be expanded to this level by incrementally increasing the pipeline looping on Northwest's system and increasing the compression horsepower at 13 existing compressor stations and the new Stanfield Compressor Station. At the expanded 800,000-Mcfd level, 313.2 miles of additional 36-inch diameter pipeline looping on Northwest's system would be constructed between the Kemmerer Compressor Station in Lincoln County, Wyoming, and a location north of the existing Caldwell Compressor Station in Baker County, Oregon. Additional compression totalling 133,850 horsepower would also be required on the Northwest, PGT, and PG&E systems: 8,900 horsepower at three existing compressor stations and the new Stanfield Compressor Station on Northwest's system; 84,020 horsepower at six existing compressor stations on PGT's system; and 40,930 horsepower at four existing compressor stations on PG&E's system. Table 2-9 identifies these compressor stations, their locations, and the individual horsepower increase required at each location. An expanded project for this alternative would **use** about 63,560 Mcfd of gas to **deliver** 736,440 Mcfd to Antioch, California. A more detailed engineering analysis of this alternative can be found in appendix E.

The facilities of the Northern Systems Alternative would probably have a 20-year minimum useful life, contingent, of course, upon any future supply of gas.

ALTERNATIVE B--SANPETE VALLEY ALTERNATIVE

The Sanpete Valley Alternative would be 200 miles long, resulting in a pipeline 630 miles long. This alternative route is shown on maps in the *Graphic Supplement*. It would cross 262 miles of land administered by BLM, 50 miles of FS land, 15 miles of state land, 10 miles of Bureau of Reclamation land (including FS land withdrawn to **Bureau of Reclamation),** 11 miles of Indian reservation (BIA) lands, and 282 miles of private land. Construction would temporarily disturb 7,636 acres; the permanent right-of-way would require 5,581 acres. This alternative would require the Sage Compressor Station, 2 meter stations, 5 maintenance bases, 34 block valves, and 15 cathodic protection stations. The land requirements for these facilities would be: Sage Compressor Station, 15 acres; meter stations, 1 acre; and maintenance bases, 20 acres.

The Sanpete Valley Alternative would depart from the proposed action at MP 176, south of Indianola, Utah. (See *Graphic Supplement* for locations of mileposts.) The alternative would follow Highway 89 through Sanpete Valley past Manti, Gunnison, and Richfield, Utah. It would continue to follow Highway 89 to a point south of Circleville, Utah, where it would proceed southwest to enter the Parowan Valley and follow Highway 91/Interstate Highway 15 for approximately 20 miles. The alternative would then extend west from Parowan and rejoin the proposed action at MP 356. The acreage and land status of the potentially affected lands are shown in tables 2-1 and 2-6.

The alternative was developed to analyze the impacts of a semirural but more populated right-of-way corridor down the Sanpete Valley which would contrast with the corresponding segment of the proposed action.

Facilities

The aboveground facilities would be the same as those for the proposed action.

Construction, Operation, and Maintenance

The construction techniques used for the Sanpete Valley Alternative would be the same as those for the proposed action. The number of double-jointing construction yards would be the same as for the proposed action; the facilities would be located at Evanston, Wyoming; Provo, Nephi, Richfield, and Cedar City, Utah; Las Vegas and Boulder City, Nevada; and Needles, California.

This alternative would transport the same amount of gas (413,000 Mcfd) as would the proposed action and would **use** the same amount of fuel, 2,910 M thus delivering to California approximately 410,000 Mcfd. The operation and maintenance of this alternative would be the same as for the proposed action.

ALTERNATIVE C--CENTRAL NEVADA ALTERNATIVE

The Central Nevada Alternative would be 666 miles long, creating a total pipeline 862 miles long. It is shown on maps in the *Graphic Supplement*. This alternative would cross 416 miles of lands administered by BLM, 63 miles of FS land, 10 miles of state lands, 19 miles of **Bureau of Reclamation** land, and 354 miles of private land. Construction would temporarily disturb 10,447 acres; the permanent right-of-way would require 7,354 acres.

This alternative would leave the proposed action at MP 196 just south of Nephi, Utah. It would proceed southwest along Highway 132 to Lynndyl, Utah, where it would join U.S. Highway 6 and cross the Sevier Desert. It then would enter Nevada and continue to follow Highway 6 past Ely and Tonopah.

The alternative would enter California at MP 429 above Benton and Chalfant Valleys, proceed past Bishop, California, and into the Owens Valley. It would then follow Highway 395 past Big Pine, leave Highway 395, and follow the east side of the Owens Valley, rejoining the highway at Lone Pine, California. From there, the alternative would continue south through the Owens Valley into the Indian Wells Valley in the California Desert Conservation Area (BLM management designation). It would continue southward along the Southern Pacific Railroad and rejoin Highway 395 southwest of Ridgecrest, California, continuing south to connect with three existing east-west pipelines--the PG&E pipeline at Kramer Junction and two SoCal pipelines near Adelanto and Cajon Junction. The alternative was developed to provide an alternate route to the congested transmission corridor in the Las Vegas area. The corridor congestion and future corridor needs are an issue in that area.

Facilities

This alternative would require the Sage Compressor Station, 2 meter stations, and an estimated 7 maintenance bases, 43 block valves, and 19 cathodic protection stations. The land requirements for these facilities would be: Sage Compressor Station, 15 acres; meter stations, 1 acre; and maintenance bases, 30 acres.

Components, facilities, and land requirements for this alternative are shown in table 2-1.

Construction, Operation, and Maintenance

Construction techniques would be the same as those used to build the proposed action. Construction work camps would probably be required in central Nevada because the towns which could provide temporary housing **might** not have the capacity. Operation and maintenance procedures would also be the same as those for the proposed action. However, this alternative would use 3,520 Mcfd of fuel, thus delivering approximately 409,000 Mcfd of the initial 413,000 Mcfd to California.

ALTERNATIVE D--SEVIER-ESCALANTE DESERT ALTERNATIVE

The Sevier-Escalante Desert Alternative would be 182 miles long, creating a pipeline 622.8 miles long. This alternative is shown in the *Graphic Supplement*. It would cross 284 miles of land administered by BLM, 50 miles of FS land, 25 miles of state lands, 232.8 miles of private land, 11 miles of BIA land, and 20 miles of land administered by **Bureau of Reclamation**. Construction would temporarily disturb 7,539 acres; the permanent right-of- way would require 5,422 acres.

The Sevier-Escalante Desert Alternative would deviate from the proposed action at MP 196, the point where Alternative C would also leave the proposed action. It would follow Highway 6 and the Central Nevada Alternative just northeast of Delta, Utah, skirt Delta, and follow Highway 257 and the Union Pacific Railroad southwesterly through the Sevier Desert to Milford, Utah. It would continue to follow the railroad, paralleling the proposed action. Where the railroad extends west, this alternative would continue south and rejoin the proposed action at MP 364 near Newcastle, Utah. The Sevier-Escalante Desert Alternative would follow existing transportation and utility corridors for much of its length. The alternative was developed to provide an alternate corridor in a less inhabited and less developed desert area.

Facilities

This alternative would require the Sage Compressor Station, 2 meter stations, and an estimated 5 maintenance bases, 34 block valves, and 15 cathodic protection stations. The land requirements for these facilities would be: Sage Compressor Station, 15 acres; meter stations, 1 acre; and maintenance bases, 20 acres.

Details on ancillary facilities would be the same as those described for the proposed action.

Construction, Operation and Maintenance

The construction techniques **for** and operating and maintenance procedures would be the same as the proposed action. This alternative would initially transport 413,000 Mcfd, use 2,910 Mcfd of fuel, and deliver to California approximately 410,000 Mcfd.

ALTERNATIVE E--WEST SALT LAKE ALTERNATIVE

The West Salt Lake Alternative would be 392 miles long, resulting in a pipeline 747 miles long. It would cross 417 miles of land administered by BLM, 30 miles of FS land, 32 miles of state lands, 256 miles of private land, 11 miles of land under BIA jurisdiction and 1 mile administered **Bureau of Reclamation** Construction would temporarily disturb 9,054 acres; the permanent right-of-way would require 6,415 acres.

The West Salt Lake Alternative would follow the existing Northwest pipeline to MP 49 near Montpelier, Idaho. It would **use** the first two loops proposed for the Northern Systems Alternative, the Kemmerer Loop and the Pegram Loop (28.7 miles). At MP 49, the West Salt Lake Alternative would leave the Northwest pipeline, make a westerly turn, and pass through the Caribou National Forest over the Bear River Range. It would pass north of Preston, Idaho, turn to the south and pass through the salt flats west of the Great Salt Lake. From there, it would cross Interstate Highway 80, pass through Skull Valley, proceed south, and rejoin the proposed route at MP 254.5 near Fillmore, Utah. The alternative was developed to provide an alternate right-of-way corridor which would avoid potential **geologic instability, potential** conflicts with national forest planning, and susceptible soils along the Wasatch Front.

Facilities

This alternative would require the Montpelier Compressor Station and maintenance base, 2 meter stations, and an estimated 5 additional maintenance bases, 37 block valves, and 50 cathodic protection stations. The land requirements for these facilities would be: Montpelier Compressor Station, 15 acres; meter stations, 1 acre; and maintenance bases, 20 acres.

Construction, Operation, and Maintenance

This alternative would require construction on the salt flats of the Great Salt Desert from MP 157 to MP 225 plus a few more scattered miles within the area. The flats appear solid, but they consist of a 1- to 2-inch thick hardpan crust with moist clay-like soil beneath. The crust cannot support the weight of a normal automobile. All construction vehicles would need wide tires or tracks to avoid sinking. **A** raised access road would also be needed for construction vehicles; this access road would be left in place to facilitate operation and maintenance

(Reynolds 1981). Additional fill material would be needed to construct the raised access road; approximately 2,100 acres of borrow sites would be necessary.

Since the area has a very shallow water table and highly corrosive salt flat soils, pipeline design would require that negative buoyancy features and corrosion inhibitors be included. Proper design would require that the pipeline have a thicker pipe wall, a thicker pipeline coating, and additional cathodic protection stations. The concrete used to provide negative buoyancy would need an added inhibitor to withstand the corrosive environment. (Bobman 1980, **Schore** 1980, Reynolds 1981).

For the rest of the pipeline, construction techniques would be the same as those for the proposed action.

This alternative would move the same amount of gas (413,000 Mcfd) as would the proposed action, would **use** 3,200 Mcfd of fuel, and would thus deliver approximately 409,800 Mcfd to California. Operation and maintenance of the pipeline would be similar to that for the proposed action.

ALTERNATIVE F--PROVO CANYON ALTERNATIVE

The Provo Canyon Alternative would be 115 miles long, resulting in a pipeline 619 miles long. This alternative is shown in the *Graphic Supplement*. This alternative would cross 264 miles of land administered by BLM, 18 miles of FS land, 19 miles of state lands, 298.8 miles of private land, 11 miles of BIA land, and 9 miles of land administered by **Bureau of Reclamation.** Construction would temporarily disturb 7,502 acres; the permanent right-of-way would require 5,844 acres.

This alternative would follow the proposed route to MP 108 near Heber City, Utah. Here it would turn west, pass through Provo Canyon, and pass to the north of Orem and American Fork. It would then turn south and rejoin the proposed action at MP 214. The alternative was developed to provide an alternate route around the vicinity of Strawberry Reservoir and potential soils and planning conflicts north and south of the reservoir.

Facilities

This alternative would require the Sage Compressor Station, 2 meter stations, and an estimated 5 maintenance bases, 34 block valves, and 15 cathodic protection stations. The land requirements for these facilities would be: Sage Compressor Station, 15 acres; meter stations, 1 acre; and maintenance bases, 20 acres.

Construction, Operation, and Maintenance

Constructing this alternative would require installing a pipeline through Provo Canyon, a narrow, steep canyon. Existing facilities in the canyon include Highway 189, a railroad, four aqueducts, and two canals. The Provo River also flows through the canyon. Due to congestion on the canyon floor and rugged terrain, construction of the pipeline through the canyon would be difficult. Blasting a bench on the hillside could be necessary to place the pipeline. Construction could also parallel the river in places, possibly causing some riverbank manipulation. It could also be necessary to construct the pipeline within the highway roadbed in certain places (West 1981, Reynolds 1980).

Construction of this alternative would require placing the pipeline in the suburban areas around Orem, Pleasant Grove, American Fork, and Lehi, Utah. The alternative route would return to a semirural setting after passing Highway 73 by the Camp Williams Military Reservation.

This alternative would **use** 2,910 Mcfd of gas for fuel, thus delivering approximately 410,000 Mcfd of the initial 413,000 Mcfd to California. Operation and maintenance procedures would be the same as those for the proposed action. Depending on actual location of pipeline, access for pipeline maintenance or repair could disrupt traffic flow on Highway 189, a major road through the Wasatch Range.

VARIATION 2--THISTLE CREEK VARIATION

The Thistle Creek Variation would **use** an existing utility corridor in Spanish Fork Canyon. It would be 27 miles long and would depart from the proposed action at MP 156, follow **U.S. Highway, 6/50, Utah** Highway **89** and the existing utility corridor past Thistle, Utah, to bypass a 20- mile long segment of the proposed action. No aboveground facility changes would be required. Construction procedures would be the same as those for the proposed action. The variation was developed to provide an alternate route around the dissected topography in the Dairy Fork area. **This variation is also being considered as an alternative in the FEIS for the Moon Lake Project of the Deseret Generating and Transmission Cooperative.**

VARIATION 3--EAST LAS VEGAS VARIATION

The 59-mile long variation **and** would leave the proposed action at MP 487.7 and rejoin it at MP 543.9 in Eldorado Valley, Nevada, thus bypassing 56 miles of the proposed action. It would follow the Clark County Sanitation District proposed advanced waste treatment pipeline corridor for 4 miles from variation MP 17 to MP 20 and a proposed Highway 515 right-of-way from variation MP 24 to MP 28. The waste water corridor is also an alternate route for a water pipeline which was analyzed in the DOI Allen-Warner Valley EIS. The East Las Vegas Variation would pass to the west of the Frenchman Mountains and avoid the Rainbow Gardens and Las Vegas Wash areas. **It would follow one of Southwest's gas pipelines through Eldorado Valley south of Las Vegas.**

Aboveground facilities, construction techniques, and operation and maintenance procedures would be the same as those for the proposed action. **The variation** was developed to provide an alternate route through the Las Vegas area in case problems were to arise with the proposed route.

SUBVARIATION 3a--EAST LAS VEGAS SUBVARIATION

The East Las Vegas Subvariation 'a' was proposed by the BLM Las Vegas District just prior to printing of the FEIS. It was developed when it became apparent that the East Las Vegas Variation might not be routed through the urban area without considerable difficulty. The purpose of the subvariation is to avoid potential land use conflicts with the Colorado River Commission on the 105,000 acres in Eldorado Valley authorized for transfer from BLM to the State of Nevada by PL 85-339.

The subvariation would leave the proposed action at MP 516, run southwest for 8 miles, and join the midpoint of the East Las Vegas Variation at MP 38.5. The remainder of the East Las Vegas Variation would be followed until it rejoined the proposed action at MP 543.9. The total length of this diversion would be 28.6 miles. See map 2-3 for the location of this route.

The variation would cross a desert valley environment virtually identical with the proposed action and the East Las Vegas Variation in this area. The new length under consideration is essentially within the corridors already studied and thus will not be further analyzed in this EIS.

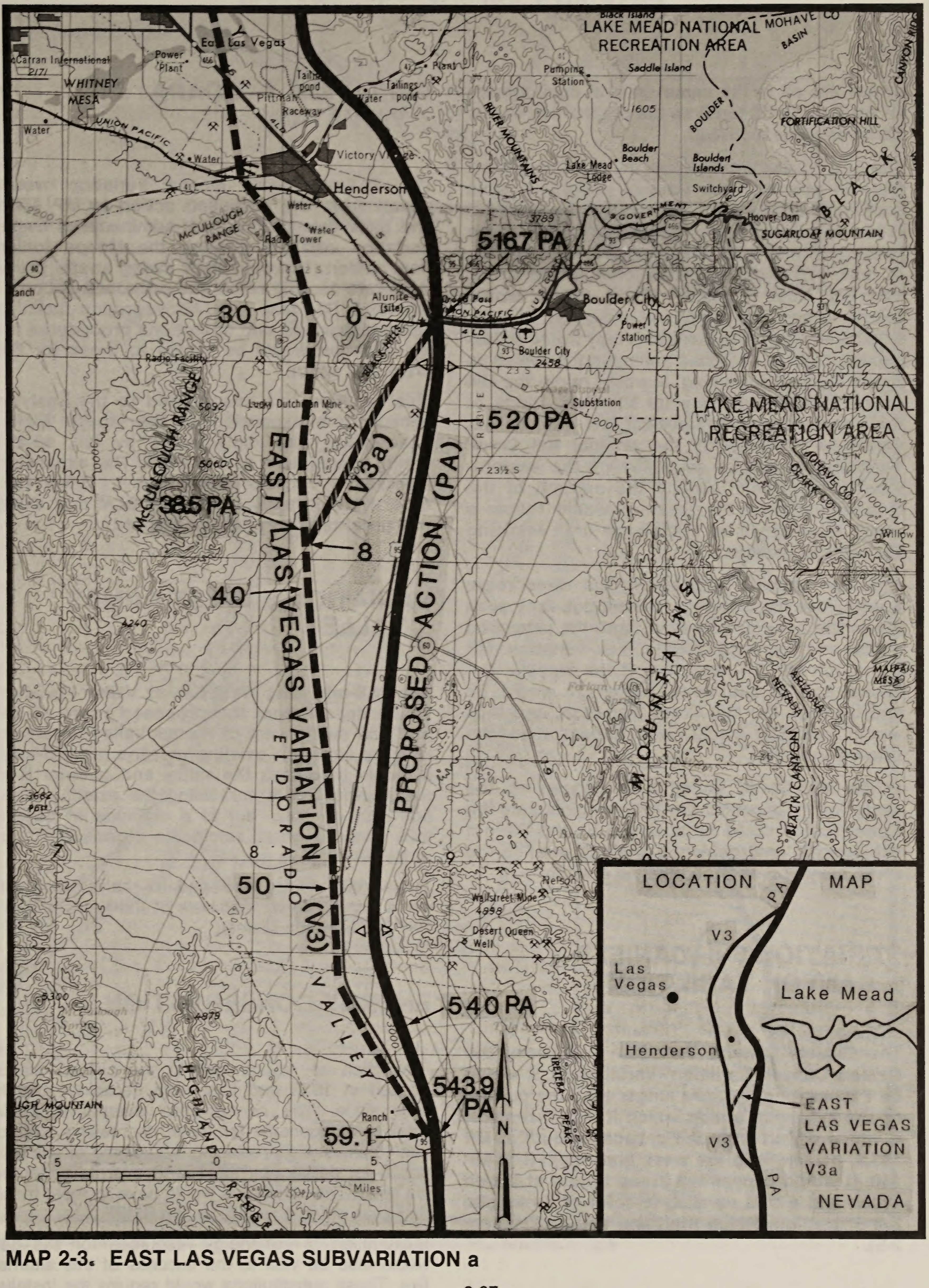
VARIATION 4--FORT MOJAVE VARIATION

The 10-mile long Fort Mojave Variation would depart from the proposed route at MP 586 in California and rejoin it at MP 596. It would parallel the proposed route and deviate a maximum of 2 miles to the west. All facilities and components for the variation would be the same as those for the proposed action. Construction, operation, and maintenance procedures would be the same as those required for the proposed action. The variation was requested by the applicant in order to have flexibility in case **it** had trouble negotiating a right-of-way across the Fort Mojave Indian Reservation.

VARIATION 5--MILL CREEK VARIATION

The Mill Creek Variation would depart from the proposed route at MP 156, circle to the east of the proposed action and follow a series of ridgetops to rejoin the proposed route at MP 168.7. The 21-mile long variation would replace 13 miles of the proposed route. The aboveground facilities and construction and operations procedures for the variation would be similar to those for the proposed action. The variation was developed as an additional alternate route around the steeply dissected Dairy Fork area which would be crossed by the proposed action. It is also being considered as an alternative in the FEIS for the Moon Lake Project of the Deseret Generating and Transmission Cooperative.

The FS has requested that the Mill Creek Variation be expanded to include the concept of three additional corridors which could provide a more direct tie to the Mill Creek Ridge system. (See page 2 of the FS comments dated September 1, 1981, in chapter 6). These three possible



MAP 2-3. EAST LAS VEGAS SUBVARIATION a

routes are all in the same general environmental setting (on FS land) as the original Mill Creek Variation. (See map 2-4).

The new routes would leave the Mill Creek Variation in Spanish Fork Canyon about 1.5 miles southeast of the proposed action. They would follow Mill Fork (a drainage with a creek and a jeep road) and split into three possible routes, of which of each rejoin the original Mill Creek Variation. The Western Route (V5-a) would follow ridges and reach an elevation of over 9,000 feet. The middle route (V5-b) would follow a pack trail up a broad rolling ridge which is probably used for hiking. It would rejoin the Mill Creek Variation midway up Mill Fork Ridge at the apparent termination of a dirt road (which would be followed by the original Mill Creek Variation). The third route (V5-c), the easternmost route, would reduce the mileage of the original variation the least. It would follow a steep ridge close to a drainage until rejoining the original variation.

Although specific analysis on the three route possibilities has not been carried out, they each are in the general vicinity of both the proposed action and the original Mill Creek Variation (MP 7 through MP 21). However, if the pipeline followed any of the three routes, it would be shorter than the Mill Creek Variation, and thus would probably cause less impact than the original variation.

If the Mill Creek Variation is chosen as the route for the pipeline, the four (original plus the three) routes could be analyzed by the FS in a site-specific environmental analysis prior to the route selection and the pipeline staking.

VARIATION 6-II--DANIELS CANYON VARIATION II

The Daniels Canyon Variation II replaces the Daniels Canyon Variation (Variation 6). It would be 7 miles long, 0.5 mile longer than the portion of the proposed action which it would replace. It would depart from the proposed route at MP 143.5, parallel it to the west, and rejoin it at MP 150. It would bypass the steep terrain at Indian Creek and would parallel, for part of its length, the Strawberry Ridge road and fence. (See map 2-5).

VARIATION 7--MOAPA VARIATION

The 30.8-mile long Moapa Variation would depart from the proposed action at MP 456.6 and pass through the BLM-administered transportation corridor through the Moapa Indian Reservation. It would then swing south, cross Interstate 15, and rejoin the proposed action at MP 485.5. See map 2-6. Aboveground facilities and construction and operations procedures for the variation would be similar to those for the proposed action.

This variation has been added to the analysis because the expansion of the Moapa Indian Reservation was implemented by P.L. 96-491 during preparation of the DEIS. The expansion reserves a corridor more than 3,000 feet wide which is administered by BLM and along which rights-of-way can be granted.

VARIATION 8--WEST KAMAS VALLEY

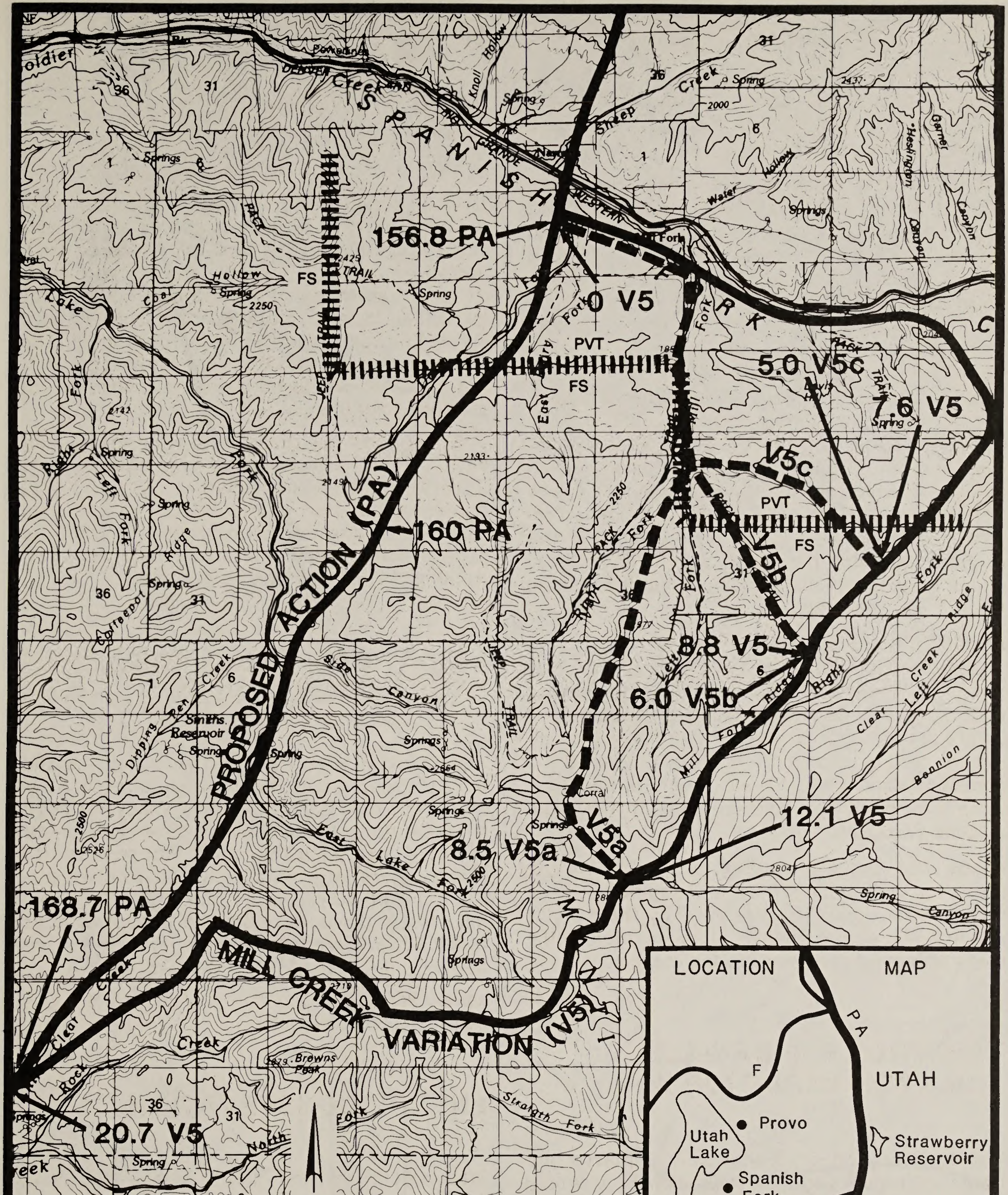
The 14.8-mile long West Kamas Valley Variation would depart from the proposed route at MP 95.7 and swing west of Kamas Valley for several miles along an existing pipeline right-of-way. It would then pass the valley and re-enter it at the southern end, paralleling the existing pipeline right-of- way, but at a distance of over a mile away. It would rejoin the proposed action at MP 107.9. (See map 2-7.)

This variation was developed to analyze the concerns expressed by members of the Kamas Valley Soil Conservation District.

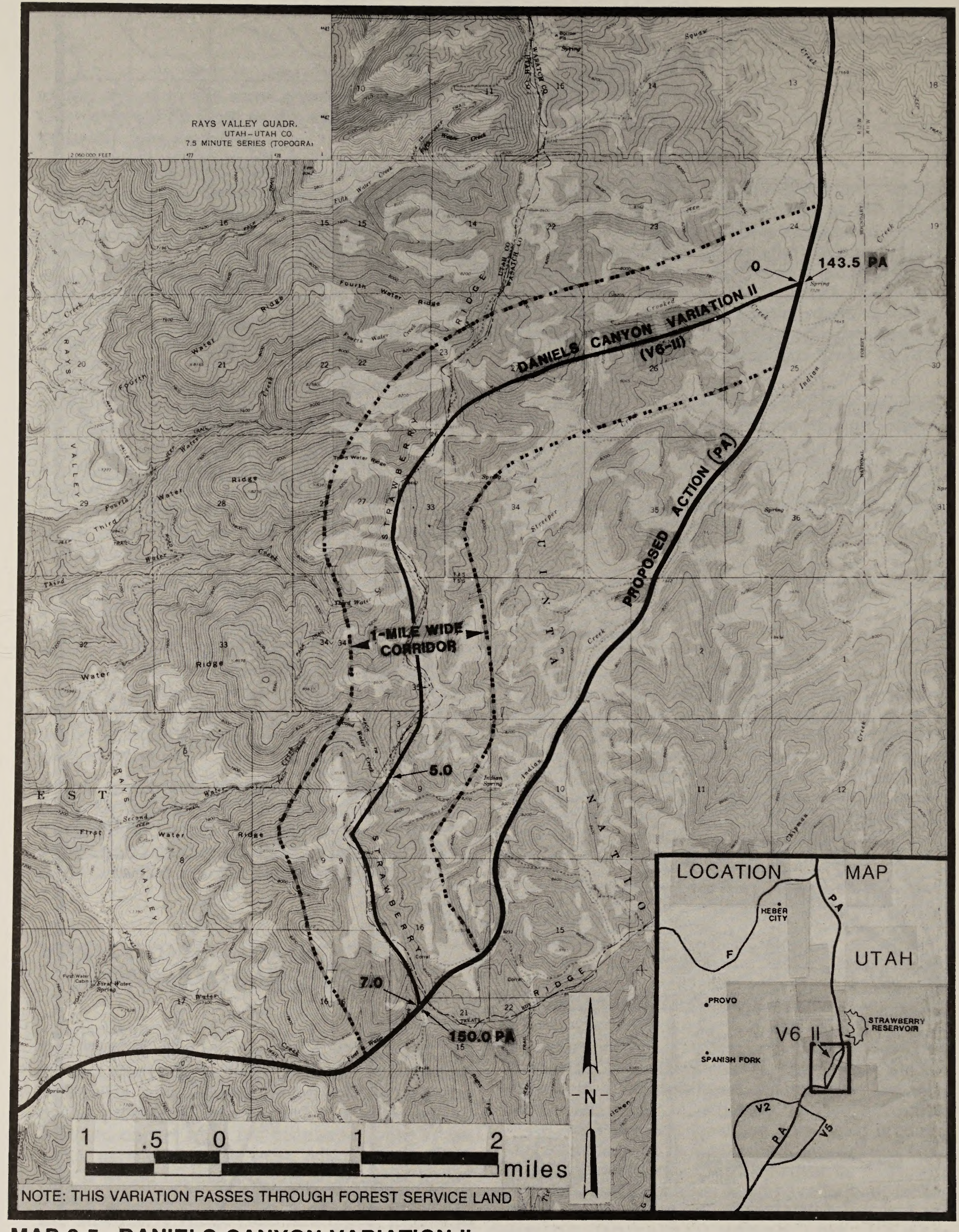
ENERGY CONSERVATION

Production of natural gas in the United States peaked in 1973 and has been declining steadily ever since. The conservation alternative would have to compensate for these decreasing production volumes while replacing the volume of gas proposed for delivery by the RMPP over its projected life span. The alternative would have to meet those demands at least as well as the RMPP.

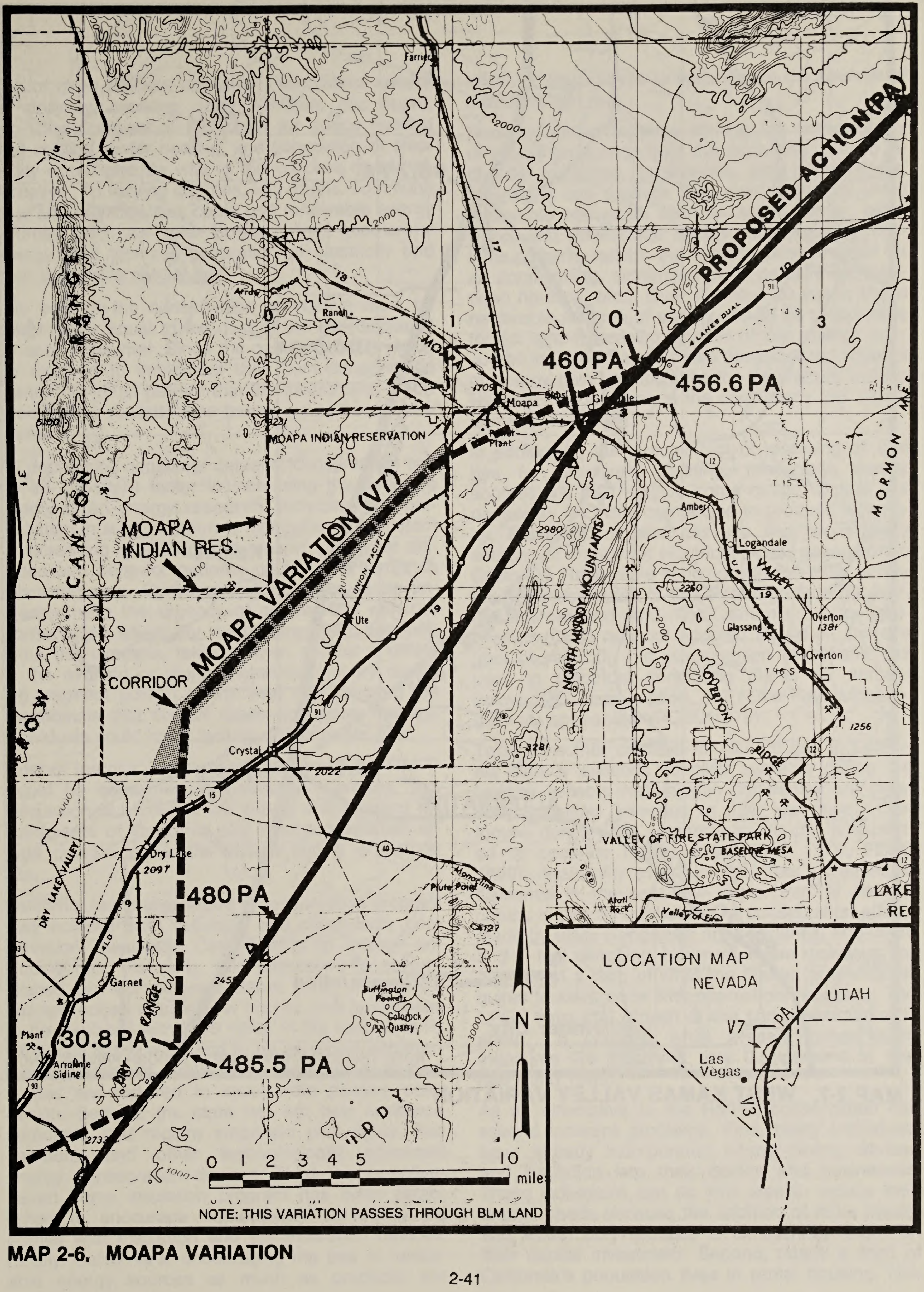
Substitution of nonenergy resources for this gas would also be vital to the success of this alternative. These substitutions would require the installa-



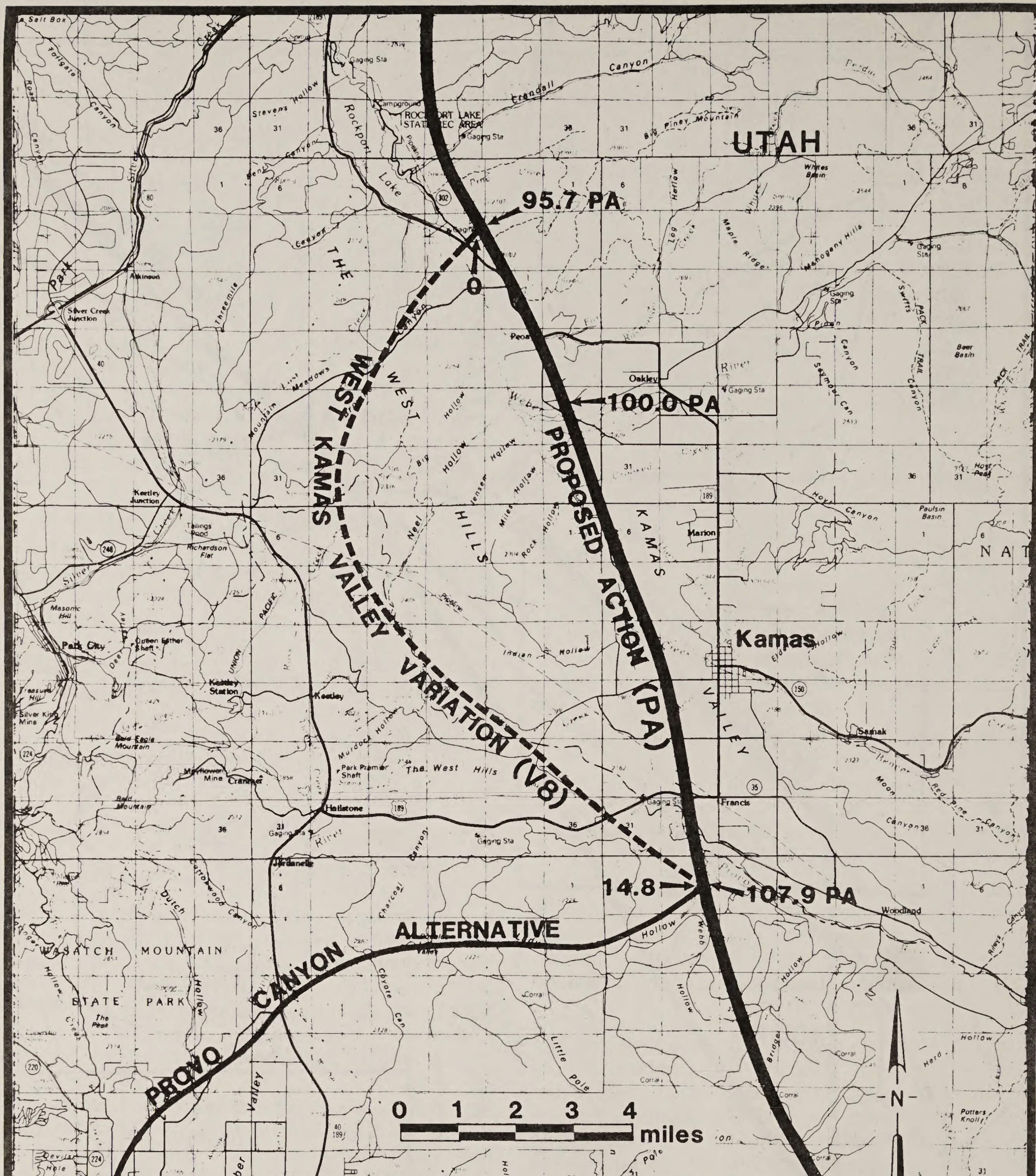
MAP 2-4. MILL CREEK VARIATION: ROUTING POSSIBILITIES



MAP 2-5 DANIELS CANYON VARIATION II



MAP 2-6. MOAPA VARIATION



MAP 2-7. WEST KAMAS VALLEY VARIATION

tion of more efficient appliances, insulation, weather stripping, caulking, storm windows and doors, etc. Displacement of gas used for space heating and cooling, water heating, and generation of electricity would also be vital to the success of this alternative. To varying degrees, individuals, communities, and municipalities could **use** renewable energy sources such as solar power, wind, geothermal energy, and biomass generation of electricity and heat to replace natural gas.

The cost of the conservation alternative must be less than or equal to the cost of the gas displaced by each consumer. Since the gas consumers would be required to implement their own conservation plans, they must believe that the investment, amortized over a realistic time frame, would be cost effective.

By decreasing consumer demand, conservation can be an important factor in increasing the available supply of an energy **resource**, providing that participation in such an effort is maintained at constant or increasing levels. For this reason, consumer attitudes and behavior patterns could be a barrier to this alternative. Consumers would have to be impressed with the urgency of cooperating with the conservation effort. By rearranging daily **use** patterns (for example, taking cooler, shorter showers in the evening or doing wintertime laundry during the warmest portion of the day) and lowering the thermostats that control space and water heaters, individuals could lower system demands for gas.

Most of the gas proposed for delivery by the RMPP would be consumed in California; therefore, this discussion is limited to the supply and demand requirements of California and how conservation efforts could improve the state's supply of natural gas.

California has implemented a conservation program that includes both voluntary and compulsory conservation measures. Conservation of energy (including gas, electricity, and petroleum) is accomplished on four different fronts. First, the state's building codes require new homes and businesses to be insulated with R-19 value in the roofs and R-11 values in the walls and to be equipped with thermopane windows. Additionally, 5 percent of all new homes are required to incorporate passive solar design. Second, the state has set new appliance standards that require automatic pilot lights, flue dampers, and other technologically advanced energy conservation devices. Third, an incentive-based home insulation program has been established to encourage homeowners to retrofit old homes with insulation and anti-infiltration devices. Finally, California is encouraging the **use** of renewable energy sources as much as practical; the effect of this policy is to decentralize the sources of electricity and gas.

Decentralization involves shifting the responsibility of energy production from the producing utility to individual industries, businesses, and homeowners. Individuals can produce their own energy by using renewable resources such as solar energy, wind, wood, and geothermal energy (residential applications primarily include the use of cold well water for air conditioning, subterranean or partially subterranean housing, etc.). Over the next 20 years, these renewable sources of energy should be responsible for an ever-increasing portion of the energy consumed in California. As these decentralized sources of energy gain in popularity, the centralized utilities will notice a decrease in the consumers' per capita demand for energy.

In addition to the direct effect of replacing oil and gas for residential heating, renewable energy sources will also replace some of the oil and gas necessary for utility companies to produce electricity. Presently, oil and gas are the two primary sources of energy for electrical power generation in California. Renewable sources with the most potential to replace some of this oil and gas are geothermal sources and wind. The California Energy Commission (CEC) has not adopted President Carter's goal of reducing the consumption of oil and gas used in electrical generating plants 50 percent below 1977 consumption, but some mandatory reductions appear likely (CEC 1979).

Total consumer demand for natural gas in California already exceeds supplies available during the heating season. Natural gas companies are presently curtailing deliveries to their low priority customers during peak demand periods; this is expected to continue (CEC 1979, FERC 1979, **FERC 1980).** Availability of natural gas has increased in California in the past few years. Part of **the** increase is directly attributable to conservation efforts made by utility companies and residential end-users and to fuel switching. However, these increases are only about a third of what the market presently requires to keep pace with population increases. The CPUC says that growth of the consumer market is about 1.5 percent, while present conservation measures are matching only 0.5 percent of that rate (King 1980).

As an alternative to the RMPP, conservation has several inherent problems. First, many individuals have already incorporated energy-saving devices and insulation into their homes and businesses. These individuals can do little else to reduce their energy needs because the addition of more insulation would only produce a diminishing return on their capital investment. Second, nearly a third of California's population lives in rental housing. Neither the renter nor the landlord is likely to incorporate energy-saving devices or insulation into these residences. Finally, a large portion of the remaining population either does not care about conservation, is too poor to afford insulating materials, or cannot be convinced that conservation is necessary.

Conservation cannot adequately replace the volumes of gas proposed for delivery by the RMPP. The current available gas supply is not adequate to satisfy demand without curtailing low priority customers. Additionally, there are demands for new service which further tax the available supply. This is true in spite of the fact that many Californians have already begun participating in state-sponsored conservation programs. Therefore, it is reasonable to assume that under the existing market conditions, further conservation efforts would continue to fall short of demand.

California presently receives gas from the Southwest and Canada to augment the gas produced within the state. In 1990, the CPUC anticipates that nearly all of the state's gas requirements will have to be supplied from Canadian sources, LNG imports, Alaskan North Slope gas, and the Overthrust region. The most vulnerable potential gas supply is the LNG import facility at Point Conception, California. There is strong opposition to the facility, and it may not be completed. Litigation will undoubtedly delay this project for quite some time. Most of the existing Canadian gas supply is governed by contract licenses that begin to expire in 1987. It is not possible to estimate how much Canadian gas will be available in the future. In addition, the Alaskan North Slope gas transported by the ANGTS may not be available before 1990.

If the LNG import facility is not built and Canadian gas imports are reduced or eliminated, California could experience serious gas supply shortfalls during the 1990's. If the RMPP were denied in favor of a conservation alternative and such a supply shortage developed, California would have only its traditional sources and the Alaskan gas to supplement its requirements, providing that the ANGTS is built. On the other hand, deregulation of natural gas may raise the price of gas, significantly reducing consumption. Because of these supply and demand uncertainities, it is impossible to determine whether the conservation alternative could eliminate the need for the proposed project. Additionally, neither the FERC, the DOI, nor the FS have the authority to require the State of California to implement comprehensive conservation and renewable energy programs intended to replace volumes of natural gas that could be delivered by the proposed project.

LOW FLOW ALTERNATIVE

The low flow alternative would **use** the spare capacity available in the existing systems of Northwest, El Paso, PGT, and PG&E, to transport incremental volumes up to 100,000 Mcfd from the Rocky Mountain Overthrust Belt to markets in California. It would transport gas to California through existing systems without any new facility construction. This alternative would only delay construction of the proposed project until the gas supply under firm contract for the RMPP exceeded the capacity of existing systems. For example, PGT has indicated in its environmental report submitted to the FERC on July 31, 1979, that Northwest has agreed to an arrangement to transport up to 100,000 Mcfd on a best-effort basis. PGT included the following description of the feasibility of such transportation arrangements:

> . . . Applicant, NGC and PTS have also recently concluded a letter of agreement with Northwest under which the latter will provide transportation and/or exchange service relating to natural gas produced and purchased from specified areas of the Rockies in the vicinity of the Northwest system. In order to rely on this agreement to transport additional volumes of Rocky Mountan gas to California, agreements will also be necessary relating to the **use** of the PGT existing system or the El Paso system, or both. These are being negotiated, and Applicant understands that NGC intends to rely upon such arrangements involving the **use** of existing facilities to make Rocky Mountain gas available to PGandE during the build-up of NGC's Rocky Mountain supplies, until volumes of gas available are sufficient to require the transportation services of the Rocky Mountain Pipeline Project. . . . The recent Northwest transportation agreement is limited to 100 **MMcfd**. . . .

The applicant has indicated that existing pipeline transmission systems are capable of handling a 100,000 Mcfd flow without major facility modifications. Because there are no gas transportation contracts and existing systems can handle 100,000 Mcfd, the proposed project should not be constructed until the RMPC has firm transportation contracts exceeding at least 100,000 Mcfd of gas for the life of the project.

NO ACTION OR POSTPONED ACTION

The actions that are available are to grant the various permits that are sought, to deny them, or to postpone action pending further study. If action were postponed, one of the other two actions would ultimately follow. The FERC is solely responsible for determining whether the RMPP is in the public interest; it will determine the need for the project.

Denial of the RMPP could result in no construction of the proposed system, construction of an equivalent alternative system, or **use** of alternative energy sources.

The alternative of "no action"--i.e., rejecting the RMPC proposal--would mean that the proposed volumes of gas would not be transported to California by the RMPC. However, if the proposed RMPP were denied, it is likely that a similar system would ultimately be proposed or that existing systems would be expanded to carry the same gas to market areas which could include the applicant's. If the volume of gas proposed for transportation materialized, the gradual expansion of existing systems might not be environmentally desirable for two reasons. First, ultimate construction requirements could be greater and could impact more environmentally sensitive areas than those to be crossed by this proposal. Second, the environmental and technical review by public and governmental participants would probably not be as great for individual projects, which together would produce as much or more impact.

Denial of the RMPP could also lead to greater **use** of alternative energy sources.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

Six total project/system alternatives were considered but eliminated from detailed consideration: the Northwest/Southwest, Northern Route, Northern Route and Southwest Gas, Northwest/El Paso, Northwest/PGT/PG&E, and North- South Alternatives. These alternatives would **use** existing pipeline syste and routes and might also establish new pipeline alignments. A description and analysis of these alternatives can be found in appendix F.

Several route alternatives were also considered but eliminated. These alternatives are discussed in appendix F.

INTERRELATIONSHIP OF PROPOSED ACTION WITH OTHER PROJECTS

Projects that are in the planning stages and within or adjacent to the **proposed action** or alternatives were examined to determine possible conflicts and coordination requirements. Planned projects with construction schedules possibly overlapping that of the **proposed action** are listed in table 2-10.

Since the **RMPC** could be drawing from the same work force available to these projects, the socioeconomic impact to local services and social infrastructures could increase. **The proposed action** could directly affect the same surface resources as those directly affected by another project. The facilities associated with these projects could also conflict with **proposed action** facility locations. These conflicts are also identified in table 2-10.

TABLE 2-10 (REVISED)

INTERRELATIONSHIP OF PROPOSED ACTION WITH OTHER PROJECTS

Routes	Project	Project Description	Location	Construction	Employment	Conflicts and Required Coordination with Proposed Action
Proposed Action	CENTRAL UTAH PROJECT (CUP)	Transportation of Uinta basin water to the Wasatch Front--reservoir, portals, aqueducts, tunnels, and operation and maintenance building.	MP 131.5 and MP 140	Mid-1981 to Mid-1983	20 to 40	Overlapping construction schedule requiring coordination of facility locations and rehabilitation.
Proposed Action	MOON LAKE PROJECT	Two 345-kV A.C. powerlines originating from a powerplant in Vernal, Utah/Rangely, Colorado area.	MP146 to MP 190	May 1981 to January 1984	20 to 45	Corridor sharing coordination for 44 miles involving vegetation clearing, access roads, rehabilitation and construction scheduling.

TABLE 2-10 (REVISED) —Continued

Routes	Project	Project Description	Location	Construction	Employment	Conflicts and Required Coordination with Proposed Action
Proposed Action	HUNTER 3 and 4 PROJECT	One 345-kV A.C. powerline	MP 156	Mid-1981 to Mid-1982	20 to 45	Overlapping construction schedules, requiring co-ordination of facility locations, rehabilitation.
Proposed Action	NEWCASTLE GEOTHERMAL RESOURCE PROJECT	Development of direct use of geothermal reosurces.	MP 366 to MP369	Well drilli ongoing	16	There could be conflicts with locations of wells, pipelines and transmission lines and possibly with construction schedules.
Proposed Action	NEVADA POWER COMPANY EXPANSION AT REID GARDNER GENERATING STATION	Expansion of powerplant and electrical transmission system.	5 miles northwest of MP 460	1981 to?	Data unavailable	Could overlap construction schedule affecting local services.
Proposed Action,	HARRY ALLEN POWER PLANT	2,000 MW powerplant with coal supplied by coal slurry pipeline from southwest Utah.	MP 482	Uncertain	Unknown	Some construction schedule overlap may cause competition for labor and materials. If coal slurry pipeline is used, pipeline locations will require coordination.
Proposed Action, East Las Vegas Variation	CLARK COUNTY SEWAGE COLLECTION AND TREATMENT WORKS	Expansion of Systems	MP 20 on Variation 3	November 1981 through June 1983	Not Available	Possible conflict between proposed action and existing or proposed works.
Proposed Action , Sevier-Escalante Desert Alternative	ROOSEVELT HOT SPRINGS GEOTHERMAL PROJECT--KNOWN GEOTHERMAL RESOURCE AREA (KGRA)	11 geothermal wells drilled; 77 geothermal wells proposed. 20 MW powerplant proposed.	MP 292 to MP 304 on RMPP	February 1981 through 1983	16 to 200	Corridor would cross through this geothermal project. There could be conflicts with locations of wells, pipelines, transmission lines, and possibly with construction schedules. Socioeconomic pressure on of Milford, Utah.
Proposed Action, Central Nevada, Sevier-Escalante, West Salt Lake, and East Las Vegas	IPP	3,000 MW powerplant and associated transmission system.	MP 300 - MP 320 MP 364 - MP 370 MP 420 - MP 460 MP 488 - MP 500	September 1981 to 1989	1981-160 employed at powerplant site to peak force in 1985	Overlap of construction schedules causing pressure to local services. Pipeline corridors would cross through or run adjacent to approved transmission right-of-ways thus causing conflicts with locations of pipelines and transmission lines. Corrosion, electrostatic coupling, and electromagnetic coupling may occur.
Proposed Action and Central Nevada	WPPP	1,500 MW powerplant and associated transmission system.	Powerplant is located in White Pine County and transmission lines as yet to be established	January 1985 to 1991	1985-160 employed at powerplant site to peak force in 1989	Pipeline corridors would cross through or run adjacent to transmission line corridors thus causing conflicts with locations of pipelines and transmission lines. Corrosion and electromagnetic coupling may occur.
Proposed Action, Central Nevada, and Sevier-Escalante Desert Alternatives	MX SYSTEM, U.S. AIR FORCE	Proposed MX Missile System	Adjacent to **proposed action** corridor from MP 320 to MP 360 Adjacent to U.S. Highways 6/50 and 6, on Central Nevada Alternative adjacent to corridor from MP 140 to MP 180 on Sevier-Escalante Desert Alternative.	1982 to 1986	21,000 to 22,000 workers at peak.	Coordination of pipeline location with MX facilities required. Possible conflhct with construction schedule.
Proposed Action, Central Nevada, Sevier-Escalante Desert and West Salt Lake Alternatives	INTERMOUNTAIN POWER PROJECT (IPP)	3,000-MW powerplant.	Plant site approximately 10 miles north of Delta, Utah.	July 1981 to 1989	1981--160 employed at powerplant site; 1985--peak work force	Overlap of construction schedules, causing pressure to local services.

TABLE 2-10 (REVISED) —Continued

Routes	Project	Project Description	Location	Construction	Employment	Conflicts and Required Coordination with Proposed Action
Central Nevada	PACIFIC INTERTIE	Existing powerplant in Oregon and associated transmission system.	MP 425 to MP 575 of Central Nevada Alternative	Existing	None	Same as WPPP except add potential electrostatic coupling problems.
Central Nevada and Sevier-Escalante Desert Alternatives	MARTIN-MARIETTA CEMENT PLANT	Production of 650,000 tons of cement per year.	MP 23 to MP 26.5 on both alternatives.	Mid-1981	300	Possible conflict between cement plant and pipeline locations.
Provo Canyon Alternative	IMPROVEMENT OF U.S. HIGHWAY 189, PROVO CANYON	Alignment changes and widening of U.S. 189.	MP 21.5 to MP 30	Mid- 1982 to Mid-1983	20 to 30	Coordination of pipeline location with road construction work required.
Proposed Action, Sevier-Escalante Desert Alternative	THERMAL HOT SPRINGS (KGRA)	Possible development as described for the Roosevelt Hot Springs Geothermal Project.	MP 142 to MP148 on Sevier-Escalante Desert Alternative. MP 320 to MP 326 on RMPP	Unknown	Unknown	There could be conflicts with locations of wells, pipelines, transmission lines, and possibly with construction schedules. Possible socioeconomic pressure on of Milford, Utah.

COMPARATIVE ANALYSIS OF THE PROPOSED ACTION, ALTERNATIVES, AND VARIATIONS

Tables 2-11 **and 2-11a** compare all significant and some less significant impacts which would be creat by the RMPP, its alternatives, or the variations. The comparative analysis is a synthesis of information from chapters 2, 3, and 4.

This table compares the alternatives to the proposed action differently than it compares the variations. Each alternative is considered as a method of transporting natural gas from the Overthrust Belt in Wyoming to southern California which would avoid possible conflicts along the route of the proposed action. Consequently, impacts along each alternative route are considered. The impacts along the proposed action north and/or south of the alternative are included to understand the total impact of each possible pipeline system. The shorter variations, however, are variants of the proposed action which would avoid potential specific localized conflicts; therefore, they are considered as segments which could substitute for segments of the proposed action.

Information is presented in the table for the proposed action, alternatives, and variations. Presentation varies for each of these. Total impacts to each resource category are shown for the proposed action. Asterisks flank these figures, indicating that they are totals.

For each alternative, three types of information are shown: on top, the impacts from the alternative; just beneath, the impacts for that portion of the RMPP which would be replaced by the alternative (this type of information is always shown in parentheses); and finally, beneath the rest, the impacts for the *TOTAL* alternative pipeline system (again, flanked by asterisks which indicate totals).

Impact of the total alternative pipeline system is not presented in table 2-11 for socioeconomics, geology and topography, air quality, noise quality, on **and** pipeline safety. These are discussed in the text.

Two types of information are shown for the variations: the impacts from the variation and (in parentheses) the impacts from that portion of the proposed action which it would replace.

The proposed action and all alternatives and variations were analyzed to determine the amount of fuel **use** per day versus the amount of natural gas transported. Tables 2-12 and **2-12a** show the results of this analysis. The discussion in 'Total System Comparison' under the Northern Systems Alternative in this section provides more detail on this alternative's fuel use.

Another comparison among the proposed action, alternatives, and variations has been made for the length and percentage of each pipeline route which would parallel or **use** existing corridors. This data is located in appendix G.

TABLE 2-11 (REVISED)

COMPARATIVE ANALYSIS OF IMPACTS FROM PROPOSED ACTION, ALTERNATIVES AND VARIATIONS

Resources	Proposed Action	Alternative A, Northern Systems		Alternative B, Sanpete Valley	Alternative C, Central Nevada	Alternative D, Sevier-Escalante Desert	Alternative E, West Salt Lake	Alternative F, Provo Canyon	Variation 2, Thistle Creek	Variation 3, East Las Vegas	Variation 4, Fort Mojave	Variation 5, Mill Creek[10]
		Best Case[1]	Worst Case[1]									
VEGETATION												
Total Acres of Native Vegetation Temporarily Disturbed[2]	*6,330 acres*	931 acres (6,330 acres) *931 acres*	1,662 acres (6,330 acres) *1,1662 acres*	1,299 acres (1,577 acres) *6,215 acres*	7,078 acres (4,413 acres) *9,149 acres*	1,648 acres (1,431 acres) *6,495 acres*	4,098 acres (2,412 acres) *8,071 acres*	1,030 acres (1,054 acres) *6,300 acres*	266 acres (242 acres)	715 acres (679 acres)	120 acres (120 acres)	253 acres (158 acres)
Acres of Timber, Pinyon-Juniper and Mountain Brush kept Cleared for Life of Project on 50-foot Width over Pipeline	*1,146 acres*	60 acres (1,146 acres) *60 acres*	60 acres (1,146 acres) *60 acres*	590 acres (360 acres) *1,738 acres*	990 acres (1,050 acres) *1,430 acres*	750 acres (360 acres) *1,212 acres*	334 acres (590 acres) *744 acres*	660 acres (574 acres) *822 acres*	54 acres (24 acres)	None (None)	None (None)	114 acres (60 acres)
Acres of Riparian Habitat Crossed[3]	*17 acres*	2 acres (17 acres) *2 acres*	8 acres (17 acres) *8 acres*	8 acres (2 acres) *22 acres*	12 acres (8 acres) *20 acres*	3 acres (2 acres) *18 acres*	5 acres (10 acres) *13 acres*	2 acres (4 acres) *15 acres*	2 acres (None)	0.5 acre (3 acres)	0.2 acre (None)	
Federal Threatened or Endangered Plant Species Potentially Affected	*8 species*	None (11 species) *None*	2 species (11 species) *2 species*	4 species (2 species) *11 species*	10 species (10 species) *12 species*	None (1 species) *10 species*	2 species (3 species) *8 species*	1 species (3 species) *9 species*	None (1 species)	None (2 species)	None (None)	1 species (None)
California Classified Plant Species Potentially Affected	*None*	None (None) *None*	None (None) *2 species*	None (None) *None*	None (None) *4 species*	None (None) *None*	None (None) *None*	None (None) *None*	None (None)	None (None)	None (None)	None (None)
WILDLIFE[4]												
Big Game Winter Range	*1,903 acres*	327 acres (1,903 acres) *327 acres*	327 acres (1,903 acres) *327 acres*	957 acres (400 acres) *2,460 acres*	654 acres (1,128 acres) *1,588 acres*	327 acres (315 acres) *1,915 acres*	848 acres (1,297 acres) *1,454 acres*	679 acres (327 acres) *2,254 acres*	242 acres (194 acres)	None (None)	None (None)	254 acres (133 acres)
Desert Bighorn Sheep Areas	*303 acres*	None (303 acres) *None*	None (303 acres) *None*	None (None) *303 acres*	85 acres 2 'point' sites (303 acres) (5 'point' sites) *85 acres* *2 'point' sites*	None (None) *303 acres* *2 'point' sites*	None (None) *303 acres* *2 'point' sites*	None (None) *303 acres*	None (None)	24 acres 4 'point' sites (73 acres) (3 'point' sites)	None (None)	None (None)
Waterfowl Nesting Areas	*412 acres*	497 acres (412 acres) *497 acres*	691 acres (412 acres) *691 acres*	497 acres (None) *909 acres*	303 acres (None) *873 acres*	24 acres (None) *618 acres*	None (412 acres) *254 acres*	None (None) *412 acres*	None (None)	None (None)	None (None)	None Known (None Known)
Sage Grouse Habitat	*400 acres*	206 acres (400 acres) *206 acres*	206 acres (400 acres) *206 acres*	315 acres (None) *715 acres*	533 acres (36 acres) *800 acres*	97 acres (None) *497 acres*	388 acres (364 acres) *558 acres*	None (97 acres) *303 acres*	None (97 acres)	None (None)	None (None)	None (400 acres)
Raptor Habitat	*618 acres*	654 acres (618 acres) *654 acres*	2,109 acres (618 acres) *2,109 acres*	667 acres (48 acres) *1,236 acres*	715 acres (170 acres) *1,164 acres*	48 acres (109 acres) *594 acres*	170 acres (448 acres) *351 acres*	545 acres (400 acres) *764 acres*	230 acres (73 acres)	None (None)	None (None)	None Known (376 acres)
Golden Eagle Nest Areas	*242 acres*	None Known (242 acres) *None Known*	None Known (242 acres) *None Known*	667 acres (158 acres) *812 acres*	None Known (218 acres) *None known*	61 acres (24 acres) *279 acres*	None Known (218 acres) *242 acres*	545 acres (12 acres) *776 acres*	230 acres (224 acres)	None (None)	None (None)	None Known (12 acres)
Desert Tortoise Habitat Not Federally Designated as Critical Habitat	*982 acres*	None (982 acres) *None*	None (982 acres) *None*	None (None) *982 acres*	558 acres (982 acres) *558 acres*	None (None) *982 acres*	None (None) *982 acres*	None (None) *982 acres*	None (None)	None (None)	121 acres (121 acres)	None (None)
Black-footed Ferret (Endangered)	Unknown acres	Unknown acres	Unknown acres	Unknown acres	Unknown acres	Unknown acres	Unknown acres	Unknown acres	None	None	None	None

Resources	Proposed Action	Alternative A, Northern Systems		Alternative B, Sanpete Valley	Alternative C, Central Nevada	Alternative D, Sevier-Escalante Desert	Atlernative E, West Salt Lake	Alternative F, Provo Canyon	Variation 2, Thistle Creek	Variation 3, East Las Vegas	Variation 4, Fort Mojave	Variation 5, Mill Creek[10]
		Best Case[1]	Worst Case[1]									
Bald Eagles (Endangered)	448 acres	Unknown	Unknown	448 acres (None) *986 acres*	36 acres (364 acres) *484 acres* **Unknown acres** (170 acres) *279 acres*	Unknown acres (230 acres) *218 acres*	Unknown acres (None) *484 acres*	None (None) *484 acres*	None	None	None (None) *484 acres*	
San Joaquin Kit Fox (Endangered)	None	None	Unknown acres	None	None	None	None	None	None	None	None	None
Blunt-nosed Leopard Lizard (Endangered)	None	None	Unknown acres	None	None	None	None	None	None	None	None	None
Railroad Valley Springfish (Candidate for Endangered)	None	None	None	None	Unknown acres of spring habitat	None	None	None	None	None	None	None
SOILS[5]												
Soils Most Susceptible to More Occurrences of Slides, High Erosion Hazards, and Other Limitations Associated with Project Construction and Restoration (Soil Groups 1-8)	*3,056 acres*	279 acres (3,056 acres) *279 acres*	1,090 acres (3,056 acres) *1,090 acres*	599 acres (575 acres) *3,056 acres*	4,884 acres (1,692 acres) *6,157 acres*	621 acres (367 acres) *3,309 acres*	2,532 acres (423 acres) *3,649 acres*	902 acres (927 acres) *2,533 acres*	230 acres (206 acres)	206 acres (255 acres)	169 acres (73 acres)	255 acres (158 acres)
(Soil Group 1--Soils of Mountain Areas with Precipitation of 14 to 28 Inches, Most susceptible to Slides and High Erosion Hazards (Part of the above total)[6]	*1,382 acres*	36 acres (1,382 acres) *36 acres*	36 acres (1,382 acres) *36 acres*	262 acres (259 acres) *1,382 acres*	0 acres (148 acres) *1,236 acres*	0 acres (51 acres) *1,309 acres*	302 acres (1,314 acres) *376 acres*	281 acres (927 acres) *739 acres*	230 acres (206 acres)	None (None)	None (None)	255 acres (158 acres)
Soil Group 9--Soils with Annual Precipitation Generally less than 8 to 10 Inches (Significant to Revegetation Potential)	*2,811 acres*	145 acres (2,811 acres) *145 acres*	497 acres (2,811 acres) *497 acres*	250 acres (404 acres) *2,945 acres	6,823 acres (2,811 acres) *7,005 acres*	999 acres (404 acres) *3,394 acres*	2,326 acres (404 acres) *4,739 acres*	None (None) *2,811 acres*	None (None)	715 acres (667 acres)	169 acres (169 acres)	None (None)
VISUAL RESOURCES Acres Which Would Exceed Acceptable Levels of Visual Contrast Based upon VRM Classes and VQO's												
Class 1/ Preservation	*None*	None (None) *None*	None (None) *None*	None (None) *None*	None (None) *None*	None (None) *None*	None (None) *None*	None (None) *None*	None (None)	None (None)	None (None)	None (None)
Class 2/Retention	*606 acres*	None (606 acres) *None*	None (606 acres) *None*	121 acres (36 acres) *702 acres*	519 acres (97 acres) *1,030 acres*	None (36 acres) *369 acres*	146 acres (544 acres) *206 acres*	527 acres (229 acres) *897 acres*	121 acres (24 acres)	182 acres (None)	None (None)	73 acres (None)

TABLE 2-11 (REVISED) —Continued

Resources	Proposed Action	Alternative A, Northern Systems		Alternative B, Sanpete Valley	Alternative C, Central Nevada	Alternative D, Sevier-Escalante Desert	Alternative E, West Salt Lake	Alternative F, Provo Canyon	Variation 2, Thistle Creek	Variation 3, East Las Vegas	Variation 4, Fort Mojave	Variation 5, Mill Creek[1]*
		Best Case[1]	Worst Case[1]									
Class 3/Partial Retention	*573 acres*	None (573 acres) *None*	None (573 acres) *None*	24 acres (146 acres) *453 acres*	229 acres (339 acres) *476 acres*	None (None) *575 acres*	None (230 acres) *344 acres*	36 acres (230 acres) *381 acres*	158 acres (None)	60 acres (121 acres)	None (None)	None (None)
Class 4/ Modification and Maximum Modification	*15 acres*	15 acres (15 acres) *15 acres*	15 acres (15 acres) *15 acres*	36 acres (None) *51 acres*	12 acres (None) *27 acres*	15 acres (15 acres) *15 acres*	None (None) *15 acres*	None (None) *15 acres*	None (None)	None (None)	None (None)	None (None)
LAND USES: RECREATION												
Managed Sites Crossed	*4 sites--Strawberry Reservoir Recreation Area, Las Vegas Sand Dunes Recreation Area, proposed Frenchman Mountain-Rainbow Gardens National Natural Landmark (includes Sunrise Mountain Natural Area), and proposed Clark County Wet Lands Park*	None (4 sites--Strawberry Reservoir Recreation Area, Las Vegas Sand Dunes Recreation Area, proposed Frenchman Mountain-Rainbow Gardens National Natural Landmark (includes Sunrise Mountain Natural Area), and proposed Clark County Wet Lands Park) *None*	None (4 sites--Strawberry Reservoir Recreation Area, Las Vegas Sand Dunes Recreation Area, proposed Frenchman Mountain-Rainbow Gardens National Natural Landmark (includes Sunrise Mountain Natural Area), and proposed Clark County Wet Lands Park) *None*	None (None) *4 sites--Strawberry Reservoir Recreation Area, Las Vegas Sand Dunes Recreation Area, proposed Frenchman Mountain-Rainbow Gardens National Natural Landmark (includes Sunrise Mountain Natural Area), and the proposed Clark County Wet Lands Park*	None (3 sites--Las Vegas Sand Dunes Recreation Area, proposed Frenchman Mountain-Rainbow Gardens National Natural Landmark (includes Sunrise Mountain Natural Area), and the proposed Clark County Wet Lands Park) *1 site--Strawberry Reservoir Recreation Area*	None (None) *4 sites--Strawberry Reservoir Recreation Area, Las Vegas Sand Dunes Recreation Area, proposed Frenchman Mountain-Rainbow Gardens National Natural Landmark (includes Sunrise Mountain Natural Area), and the proposed Clark County Wet Lands Park*	1 site--Emigration Campground (1 site--Strawberry Reservoir Recreation Area) *4 sites--Emigration Campground, Las Vegas Sand Dunes Recreation Area, proposed Frenchman Mountain-Rainbow Gardens National Natural Landmark (includes Sunrise Mountain Natural Area), and the proposed Clark County Wet Lands Park*	None (1 site--Strawberry Reservoir Recreation Area) *3 sites--Las Vegas Sand Dunes Recreation Area, proposed Frenchman Mountain-Rainbow Gardens National Natural Landmark (includos Sunrise Mountain Natural Area), and the proposed Clark County Wet Lands Park*	None (None)	1 site--Las Vegas Sand Dunes Recreation Area (3 sites--Las Vegas Sand Dunes Recreation Area, proposed Frenchman Mountain-Rainbow Gardens National Natural Landmark (includes Sunrise Mountain Natural Area), and the proposed Clark County Wet Lands Park)	None (None)	None (None)
ORV Events	*1 known event-Mint 400*	None (1 known event-Mint 400) *None*	None (1 known event-Mint 400) *None*	None (None) *1 known event-Mint 400*	None (Mint 400) *None*	None (None) *Mint 400*	None (None) *Mint 400*	None (None) *Mint 400*	None (None)	None (None)	None (None)	None (None)
LAND USES: WILDERNESS	*None*	None (None) *None*	None (None) *None*	None (None) *None*	2 direct WSA conflicts--Notch Peak WSA (U-050-078), Rawhide Mountains (NV-060-059) (None) *2 direct WSA conflicts--Notch Peak WSA (U-050-078), Rawhide Mountains WSA (NV-060-059)*	None (None) *None*	None (None) *None*	None (None) *None*	None (None)	None (None)	None (None)	None (None)
LAND USES: AGRICULTURE*												
Acres of Cropland Temporarily Disturbed	*1,065 acres*	521 acres (1,065 acres) *521 acres*	1,065 acres (1,065 acres) *1,065 acres*	1,125 acres (605 acres) *1,585 acres*	944 acres (351 acres) *1,295 acres*	557 acres (605 acres) *1,016 acres*	653 acres (666 acres) *1,053 acres*	363 acres (230 acres) *1,198 acres*	61 acres (None)	None (None)	None (None)	None (None)
Acres of Cropland Permanently Removed from Production	*5 acres*	None (5 acres) *None*	None (5 acres) *None*	5 acres (None) *5 acres*	5 acres (None) *5 acres*	5 acres (None) *5 acres*	5 acres (5 acres) *5 acres*	5 acres (None) *5 acres*	None (None)	None (None)	None (None)	None (None)
LAND USES: FOREST RESOURCES												
Commercial Timber in thousand board feet (Mbf)	*1,016 Mbf* *$16,115*	None (1,016 Mbf) ($16,115) *None*	None (1,065 Mbf) (16,115) *None*	None (None) *1,016 Mbf* *$16,115*	None (None) *1,016 Mbf*$16,115*	None (None) *1,016 Mbf* *$16,115*	42 Mbf $663 (1,016 Mbf) $16,115) *42 Mbf* *$875*	10 Mbf $220 (1,016 Mbf) ($16,115) *10 Mbf* *$220*	None (None)	None (None)	None (None)	1,167 Mbf $25,685 (460 Mbf) ($10,124)

Cords of Firewood*	*3,570 cords* *$7,140*	None (3,570 cords) (7,140) *None*	None (3,570 cords) ($7,140) *None*	1,814 cords $3,628 (848 cords) ($1,696) *11,580 cords* *$23,160*	5,800 cords $11,600 (3,420 cords) ($16,840) *6,120 cords* *$12,240*	480 cords $960 (3,420 cords) ($6,840) *4,305 cords* *$8,610*	5,330 cords $10,600 (2,424 cords) ($4,848) *8,060 cords* *$16,120*	1,200 cords $2,400 (480 cords) ($960) *5,275 cords* *$10,550*	545 cords $1,090 (40 cords) ($80)	None (None)	None (Nona)	144 cords $288 (60 cords) ($120)
LAND USES: **Conflicts with Land Use Plans, Controls, and Constraints**	*Would not coincide with the Utility Corridor Rule in tha proposed Forest Land Managemant Plan for the Uinta National Forest. The proposed ection would not follow the 3,000-foot wide BLM corridor through the 70,000 ecres of BLM lands trensferred to the Moape Indian Raservetion. BLM policy is to follow the corridor wherever possible. Tha proposed action would conflict with the Trades end Services zone (T&S) of the Uteh County Lend Use Plan*).	No known conflicts. (The proposed action would not follow tha 3,000 foot wida BLM corridor through the 70,000 acres transferred to the Moepe Indian Reservetion. BLM policy is to follow tha corridor whenever possible. Tha proposed ection would conflict with the Utility Corridor Rule in the proposed Forest Lend Menagement Plen for the Uinta Netional Forest.) *No known conflicts.*	No known conflicts. (The proposed action would not follow the 3,000-foot wida BLM corridor through the 70,000 ecre of BLM lands transferred to the Moepa Indian Reservation. BLM policy is to follow the corridor wherever possible. The proposed action would conflict with the Utility Corridor Rule in the proposed Forest Land Management Plan for the Uinta Nationel Forest.) *No Known Conflicts.*	No known conflicts. (No known conflicts.) *Would not follow the 3,000-foot wida BLM corridor through the 70,000 acres of BLM lands trensferred to tha Moapa Indian Raservation. BLM policy is to follow the corridor whenever possible. Would not coincide with the Utility Corridor Rule in the proposed Forest Lend Management Plan for the Uinta Nationel Forest.*	Would not follow the Utility Corridor designated in the BLM Celifornie Desart Plen. Would follow e contingency corridor. Would not follow the transmission utilities corridor of the BLM draft Banton-Owans Vallay MFP. (The proposed action would not follow the 3,000-foot wida BLM utility corridor through the 70,000 acres of BLM lands transferred to the Moepa Indian Reservation. BLM policy is to follow the corridor whenevar possible.) *Would conflict with tha Utilities Corridor Rule of the proposed Forest Land Manegement Plen for the Uinte National Forast. Would not follow the utility corridor dasignated in the BLM California Desert Plen. Would follow a contingency plenning corridor. Would not follow the transmission utilities corridor of the BLM dreft Benton-Owens Valley MFP*	No known conflicts. (No known conflicts.) *Would conflict with the Utility Corridor Rule of the proposed Forest Land Management Plan for the Uinta National Forest. Would not follow the 3,000-foot wide BLM corridor through the 70,000 acras of BLM lands transferred to the Moapa Indian Reservation. BLM policy is to follow tha corridor whenever possible.*	No known conflicts. (The proposed action would conflict with the Utility Corridor Rule of the proposed Forest Land Management Plan for the Uinta National Forest.) *The proposed action would not follow the 3,000-foot wide BLM utility corridor through the 70,000 acres of BLM lands transferred to the Moapa Indian Reservation. BLM policy is to follow the corridor whenever possibla.*	No known conflicts. (The proposed action would conflict with the Utility Corridor Rule of the proposed Forest Land Management Plan for the Uinta National Forest.) *The proposed action would not follow the 3,000-foot wide BLM corridor through the 70,000 acres of BLM lands transferred to the Moapa Indian Reservation. BLM policy is to follow the corridor whenever possible.*	The variation would conflict with the trades end services zone (T&S) of the Utah County Land Use Plan. (The proposed action would conflict with the trades and services zone of the Utah County Land Usa Plan.)	Would conflict with expansion plans and ongoing ectivities of the Clark County Sanitation District facilities within the mile-wide corridor. (No known conflicts)	No known conflicts. (No known conflicts)	No known conflicts. (No known conflicts)

TABLE 2-11 (REVISED) —Continued

Resources	Proposed Action	Altarnative A, Northern Systams		Alternative B, Senpeta Valley	Alternetiva C, Central Nevada	Altarnative D, Sevier-Escelante Desert	Atlernetive E, Wast Salt Lake	Alternative F, Provo Canyon	Variation 2, Thistle Creek	Variation 3, East Les Veges	Variation 4, Fort Mojeve	Verietion 5, Mill Creek[10]
		Best Case[1]	Worst Casa[1]									
SOCIO-ECONOMICS												
Construction Crews Requiring Over 10 Percent of Available Housing	*Compressor Station--1; Pipeline Spraad--1; Double-Jointing Yards--3*	Compressor Stations--2; Pipeline Spread--1; Double-Jointing Yerds not evaluated (Compressor Station--1; Pipeline Spread--1; Double-Jointing Yards--3)	Compressor Stations--2; Pipelina Spread--1; Double-Jointing Yards not evaluated (Compressor Station--1; Pipeline Spread--1; Double-Jointing Yards--3)	Double-Jointing Yerd--1 (Doubla-Jointing Yerd--1)	Pipelina Spreads--5; Double-Jointing Yards and Communication Crews not evaluated (Pipeline Spread--1; Doubla-Jointing Yerds--2)	No significant requirement (no significant requirement)	Compressor Station--1; Pipelina Spraads--4; Double-Jointing Yards and Communication Craw not evaluated (Pipeline Spreads--3; Double-Jointing Yard--1)	Pipeline Spread-- 1; Double-Jointing Yard--1 (Double-Jointing Yerd--1)	No significant requirement (No significant requirement)	No significant requirement (No significent requirement)	Pipeline Spreed--1 (Pipeline Spread--1)	No significent requirement (No significant requirement)
Construction Worker Spending Increasing Regionel Ratail Seles More Then 10 Percent	*No significent increase*	No significent increase (No significant incraase)	No significant increase (No significent increasa)	No significent increase (No significant increase)	Pipeline Spreads-3; Double-Jointing Yerds end Communicetion Crews not evaluated (No significant incraese)	No significent increase (No significant increase)	Pipeline Spread--1 (No significent increase)	No significant increese (No significant increese)	No significent increese (No significant incraase)	No significant increese (No significent increase)	No significent increase (No significent increese)	No significent increese (No significent increase)
Total Property Tax: First Yeer of Operation	*$4,960,000*	Not quentified. Howevar tax would probebly be less than RMPP because there would be fewer fecilities. ($4,960,000)	Not quantified. However, tax would probebly be less becousa there would be fewer facilities. ($4,960,000)	$1,537,000 ($1,531,000)	Not quantified. However, tax probably greater than RMPP because thera would be more facilitias. ($43,182,000)	$1,550,000 ($1,454,000)	$1,464,000 ($2,315,000)	$1,165,000 ($967,000)	$312,000 ($252,000)	$1,001,000 ($980,000)	$980,000 ($980,000)	$241,000 ($175,000)
Demand on Fire Protection During Construction	*No significant demand.*	NXXXo significant demend (No significent demend)	No significant demand (No significent demand)	No significant demend (No significent demend)	Because new housing would probebly be constructed to house the construction crews, there would be an increesed need for fira protection. (No significent demend)	No significant demend (No significant demend)	No significant demand (No significent demend)	No significent demend (No significent demand)	No significent demend (No significant demend)	No significant demend (No significent demend)	No significent demand (No significent demend)	No significant demand (No significant demend)
CULTURAL RESOURCES												
Number of Acres with High Site Density	*4,545 acres*	931 ecres (4,545 acres) *931 acres*	1,537 ecras (4,545 ecres) *1,537 acres*	2,121 acres (1,515 acres) *4,480 acres*	4,235 acres (2,723 acres) *6,050 acras*	1,515 ecras (1,210 ecres) *6,050 ecres*	1,863 ecres (1,818 acras) *3,984 acres*	1,210 ecres (908 acras) *4,840 acres*	326 acres (242 ecres)	714 acres (678 ecres)	121 acres (121 ecres)	254 ecres (157 ecras)
Number of Acres with High Site Significance	*1,515 acres*	None (1,515 acres) *None*	605 acres (1,515 ecres) *605 acras*	1,818 ecras (906 acres) *2,420 acras*	606 ecres (303 acres) *908 ecres*	606 ecres (606 ecres) *1,515 ecres*	303 acres (606 ecres) *1,210*	606 ecres (303 acres) *1,818 ecres*	None (None)	303 acres (None)	121 acres (121 ecres)	None (None)
GEOLOGY/ TOPOGRAPHY												
Feults Crossed	*8*	3 (8)	6 (8)	Many (7)	23 (6)	1 (8)	7 (7)	1 (3)	None (1)	None (None)	None (None)	1 (1)
Miles Parellel To Faults	*10 miles*	None (10 miles)	None (10 miles)	165 miles (10 miles)	146 miles (10 miles)	None (10 miles)	None (10 miles)	8 miles (None)	None (None)	None (None)	None (None)	None (None)
Miles of Route Over 0.1g	*255 miles*	46 miles (255 miles)	194 miles (255 miles)	145 miles (125 miles)	486 miles (105 miles)	100 miles (105 miles)	326 miles (255 miles)	115 miles (108 miles)	27 miles (20 miles)	None (None)	None (None)	21 miles (13 miles)
Miles of Liquefaction Potentiel	*19 miles*	Unknown (19 miles)	Unknown (19 miles)	115 miles (19 miles)	Unknown (19 miles)	18 miles (19 miles)	More than 127 miles (19 miles)	5 miles (10 miles)	None (None)	None (None)	None (None)	None (None)
Miles of Volcenic Flows	*50 miles*	21 miles (50 miles)	21 miles (50 miles)	None (50 miles)	60 miles (50 miles)	60 miles (50 miles)	2 miles (5 miles)	None (None)	None (None)	None (None)	None (None)	None (None)

Miles of Landslide Potential	*17 miles*	None (17 miles)	15 miles (17 miles)	None (2 miles)	more than 34 miles (None)	None (None)	None (17 miles)	3 miles (17 miles)	3 miles (10 miles)	None (None)	None (None)	8 miles (10 miles)
Miles of Side Slope Greater Than 30%	*31 miles*	1 mile (31 miles)	1 mile (31 miles)	8 miles (None)	5 miles (3 miles)	None (None)	5 miles (28 miles)	6 miles (22 miles)	4 miles (13 miles)	None (None)	None (None)	2 miles (13 miles)
Number of Slopes Crossed of Over 100%	*3*	None (3)	None (3)	None (1)	None (3)	None (1)	None (None)	1 (None)	None (None)	None (None)	None (None)	None (None)
WATER RESOURCES												
Total Stream Crossings	*61*	10 (61) *10*	36 (61) *36*	34 (10) *85*	52 (24) *88*	12 (9) *64*	23 (44) *45*	9 (17) *53	7 (4)	2 (3)	1 (1)	1 (1)
Intermittent Stream Crossings[11]	*32*	*3*	*18*	*41*	*44*	*29*	*20*	*28*	*5*	*2*	*1*	*1*
Perennial Stream Crossings[11]	*29*	*7*	*18*	*44*	*44*	*35*	*25*	*25*	*2*	*None*	*None*	*None*
Class I Stream Crossings[11]	*3*	*None*	*None*	*3*	*2*	*3*	*1*	*3*	*None*	*None*	*None*	*None*
Class II Stream Crossings[11]	*9*	*None*	*None*	*8*	11*	*9*	*1*	*2*	*None*	*None*	*None*	*1*
Class III Stream Crossings[11]	*5*	*4*	*5*	*11*	*5*	*5*	*4*	*5*	*2*	*None*	*None*	*None*
Class IV Stream Crossings[11]	*2*	*None*	*1*	*4*	*4*	*4*	*5*	*1*	*1*	*None*	*None*	*None*
Unclassified Stream Crossings[11]	*42*	*6*	*30*	*59*	*66*	*43*	*34*	*42*	*4*	*2*	*1*	*None*
AIR QUALITY												
Dust	*Temporary increase in dust during construction*	Temporary increase in dust during construction	Temporary increase in dust during construction	Temporary increase in dust during construction	Temporary increase in dust during construction	Temporary increase in dust during construction	Temporary increase in dust during construction	Temporary increase in dust during construction	Temporary increase in dust during construction	Temporary increase in dust during construction	Temporary increase in dust during construction	Temporary increase in dust during construction
Total NO_x Emissions	*[12]184 tons per year*	[13]5 tons per year (184 tons per year)	[14]268 tons per year (184 tons per year)	184 tons per year (184 tons per year)	[15]222 tons per year (184 tons per year)	184 tons per year (184 tons per year)	[16]202 tons per year (184 tons per year)	184 tons per year (184 tons per year)	184 tons per year (184 tons per year)	184 tons per year (184 tons per year)	184 tons per year (184 tons per year)	184 tons per year (184 tons per year)
Maximum Ground-level Concentration of NO_x	*21.49 ug per cubic meter*	Negligible (21.49 ug per cubic meter)	[17]44 ug per cubic meter (21.49 ug per cubic meter)	21.49 ug per cubic meter (21.49 ug per cubic meter)	21.79 ug per cubic meter (21.49 ug per cubic meter)	21.49 ug per cubic meter (21.49 ug per cubic meter)	21.62 ug per cubic meter (21.49 ug per cubic meter)	21.49 ug per cubic meter (21.49 ug per cubic meter)	21.49 ug per cubic meter (21.49 ug per cubic meter)	21.49 ug per cubic meter (21.49 ug per cubic meter)	21.49 ug per cubic meter (21.49 ug per cubic meter)	21.49 ug per cubic meter (21.49 ug per cubic meter)
Applicability Determination on PSD Review Required	*Sage Compressor Station*	None (Sage Compressor Station)	Ione and Deleven Compressor Stations (Sage Compressor Station)	Sage Compressor Station (Sage Compressor Station)	Sage Compressor Station (Sage Compressor Station)	Montpelier Compressor Station (Sage Compressor Station)	Sage Compressor Station (Sage Compressor Station)	Sage Compressor Station (Sage Compressor Station)	Sage Compressor Station (Sage Compressor Station)	Sage Compressor Station (Sage Compressor Station)	Sage Compressor Station (Sage Compressor Station)	Sage Compressor Station (Sage Compressor Station)
NAAQS	*The NAAQS would not be exceeded.*	The NAAQS would not be exceeded.	The NAAQS would not be exceeded.	The NAAQS would not be exceeded.	The NAAQS would not be exceeded.	The NAAQS would not be exceeded.	The NAAQS would not be exceeded.	The NAAQS would not be exceeded.	The NAAQS would not be exceeded.	The NAAQS would not be exceeded.	The NAAQS would not be exceeded.	The NAAQS would not be exceeded.
NOISE QUALITY												
Operation L_{eq}	*43.3 dB(A)*	Noise data for the Stanfield Compressor Station are not available. (43.3 dB(A))	Noise data for the Stanfield Compressor Station are not available. 3 dB(A) increase for each doubling of horsepower if similar units are installed. (43.3 dB(A))	43.3 dB(A) (43.3 dB(A))	43.3 dB(A) (43.3 dB(A))	43.3 dB(A) (43.3 dB(A))	Unknown (Unknown)	43.3 dB(A) (43.3 dB(A))	43.3 dB(A) (43.3 dB(A))	43.3 dB(A) (43.3 dB(A))	43.3 dB(A) (43.3 dB(A))	43.3 dB(A) (43.3 dB(A))

TABLE 2-11 (REVISED) —Continued

Resources	Proposed Action	Alternative A, Northern Systems		Alternative B, Sanpete Valley	Alternative C, Central Nevada	Alternative D, Sevier-Escalante Desert	Alternative E, West Salt Lake	Alternative F, Provo Canyon	Variation 2, Thistle Creek	Variation 3, East Las Vegas	Variation 4, Fort Mojave	Variation 5, Mill Creek[16]
		Best Case[1]	Worst Case[1]									
Operation L_{dn}	*49.7 dB(A)*	Noise data for the Stanfield compressor station are not available. (49.7 dB(A))	Noise data for the Stanfield compressor station are not available. Three dB(A) increase for each doubling of horsepower if similar units are installed. (49.7 dB(A))	49.7 dB(A) (49.7 dB(A))	49.7 dB(A) (49.7 dB(A))	49.7 dB(A) (49.7 dB(A))	49.7 dB(A) (49.7 dB(A))	49.7 dB(A) (49.7 dB(A))	49.7 dB(A) (49.6 dB(A))	49.7 dB(A) (49.7 dB(A))	49.7 dB(A) (49.7 dB(A))	49.7 dB(A) (49.7 dB(A))
SAFETY												
Incidents Per Year	*0.8*	0.10 (0.81)	0.30 (0.81)	0.83 (0.81)	1.44 (0.81)	0.82 (0.81)	0.99 (0.81)	0.82 (0.81)	0.81 (0.81)	0.81 (0.81)	0.81 (0.81)	0.82 (0.81)

NOTE: The information presented in this table for the proposed action, alternatives, and variations indicates total impacts to each resource category. For each alternative, the table shows three types of information: the impacts from the alternative only; in parentheses, the impacts for that portion of the RMPP which would be replaced by the alternative; and flanked, by asterisks, the impacts for the total alternative pipeline system from Wyoming to California.

NOTE: The abbreviations and acronyms used in this table are identified in the glossary.

[1]Best Case--78.8 miles of pipeline construction; no pipeline required in California. Worst Case--225.1 miles of pipeline construction; 148.3 miles of pipeline required in California.

[2]Vegetation includes all vegetation types and barren land, but not cropland.

[3]Riparian acres are estimated by multiplying a standard right-of-way width of 100 feet by an average 100 foot wide riparian zone by the number of stream crossings.

[4]All impacts noted in the wildlife section are potential impacts to habitat except those to desert tortoise, which are to the animal.

[5]These are general groups of soils containing specific areas that warrant more intensive implementation of erosion control and restoration procedures to minimize soil erosion and potential impacts.

[6]Soil Group 1 is included in the previous total but is highlighted because it contains the most frequent occurrences of severe erosion hazard and slide potential.

[7]Temporary disturbance of cropland along the right-of-way would be restored within 1 to 2 years. Lands would be permanently removed from production for the life of the project because surface facilities located within cropland would permanently remove that land from production for the life of the project.

[8]A cord is a volume of wood 4 feet high by 4 feet wide by 8 feet long. Cords of fuel wood are valued at $2 per cord, minimum price. Actual value may be more nearly $26 commercial or $110 retail per cord.

[9]Based on estimates of known cultural resources only. Field surveys would be conducted after a route is selected and centerline staked.

[10]Only totals are given for the various classifications of streams. They apply to the total length of the alternative pipeline system, including those portions of the proposed action north and/or south of each alternative which would be necessary to move the gas from Wyoming to California.

[11]Total installed nominal horsepower of 31,800. Emission figures represent total potential to emit.

[12]This requires the construction of a 400-hp. compressor station at Stanfield.

[13]This requires the installation of the following compression: 400 horsepower at Stanfield, 8,975 horsepower at Ione, 14,450 horsepower at Madres, 11,375 horsepower at Bonanza, and 8,750 horsepower at Delevan.

[14]The Central Nevada Alternative requires installation of 25,650 horsepower of compression at the Sage Compressor Station.

[15]The West Salt Lake Alternative requires the installation of 23,350 horsepower of compression at the Montpelier Compressor Station.

[16]Figures are for Ione, which of all of the compressor stations on the alternative, would emit the most CO.

TABLE 2-11A

COMPARATIVE ANALYSIS OF IMPACTS FROM PROPOSED ACTION, ALTERNATIVES, AND VARIATIONS; ADDENDUM

Resources	Variation 6-II, Daniels Canyon II	Variation 7, Moapa	Variation 8, West Kamas Valley
VEGETATION			
Total Acres of Native Vegetation Temporarily Disturbed[1]	85 acres (78 acres)	352 acres (327 acres)	170 acres (12 acres)
Acres of Timber, Pinyon-Juniper and Mountain Brush kept Cleared for Life of Project on 25-foot Width over Pipeline	32 acres (32 acres)	None (None)	None (None)
Acres of Riparian Habitat Crossed[2]	None (None)	None (None)	None (None)
Federal Threatened or Endangered Plant Species Potentially Affected	None (None)	None (None)	None (None)
State Classified Plant Species Potentially Affected-California	None (None)	None (None)	None (None)
WILDLIFE[3]			
Big Game Winter Range	None (None)	None (None)	None (None)
Desert Bighorn Sheep Areas	None (None)	1 point site (1 point site)	None (None)
Waterfowl Nesting Areas	None (None)	None (None)	None (None)
Sage Grouse Habitat	None (None)	None (None)	None (None)
Raptor Habitat	85 acres (79 acres)	None (None)	None Known (None Known)
Golden Eagle Nest Areas	None Known (None Known)	None Known (None Known)	None Known (None Known)
Desert Tortoise Habitat Not Federally Designated as Critical Habitat	None (None)	376 acres (339 acres)	None (None)
Black-footed Ferret (Endangered)	None (None)	None (None)	None (None)
Bald Eagles (Endangered)	None Known (None Known)	None (None)	None Known (None Known)
Sandhill Crane	None (None)	None (None)	None (145 acres)
San Joaquin Kit Fox (Endangered)	None	None	None
Blunt-nosed Leopard Lizard (Endangered)	None	None	None
Railroad Valley Springfish (Candidate for Endangered)	None	None	None
SOILS[4]			
Soils Most Susceptible to More Occurrences of Slides, High Erosion Hazards, and Other Limitations Associated with Project Construction and Restoration (Soil Groups 1-8)	85 acres (79 acres)	48 acres (24 acres)	133 acres (None)
(Soil Group 1--Soils of Mountain Areas with Precipitation of 14 to 28 Inches, Most susceptible to Slides and High Erosion Hazards (Part of the above total)[5]	85 acres (79 acres)	None (None)	133 acres (None)
Soil Group 9--Soils with Annual Precipitation Generally less than 8 to 10 Inches (Significant to Revegetation Potential)	None (None)	376 acres (351 acres)	None (None)
VISUAL RESOURCES			
Acres Which Would Exceed Acceptable Levels of Visual Contrast Based upon VRM Classes and VQO's			
Class 1/Preservation	None (None)	None (None)	None (None)
Class 2/Retention	None (12 acres)	None (None)	36 acres (146 acres)
Class 3/Partial Retention	None (None)	None (None)	None (None)
Class 4/Modification and Maximum Modification	12 acres (None)	None (None)	None (None)

TABLE 2-11A —Continued

Resources	Variation 6-II, Daniels Canyon II	Variation 7, Moapa	Variation 8, West Kamas Valley
LAND USES: RECREATION			
Managed Sites Crossed	None (None)	None (None)	None (None)
ORV Events	None (None)	1 known event-Mint 400 (1 known event-Mint 400)	None (None)
LAND USES: WILDERNESS	None (None)	None (None)	None (None)
LAND USES: AGRICULTURE[6]			
Acres of Cropland Temporarily Disturbed	None (None)	24 acres (24 acres)	12 acres (109 acres)
Acres of Cropland Permanently Removed from Production	None (None)	None (None)	None (None)
LAND USES: FOREST RESOURCES			
Commercial Timber in thousand board feet (Mbf)	None (None)	None (None)	None (None)
Cords of Firewood[6]	30 cords (30 cords)	None (None)	None (None)
LAND USES:			
Conflicts with Land Use Plans, Controls, and Constraints	No Known conflicts (Would Conflict with the Utility Corridor Rule in the proposed Forest Land Management Plan for the Uinta National Forest.)	No Known Conflicts (Proposed action would not follow the 3,000-foot wide BLM corridor through the Moapa Indian Reservation)	No Known Conflicts (No Known Conflicts)
SOCIO-ECONOMICS			
Construction Crews Requiring Over 10 Percent of Available Housing	No significant increase (No significant increase)	No significant increase (No significant increase)	No significant increase (No significant increase)
Construction Worker Spending Increasing Regional Retail Sales More Than 10 Percent	No significant increase (No significant increase)	No significant increase (No significant increase)	No significant increase (No significant increase)
Total Property Tax: First Year of Operation	$67,700 ($48,500)	$993,000 ($980,000)	$834,000 ($811,000)
Demand on Fire Protection During Construction	No significant demand (No significant demand)	No significant demand (No significant demand)	No significant demand (No significant demand)
CULTURAL RESOURCES[7]			
Number of Acres with High Site Density	85 acres (79 acres)	373 acres (350 acres)	179 acres (148 acres)
Number of Acres with High Site Significance	None (None)	373 acres (350 acres)	179 acres (148 acres)
GEOLOGY/TOPOGRAPHY			
Faults Crossed	None (None)	None (None)	None (None)
Miles Parallel To Faults	None (None)	None (None)	None (None)
Miles of Route Over 0.1g	7.0 miles (6.5 miles)	None (None)	14.8 miles (12.2 miles)
Miles of Liquefcation Potential	None (None)	None (None)	None (None)
Miles of Volcanic Flows	None (None)	None (None)	None (None)
Miles of Landslide Potential	3.5 miles (None)	None (None)	None (None)
Miles of Side Slope Greater Than 30 Percent	None (None)	None (None)	None (None)
Number of Slopes Crossed of Over 100 Percent	None (None)	None (None)	None (None)
WATER RESOURCES			
Total Stream Crossings	2 (2)	None (1)	2 (3)
Intermittent Stream Crossings[8]	2	None	1
Perennial Stream Crossings[8]	None	None	1

TABLE 2-11A —Continued

Resources	Variation 6-II, Daniels Canyon II	Variation 7, Moapa	Variation 8, West Kamas Valley
Class I Stream Crossings[8]	None	None	None
Class II Stream Crossings[8]	None	None	1
Class III Stream Crossings[8]	None	None	1
Class IV Stream Crossings[8]	None	None	None
Unclassified Stream Crossings[8]	2	None	None
AIR QUALITY			
Dust	Temporary increase in dust during construction	Temporary increase in dust during construction	Temporary increase in dust during construction
Total NO_x Emissions	184 tons per year (184 tons per year)	184 tons per year (184 tons per year)	184 tons per year (184 tons per year)
Maximum Ground-level Concentration of NO_x	21.49 ug per cubic meter (21.49 ug per cubic meter)	21.49 ug per cubic meter (21.49 ug per cubic meter)	21.49 ug per cubic meter (21.49 ug per cubic meter)
PSD Review Required	Sage Compressor Station (Sage Compressor Station)	Sage Compressor Station (Sage Compressor Station)	Sage Compressor Station (Sage Compressor Station)
NAAQS	The NAAQS would not be exceeded	The NAAQS would not be exceeded	The NAAQS would not be exceeded
NOISE QUALITY			
Operation L_{eq}	43.3 dB(A) (43.3 dB(A))	43.3 dB(A) (43.3 dB(A))	43.3 dB(A) (43.3 dB(A))
Operation L_{dn}	49.7 dB(A) (49.7 dB(A))	49.7 dB(A) (49.7 dB(A))	49.7 dB(A) (49.7 dB(A))
SAFETY			
Incidents Per Year	0.81 dB(A) (0.81 dB(A))	0.81 dB(A) (0.81 dB(A))	0.81 dB(A) (0.81 dB(A))

NOTE: The information presented in this table for the proposed action, alternatives, and variations indicates total impacts to each resource category. For each alternative, the table shows three types of information: the impacts from the alternative only; in parentheses, the impacts for that portion of the RMPP which would be replaced by the alternative; and finally, flanked by asterisks, the impacts for the total alternative pipeline system from Wyoming to California.

NOTE: The abbreviations and acronyms used in this table are identified in the glossary.

[1]Vegetation includes all vegetation types and barren land, but not cropland.

[2]Riparian acres are estimated by multiplying a standard width of 100 feet by an average 100 foot wide riparian zone by the number of stream crossings.

[3]All impacts noted in the wildlife section are potential impacts to habitat except those to desert tortoise, which are to the animal.

[4]These are general groups of soils containing specific areas that warrant more intensive implementation of erosion control and restoration precedures to minimize soil erosion and potential impacts.

[5]Soil Group 1 is included in the previous total but is highlighted because it contains the most frequent occurrences of severe erosion hazard and slide potential.

[6]A cord is a volume of wood 4 feet high by 4 feet wide by 8 feet long. Cords of fuel wood are valued at $2 per cord, minimum price. Actual value may be more nearly $26 commerical or $110 retail per cord.

[7]BAsed on estimates of known cultural resources only. Field surveys will be conducted after a route is selected and centerline staked.

[8]Totals only are given for the various classifications of streams. They apply to the total length of the alternative pipeline system, including those portions of the proposed action north and/or south of each alternative which would be necessary to move the gas from Wyoming to California.
19This analysis is for the original Mill Creek Variation; impacts for each of the possible modification a, b, and c would all be less.

TABLE 2-12 (REVISED)

EFFICIENCY ANALYSIS OF PROPOSED ACTION, ALTERNATIVES, AND VARIATIONS

System Requirements	Proposed Action	Alternative A, Northern Systems		Alternative B, Sanpete Valley	Alternative C, Central Nevada	Alternative D, Sevier-Escalante Desert	Alternative E, West Salt Lake	Alternative F, Provo Canyon	Variation 2, Thistle Creek	Variation 3, East Las Vegas	Variation 4, Fort Mojave	Variation 5, Mill Creek
		Best Case[a]	Worst Case[b]									
Fuel Use (Mcfd)	[c]2,910	[d]17,160 [e]27,620	[d]17,160 [e]27,620	2,910	3,520	2,910	[f]3,200	2,910	If substituted for portion of the RMPP, this variation would not change fuel use or compression.	If substituted for portion of the RMPP, this variation would not change fuel use or compression.	If substituted for portion of the RMPP, the variation would not change fuel use or compression.	If substituted for portion of the RMPP, this variation would not change fuel use or compression.
Fuel Efficiency	99.3%	95.8%	93.3%	99.3%	99.1%	99.3%	99.2%	99.3%	99.3%	99.3%	99.3%	99.3%
Compression (Horsepower)	[g]21,200	[h]400 [i]21,600	[h]400 [i]21,600	21,200	25,650	21,200	23,350	21,200	21,200	21,200	21,200	21,200
Length (Miles)	610.18	[h]76.8	[h]225.1	630.18	862.18	622.18	747.18	619.18	27 miles would replace 20-mile long segment of RMPP	59 miles would replace 56-mile long segment of RMPP	10 miles would replace 10-mile long segment of RMPP	21 miles would replace 13-mile long segment of RMPP

Note: The abbreviations and acronyms used in this table are identified in the glossary.

[a]Best Case--76.8 miles of pipeline construction; no pipeline required in California.

[b]Worst Case--225.1 miles of pipeline construction; 148.3 miles of pipeline required in California.

[c]Does not include fuel used on Northwest's system to transport Canadian gas (90,000 Mcfd) or other RMPP gas obtained between Stanfield, Oregon, and Sage, Wyoming.

[d]Does not include fuel use/savings on Northwest system from shortened transportation of Canadian gas (90,000 Mcfd). Portion of Western Leg of the ANGTS prebuilt, no Alaskan gas flowing.

[e]Does not include fuel use/savings on Northwest system from shortened transportation of Canadian gas (90,000 Mcfd). Western Leg completed, Alaskan gas flowing.

[f]Does not include fuel use on Northwest's system between Kemmerer and Montpelier Compressor Stations.

[g]Three 10,600-hp. units would be installed. One unit would be used as a spare.

[h]Portions of Western Leg prebuilt (380 miles).

[i]Western Leg completed.

TABLE 2-12A

EFFICIENCY OF PROPOSED ACTION, ALTERNATIVES, AND VARIATIONS; ADDENDUM

System Requirements	Variation 6-II, Daniels Canyon II	Variation 7, Moapa	Variation 8, West Kamas Valley
Fuel Use (Mcfd)	If substituted for portion of the RMPP, this variation would not change fuel use or compression.	If substituted for portion of the RMPP, this variation would not change fuel use or compression.	If substituted for portion of the RMPP, this variation would not change fuel use or compression.
Fuel Efficiency	99.3%	93.3%	99.3%
Compression (Additional Horsepower)	21,200	21,200	21,200
Length (Miles)	7 miles would replace 6.5-mile long segment of RMPP	15 miles would replace 12-mile long segment of RMPP	31 miles would replace 29-mile long segment of RMPP

Proposed Action

Although it would temporarily disturb **6,331** acres of native vegetation, the proposed action would not cross unique or extremely sensitive vegetation types except for **Joshua trees and cactus which are scattered in the creosote bush and saltbush greasewood vegetative types.** The proposed route could cross habitat of eight species of plants which are federally listed or candidates for listing as threatened or endangered. Neither the proposed action nor any of the alternatives would cross significant acres of riparian vegetation. **However, two miles of the proposed action would follow the Indian Creek drainage and impacts would occur to riparian vegetation. There appears to be no latitude in placing the pipeline up slope due to restrictive terrain feature. Those** which would be crossed would recover quickly.

The proposed action would cross many miles of various sensitive wildlife **habitats,** including big game winter range, desert bighorn sheep range, waterfowl nesting areas, sage grouse habitat, golden eagle nesting areas, and state-listed desert tortoise habitat. However, none would be significantly affected if construction were timed to avoid certain areas identified in the mitigation measures in appendix C. The proposed route would cross an unquantifiable acreage of potential endangered black-footed ferret habitat and bald eagle habitat.

The proposed action would disturb 3,056 acres of soils which have characteristics most susceptible to slides, high erosion hazards, and other limitations. It would cross 1,382 acres of the most sensitive of these, Soil Group 1, which occurs in mountainous areas. However, with implementation of the Erosion Control, Restoration, and Revegetation Guidelines presented in appendix C, all but a few problem areas would be stabilized and rehabilitated within 3 years. **The FS position is that these areas occur especially between MP 140 and MP 168 and that achieving stability could take 5 years or longer.**

The proposed action would create significant visual resource contrasts which would not be mitigated on 606 acres of VRM Class 2 areas, 573 acres of Class 3 areas, and 15 acres of Class 4 areas.

The proposed action would conflict with **two** managed **and two proposed** recreation sites and one off-road vehicle (ORV) event. Impacts to three of these, the Mint 400 ORV race, the proposed Frenchman Mountain- Rainbow Gardens National Natural Landmark, and the proposed Clark County Wetlands Park would be of moderate significance; two, the Strawberry Reservoir Recreation Area and the Las Vegas Sand Dunes Recreation Area would be of lesser significance.

The proposed action would temporarily disturb 1,065 acres of **cropland; however,** such impacts would not last over one agricultural season. The proposed route would also permanently remove 5 acres of cropland from production.

The proposed action would conflict with the Utility Corridor Rule proposed in the Forest Land Management Plan for the Uinta National Forest. This would violate the intent of the draft plan in designating lands suitable for utility corridors. However, the values which determined the placement of utility corridors would not be significantly affected by the proposed action.

The proposed action would not follow the 3,000-foot wide corridor administered by BLM through the 70,000 acres of BLM lands transferred to the Moapa Indian Reservation. The BLM policy is to follow the corridor wherever possible.

The route would also cross the land within the proposed Clark County Wetlands Park in southern Nevada. **Since** the Draft Management Master Plan **has not yet been released,** it is not known whether there would be conflicts. **Clark County does not endorse the RMPP, although it acknowledges that RMPC has** proposed a pipeline.

The construction work force for the RMPP would place a significant **but temporary** demand on housing and campgrounds in Kemmerer and Evanston, Wyoming; all communities in Rich and Cache Counties, Utah; Nephi, Utah; Boulder City, Nevada; Bullhead City, Arizona; and Needles, California. This would inconvenience travelers and campers seeking accommodations during construction. **Property tax revenues would increase more than 18 percent in six counties crossed by the pipeline.**

Although the proposed action would cross 4,545 acres of land estimated to contain a high density of cultural resource sites and 1,515 acres of land estimated to contain sites of high significance, compliance procedures would effectively mitigate the potential impacts.

The RMPP would cross potentially active faults in eight locations and would parallel such faults for about 10 miles. At these locations, faulting could conceivably cause a pipeline rupture. Ground liquefaction would pose a hazard to about 19 miles of the route, landsliding to another 17 miles. Areas of significant topographic impact and construction difficulty resulting from sidehill construction total **31** miles. The route would cross three areas of significant slope (greater than 100 percent) parallel to the right-of- way.

Although the proposed action would cross 61 streams, impacts would be insignificant because of the small amount of sediment produced and the short distance that it would be transported downstream.

Construction and operation of the proposed Sage Compressor Station would not significantly change the existing air quality. Therefore, no impact upon public health and welfare would be expected.

The noise increase expected from operation of the Sage Compressor Station would be below EPA's long-term goal of a day-night average of 55 decibels on the A-weighted scale (dB(A)). Furthermore, any new compressor units would be required to meet all state and Federal regulations in effect at the time of their purchase.

Alternative A--Northern Systems Alternative

IMPACT TO RESOURCES

The Northern Systems Alternative would temporarily disturb 931 acres of native vegetation along the best case route and 1,662 acres along the worst case, similar to that along the proposed action (neither unique nor sensitive). The best case would disturb about **5,400** fewer acres of native vegetation than would the proposed action. The worst case would disturb fewer acres of native vegetation than would the proposed action.

The best case of the alternative would not cross the potential habitat of any Federal or state listed plant species. The worst case of the alternative would cross the potential habitat of two federally listed plant species and two species protected by the State of California, a total of four fewer plants than the proposed action.

As would the proposed action, this alternative would cross various wildlife habitats, all the same types as the proposed action, but would also not cause significant impacts if construction were timed properly. The worst case of the alternative would disturb potential habitat of the endangered black-footed ferret and an unquantified acreage of San Joaquin kit fox and blunt-nosed leopard lizard habitat in California.

The Northern Systems Alternative would disturb significantly fewer acres of sensitive soils than would the proposed action for the worst case: 1,090 acres compared to 3,056 acres disturbed by the proposed action.

This alternative would create significant visual resource contrasts on 15 acres of Class 4 areas compared to a total of 1,194 acres of significant visual resource contrasts of Class 4 areas along the proposed action.

The best-case alternative would temporarily disturb half the acres of agricultural lands **that** the proposed action **would** and the worst case would temporarily disturb the same acreage as would the proposed action.

The construction work force for the best-case Northern Systems Alternative would place a high demand on housing and campgrounds equal to that of the RMPP in only one small area but in generally different and fewer locations. These locations include all communities in Bear Lake, Caribou, Bannock, and Power Counties, Idaho (Pocatello excepted); Prineville, Oregon; and Colusa, Williams, and Willows, California.

The demand for housing in Kemmerer, Wyoming, and all communities in Rich County, Utah, would be as high as for the proposed action, but would probably be shorter term because the demand would be from pipeline workers rather than compressor station workers. Therefore, inconvenience to travelers and campers during construction of this alternative would be equal to that caused by the proposed action, but it would occur for a shorter period.

Constructing the worst case would have the same socioeconomic effects as constructing the best case. The additional 120 miles and 28.3 miles of looping construction required for the worst case would not create any significant socioeconomic impact.

The Northern Systems Alternative best case would cross approximately one-fifth the acres with high density cultural resource sites crossed by the proposed action and no acres of high site significance. The worst case would cross between one-third and one-half the acres of high site density and high site significance crossed by the proposed action.

The worst case facility requirements for the Northern Systems Alternative would avoid the major fault crossings associated with the RMPP, as well as reduce the length of pipeline parallel and adjacent to faults. It would also avoid all of the landslide areas, steep parallel slopes (over 100 percent), and virtually all of the side slope construction of the proposed route. The best case would encounter significantly fewer geologic hazards than the worst case.

This alternative would cross one-sixth of the streams which would be crossed by the proposed action for the best case and a little over one-half for the worst case.

Although ambient concentrations of nitrogen oxides (NO_x) and carbon monoxide (CO) would increase at each of the existing compressor stations along the Northwest, PGT, and PG&E pipeline systems that would be modified for the Northern Systems Alternative, the change would not represent a significant impact. Even after modification, none of the compressor stations would exceed the national ambient air quality standards (NAAQS).

All of the modifications would take place in rural areas. Therefore, the incremental increase in noise emissions resulting from the operation of compressor additions would not significantly affect the existing noise environment.

TOTAL SYSTEM COMPARISON

The Northern Systems Alternative would require significantly less pipeline construction than the RMPP because it would **use** the existing transmission systems of Northwest, would **use** the existing PGT and PG&E systems, modified with a prebuilt portion of the Western Leg of the ANGTS, and would exchange up to 240,000 Mcfd of Rocky Mountain gas for Pan Alberta gas.

The assumptions that the Western Leg will be completed south of Stanfield, Oregon, and that it can be prebuilt are essential to the feasibility of the Northern Systems Alternative. This alternative requires that 380 miles of the 630-mile long Western Leg be constructed ahead of the ANGTS schedule. At the present time, construction of the Western Leg between Stanfield and Antioch, California, is anticipated to begin in 1984 or 1985 when construction of the Alaskan portion of the ANGTS begins. If the Western Leg of the ANGTS is never completed, the 380 miles of pipeline looping on PGT's and PG&E's systems would have to be considered as a facility component of the Northern Systems Alternative. If additional pipeline were required south of Brentwood, California, the Northern Systems Alternative would create a project 605.1 miles long--i.e., 76.8 miles of pipeline on Northwest's system, 380 miles on the Western Leg, and 148.3 miles south of Brentwood.

For the 413,000-Mcfd proposal, Northwest would exchange 240,000 Mcfd of RMPP's Rocky Mountain gas for 240,000 Mcfd of PIT's Pan Alberta gas that would otherwise be delivered to Northwest at Stanfield. Northwest would also deliver to Stanfield 90,000 Mcfd of gas from Canada instead of delivering it south to Sage, Wyoming, as proposed. The Northern Systems Alternative would **use** the Northwest system to transport about 83,000 Mcfd of RMPP gas from existing Kemmerer Compressor Station northwest to Stanfield, Oregon. Once the RMPP gas volumes exceeded 330,000 Mcfd, 76.8 miles of looping along Northwest's existing system and a new 400-hp. compressor station at Stanfield would be needed to transport the entire 413,000 Mcfd. However, until the RMPP volumes exceed 330,000 Mcfd, no facilities would be required on Northwest's system.

The Pan Alberta gas is presently authorized to be transported to California from Stanfield, Oregon, using new and existing Northwest and El Paso facilities. On June 13, 1980, the FERC approved construction of approximately 350 miles of pipeline paralleling the existing Northwest system. The design of the Northwest system is reversible so that gas from developing Rocky Mountain fields can be transported to the Pacific Northwest and northern California. This design also offers the potential for diversification of the sources of gas supply for the Pacific Northwest, the region most dependent on Canadian supply. At the present time, the Pan Alberta facilities are under construction.

In its November 12, 1980, response to an FERC data request, the RMPC did not state with certainty whether the 120 miles of pipeline between Brentwood and Panoche Junction, California, or the 28.3 miles of pipeline between Hinkley and Adelanto, California, would be required to deliver gas to SoCal and PLS. However, construction of the Brentwood-Panoche Junction pipeline has been considered several times in recent years by pipeline companies and the CPUC. For instance, PIT considered this construction as a portion of an alternative route to deliver the 240,000 Mcfd of Pan Alberta gas to California. PIT alleged that prebuilding portions of the Western Leg to Brentwood might require the phased installation of approximately 96 miles of 36-inch diameter pipeline between Brentwood and Panoche Junction. In addition, PG&E prepared an environmental impact report in 1979 on the construction of additional pipeline facilities in the Brentwood-Panoche Junction corridor in connection with an application filed with the CPUC. This application, filed to allow the CPUC to act quickly if such facilities were needed during a severe shortage of natural gas in southern California, is presently on file as a standby measure; no action is expected on it unless an emergency should appear imminent.

The Brentwood-Panoche Junction and Hinkley-Adelanto facilities could also be required to transport the ANGTS gas to markets in southern California. On the other hand, if the Western LNG Project is completed or deliveries from traditional sources (such as El Paso) remain constant or improve, there might be no need for these facilities. Because of the many variables in forecasting the gas supply for California and which system within California would receive what amount of the RMPP gas, it is not possible at this time to determine whether the facilities would be required for the Northern Systems Alternative; **nor is it possible to determine at present whether they would be needed later, even if the RMPP were authorized instead of the Northern Systems Alternative.**

At the 413,000-Mcfd level, the 76.8-mile long Northern Systems Alternative would require a minimum of 533.4 fewer miles of pipeline construction than the proposed project, if no additional facilities were required in California. Even with the additional California pipelines, the Northern Systems Alternative would still be 385.1 miles shorter than the RMPP.

The Northern Systems Alternative has the advantage of being able to have all of its facilities constructed adjacent to existing rights-of-way. This would allow phased construction of facilities as gas from the Rocky Mountain region becomes available; all pipeline construction could be delayed indefinitely and built only as needed.

Northwest has not filed an application with the FERC for the facilities that it would need to implement the RMPP. Although the RMPC has indicated that Northwest would require only 0.18 mile of pipe and a meter station for the proposed project, it is not known if additional facilities on Northwest's system would be necessary for the RMPP to transport El Paso's and Northwest's 90,000 Mcfd of "committed" RMPP gas from Sumas, Washington, to Sage, Wyoming. RMPC has indicated that additional facilities--approximately 63 miles of 24-inch and 19 miles of 36-inch diameter looping and 15,230 **horsepower** of additional compression--might be required on Northwest's system to transport 800,000 Mcfd. Since both the 800,000- and 413,000-Mcfd levels of the RMPP would receive 90,000 Mcfd of gas from Canada and the remaining sources for either level are unknown, these extra facilities might be required for both levels. In that case, the proposed transportation system would be 692 miles long instead of 610 miles.

RMPC's proposal identifies only 2,910 Mcfd as the fuel required to implement the project. However, the RMPC has not identified the incremental fuel which Northwest would require to transport the Canadian gas from Sumas, Washington, to Sage, Wyoming, or more importantly, between Stanfield and Sage. In addition, the applicant has not identified the fuel consumption within California.

If the Western Leg were prebuilt, the Northern Systems Alternative would **use** about 17,160 Mcfd of fuel gas to deliver 395,840 Mcfd of gas to Antioch California, at the 413,000-Mcfd level. This fuel **use** represents a worst-volume because it does not consider the fuel savings that should occur on the Northwest system as a result of the reduced transportation of other Canadian gas between Stanfield and Sage or the possibility of reduced deliveries from ANGTS or existing Canadian contracts. Fuel **use** south of Antioch has not analyzed for the Northern Systems Alternative. According to available information, the alternative would consume 14,250 Mcfd more gas as fuel than the RMPP (490 percent more).

To transport 413,000 Mcfd of RMPP gas plus the ANGTS gas, the Northern Systems Alternative would **use** 27,780 Mcfd of fuel gas to deliver 385,220 of RMPP gas to Antioch--i.e., it would **use** 24,870 Mcfd more gas for fuel (855 percent more) than the RMPP at the 413,000-Mcfd level.

At the 800,000-Mcfd level, RMPP would **use** 11,560 Mcfd of gas to deliver 788,440 Mcfd of gas to Needles, California. Assuming that the ANGTS had been completed, the Northern Systems Alternative would **use** 63,560 Mcfd of gas to deliver 736,440 Mcfd of gas to Antioch. Once again, the facility and fuel considerations on Northwest's system are not known; this analysis presents a worst-case comparison. At these volumes, the Northern Systems Alternative would **use** 52,000 Mcfd more fuel gas than the RMPP (450 percent more).

To transport 800,000 Mcfd of RMPP gas as well as the Alaskan volumes, the Northern Systems Alternative would have a minimum requirement of 390 miles of new pipeline construction on Northwest's system between the Kemmerer Compressor Station in Lincoln County, Wyoming, and a location north of Caldwell Compressor Station in Baker County, Oregon. However, since both the ANGTS and the Northern Systems Alternative would deliver gas to northern California, there is a much stronger possibility that the facilities south of Antioch would be required and that a total of 538.3 miles of pipeline would be necessary. If only 82 miles of additional pipeline construction were required on Northwest's system to deliver 800,000 Mcfd to the 610-mile long RMPP, there would be a difference of only 153.7 miles of pipeline between the RMPP and the alternative. Consequently, the Northern Systems Alternative would still require fewer miles of pipeline construction than the RMPP, but the fuel **use** for this alternative would be much greater.

The Northern Systems Alternative engineering analysis provided in appendix E assumes that the Canadian import volumes would remain constant at the 1980 volume and that the ANGTS will transport 640,000-Mcfd through the Western Leg. If either the Alaskan or Canadian volumes were smaller, both the need for additional compression on the Western Leg and the fuel **use** identified for both the 413,000- and 800,000-Mcfd levels of this alternative would be reduced.

The RMPC has asserted that gas supply for the RMPP would be available from four sources: the Overthrust Belt, other producing areas in the Rocky Mountains, the Hingeline area of central and southern Utah, and other sources including Canadian gas. However, when the RMPC filed its application with the FERC, it had no gas supply under contract; this is still the case nearly **2.5** years later. Therefore, implementation of the RMPP at this time would require the immediate construction of over 600 miles of entirely new transmission pipeline on the assumption that gas would be available when the system is completed.

On the other hand, the **best case of the** Northern Systems Alternative could transport up to 330,000 Mcfd, 80 percent of the currently proposed but hypothetical volume of gas, before any non-ANGTS facilities were required. The only new facilities which might be needed would be the prebuilt portions of the Western Leg. Should more gas materialize, new facilities could be added as necessary to Northwest's system until the 76.8 miles of pipeline required for the proposed volume were constructed.

This EIS compares the facility requirements for the RMPP and Northern Systems Alternative at the 800,000-Mcfd level. The difference in miles of pipeline required favors the alternative; however, the alternative would **use** 5.5 times as much fuel gas per day as the RMPP to accomplish the same purpose.

Alternative B--Sanpete Valley Alternative

This alternative would disturb a total of 6,215 acres of native vegetation of a similar amount and of similar low significance to that which would be disturbed by the proposed action. It would cross potential habitat of four Federal threatened or endangered or candidate species, compared to the proposed action, which would cross potential habitat of eight species.

The Sanpete Valley Alternative would cross types of wildlife habitats similar to the types which would be crossed by the proposed action, but it would cross twice as much of some types. These include big game range, waterfowl nesting areas, sage grouse habitats, and raptor habitat. Like the proposed action, the alternative would cross an unquantifiable amount of potential endangered black-footed ferret and bald eagle habitat.

The Sanpete Valley Alternative would cross essentially the same amounts of susceptible soil types as would the proposed action. Acres of **significant** visual resource contrasts would also be similar to those affected by the proposed action, and recreation resources affected would be the same. Temporary disturbance of agricultural lands would total 1,585 acres versus 1,005 acres of disturbance from the proposed action. The alternative would, like the proposed action, permanently remove 5 acres of cropland from production. The alternative would conflict with the same two land **use** plans and constraints as the proposed action and have same potential for possible conflicts with a third draft plan.

The alternative would cross 4,840 acres with a potential for cultural resources of high site significance and 2,420 acres of high site density. This compares to 4,545 acres for the former category and 1,515 acres for the latter category on the proposed action.

This alternative would be subject to less hazard from lava flows and landslides than the RMPP; it would also avoid areas of high slope (over 100 percent) parallel to the route. However, major geologic disadvantages of this alternative include high fault rupture hazard (with little chance for mitigation) and extensive areas subject to liquefaction. In addition, the alternative would create greater topographic impact than the proposed route because it would require 8 miles of sidehill construction, whereas the corresponding portion of the proposed project would require none.

The alternative would cross almost a third more streams than the proposed action--85 crossings compared to 61 crossings. The alternative would create air and noise quality impacts similar to those from the RMPP.

Alternative C--Central Nevada Alternative

The Central Nevada Alternative would disturb 9,149 acres of native vegetation, almost 2,000 acres more than would be disturbed by the proposed action; again, these impacts would be of low significance. It would cross potential habitat of 12 federally listed plant species and 4 California listed plant species, compared to the potential habitat of 8 federally listed species which would be crossed by the proposed action.

The alternative would cross the same types of wildlife habitat as the proposed action. Acres of big game winter range would be approximately the same; acres of desert bighorn sheep habitat and golden eagle nest areas would be one-half and one-tenth, respectively, of the acres which would be crossed by the proposed action; desert tortoise habitat not on the Federal list would be almost half of that which would be crossed by the proposed action. The alternative would cross approximately twice as many acres of waterfowl nesting areas, sage grouse habitat, and raptor habitat as the proposed action. The alternative would cross potential habitat of the endangered black-footed ferret north of where it would leave the proposed action and would have a slight potential of crossing the aquatic habitat of the Railroad Valley springfish, **a candidate species for Federal listing.**

The Central Nevada Alternative would disturb 6,217 acres of soils most susceptible to slides and other erosion hazards, compared to 3,056 acres which would be disturbed by the proposed action. As with the proposed action, stabilization would occur on all but a few localized areas within 3 years. The alternative would disturb about the same acreage of Soil Group 1, mountainous soils--1,236 acres, as would the proposed action--1,382 **acres--but** it would disturb 6,823 acres of Soil Group 9 (soils receiving less than 8 to 10 inches of rainfall annually), compared to 2,811 acres of this soil group disturbed by the proposed action.

The alternative would create significant visual resource contrasts on 1,030 acres of VRM Class 2 areas, on 479 acres of Class 3 areas, and on 27 acres of Class 4 areas, as opposed to the proposed action, which would create significant contrasts on 606 acres of Class 2, 573 acres on Class 3, and 15 acres on Class 4 areas.

The alternative would affect one managed recreation site, Strawberry Reservoir Recreation Area, compared to the proposed action, which would conflict with an ORV race and users of four managed recreation sites.

The Central Nevada Alternative would directly conflict **with (pass through)** two BLM Wilderness Study Areas (WSA's). This is the only route analyzed with such conflicts.

It would temporarily disturb slightly more acres of agricultural land than would the proposed action, 1,295 acres compared to 1,065 acres. Like the proposed action, **it would permanently remove** 5 acres of cropland would be permanently removed from production.

The alternative would not follow the utility corridor designated in the BLM California Desert Plan, although it would follow a contingency corridor. It also would not follow the transmission utilities corridor cited in the BLM draft Benton-Owens Valley **Management Framework Plan (MFP), and like the proposed action, it would conflict with the Utilities Corridor Rule in the proposed Forest Land Management Plan for the Uinta National Forest. The proposed action would conflict with the same utility corridor rule and would not follow the transmission corridor through the enlarged Moapa Indian Reservation.**

The construction work force for the Central Nevada Alternative would place a higher demand on housing and campgrounds than the proposed action. This demand would be greater than the supply in Delta, Utah; all communities in White Pine, Nye, Esmeralda, and Mineral Counties, Nevada; and Mono and Inyo Counties, California. To house the work force, workcamps would be needed, increasing the demand on fire protection. Although the work force would theoretically increase the demand on police and medical services too, the relative increase in population would be less than 4 percent; thus, no deleterious strain on the area would be expected.

The alternative would cross more acres of potentially high density cultural resource sites than would the proposed action--a total of 6,050 acres--but fewer acres of high site significance (1,515 acres) than the proposed action.

With the exception of sharp ridge crossings (slopes over 100 percent) which the alternative would avoid, there are no geologic hazards or topographic constraints which favor this alternative over the proposed action. Major geologic hazards encountered by the alternative would include faulting, ground liquefaction, and landsliding. Volcanic activity within the geologically recent past is also more prevalent along this alternative. The route would require 70 percent more sidehill construction than the proposed route.

The alternative would cross 88 streams instead of the 61 which would be crossed by the proposed action.

The air and noise quality impact resulting from operation of the Sage Compressor Station would be similar to that expected from operation of the RMPP.

The alternative would temporarily disturb 1,016 acres of agricultural land versus 1,065 acres disturbed by the proposed action and, like the proposed action, would permanently remove 5 acres of cropland from production.

This alternative would encounter fewer faults than the corresponding segment of the RMPP; therefore the geologic hazards would be substantially fewer. The other hazards would be comparable.

The alternative would cross about the same number of streams as the proposed action. Impacts to air and noise quality would be the same for the alternative as for the proposed action.

Alternative D--Sevier-Escalante Desert Alternative

This alternative would disturb 6,495 acres of native vegetation, slightly more than that disturbed by the proposed action. It would cross potential habitat of 10 plant species which are federally listed or candidates for listing as threatened or endangered; this is similar to the proposed action, which would cross 8 potential habitats.

The Sevier-Escalante Desert Alternative would cross essentially the same acreages of big game winter range, raptor habitat, and nonfederally designated desert tortoise habitat as the proposed action. It would cross fewer than half the acres of desert bighorn sheep areas and more acres of waterfowl nesting areas, sage grouse habitat, and golden eagle nesting areas than the proposed action. The alternative would cross potential habitat of the endangered black-footed ferret north of where it would leave the proposed action and an unquantifiable amount of bald eagle habitat.

Acres of susceptible soils crossed by the alternative would be similar to those crossed by the proposed action, with slightly higher acreages for dry soils receiving less than 8 to 10 inches of rainfall annually, Soil Group 9.

Acres of **significant** visual resource contrasts and managed recreation sites and trails crossed would be essentially the same for the alternative as for the proposed action. Acres of potentially high cultural resource site density crossed by the alternative would be 6,050, higher than the proposed action **(1,505 acres).** Acres of high cultural resource site significance would be the same as those which would be affected by the proposed action. The alternative would conflict with the same land use plans and constraints as the proposed action.

Alternative E--West Salt Lake Alternative

The alternative would disturb 8,071 acres of native vegetation, an increase of 1,741 acres over the acres the proposed action would disturb. Like the proposed action, it would cross potential habitat of eight federally listed or candidate threatened or endangered plant species.

The alternative would cross the same or similar acreages of sage grouse habitat, golden eagle nest areas, and nonfederally designated desert tortoise habitat and desert bighorn sheep habitat. It would cross fewer acres of big game winter range, waterfowl nest areas, and raptor habitat than the proposed action. It would cross potential habitat of the endangered black-footed ferret and bald eagle, as would the proposed action.

The West Salt Lake Alternative would cross 3,649 acres of soils **susceptible to erosion hazards and impacts** compared to 3,056 acres crossed by the proposed action. Of this, 897 acres would be moist salt playa soils which would cause construction difficulties. The alternative would cross over 1,000 fewer acres of Soil Group 1, mountainous soils, than would the proposed action, but almost 2,000 more acres of Soil Group 9--soils receiving less than 8 to 10 inches of precipitation annually.

The alternative would create significant visual resource contrasts on 20 acres of VRM Class 2 areas, on 344 acres of Class 3 areas, and 15 acres on Class areas, less than half that which would be caused by the proposed action.

Conflicts with the Emigration Campground would be moderately significant, as would conflicts with the proposed Frenchman Mountain-Rainbow Gardens National Natural Landmark and proposed Clark County Wetlands Park, which the West Salt Lake Alternative would cross after it rejoined the proposed action. The alternative would also conflict with the same major ORV event as the proposed action. The alternative would avoid the proposed action's conflict with the Utility Corridor Rule of the proposed Forest Land Management Plan for the Uinta National Forest. However, like the proposed action, it would not follow the over 3,000-foot wide corridor administered by BLM through the expanded Moapa Indian Reservation.

The alternative would cross fewer acres with a potential for cultural resource sites of high density and high significance than the proposed action.

The West Salt Lake Alternative would require a greater portion of the local housing supply than required by the portion of the proposed action it would replace; thus, the net effect would be a greater inconvenience to travelers and campers seeking accommodations during construction.

Except for liquefaction potential, the geological hazards along this alternative are less than those of the proposed segment it would replace. However, the length of alternative pipeline subject to liquefaction would be an order of magnitude higher than that of the proposed route.

The alternative would cross 45 streams instead of the 61 which the proposed action would cross. Air quality and noise quality impacts for this alternative would be similar to those from the RMPP.

Alternative F--Provo Canyon Alternative

The Provo Canyon Alternative would disturb a similar amount and type of native vegetation as that disturbed by the proposed action and would cross potential habitat of nine plant species which are federally listed or candidates for threatened or endangered designation, one more than the proposed action.

The alternative would cross more acres of big game winter range, sage grouse habitat, raptor habitat, and significantly more acres of golden eagle nest areas than the proposed action, 776 acres compared to 242 acres. It would cross the same amount of all other habitats, including desert bighorn sheep areas, waterfowl nest areas, state designated desert tortoise habitat, and potential habitats of the endangered black-footed ferret and bald eagle.

The Provo Canyon Alternative would disturb 2,533 acres of soils which are susceptible to erosion hazards and other limitations, compared to 3,056 acres along the proposed action. **The alternative would create significant visual resource contrasts on 897 acres of VRM Class 2 areas, on 381 acres of Class 3 areas, and 15 acres in Class 4 areas, or a total of 97 acres more of contrast than the proposed action, which would range contrasts in 616 acres of Class 2, 578 acres, of Class 3, and 15 acres in Class 4 areas.**

The alternative would temporarily disturb 1,198 acres of agricultural land compared to 1,065 acres which would be disturbed by the proposed action, and each would permanently remove 5 acres of cropland from production.

The alternative would avoid the conflict with the proposed Uinta National Forest Land Management Plan, but like the proposed action, it would not follow the over 3,000-foot wide corridor administered by BLM through the expanded Moapa Indian Reservation. The alternative would cross slightly more acres of potential high cultural resources density and significance than would the proposed action.

Table 2-11 suggests that the geological hazards and topographical impact for this alternative would be somewhat less than those for the proposed route. **However the numbers are misleading because the severity of the known landslide and fault hazard would be greater and the risk to individuals would be higher. Moreover,** the crowding of existing facilities within Provo Canyon places serious doubt upon the technical feasibility of this alternative. Further, the side slopes which the alternative would encounter are significantly more severe (60 to 100 percent versus 30 percent) than those along the corresponding segment of the proposed route.

The alternative would cross 53 streams, compared to 61 which the proposed action would cross. Air quality and noise quality impacts which would be created by the alternative would be similar to those which would be created by the RMPP.

Variation 2--Thistle Creek Variation

The variation would disturb 266 acres of native vegetation, more than the 194 acres of which would be disturbed along the segment of the proposed action which it would replace, and it would not cross any potential habitat of Federal or state listed, or candidate plant species, thus avoiding one species. It would cross more acres of big game winter range, raptor habitat, and golden eagle nest areas than would the segment of the proposed action which it would replace, but it would cross fewer areas of sage grouse habitat.

The variation would cross about 24 acres of Soil Group 1. However, it would traverse a mountain valley consisting of a narrow floodplain and smoother sloping side slopes than the corresponding segment of the proposed action. It would exceed acceptable levels of visual resource contrast on 121 acres of Class 2 **areas and 109** acres of Class 3 **areas,** compared to 24 acres **of constrast if** Class 2 **areas** on the segment of the proposed action. It would temporarily disturb 61 acres of agricultural land compared to none disturbed by the **corresponding** segment of the proposed action.

The variation would cross 326 acres of potentially high cultural resource site density, compared to 242 acres which would be crossed by the portion of the proposed action it would replace.

The Thistle Creek Variation would encounter fewer geological hazards and create less topographic impact than the proposed route. Some question remains about the feasibility of locating the pipeline in the canyon with the existing roads and railroad.

The variation would cross seven streams instead of four which the segment of the proposed action would cross. It would cause impacts to air quality and noise quality similar to those caused by the segment of the proposed action it would replace.

Variation 3--East Las Vegas Variation

The variation would disturb 715 acres of native vegetation, a few more than the corresponding portion of the proposed action, and would avoid the habitat of two species of federally listed plants. **It would cross .5 acre of riparian vegetation compared to 3 acres which would be crossed by the portion of the proposed action in the Las Vegas Wash area.** It would cross 24 acres of desert bighorn sheep habitat and 4 'point' sites, compared to 73 acres and 3 'point' sites crossed by the segment of the proposed action.

The East Las Vegas Variation would cross slightly fewer acres of susceptible soils than the proposed action, but more acres of soils receiving less than 8 to 10 inches of rainfall annually. The variation would exceed acceptable levels of visual contrast on 182 acres of Class 2 **areas** and 60 acres of Class 3 **areas,** compared to the **corresponding** segment of the proposed action, which would exceed acceptable contrast levels on 121 acres of land rated as Class 3.

The variation would cross one recreation site; the corresponding segment of the proposed action would cross three.

The variation would conflict with existing activities and future expansion of the Clark County Sanitation District facilities, which are within the mile-wide corridor.

The East Las Vegas Variation would cross 714 acres of potentially high density cultural resource sites, compared to 678 acres crossed by the proposed segment which it would replace, and 303 acres of potentially high significance sites, compared to none crossed by the proposed action.

The variation would have no significant geological or topographical difference from the proposed route. It would cross two streams instead of the three which would be crossed by the corresponding segment of the proposed action. The variation would cause impacts to air quality and noise quality similar to those which the RMPP would cause.

Variation 4--Fort Mojave Variation

The Fort Mojave Variation would cross the same amount of native vegetation as the corresponding segment of the proposed action. Neither the variation nor the RMPP segment would encounter federally designated plant species. Both the variation and the segment of the proposed action would cross 121 acres of nonfederally designated desert tortoise habitat.

The variation would cross a few more acres of susceptible soils than the segment of the proposed action. Neither the variation nor the segment of the proposed action it would replace would exceed acceptable levels of visual resource contrasts. Neither would affect recreation resources, or agricultural lands or conflict with land **use** plans. Impacts to cultural resources, a quality, and noise quality would be the same from the variation as from the corresponding segment of the proposed action. The variation would have no significant geological or topographical differences from the proposed route, although it would cross a more deeply dissected alluvial fan. It would cross one stream, as would this segment of the proposed action. This variation would not cross the Fort Mojave Indian Reservation.

Variation 5--Mill Creek Variation

The Mill Creek Variation would disturb almost 100 more acres of native vegetation than would the segment of the proposed action which it would replace. It would cross the potential habitat of one federally endangered plant species which the corresponding segment of the proposed action would avoid. It would cross over 100 more acres of big game winter range, but it would avoid 400 acres of sage grouse habitat, 376 acres of raptor habitat, and 12 acres of golden eagle nest areas which the corresponding segment of the proposed action would cross.

The variation would cross almost 100 more acres of susceptible mountain soils, but because the topography is less dissected, being for the most part a rounded ridge top, considerably less erosion potential would be present than on the corresponding segment of the proposed action. The variation would exceed acceptable **levels of** visual resource contrast for 73 acres in a Class 2 area; the corresponding segment of the proposed action would not create any unacceptable contrasts. No conflicts with recreation resources would occur along the variation or **the** segment of the proposed action it would replace.

The variation would cross 254 acres of potentially high density cultural resource sites, compared to 157 acres along the proposed action.

The variation would cross one stream, as would the segment of the proposed action which it would replace. Impacts to air quality and noise quality would be the same as those from the corresponding segment of the proposed action.

The variation would avoid most of the sidehill construction associated with the replaced segment of the proposed action.

Variation 6-II,--Daniels Canyon Variation II

The Daniels Canyon Variation II would be 7 miles long, replacing 6.5 miles of the proposed action. The environment is basically the same as that along the proposed action The type of vegetation would be essentially the same as the proposed action: forest areas, sagebrush, and mountain brush. The variation would remove 85 acres of vegetation compared to 78 acres removed by the proposed action. No federally listed plant or animal species would be in the vicinity of either route. Raptor habitat would occur along the whole length of both routes.

Soil Group 1 would be affected along the entire lengths of both routes, but the terrain would be less desected along the variation. The proposed action would create significant visual resource contrasts on 12 acres of Class 2 lands; the variation would create significant visual resource contrasts on 12 acres of Class 4 lands.

The variaton would not conflict with any land **use** plans, while the proposed action would conflict with the Utility Corridor Rule in the proposed Forest Land Management Plan for the Uinta National Forest. Both routes would cross high site densities of cultural resources for their entire lengths. Both routes would cross two streams; **however, the variation would not impact significant riparian vegetation, as would the corresponding crossings of the proposed action.**

Variation 7--Moapa Variation

This variation would be 31 miles long, replacing 29 miles of the proposed action. The environment is basically the same as that along the proposed action. The same type of native vegetation--saltbush-greasewood and creosote bush--would be crossed by both routes. The variation would cross 37 more miles of desert tortoise habitat than would that segment of the proposed action.

The variation would cross 48 acres of **Soil Groups** 1 through 8 compared to 24 acres crossed by the proposed action, and 376 acres of **Soil Group** 9 compared to 351 acres **disturbed by the proposed action.** Both would conflict with the Mint 400 ORV race and would cross 24 acres of cropland. The variation would not conflict with any land use plans or policies; the proposed action would conflict with BLM policy to follow the 3,000-foot wide BLM corridor through the Moapa Indian Reservation. The variation would cross 373 acres of cultural resources occurring in high site densities **with** high significance. The proposed action would cross 350 acres of the same type of density and **significance** of cultural resources. **The variation would have no significant geological or topographical differences from the proposed route.** The variation would cross **two perennial** streams, compared to one which would be crossed by the proposed action.

VARIATION 8--WEST KAMAS VALLEY VARIATION

The West Kamas Valley Variation would be 15 miles long, replacing 12 miles of the proposed action. It would bypass the agricultural lands in Kamas Valley and swing through the low hills to the west. It would cross 170 acres of native vegetation compared to 12 acres along the proposed action. However, it would only disturb 12 acres of cropland versus 109 acres disturbed by the proposed route. The proposed route would cross 145 acres of sandhill crane habitat in Kamas Valley, while the variation would avoid all crane habitat.

The variation would cross 133 acres of Soil Group 1 which would not be crossed by that segment of the proposed action. The variation would create significant visual resource contrasts on 36 acres of Class 2 lands, while the proposed action would create significant contrasts on 146 acres. The variation would cross 179 acres of cultural resources occurring in high site density with high significances opposed to 148 acres of the same type of density and significance of cultural resources affected by the proposed action. The variation would have no significant geological difference from the proposed route. Topographically, the variation would cross rougher terrain, but no significant construction difficulties would be anticipated. Minor adjustment of the alignment (less than 0.25 mile) would avoid the limited areas of 30-percent side slope along the variation. The variation would cross two streams instead of three streams which would be crossed by the proposed action.

Chapter 3
Affected Environment

This EIS analyzes the environment which would be affected by the entire project, including the complete pipeline and related facilities. In addition to the subjects identified in this chapter, the following topics have been analyzed: aquatic biology, transportation networks, floodplains, ground water, and other land uses. The affected environment analyzed for the alternatives includes the pertinent resources along the proposed action plus the resources along each alternative. For example, the affected environment for Alternative B, Sanpete Valley Alternative, includes the entire project area from Sage, Wyoming (MP 0) to south of Needles, California (MP 610); the only portion which differs is the segment from where the alternative would leave the proposed action (MP 176) to where it would rejoin it (MP 356). However, in most cases, in compliance with the Council of Environmental Quality regulations for eliminating duplication, only the portion of the alternative that is different from the proposed action is described, even though the entire project incorporating the alternative is analyzed for total impacts. For the variations, only the portions that differ from the proposed route are described.

Baseline data were collected on each topic for the pipeline right-of-way and surface facility sites (shown on the maps in the *Graphic Supplement*) to a distance where impacts could no longer be identified. For many resources, a mile-wide corridor was analyzed. This area is defined as the affected area. For some resources such as vegetation and soils, the affected area would be confined to the immediate vicinity of construction. For other resources, such as socioeconomics, the affected area would extend beyond the immediate area of construction. To analyze cultural resources which would be affected, a corridor concept was adopted. Existing literature for known cultural resources was reviewed for a 10-mile wide corridor centered on the proposed pipeline right-of-way, **as well as all alternatives and variations.**

Resources and other environmental categories which would not be greatly affected by implementation of the proposed action or alternatives and variations or issues which were not raised in the public scoping process are not discussed in detail. The criteria for determining significance of impact is described at the beginning of chapter 4.

Figure 3-1 shows which environmental categories are discussed in this chapter and in chapter 4, which categories would sustain no significant impact, which would sustain impacts similar to those that would occur from the proposed action, and which are unknown. A brief discussion of insignificant impacts is presented at the beginning of chapter 4.

Two environmental categories--cultural resources and water resources--are treated somewhat differently from the rest. These resources are different along each of the alternatives, but the impacts would be the same. Consequently, affected environments are described for each of the alternatives, but environmental consequences in chapter 4 are described only in the proposed action section and apply to all routes.

PROPOSED ACTION

Vegetation

The proposed action would traverse 46 miles of forest, 103 miles of sagebrush, 101 miles of mountain brush, 42 miles of pinyon-juniper, 37 miles of saltbush-greasewood, and 193 miles of creosote bush vegetation types. In addition, it would cross 14 acres of riparian vegetation. Estimates of the mileage which would cross riparian vegetation have been based on an average stream crossing width including a 100-foot wide zone of riparian vegetation.

Each vegetation type is described in detail in the *Terrestrial and Aquatic Biology Technical Report* (BLM 1981d). General locations of the vegetation types adopted from **A.W.** Kuchler (1975) appear on map S-24 of the *Graphic Supplement*; mileage is summarized on table 3-1. Lands which would be affected are used largely for agriculture, livestock grazing, wildlife habitat, recreation and watershed, and forest products.

PROPOSED ACTION, ALTERNATIVE, OR VARIATION

RESOURCE	PROPOSED ACTION	ALTERNATIVE A (NORTHERN SYSTEMS)	ALTERNATIVE B (SANPETE VALLEY)	ALTERNATIVE C (CENTRAL NEVADA)	ALTERNATIVE D (SEVIER-ESCALANTE DESERT)	ALTERNATIVE E (WEST SALT LAKE)	ALTERNATIVE F (PROVO CANYON)	VARIATION 2 (THISTLE CREEK)	VARIATION 3 (EAST LAS VEGAS)	VARIATION 4 (FORT MOJAVE)	VARIATION 5 (MILL CREEK)	VARIATION 6 - II (DANIELS CANYON II)	VARIATION 7 (MOAPA)	VARIATION 8 (WEST KAMAS VALLEY)
VEGETATION	■	■	■	■	■	■	■	■	■	■	■	■	■	■
WILDLIFE	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AQUATIC BIOLOGY	○	○	○	○	○	○	○	○	○	○	○	○	○	○
SOILS	■	■	■	■	■	■	■	■	■	■	■	■	■	■
VISUAL RESOURCES	■	■	■	■	■	■	■	■	■	○	■	■	○	■
RECREATION	■	○	▲	○	▲	■	○	○	○	○	○	○	■	○
WILDERNESS	○	○	○	■	○	○	○	○	○	○	○	○	○	○
TRANSPORTATION NETWORKS	○	○	○	○	○	○	○	○	○	○	○	○	○	○
AGRICULTURE	■	■	■	■	■	■	■	■	○	○	○	○	■	■
LIVESTOCK GRAZING	□	□	□	□	□	□	□	□	□	□	□	□	□	□
FOREST RESOURCES	□	□	□	□	□	□	□	□	□	□	□	□	□	□
CONFLICTS WITH LAND USE PLANS	■	●	▲	■	▲	▲	▲	■	●	●	●	○	○	○
SOCIOECONOMICS	■	■	■	■	■	■	■	▲	▲	▲	▲	▲	▲	▲
NATIVE AMERICAN	■	○	▲	○	▲	▲	▲	○	○	○	○	○	○	○
CULTURAL RESOURCES	■	△	△	△	△	△	△	△	△	△	△	△	△	△
GEOLOGY/ TOPOGRAPHY	■	■	■	■	○	■	■	■	○	▲	■	■	▲	○
WATER RESOURCES	■	△	△	△	△	△	△	△	△	△	△	△	△	△
NOISE	■	■	▲	▲	▲	■	▲	▲	▲	▲	▲	▲	▲	▲
AIR QUALITY	■	■	▲	■	▲	■	▲	▲	▲	▲	▲	▲	▲	▲
PIPELINE SAFETY	■	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲

DIFFERENT AFFECTED ENVIRONMENTS, SAME IMPACTS; DISCUSSION FOR ALL ROUTES IN CH. 3, PROPOSED ACTION ONLY IN CH. 4	△
IMPACTS; DISCUSSION IN TEXT	■
NO SIGNIFICANT IMPACTS; NO DISCUSSION	○
SAME AS PROPOSED ACTION; NO DISCUSSION	▲
UNKNOWN	●
IMPACTS; DISCUSSED IN APPENDIX	□

FIGURE 3-1 KEY TO LEVEL OF RESOURCE DISCUSSION IN CHAPTERS 3 AND 4

TABLE 3-1

MILES AND ACRES OF VEGETATION TEMPORARILY DISTURBED BY RMPP AND ALTERNATIVES[a]

[a]Vegetation Type	Proposed Action		Alternative A, Northern Systems				Alternative B, Sanpete Valley		Alternative C, Central Nevada		Alternative D, Sevier-Escalante Desert		Alternative E, West Salt Lake		Alternative F, Provo Canyon		Variation 2, Thistle Creek		Variation 3, East Las Vegas		Variation 4, Fort Mojave		Variation 5, Mill Creek	
			Worst		Best																			
	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres
Forest	46	558	--	--	--	--	27	327	41	497	32	388	16	194	5	61	--	--	--	--	--	--	2	24
Mountain Brush	101	1,224	10	121	10	121	69	836	94	1,139	97	1,176	9	97	45	545	--	--	--	--	--	--	13	157
Sagebrush	103	1,250	41	498	41	498	45	545	130	1,576	50	606	145	1,758	133	1,611	18	218	--	--	--	--	2	24
Pinyon-Juniper	42	510	--	--	--	--	191	2,313	101	1,224	71	861	133	1,612	87	1,055	9	109	--	--	--	--	4	48
Saltbush-Greasewood	37	448	--	--	--	--	--	--	208	2,520	86	1,042	86	1,042	57	691	--	--	--	--	--	--	--	--
Creosote Bush	193	2,341	28	339	26	312	181	2,194	181	2,194	200	2,422	193	2,338	193	2,338	--	--	59	715	10	120	--	--
Annual Grass	--	--	58	--	704	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barren Land	--	--	--	--	--	--	--	--	--	--	--	--	85	1,030	--	--	--	--	--	--	--	--	--	--
Riparian Vegetation[b]	--	17	--	8	--	2	--	19	--	20	--	14	--	10	--	12	--	2	--	.5	--	.2	--	2
Total Miles	522	--	137	77	--	--	513	--	755	--	536	--	666	--	520	--	27	--	59	--	10	--	21	--
Total Acres	--	6,331	--	--	1,662	933	--	6,215	--	9,149	--	6,495	--	8,071	--	6,300	--	266	--	715.5	--	120.2	--	253.2

[a]Acreage based upon 100-foot wide right-of-way described in chapter 2.

[b]Riparian vegetation was computed for a standard 100 square feet at each stream crossing listed in the Water Resources. Acres per route include all vegetative types therefore this acreage is not included in the total acreage figures.

Source: Table derived from Kuchler (1975), FS data, BLM unit resource analysis data, SCS Soils Publication, vegetation maps, and personal contact.

TABLE 3-1a

MILES AND ACRES OF VEGETATION TEMPORARILY DISTURBED BY THE THREE NEW VARIATIONS; ADDENDUM

[a]Vegetation Type	Variation 6-II, Daniels Canyon II		Variation 7, Moapa		Variation 8, West Kamas Valley	
	Miles	Acres	Miles	Acres	Miles	Acres
Forest	3	37	--	--	--	--
Mountain Brush	3	37	--	--	--	--
Sagebrush	1	11	--	--	15	180
Pinyon-Juniper	--	--	--	--	--	--
Saltbush-Greasewood	--	--	--	--	--	--
Creosote Bush	--	--	30	365	--	--
Annual Grass	--	--	--	--	--	--
Barren Land	--	--	--	--	--	--
Riparian Vegetation [b]	--	--	--	--	--	--
Total Miles	7	--	30	--	15	--
Total Acres	--	85	--	365	--	180

[a]Acreage based upon 100-foot wide right-of-way described in chapter 2.

[b]Riparian vegetation was computed at a standard width of 100 feet at each stream crossing listed in the Water Ressources Technical Report. Acres per route include all vegetative types, therefore, this acreage is not included in the total acreage figures.

Source: Table derived from Kuchler (1975), FS data, BLM unit resource analysis data, Soil Conservation Service Soils Publication, vegetation maps, and personal contact.

THREATENED AND ENDANGERED SPECIES

The federally listed plants and animals discussed in the vegetation and wildlife sections were identified by the FWS as a result of a section 7(c) of the Endangered Species Act request for a listing of threatened or endangered species that might occur on or near any of the pipeline routes. The *Threatened and Endangered Species Technical Report* (BLM 1981e), was prepared from these lists. This report and a cover letter constitute the *biological assessment* required by the Endangered Species Act of 1973. Any species found to be in a *may affect* category as a result of the biological assessment will require formal consultation with the FWS before the Notice to Proceed on construction would be issued, because there can be no irreversible or irretrievable commitment of resources after the consultation process begins. After receiving the biological assessment, the FWS issued a biological opinion stating what effect the proposed action would have on the species under consideration and includes, among other items, a presentation of reasonable and prudent mitigation which would avoid jeopardy to the listed species or their critical habitats. **The biological opinion appears in appendix H.**

The federally listed and state recommended threatened and endangered plants listed in appendix H could occur within the 1-mile wide corridor or could occupy habitat similar to that which would be crossed by the proposed action, Alternative A (worst case), Alternatives B, C, D, E, and F, and Variations 5 and **6-II**.

OTHER SIGNIFICANT VEGETATION SPECIES

Other species along the routes are unique to the desert biome and include Joshua trees and cactus species that are not protected under threatened and endangered species legislation, although Federal and state permits authorizing their removal would be required. Populations of these desert plants can be found in numerous locations along the proposed route within the creosote bush and saltbush-greasewood vegetation types from the southern portion of Utah near St. George to Needles, California. These species are desirable for landscaping and collecting and, as a result, Nevada and California require permits for their removal. Refer to map S-24 in the *Graphic Supplement* for the locations and table 3-1 for the acreages of the creosote bush and saltbush-greasewood vegetation types.

Wildlife

Several terrestrial communities composed of a more or less distinct mixture of plants and animals would occur in the vicinity of the proposed pipeline route. These are discussed in detail in the *Terrestrial and Aquatic Biology Technical Report* (BLM **1981d).**

All terrestrial communities are somewhat influenced by vegetation. Many animals, such as small birds, rodents, weasels, snakes, and frogs, tend to have territories or ranges that are small relative to the area covered by the vegetative type; therefore, they do not usually leave the type. Some creatures, such as beavers, squirrels, and some insects, are restricted to certain vegetation because they are food-specific. On the other hand, some species or groups of species are not restricted but occur over large areas with diverse vegetative types. Some animals adapt to varied conditions and can live in numerous habitats, even though individuals tend to remain in small areas. Deer, elk. larger birds, and larger carnivores have relatively large territories and **use** a variety of vegetation types in their activit Large mobile or migratory species are influenced by weather and other factors and tend to move between one or more communities during the year. For instance, deer, elk, and moose move from the higher coniferous forests of their summer range to lower forests, prairies, or agricultural vegetative habitats to winter where the snow cover is not so deep and food is more plentiful. Some avian species, such as ducks, geese, shorebirds, and songbirds, are migratory and remain in communities for only short periods. Table 3-2 lists the preferred vegetative habitats of wildlife species of environmental concern which could be affected by the proposed pipeline project.

TABLE 3-2 (REVISED)

TERRESTRIAL AND AQUATIC SPECIES OF ENVIRONMENTAL CONCERN AND THEIR PREFERRED VEGETATIVE HABITATS [1]

Species	State	Vegetative Habitat [2]									Route
		C	Sa	Mb	Fo	P-J	SG	Cb	AG	BL	
Endangered or Threatened: Federal List											
Black-footed Ferret	UT,WY	x	x				x				Proposed Action, all alternatives
San Joaquin Kit Fox	CA	x	x				x				Northern Systems
Bald Eagle	CA,ID,NV,UT,WY	*	*	*	*	*	*	*	*	*	All
Yuma Clapper Rail	CA	x									Proposed Action
Desert Tortoise	UT						x	x			Proposed Action
Blunt-Nosed Leopard Lizard	CA						x	x	x		Northern Systems
San Joaquin Kit Fox	CA		x	x			x				Northern Systems
Railroad Valley Springfish	**	**	**	**	**	**	**	**	**	**	Central Nevada
Endangered or Threatened: State List											
Mohave Ground Squirrel	CA		x				x	x	x		Northern Systems
Desert Tortoise	CA,NV,UT						x	x			Proposed Action, Central Nevada, Fort Mojave
Big Game											
Mule Deer	All states		x	x	x	x					All, except Fort Mojave
American Elk	ID,NV,UT,WY			x	x						Proposed Action, Northern Systems, Central Nevada, West Salt Lake, Thistle Creek, Mill Creek
Pronghorn	ID,NV,UT,WY		x								Proposed Action, Central Nevada, West Salt Lake
Moose	ID,UT,WY				x						Proposed Action, Northern Systems, West Salt Lake
Desert Bighorn Sheep	CA,NV,UT						x	x	x	x	Proposed Action, Central Nevada, East Las Vegas
Tule Elk	CA		x	x	x	x	x				Central Nevada
Game Birds											
Sage Grouse	WY,ID,NV,UT		x								Proposed Action, all alternatives, all variations except West Salt Lake and Fort Mojave
Gray Partridge	ID,UT	x	x						x		Northern Systems, West Salt Lake
Ring-necked Pheasant	ID,UT	x									Proposed Action, all alternatives
Other Species of Special Environmental Concern[3]											
Golden Eagle	All states	*	*	*	*	*	*	*	*	*	All
White-tailed Prairie Dog	UT,WY		x						x	x	Proposed Action, Northern Systems, West Salt Lake
Gila Monster	CA,NV						x	x		x	Proposed Action, Fort Mojave

[1]This table lists only terrestrial species that may be affected. Aquatic species are not expected to be affected and therefore are not included.

[2]C=Cropland; Sa=Sagebrush; Mb=Mountain brush; Fo=Forest; P-J=Pinyon-Juniper; SG=Sagebrush-Greasewood; Cb=Creosote Bush; AG=Annual Grass; BL=Barren Land.

[3]Includes species covered by the Bald Eagle Act (golden eagle), species of state concern (gila monster), and the white-tailed prairie dog because it is associated with the black-footed ferret.

*Wide ranging raptors, may occur in all habitats.

**Big Spring near Lockes, Nevada.

Big game species that could occur in the vicinity of the various routes include mule deer (*Odocoileus hemionus*), pronghorn antelope (*Antilocapra americana*), American elk (*Cervus elaphus*), moose (*Alces alces shirasi*), and desert bighorn sheep (*Ovis canadensis nelsoni*). The various vegetative habitats where these species could be encountered are noted in table 3-2. Small game species such as cottontail rabbits (*Sylviagus auduboni*) occur in all states and occupy most vegetative habitats which would be traversed.

Nongame mammals that would be expected to occur in areas which would have project components include insectivores, bats, and rodents. Rodents, especially mice, voles, and gophers, are very common in cultivated areas and grasslands. Shrews tend to live in damp areas along rivers. Most bats hunt and probably rest in or near grasslands or open forest areas. Streams, lakes, and ponds also tend to attract feeding bats.

Abundant upland game birds within the project and alternative areas provide a wide diversity for hunters. Some of the important upland game species that could be encountered along some of the pipeline routes include sage grouse (*Centrocercus urophasianus*), blue grouse (*Dendragapus obscurus*), ring-necked pheasant (*Phasianus colchicus*), Gambel's quail (*Lophortyx gambelii*), chukar (*Alectoris chuka*), gray partridge (*Perdix perdix*), and sharp-tailed grouse (*Pedioecetes phasianellus*).

Many species of lizards, snakes, frogs, and salamanders could occur along the RMPP. Some of these species also range over several vegetative types because of their food requirements. Species of herpetofauna that should receive special attention include the desert tortoise (which is federally listed in Utah), **and the** blunt-nosed leopard lizard. Data on these animals will be found in the *Threatened and Endangered Species Technical Report* (BLM 1981e). In addition, the desert tortoise and blunt-nosed leopard lizard are discussed under 'Federal Threatened and Endangered Species' in chapter 4.

MAMMALS AFFECTED BY THE PROPOSED ACTION

Large populations of mule deer are found along most sections of the proposed route in Wyoming and Utah. Table 3-3 shows the locations of mule deer ranges. The estimated 157 miles of critical deer winter range habitat along this route consist primarily of sagebrush, mountain brush, and pinyon-juniper vegetative types. In general, deer move onto their winter ranges in mid-November and remain there until mid-April, depending upon the onset of winter and snow depth.

TABLE 3-3 (REVISED)

DEER WINTER RANGES ALONG THE VARIOUS PIPELINE ROUTES[1]

Route	[2]MP	Total Miles
Proposed Action		
	0-43	43
	49-52	3
	68-92	24
	152-163	11
	165-170	5
	182-184	2
	188-193	5
	210-224	14
	276-280	4
	288-296	8
	367-379	12
	381-407	26
		157
Alternative A, Northern Systems Alternative		
Kemmerer Loop	0-10	10
Kemmerer Lopp	15-20	5
Pegram Loop	33-40	7
Soda Springs Loop	66-71	5
		27
Alternative B, Sanpete Valley Alternative[3]		
Proposed Action	0-43	43
	49-52	3
	68-92	24
	152-163	11
	165-170	5
Sanpete Valley Alternative	75-154	79
Proposed Action	367-379	12
	381-407	26
		203
Alternative C, Central Nevada Alternative[4]		
Proposed Action	0-43	43
	49-52	3
	68-92	24
	152-163	11
	165-170	5
	182-184	2
	188-193	5
Central Nevada Alternative		
	156-158	2
	179-180	1
	205-207	2
	224-230	6
	234-247	13
	428-435	7
	439-446	7
		131
Alternative D, Sevier-Escalante Desert Alternative[3]		
Proposed Action	0-43	43
	49-52	3
	68-92	24
	152-163	11
	165-170	5
	182-184	2

TABLE 3-3 (REVISED) —Continued

Route	[2]MP	Total Miles
	188-193	5
Sevier-Escalante Desert Alternative	5-13	8
	19-27	8
	128-139	11
Proposed Action	367-379	12
	381-407	26
		158
Alternative E, West Salt Lake Alternative[5]		
Kemmerer Loop	0-10	10
Kemmerer Loop	15-20	5
	33-40	7
	64-70	6
	73-86	13
	96-102	6
	284-307	23
Proposed Action	276-280	4
	288-296	8
	367-379	12
	381-407	26
		120
Alternative F, Provo Canyon Alternative		
Proposed Action[3]	0-43	43
	49-52	3
	68-92	24
Provo Canyon Alternative	11-39	28
	87-115	28
Proposed Action	210-224	14
	276-280	4
	288-296	8
	367-379	12
	381-407	26
		190
Variation 2, Thistle Creek Variation		
	0-2	2
	9-27	18
		20
Variation 3, East Las Vegas Variation No crucial winter ranges		
Variation 4, Fort Mojave Variation No crucial winter ranges		
Variation 5, Mill Creek Variation	0-21	21
Variation 6-II, Daniels Canyon Variation II		
	12-24	12
	47-52	5
		17

[1]Wildlife data were obtained from maps furnished by the following state wildlife agencies: California Department of Fish and Game, Idaho Fish and Game Department, Nevada Department of Fish and Game, Utah Division of Wildlife Resources, and Wyoming Game and Fish Department.

[2]Refer to the *Graphic Supplement* to obtain location of various routes and mileposts.

[3]Includes the proposed action above and below where this alternative would leave and rejoin it

[4]Includes the proposed action above where this alternative would depart.

[5]Includes the proposed action below where this alternative would join.

American elk and possibly moose may also be found along portions of the proposed route. In most cases, their winter ranges coincide with those of mule deer; thus, the impact to these animals would be similar. Elk and moose generally tend to winter at slightly higher elevations than mule deer, even though they might winter in the same general area.

Desert bighorn sheep populations could be encountered along the Nevada portions of this route from about the Mormon Mountains south to the Newberry Mountains. In most cases, the pipeline route would not actually intersect the sheep ranges but would go within a few miles of that habitat. (Refer to table 3-4 for the locations of bighorn sheep habitat.) However, the route would cross sheep ranges in the Sunrise Mountain-Frenchman Mountain-Lava Butte area south of Las Vegas. Sheep migration paths would cross the pipeline route in the Muddy Mountains-Dry Lake Range area, McCullough Range-River Mountain area, and the Eldorado Mountains-Highland Range area.

Feral horses and burros would be found scattered in four areas along the proposed route: just west of Kanosh, Utah; south along White Sage Flats to west of Dog Valley in the vicinity of the East Mormon Mountains in Nevada; in the Dry Lake Range northwest of Las Vegas; and along Highway 95 south of Henderson, Nevada, a distance of about 10 miles.

TABLE 3-4 (REVISED).

DESERT BIGHORN SHEEP YEAR-ROUND RANGES NEAR THE VARIOUS PIPELINE ROUTES[1]

Route	MP[2]	Total Miles
Proposed Action		
	435-445	10
	463-464	1
	485-486	1
	494-495	1
	509-515	6
	537-538	1
	548-549	1
	556-570	4
		25
Alternative B, Sanpete Valley		
Sanpete Valley Alternative		None
Proposed Action	435-445	10
	436-464	1
	485-486	1
	494-495	1
	509-515	6
	537-538	1
	548-549	1
	556-570	4
		25
Alternative C, Central Nevada Alternative		
Proposed Action		None

TABLE 3-4 (REVISED) —Continued

Route	MP[2]	Total Miles
Central Nevada Alternative	385-390	5
	395-397	2
		7
Alternative D, Sevier-Escalante Desert Alternative		
Sevier-Escalante Desert Alternative		none
Proposed Action		
	435-445	10
	463-464	1
	485-486	1
	494-495	1
	509-515	6
	537-538	1
	548-549	1
	556-570	14
		35
Alternative E, West Salt Lake Alternative		
West Salt Lake Alternative		none
Proposed Action		
	435-445	10
	463-464	1
	485-486	1
	494-495	1
	509-515	6
	537-538	1
	548-549	1
	556-570	14
		35
Alternative F, Provo Canyon Alternative		
Provo Canyon Alternative		none
Proposed Action		
	435-445	10
	463-464	1
	485-486	1
	494-495	1
	509-515	6
	537-538	1
	548-549	1
	556-570	4
		25
Variation 3, East Las Vegas Variation		
East Las Vegas Variation	14-15	1
	28-30	2
	32-33	1
	53-54	1
		5
The East Las Vegas Variation has four 'point' sites and 2 miles of range close to the route.		
Variation 7, Moapa Variation	30-31	1

[1]Wildlife data were obtained from maps furnished by the following state wildlife agencies: California Department of Fish and Game, Idaho Fish and Game Department, Nevada Department of Fish and Game, Utah Division of Wildlife Resources, and Wyoming Game and Fish Department.

[2]Refer to the *Graphic Supplement* to obtain locations of various routes and mileposts.

Small mammals (rodents, bats, shrews, etc.) would be found throughout the entire length of this route, occurring in large numbers in all vegetation habitats. The only small mammal species of environmental concern along this route would be the **white-tailed prairie dog which would furnish food and burrow habitat for the endangered black-footed ferret. Even though the white-tailed prairie dog is not federally listed, it is discussed in conjunction with the black-footed ferret because these two species are so closely interrelated.**

BIRDS AFFECTED BY THE PROPOSED ACTION

Sagebrush habitat, occupied by sage grouse, would be traversed by the proposed route for an estimated total of 33 miles. (A 100-foot **wide** right-of-way 33 miles long equals 400 acres.) (Refer to table 3-5 for locations of sage grouse habitat.) Most of the sage grouse habitats in Utah are located north of a line running east and west through Beaver, Utah, with the largest populations occurring in the northern half of the state.

Ring-necked pheasant distribution along this route **coincides** with croplands and irrigated areas.

TABLE 3-5 (REVISED)

SAGE GROUSE HABITAT ALONG THE VARIOUS PIPELINE ROUTES[1]

Route	[2]MP	Total Miles
Proposed Action	5-9	4
	22-26	4
	30-41	11
	49-52	3
	134-139	5
	173-176	3
	281-284	3
		33
Alternative A, Northern Systems Alternative		
Kemmerer Loop	0-8	8
Kemmerer Loop	15-19	4
Kemmerer Loop	34-39	5
		17
Alternative B, Sanpete Valley Alternative[3]		
Proposed Action		
	5-9	4
	22-26	4
	30-41	11
	49-52	3
	134-139	5
	173-176	3
Sanpete Valley Alternative	0-18	18
	135-139	4
	144-148	4
Proposed Action	281-284	3
		59

TABLE 3-5 (REVISED) —Continued

Route	[2]MP	Total Miles
Alternative C, Central Nevada Alternative[4]		
Proposed Action	5-9	4
	22-26	4
	30-41	11
	49-52	3
	134-139	5
	173-176	3
Central Nevada Alternative	145-150	5
	165-169	9
	187-196	7
	200-207	7
	240-248	8
		66
Alternative D, Sevier-Escalante Desert Alternative[3]		
Proposed Action	5-9	4
	22-26	4
	30-41	11
	49-52	3
	134-139	5
	173-176	3
Sevier-Escalante Desert Alternative	11-19	8
Proposed Action	281-284	3
		41
Alternative E, West Salt Lake Alternative[3]		
West Salt Lake Alternative	0-8	8
	15-18	3
	120-128	8
	142-161	19
	292-297	5
Proposed Action	281-284	3
		46
Alternative F, Provo Canyon Alternative		
Proposed Action	5-9	4
	22-26	4
	30-41	11
	49-52	3
	281-284	3
		25
Provo Canyon	None Known	
Variation 2, Thistle Creek Variation	21-22	1
Variation 5, Mill Creek No sage grouse areas known		

[1]Wildlife data were obtained from maps furnished by the following state wildlife agencies: California Department of Fish and Game, Idaho Fish and Game Department, Nevada Department of Fish and Game, Utah Division of Wildlife Resources, and Wyoming Game and Fish Department.

[2]Refer to the *Graphic Supplement* to obtain various locations of routes and mileposts.

[3]Includes the proposed action above and below where this alternative would leave and rejoin it.

[4]Includes the proposed action above where this alternative would depart.

The small Gambel's quail would be found near the southern portions of this route in Utah from about the Bull Valley Mountains to the Utah/Nevada state line. **It is** also found along the east side of the Mormon Mountains, near the Desert Queen Well area, north and east of Searchlight, and in an area about 25 miles south of Searchlight. All of these populations are located in intensively managed quail areas which are principally managed using gallinaceous guzzlers (artificial water sources). These quail populations are extremely dependent upon artificial water sources for survival during the late nesting period and through the hot summer months.

Sandhill crane habitat (nesting areas, premigratory staging areas, and feeding areas) would be found in the Kamas Valley along the proposed action (between approximately MP 96 and MP 108).

Various species of waterfowl could be found along some of the wet, marshy, or riverine areas and reservoirs in areas which would be traversed by the pipeline. There would be an estimated 34 miles of waterfowl habitat along this route in Utah. (See table 3-6 for these locations.) This small amount of habitat and the resulting low nesting population of ducks and geese are functions of the dry areas that would be traversed by the pipeline rather than indications of total waterfowl habitat in the entire state of Utah. Nesting of some waterfowl species begins in early April and can continue into early June in the northern parts of the state which would be traversed by the pipeline. Good waterfowl habitat could be found along this route along the Bear River from Sage Creek Junction to about Woodruff (MP 5 to MP 26). The areas around Neponset Reservoir (MP 36 to MP 39) and Strawberry Reservoir (MP 130 to MP 140) also furnish good waterfowl habitat.

TABLE 3-6 (REVISED)

WATERFOWL AREAS ALONG THE VARIOUS PIPELINE ROUTES[1]

Route	[2]MP	Total Miles
Proposed Action	5-26	21
	36-39	3
	130-140	10
		34
Alternative A, Northern Systems Alternative		
Best Case	18-24	6
	73-83	10
	142-167	25
		41
Worst Case	0-16	16
Alternative B, Sanpete Valley Alternative		
Proposed Action[3]	5-26	21
	36-39	3
	130-140	10
Sanpete Valley Alternative	39-44	5
	59-74	15
	88-96	8
	103-110	7
	125-131	6
		75

TABLE 3-6 (REVISED) —Continued

Route	[2]MP	Total Miles
Alternative C, Central Nevada Alternative		
Proposed Action[4]	5-26	21
	36-39	3
	130-140	10
Central Nevada Alternative	485-487	2
	525-542	17
	565-569	4
		57
Alternative D, Sevier-Escalante Desert Alternative*		
Proposed Action[3]	5-26	21
	36-39	3
	130-140	25
Sevier-Escalante Desert Alternative	45-47	2
		51
Alternative E, West Salt Lake Alternative	18-24	6
Alternative F, Provo Canyon Alternative*		
Proposed Action[3]	5-26	21
	36-39	3
Provo Canyon Alternative	None Known	
		24
Variation 5, Mill Creek Variation	3-7	4
	10-13	3
		7

[1]Wildlife data were obtained from maps furnished by the following state wildlife agencies: California Department of Fish and Game, Idaho Fish and Game Department, Nevada Department of Fish and Game, Utah Division of Wildlife Resources, and Wyoming Game and Fish Department.

[2]Refer to the *Graphic Supplement* to obtain various locations of routes and mileposts.

[3]Includes proposed action above and below where this alternative would leave and rejoin the proposed action.

[4]Includes the proposed action above where this alternative departs.

There would be an abundance of raptor habitat and a wide variety of raptorial birds along an estimated 51 miles of the proposed route in both Utah and Nevada. (Refer to table 3-7 for these locations.) The northern portion of the route from Sage, Wyoming, through Strawberry Valley furnishes nesting habitat for Swainson's hawks, great horned owls, prairie falcons, and red-tailed hawks; all of these species have been reported as nesting in this area. The Strawberry Valley is a wintering area for many raptors, and during the summer, the area south of the Uinta National Forest from Strawberry Valley to Sheep Creek furnishes nesting habitat for Cooper's, red-tailed, sharp-shinned, and rough-legged hawks and goshawks. The Little Clear Creek area is a well-known nesting area for ferruginous hawks.

The Mineral Mountain area, Antelope Range, and the Beaver Dam Mountains all furnish good raptor habitat. Habitat for cliff-nesting raptors such as great horned owls, prairie falcons, and golden eagles (listed in table 3-8) would be found in all cliff areas along the route, but especially in the area southeast of Las Vegas near the River Mountains where good nesting cliffs would be located 1 to 2 miles from the proposed route. Nesting periods generally occur between March 1 and July 1.

TABLE 3-7 (REVISED)

RAPTOR HABITAT LOCATED WITHIN 2.5 MILES OF THE VARIOUS PIPELINES[1]

Route	[2]MP	Total Miles
Proposed Action	17-18	1
	27-29	2
	39-40	1
	129-158	29
	165-169	4
	290-294	4
	356-358	2
	404-407	3
	510-515	5
		51
Alternative A, Northern Systems Alternative		
	33-40	7
Best Case	66-88	22
	142-167	25
		54
Worst Case	0-120	120
Alternative B, Sanpete Valley Alternative[3]		
Proposed Action	17-18	1
	27-29	2
	39-40	1
	129-158	29
	165-169	4
Sanpete Valley Alternative	5-11	6
	40-45	5
	94-105	11
	113-118	5
	130-155	25
	183-186	3
Proposed Action	356-358	2
	404-407	3
	510-515	5
		102
Alternative C, Central Nevada Alternative[4]		
Proposed Action	17-18	1
	27-29	2
	39-40	1
	129-158	29
	150-154	4
Central Nevada Alternative	152-154	2
	157-196	39
	202-204	2
	235-238	3
	310-313	3
	329-331	2
	334-341	7
		95
Alternative D, Sevier-Escalante Alternative[3]		
Proposed Action	17-18	1
	27-29	2
	39-40	1
	129-158	29
	165-169	4
Sevier-Escalante Desert Alternative	82-83	1

TABLE 3-7 (REVISED) —Continued

Route	[2]MP	Total Miles
	92-93	1
	127-128	1
	134-135	1
Proposed Action	404-407	3
	510-515	5
		49
Alternative E, West Salt Lake Alternative[5]	63-64	1
West Salt Lake Alternative	63-64	1
	150-161	11
	177-180	3
	63-64	1
Proposed Action	290-294	4
	356-358	2
	404-407	3
	510-515	5
		29
Alternative F, Provo Canyon Alternative		
Proposed Action	17-18	1
	27-29	2
	39-40	1
Provo Canyon Alternative	5-24	19
	105-113	8
Proposed Action	290-294	4
	356-358	2
	404-407	3
	510-515	5
		45
Variation 2, Thistle Creek Variation	8-27	19

[1]Wildlife data were obtained from maps furnished by the following state wildlife agencies: California Department of Fish and Game, Idaho Fish and Game Department, Nevada Department of Fish and Game, Utah Division of Wildlife Resources, and Wyoming Game and Fish Department.

[2]Refer to the *Graphic Supplement* to obtain locations of various routes and mileposts.

[3]Includes the proposed action above and below where this alternative would leave and rejoin it.

[4]Includes the proposed action above where this alternative would depart.

[5]Includes the proposed action below where this alternative would join.

FEDERAL AND STATE LISTED SPECIES

Several federally listed species may occur along the proposed route, including the black-footed ferret (endangered), the bald eagle (endangered), and the desert tortoise (threatened only in Utah). The black-footed ferret could be found along portions of the proposed route in Wyoming and Utah wherever the route would encounter white-tailed prairie dog colonies. Field surveys **would** be required to determine whether the route would cross prairie dog colonies; if it were, surveys for ferrets would have to be initiated. The proposed route would cross about 37 miles of bald eagle **winter** habitat. The desert tortoise is federally listed as threatened only in the Beaver Dam Slope area of southwestern Utah. The present alignment of the

TABLE 3-8 (REVISED)

GOLDEN EAGLE NESTING AREAS ALONG THE VARIOUS PIPELINE ROUTES[1]

Route	[2]MP	Total Miles
Proposed Action		
	28-29	1
	164-165	1
	306-307	1
	312-313	1
	477-488	11
	510-515	5
		20
Alternative B, Sanpete Valley Alternative		
Proposed Action	28-29	1
	164-165	1
Sanpete Valley Alternative	5-11	6
	40-45	5
	94-105	11
	113-118	5
	130-155	25
	183-186	3
Proposed Action	356-358	2
	404-407	3
	510-515	5
		67
Alternative D, Sevier-Escalante Desert Alternative[3]		
Proposed Action	28-29	1
	164-165	1
Sevier-Escalante Desert Alternative	66-67	1
	82-83	1
	92-93	1
	127-128	1
	134-135	1
Proposed Action	477-488	11
	510-515	5
		23
Alternative F, Provo Canyon Alternative[3]		
Proposed Action	28-29	1
Provo Canyon Alternative	3-11	8
	21-39	18
	89-100	11
	105-113	8
Proposed Action	306-307	1
	312-313	1
	477-488	11
	510-515	5
		64
Variation 2, Thistle Creek Variation	8-27	19
Variation 7, Moapa Variation	22-30	8

[1]Wildlife data were obtained from maps furnished by the following state wildlife agencies: California Department of Fish and Game, Idaho Fish and Game Department, Nevada Department of Fish and Game, Utah Division of Wildlife Resources, and Wyoming Game and Fish Department.

[2]Refer to the *Graphic Supplement* to obtain locations of various routes and mileposts.

[3]Includes the proposed action above and below where this alternative would leave and rejoin it.

proposed route would not cross the designated critical habitat **of** this species, although it would pass within several miles.

The desert tortoise is listed as rare by the states of Nevada and Utah and has protected status in California. It is located along the proposed route from about MP 441 to MP 580 in **Nevada.**

The Utah prairie dog, which is also federally listed as an endangered species, may occur near portions of this route in south-central Utah.

Soils

The project area includes a complex combination of soils due to the wide variation of geologic, topographic, climatic, and vegetation features. This complexity creates a wide variety but a repetitive distribution of soils. Physical and chemical soil properties would react in various ways to project construction. Soils are discussed in more detail in the *Soils and Agriculture Technical Report* (BLM **1981c).**

Due to the complex combination and wide variety of soils that would be encountered in the project area, this analysis combines general soil associations into generalized groupings to identify the soils most susceptible to impact. The general soil associations considered most susceptible to impacts, requiring more intensive erosion control, revegetation, and restoration measures, are grouped as follows.

SOIL GROUP 1

Shallow to deep, moderately steep, and steep soils of the mountains (including narrow valleys, floodplains and smoother side slopes, and alluvial fans) receiving an average annual precipitation of 14 to 28 inches. **Small localized areas of high mountain soils have an annual precipitation of 28 to 48 inches.** Soils and topography of this soil group are extremely variable within short distances. They include soils with 15- to 50-percent coarse fragments. Areas of Soil Group 1 are identified on the base maps in the *Graphic Supplement.*

SOIL GROUP 2

Shallow to deep, moderately steep, and steep, stony soils of the mountains and plateaus that are usually dry; average annual precipitation ranges from 8 to 14 inches. Included are soils on smoother side slopes and alluvial fans. Soils and topography of this soil group are extremely variable within short distances.

SOIL GROUP 3

Strongly alkaline and saline, poorly to well-drained soils on floodplains, lake basins, and valley plains.

SOIL GROUP 4

Predominantly sandy and loamy sand soils on undulating to rolling convex slopes **on** broad upland benches.

SOIL GROUP 5

Soils with duripans, hardpans, and shallow soils over bedrock on dissected fans, pediments, and foothills.

SOIL GROUP 6

Soils on moderately steep to steep side slopes and ridges, including strongly sloping areas with 9- to 30-percent slopes (not including mountain areas).

SOIL GROUP 7

Playas (land type).

SOIL GROUP 8

Rockland and barren land (land types).

SOIL GROUP 9

Soils receiving an annual precipitation generally less than 8 to 10 inches. This soil group also includes some areas receiving annual precipitation of 10 to 14 inches related to elevation variations (principally in the west-central Nevada area).

Estimated acreages and mileages of these soil groupings for the proposed action, alternatives, and variations are listed in table 3-9. Approximate occurrences and extent of these generalized soil associations are presented in the *Soils and Agriculture Technical Report* (BLM 1981c).

All soils would be temporarily affected by project construction and operation, but the nine identified soil groups provide a basis for determining areas of potential impacts.

TABLE 3-9 (REVISED)

GROUPING OF GENERAL SOIL ASSOCIATIONS MOST SUSCEPTIBLE TO EFFECTS OF PROJECT ACTIVITIES

Description of General Soil Association Groups	Proposed Action	Alternative A, Northern Systems		Alternative B, Sanpete Valley	Alternative C, Central Nevada	Alternative D, Sevier-Escalante Desert	Alternative E, West Salt Lake	Alternative F, Provo Canyon	Variation 2, Thistle Creek	Variation 3, East Las Vegas	Variation 4, Fort Mojave	Variation 5, Mill Creek	Variation 6-II, Daniels Canyon II	Variation 7, Moapa	Variation 8, West Kamas Valley	Comments-Limitations to Pipeline Construction and Right-of-Way Restoration and Revegetation
		Miles, *Acres														
	Miles, *Acres	Worst Case	Best Case	Miles, *Acres	Miles, *Acres	Miles, *Acres	Miles, *Acres	Miles, *Acres	Miles, *Acres	Miles, *Acres	Miles, *Acres	Miles, *Acres	Miles, *Acres	Miles, *Acres	Miles, *Acres	
Soil Group 1 Shallow to deep, moderately steep and steep soils of the mountains that are usually moist part of the summer (14-28 inches precipitation). Including narrow valleys, flood plains and less sloping areas	114 *1,382	3 *36	3 *36	114 *1,383	102 *1,236	108 *1,309	31 *376	61 *739	[a]19 *230 (17) (*206)			[b]21 *255 (13) (*158)	7 (6.5) *85 (*79)		11 *133 (0) (*0)	Contains specific areas of poor slope stability, high erosion hazards on areas of steep slopes. Some areas of hard bedrock.
Soil Group 2 Shallow to deep, moderately steep to very steep, stony soils of the mountains that are usually dry. (8-14 inches precipitation)	14 *170			21 *255	74 *897	19 *230	23 *279	24 *291			2 *24 (0)			1 *12 (0)		Stony areas, hard bedrock, difficult restoration of vegetation, and difficult construction.
Soil Group 3 Dominantly strong alkaline and saline, poorly to well drained soils of the flood plains, lake basins and valley plains	36 *436			34 *412	162 *1,963	60	*727	73 *885	35 *424					....	3 *36 (2) (*24)	Wind erosion hazard, restoration very difficult requiring special construction technique.
Soil Group 4 Dominantly sandy soils on undulating ridges and terraces.	5 *61	26 *315		5 *61	66 *800	5 *61	4 *48	5 *61			1 *12 (5) (*61)					High wind erosion hazard, restoration and erosion control very difficult.
Soil Group 5 Soils with duripans and soils shallow over bedrock on dissected fans, foothills and sediments.	47 *570	10 *121	7 *85	47 *570	40 *485	47 *570	47 *570	47 *570		17 *206 (15) (*182)						Restoration and erosion control difficult.
Soil Group 6 Soils on slopes of 15-25% (not including mountain areas).	17 *206	49 *594	13 *158	17 *206	38 *461	17 *206	35 *424	16 *194		0 *0 (6) (*73)	9 *109 (6) (*73)					Erosion Control
Soil Group 7 Playas (land type)	5 *61				8 *97	3 *36	74 *897	4 *48								Difficult construction.
Soil Group 8 Dominantly rockland and barren land (land type)	14 *170	2 *24		14 *170	18 *218	14 *170	14 *170	17 *206			2 *24 (0) (*0)					Erosion hazard on barren areas and difficult construction.
Total of Soil Groups 1 through 8	252 *3,056	90 *1,090	23 *279	252 *3,056	508 *6,157	273 *3,309	301 *3,649	209 *2,533	19 *230 (17) (*206)	17 *206 (21) (*255)	14 *169 (11) (*134)	21 *255 (13) (*158)	7 (6.5) *85 (*7.9)	4 *48 (2) (*24)	11 *133 (0) (*0)	
Soil Group 9[a]																

Soils in climatic settings generally with annual precipitation less than 8 to 10 inches.	232 •2,811	41 •497	12 •145	243 •2,945	578 •7,005	280 •3,394	391 4,739	232 •2,811		59 •715 (55) (•667)	10 •121 (0) (•0)			31 •376 (29) (•351)		Restoration of native vegetative areas. Reseeding usually not as successful. Erosion hazard.

NOTES: These are general groups of soils containing more occurrences of specific areas with soil properties more susceptible to effects resulting from project activities. Mileage totals are estimates tabulated from General Soil Association Display Maps on scale of 1:250,000 and from appendix B in *Soils and Agriculture Technical Report*. Acreage totals based on 100-foot wide right-of-way. These soils require more intensive implementation for erosion control and restoration procedures to minimize soil erosion and potential impacts,

NOTE: ( ) indicates miles of soil group replaced by alternative or variation.

[a]Consists of 19 miles of narrow mountain valley bottom with steep mountain slopes that is included in mapping.

[b]Differs from the area replaced in proposed action by traversing 6 miles of a very narrow mountain valley.

[c]Differs from the area replaced in proposed action in that it follows a very narrow canyon.

[d]Soil Group 9 is based on climatic setting and includes Soil Groups 3, 4, 5, 6, 7, and 8 where they occur in this setting.

Visual Resources

Visual resources are the physical characteristics of a landscape coupled with the viewing public's perception of these and **other** characteristics **and** its response to observable change within the landscape. These characteristics are frequently described in design terms according to the form, line, color, and texture of the natural features found in the specific landscape being scrutinized. Change in the landscape is perceived by the viewer when the land or water form or vegetation is modified and/or structures are added to that landscape. These concepts and the analysis process are discussed in detail in the *Visual Resource Technical Report* (BLM 1981g).

METHODOLOGY

The diverse landscapes upon which the proposed action, alternatives, and variations would be overlain are classified into a number of physiographic provinces (Fenneman 1931). These provinces serve as a basis for grouping the various routes into homogeneous segments to assess visually perceived changes to the landscape which would occur as a result of the project. For purposes of analyzing these changes, the BLM Visual Resource Management (VRM) system and the FS Visual Management System (VMS) were used as analytical tools (BLM 1978b, FS 1974). See appendix I for a description of the methodologies.

The result of the analysis is a classification of either a BLM VRM Class or FS Visual Quality Objective (VQO) being assigned to segments by milepost along each route. Three considerations were made in each case: (1) the scenic quality or visual variety of the landscape, (2) the visual sensitivity of the area, based upon volumes of users within the area and how they would accept visually perceivable changes within the particular landscape, and (3) the distance between the viewer and the change which would be created by the project. Each VRM Class or VQO is defined in terms of how much visual contrast can be made to the landscape while maintaining a visually acceptable environment within the area.

National Forests were analyzed using the **VQO**, and public land and lands of all other ownerships were analyzed using the VRM system. The visual resources within the affected environment along the proposed route were examined for the significance which might be created by constructing the pipeline and ancillary facilities (compressor stations, maintenance **bases**, block valves, metering stations, communications sites, borrow sites, and associated access roads). As a result of the analysis, only the existing visual resources for those landscapes where the pipeline or its ancillary facilities would cause significant visual impacts are described in detail in the EIS. (Refer to chapter 4, 'Environmental Consequences,' for an explanation of the criteria used to determine significance of impact.)

VISUAL RESOURCES AFFECTED BY THE PROPOSED ACTION

The proposed action would traverse the distinctive landscapes of the Middle Rocky Mountains, Colorado Plateaus, and Basin and Range physiographic provinces. Landform varies from steep mountainous areas with confined canyons in the northern portions to rolling transitional slopes and broad valley bottoms in the middle portions to a flat desert landscape with occasional contrasting mountains in the southern portion. Vegetation varies from thickly vegetated slopes in the north, through sage-covered valleys with intermingling agricultural lands in the middle, to desert vegetation with Joshua trees and barrel cactus toward the southern end. Cultural modifications of communities, utilities, mining activity, and highways are scattered throughout the area. Visual resources for those segments which would have significant adverse impacts are described more specifically in the table 3-10. Refer to the *Graphic Supplement* for location of mileposts.

Table 3-11 summarizes the number of miles and acres for each segment by VRM Class and/or VQO (based upon a 100-foot wide construction right-of-way) which would be crossed by the proposed action, alternatives, and variations.

TABLE 3-10 (REVISED)

AFFECTED ENVIRONMENT FOR VISUAL RESOURCES: PROPOSED ACTION

MP	VRM Class and/or VQO[2]	Description
Pipeline[1]		
MP 85-MP 110	2	Landform consists of valley bottoms with transitional slopes, covered with sagebrush interrupted by agriculture. Landscape dotted with small communities, Interstate 80, Highways 35 and 133, and Highway Alternative 189. Rockport Lake State Park is near MP 98.
MP 118-MP 123	R,PR	The mountainous slopes are vegetated with aspen, conifer pockets, and oakbrush, showing fall color. Proposed access to the Currant Creek recreation complex is within the area.
MP 130-MP133	R	The gently rolling to transitional landscape is vegetated with sagebrush. U.S. Highway 40, which serves as access to the Strawberry Reservoir Recreation Area, passes through the area.
MP 133-MP 137	PR	The landform surrounding the Strawberry Reservoir area consists of transitional slopes uphill from a gently rolling landscape. Vegetation is sagebrush. Area is known for intensive and expanding recreation opportunities.
MP 137-MP 144	R	The intensive recreation area surrounding Strawberry Reservoir will increase as the reservoir is filled. Landform consists of gently rolling to transitional slopes. Vegetation is sagebrush, with occasional riparian vegetation. Modifications include the west shore recreation road and recreation sites, viewed from the reservoir.
MP 153-MP 158	2,R,PR	The landform consists of mountainous terrain with a steep, narrow river canyon. Vegetation consists of mountain brush and sagebrush. Area is traversed by U.S. Highway 6, a railroad, and proposed access to the proposed Fifth Water Reservoir.
MP 183-MP 190	3	Landform consists of flat valley to transitional slopes. Vegetation includes sagebrush, with juniper on upper slopes. Area is traversed by Highway 132.
MP 190-MP 195	3	Restricted steep canyon walls give rise to mountain slopes on each side. Vegetation is mainly juniper, with mountain brush higher up on slopes. Highway 132 and powerlines penetrate area. Area can be seen from Nephi.
MP 232-MP 235	2	Landform is steep, restricted canyon, with sagebrush cover and juniper on upper slopes. U.S. Highway 91 and Interstate 15 traverse the canyon area known as Scipio Pass.
MP 370-MP 393	3,R,PR	Landform consists of mountainous terrain covered with sagebrush and scattered juniper on upper slope, Highway 18, small communities, and electrical and telephone lines are present. The proposed action would also cross the Dixie National Forest.
MP 495-MP 505	3	Route would cross Frenchman Mountain/Rainbow Gardens potential National Natural Landmark. Landform is gently rolling to rugged, with irregular erosion patterns which display vivid soil color and textural variety that make the area geologically unique. Creosote bush is the predominant vegetation.
Ancillary Facilities		
MP 0	4	Sage Compressor Station and Sage maintenance base. Landform is the flat valley bottom along the Bear River. Vegetation consists of mixed meadow species and sagebrush. Cultural modifications are limited to primitive roads in a rural setting. The area is located near and viewed from Highways 51/89 and 89/30N.
Cedar City, Utah Vicinity	3	Cedar City maintenance base. Landform is flat to gently rolling terrain with agricultural areas or sagebrush cover. Cultural modifications consist of occasional rural agricultural structures and a railroad, and may be viewed from local highways.

[1]Only those segments and facilities which would be significantly affected by the proposed action are described.

[2]Definitions of VRM Classes

Class 1: This class provides primarily for natural ecological changes; management activities are to be restricted and are not to attract attention.

Class 2: Changes in basic elements by management activities should not be evident in the characteristic landscape.

Class 3: Contrasts to the basic elements may be evident and begin to attract attention, but they should remain subordinate to the existing characteristic landscape.

Class 4: Alterations may attract attention but should repeat the form, line, color, and texture of the characteristic landscape.

Definitions of VQO's

Preservation (P)--Allows ecological changes only. Management activities, except for very low visual impact recreation facilities, are prohibited.

Retention (R)--Activities may only repeat form, line, color, and texture which are frequently found in the characteristic landscape.

Partial Retention (PR)--Management activities must remain visually subordinate to the characteristic landscape. Activities may repeat or introduce form, line, color, or texture common to the characteristic landscape, but changes in their qualities or size, amount, intensity, direction, pattern, etc., remain visually subordinate to the characteristic landscape.

Modification (M)--Activities may visually dominate the original characteristic landscape. However, vegetative and landform alterations must borrow from naturally established form, line, color, or texture so completely and at such a scale that its visual characteristics are those of natural occurrences within the surrounding area or character type. Additional elements must remain visually subordinate to the proposed composition.

Maximum Modification (MM)--Management activities altering vegetation and landform may dominate the characteristic landscape. However, when viewed as background, the visual characteristics must be those of natural occurrences within the surrounding area or character type. When viewed as foreground or background, they may not appear to completely borrow from naturally established form, line, color, or texture.

TABLE 3-11 (REVISED)

SUMMARY OF TOTAL AFFECTED ENVIRONMENT FOR VISUAL RESOURCE FOR THE PROPOSED ACTION, ALTERNATIVES, AND VARIATIONS

Route	Number of Miles and Acres in Each VRM Class/VQO[a]																			
	Class 1		Class 2		Class 3		Class 4		P		R		PR		M		[b]MM		Totals	
	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres
PIPELINE																				
Proposed Action	-	-	32	388	244	2,975	270	3,272	-	-	20	242	35	425	9	109	-	-	610	7,393
Alternative A, Northern Systems Best Case	-	-	17	206	24	291	36	436	-	-	-	-	-	-	-	-	-	-	77	933
Alternative A, Northern Systems Worst Case	-	-	17	206	24	291	179	2,169	-	-	20	242	35	425	9	109	-	-	-	-
Alternative B, Sanpete Valley	-	-	39	473	275	3,333	252	3,055	-	-	20	242	35	424	9	109	-	-	630	7,635
Alternative C, Central Nevada	-	-	110	1,333	328	3,975	352	4,266	-	-	21	255	36	436	9	109	6	73	862	10,447
Alternative D, Sevier-Escalante Desert	-	-	57	690	197	2,388	306	3,708	-	-	20	243	35	424	9	109	-	-	624	7,563
Alternative E, West Salt Lake	-	-	35	424	169	2,049	516	6,254	-	-	17	206	11	133	-	-	-	-	748	9,066
Alternative F,Provo Canyon	-	-	125	1,516	202	2,448	271	3,285	-	-	7	85	14	170	-	-	-	-	619	7,503
Variation 2, Thistle Creek	-	-	10	121	17	206	-	-	-	-	-	-	-	-	-	-	-	-	27	327
Variation 3, East Las Vegas	-	-	37	448	22	267	-	-	-	-	-	-	-	-	-	-	-	-	59	715
Variation 4, Fort Mojave	-	-	-	-	10	121	-	-	-	-	-	-	-	-	-	-	-	-	10	121
Variation 5, Mill Creek	-	-	6	73	-	-	-	-	-	-	-	-	2	24	13	158	-	-	21	255
Variation 6-II, Daniels Canyon II	-	-	-	-	-	-	-	-	-	-	-	-	3	36	4	49	-	-	7	85
Variation 7, Moapa	-	-	31	376	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31	376
Variation 8, West Kamas Valley	-	-	15	182	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	182
ANCILLARY FACILITIES																				
Proposed Action	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
Compressor Station (1)	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-
Maintenance Bases (4)	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alternative A, Northern Systems	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
Compressor Station (1)	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-
Alternative B, Sanpete Valley	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
Compressor Station (1)	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 3-11 (REVISED) —Continued

Route	Number of Miles and Acres in Each VRM Class/VQO[a]																			
	Class 1		Class 2		Class 3		Class 4		P		R		PR		M		[b]MM		Totals	
	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres
Maintenance Bases (4)	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alternative C, Central Nevada	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30
Compressor Station (1)	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-
Maintenance Bases (6)	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alternative D, Sevier-Escalante Desert	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
Compressor Station (1)	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-
Maintenance Bases (4)	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alternative E, West Salt Lake	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
Compressor Station (1)	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-
Maintenance Bases (4)	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alternative F, Prove Canyon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
Compressor Station (1)	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-
Maintenance Bases (4)	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-

[a]Acreage figures are based upon a 100-foot wide construction right-of-way. Summaries for the alternatives include those portions of the proposed action which precede and follow the alternatives, whereas summaries for the variations include only those portions which deviate from the proposed action.

[b]Refer to table 3-10 for definitions of abbreviations.

Land Uses: Recreation Resources, Agriculture, and Conflicts with Land Use Plans, Policies, and Controls

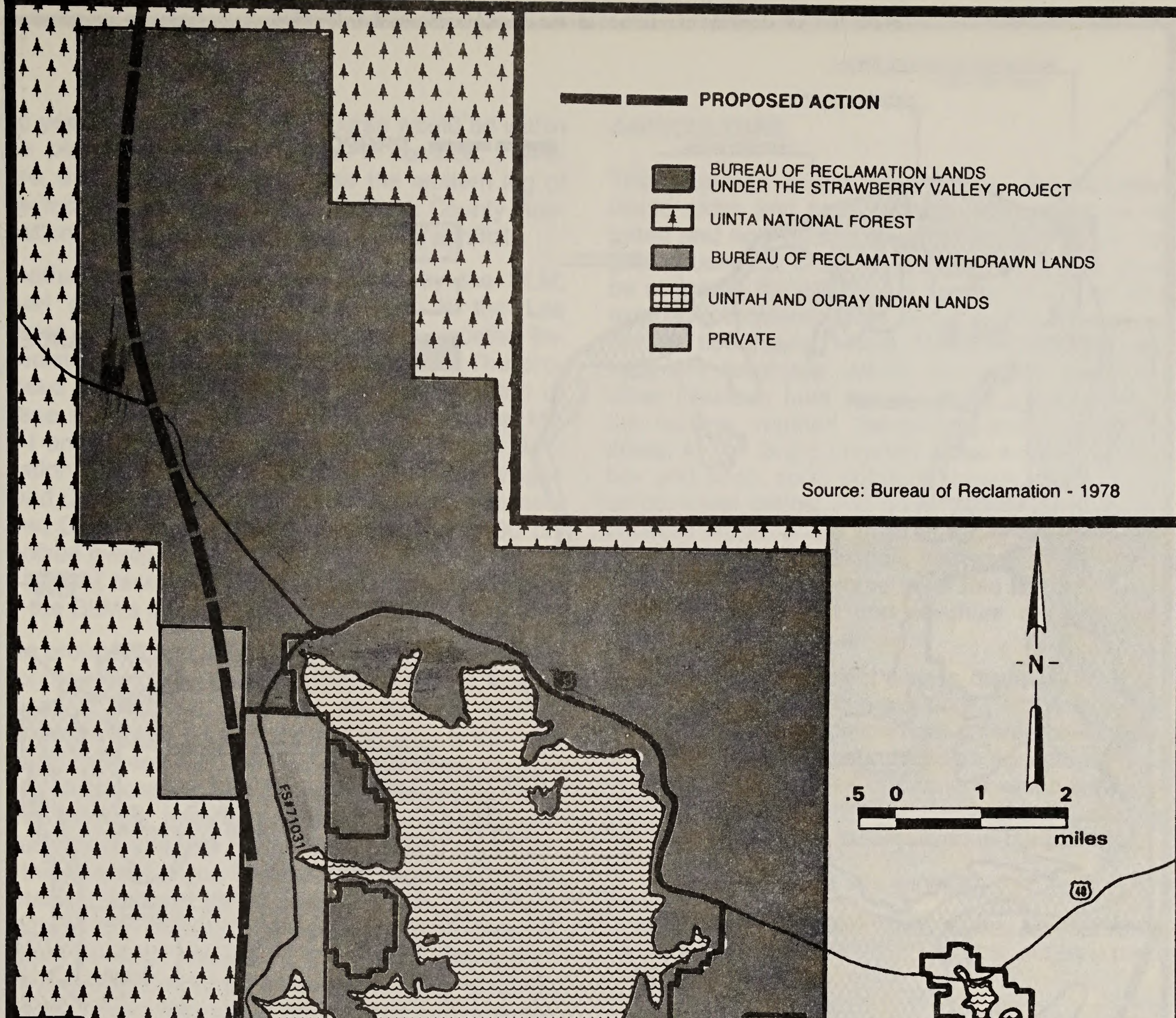
RECREATION RESOURCES

Recreation resources are defined as formally designated areas and informal dispersed areas that are managed by Federal, state, and local agencies in order to preserve and further the areas used for play, amusement, or relaxation. This analysis focuses on formally managed areas where the quality of the recreation experience could be directly affected by the proposed action, alternatives, and variations. Recreation lands which would be altered by any components of the proposed project or which would allow a view of construction activity, thereby affecting the natural scenic qualities of the landscape, are discussed. The amount of noise intrusion and the amount of dust and odors from construction equipment (trucks, trenchers, and bulldozers) within the proximity of a recreation site are also considered in determining the significance of impacts. For further information on the recreation areas under the management of various Federal, state, county, and city agencies which have been inventoried, see *Recreation and Wilderness Technical Report* (BLM 1981).

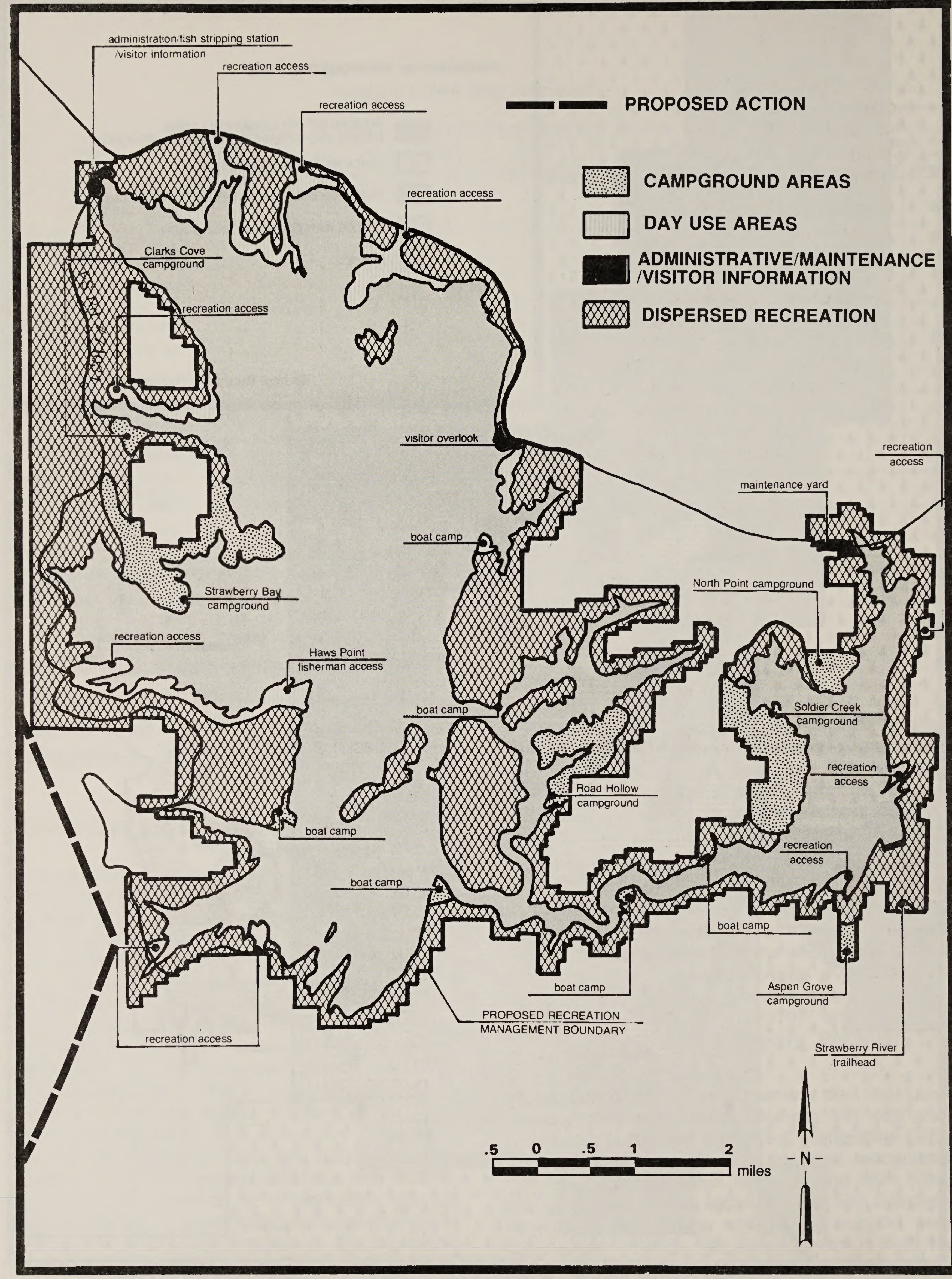
The proposed action would cross the west portion of the Strawberry Reservoir Recreation Area, which is 65 miles southeast of Salt Lake City approximately between MP 131 and MP 145. This recreation area is known for its various recreational opportunities--i.e., camping, fishing, hiking, ORV use, and other day **use** activities. An estimated 40,00 people **use** the reservoir area on a typical summertime weekend (Daniels 1

The proposed action would be located approximately 1 to 1.5 miles west of the west shore Strawberry Reservoir road (Forest Road #71031). See map 3-1, "Administrative Status of Lands (Strawberry Reservoir Enlargement-1978)" and map 3-2, "Recommended Plan (Strawberry Reservoir Enlargement-1978)."

The proposed action would cross the Dry Lake Valley area, approximately between MP **468** and MP 487, where several organized, competitive ORV events take place annually. The most recognized ORV event in Dry Lake Valley is the Mint 400, which annually attracts approximately 500 competitors, 45,000 spectators, and 14,500 support personnel (BLM 1980b). This annual event is held on the last Saturday in April or on the first Saturday in May. Because of its size and scope, the Mint 400 cannot be relocated to another area or rescheduled once the date has been established for the upcom-



MAP 3-1 ADMINISTRATIVE STATUS OF LANDS (STRAWBERRY RESERVOIR ENLARGEMENT-1978)



MAP 3-2 RECOMMENDED PLAN (STRAWBERRY RESERVOIR ENLARGEMENT – 1978)

ing year. The Mint 400 ORV course would be within the proposed 1-mile wide RMPP corridor. Therefore, the pipeline would traverse the eastern leg of the race course. (See map 3-3, 'Clark County Recreation Lands,' for an illustration of this conflict.)

Another recreation area designated by the BLM, used primarily by ORV enthusiasts, is the Las Vegas Sand Dunes Recreation Lands, located immediately north of Nellis Air Force Base. The proposed action would cross the southeast portion of these recreation lands approximately between MP 491 and MP 493. (See map 3-3, 'Clark County Recreation Lands,' for this location.) The Las Vegas Sand Dunes Recreation Lands is the most intensely used ORV area in southern Nevada. Nearly 30 organized events occur there annually under a Federal special recreation use permit program administe by the BLM's Las Vegas District Office.

The proposed action would traverse the Frenchman Mountain-Rainbow Gardens area northeast of Las Vegas, a potential candidate for National Natural Landmark status (HCRS 1980). The area is approximately between MP 496 and MP 502. (See map 3-3 for this location.) The Frenchman Mountain-Rainbow Gardens area is important geologically because more years of history are exposed here than in the Grand Canyon (Szarka and Thomsen 1980). Botanical species found here are also of primary value to the recreation experience. Typical recreational pursuits enjoyed in the Frenchman Mountain-Rainbow Gardens include sightseeing, equestrian use, hiking, four-wheel driving, and nature study. Included within the boundary of the potential National Natural Landmark (northwest quadrant) is the BLM-designated Sunrise Mountain Outstanding Natural Area, which comprises 10,240 acres. Several scenic geologic features are found within that area; however, extensive ORV use recently threatened much of the natural qualities of the northern half of this Outstanding Natural Area.

Immediately south of the potential Frenchman Mountain-Rainbow Gardens National Natural Landmark lies the proposed Clark County Wetlands Park. This proposed park also encompasses a portion of the Rainbow Gardens. The proposed action would cross the proposed wetlands park approximately between MP 500 and MP 505. Typical recreation activities enjoyed in the proposed wetlands park area include sightseeing, nature study, hiking, and hunting. Scenic, geological, and wildlife values all contribute toward a high quality recreation experience which would be affected by pipeline construction and, to a lesser degree, by pipeline operation.

AGRICULTURE

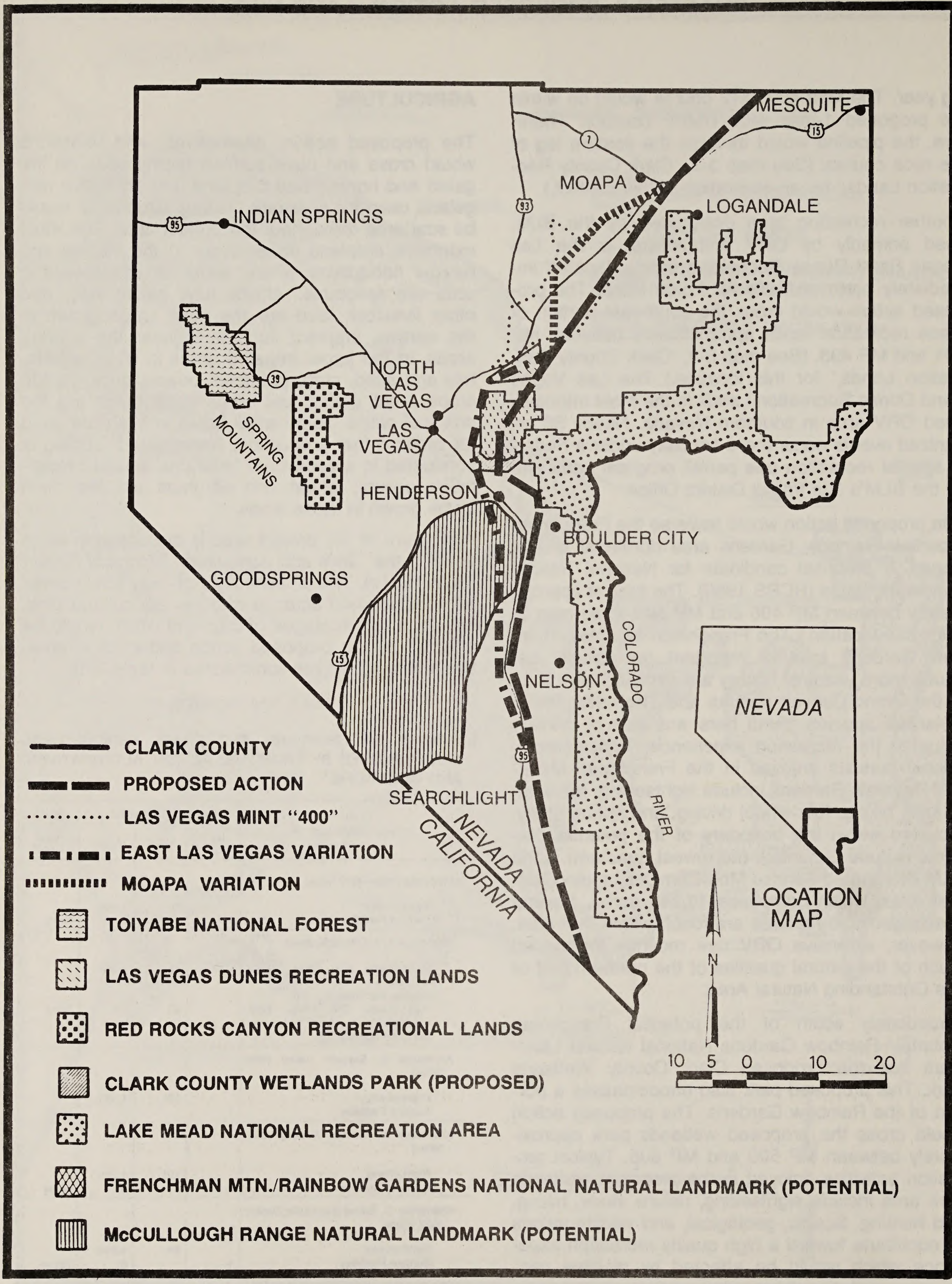
The proposed action, alternatives, and variations would cross and have surface facility sites on irrigated and nonirrigated cropland and on native rangeland used for livestock grazing. Croplands would be scattered throughout the project area. The most extensive cropland areas occur in the valleys and narrow floodplains where water is available and soils are favorable. Alfalfa hay, native hay, and other livestock feed are the main crops grown in the narrow, irrigated floodplains near the grazing areas. In the larger irrigated areas in Utah, alfalfa, hay and seed, corn, potatoes, beans, truck garden crops, small grains, and some sugar beets are the principal crops. Some small areas in Utah are used for orchard fruit production. Nonirrigated farming is conducted in areas where favorable annual precipitation occurs; wheat and sorghum are the main crops grown in these areas.

Agriculture of the project area is discussed in more detail in the *Soils and Agriculture Technical Report* (BLM 1981c). The pipeline right-of- way could cross an undetermined acreage of prime agricultural land. Mileages and acreages of cropland which would be affected by the proposed action and each alternative and variation are summarized in table 3-12.

TABLE 3-12 (REVISED)

SUMMARY OF CROPLAND AND PRIME AGRICULTURAL LAND CROSSED BY PROPOSED ACTION, ALTERNATIVES, AND VARIATIONS

Project Component	Number[1]	Cropland		Prime Agricultural Land[2]
		Miles	Acres	
Proposed Action (610 Miles)				
Right-of-way[3]		88	1,065	
Surface Facilities[4]	1		5	None
Alternative A, Northern Systems				
Right-of-way (255 Miles, Worst Case)		88	1,065	
Surface Facilities				
Right-of-way (77 Miles, Best Case)		43	521	None
Surface Facilities				
Alternative B, Sanpete Valley (630 Miles)				
Right-of-way		131	1,585	
Surface Facilities	1		5	None
Alternative C, Central Nevada (862 Miles)				
Right-of-way		107	1,295	
Surface Facilities	1		5	None
Alternative D, Sevier-Escalante Desert (622 Miles)				
Right-of-way		84	1,016	
Surface Facilities	1		5	None
Alternative E, West Salt Lake (747 Miles)				
Right-of-way		87	1,053	
Surface Facilities				None



MAP 3-3 CLARK COUNTY RECREATION LANDS

TABLE 3-12 (REVISED) —Continued

Project Component	Number[1]	Cropland		Prime Agricultural Land[2]
		Miles	Acres	
Alternative F, Provo Canyon (619 Miles)				
Right-of-way		99	1,198	
Surface Facilities	1		5	None
Variation 2, Thistle Creek (27 Miles)				
Right-of-way[3]		5	61	
Surface Facilities[4]	None			None
Variation 3, East Las Vegas (59 Miles)				
Right-of-way		None	None	
Surface Facilities	None			None
Variation 4, Fort Mojave (10 Miles)				
Right-of-way		None	None	
Surface Facilities	None			None
Variation 5, Mill Creek (21 Miles)				
Right-of-way		None	None	
Surface Facilities	None			None
Variation 6-II, Daniels Canyon II (7 Miles)				
Right-of-way		None	None	
Surface Facilities	None			None
Variation 7, Moapa				
Right-of-way		2	24	
Surface Facilities	None			None
Variation 8, West Kamas Valley				
Right-of-way		1	12	
Surface Facilities	None			None

[1]Number of surface facility sites (compressor stations and maintenance bases) located on cropland.

[2]Prime agricultural land is identified only for surface facilities.

[3]Construction right-of-way is considered to be temporary disturbance.

[4]Surface facility sites are considered permanent disturbance that would cause a land use change for the life of the project. Surface facility sites considered to have significant acreages are compressor stations and maintenance bases. Specific sites of surface facilities are not available, estimates were made only for the Sage Compressor Station and Heber City maintenance base.

The proposed action would traverse 88 miles of cropland and an undetermined acreage of prime agricultural land. Since surface facilities associated with the proposed action could take cropland out of production for the life of the project (20 years), each major surface facility location was evaluated to determine existing land **use** and whether the facility would located on prime agricultural land. The proposed compressor station near Sage, Wyoming, would be located on native grazing land and not on prime agricultural land. Land **use** for the remaining surface facility sites (maintenance bases) associated with the proposed action is not known because specific site locations are not available at this time.

Appendix J contains a description of livestock grazing which occurs in the vicinity of the proposed action and other alternative routes.

An agriculture experiment station is located within the proposed corridor approximately 6 miles south of Nephi, Utah (MP 199).

CONFLICTS WITH LAND USE PLANS, POLICIES, AND CONTROLS

The Uinta National Forest personnel **are** preparing their Land Management Plan pursuant to the Resource Planning Act of 1975. The proposed Forest Land Management Plan for the Uinta National Forest in Utah includes a Utility Corridor Rule based on existing utilities and forest resources including wildlife, soils, and visual values. The proposed action would cross the Uinta National Forest but would not coincide with the areas designated for consideration as utility corridors.

The proposed action would also cross the expansion of the Moapa Indian Reservation in Nevada. Recent legislation transferred over 70,000 acres from BLM administration to the reservation. As part of the legislation, a 3,000-foot wide corridor was designated for utilities. BLM will adminster **grants within this corridor.** The policy of the BLM Nevada rights-of-way State Director is to **use** the corridor wherever possible. The proposed action would parallel but would not be within the 3,000-foot wide corridor.

The proposed action would traverse the area covered by the proposed Clark County Wetlands Park in southern Nevada. The county plans to issue a Draft Management Master Plan in **late** 1981. **Clark County does not endorse the RMPP nor has it determined whether the pipeline would conflict with its plan.**

The proposed action **would** cross the Trades and Services (T and S) zone of the Utah County Land Use Plan on the Thistle and Sheep Creek areas **in Utah**. The T and S zone is applied to 5-acre parcels along roads for the purpose of roadside business. It limits gas pipelines to 16 **inches in** diameter and 600 **pounds per square inch.**

LAS VEGAS AREA LAND USE CONFLICTS

The proposed action would trasect the proposed Clark County Wetlands Park, the City of Henderson, and the 105,000-acre area slated for transfer to the State of Nevada but currently administered by the BLM.

The proposed action would traverse the proposed Clark County Wetlands Park between MP 500 and MP 505. This 300-acre multi-use park administered by the Clark County Department of Parks and Recreation includes both high and

low density use areas, including hiking and equestrian trails, bicycle paths, and a headcut control structure to control erosion. In addition, the Clark County Department of Parks and Recreation master plan allows for the establishment of the Silverbowl Regional Park which would be an organized field sports complex.

This area contains a 90-inch diameter water pipeline constructed in 1970. Since the installation of the pipeline, normal water flow and high volume water flow due to flooding has removed approximately 8 feet of overburden. However, headcutting has apparently slowed due to a change in the soil structure depth.

The proposed action would traverse some subdivisions in the greater Henderson area from approximately MP 507 to MP 514. In addition, the Navajo-McCullough line transects the eatern portion of this rapidly expanding urban area, and four other high voltage transmission lives are proposed. One, the Intermountain Power Project (IPP), would use the existing utility corridor, but the Henderson Planning Commission denied a land use permit to the company in 1981. IPP plans to submit a new land use permit application.

On March 6, 1958, Public Law 85-339 (Eldorado Valley Act) authorized the transfer of 105,000 acres of public land to the State of Nevada under a purchase agreement. Although the area will be administered by BLM until the state has adequate funding, permission for issuance of rights-of-way must be given by the state. The proposed action would transect this transferred area from approximately MP 520 to MP 538, an area reserved for industrial and residential development. Other permanent use activities have been withdrawn.

Socioeconomics

Most of the counties where the proposed compressor stations, pipeline, maintenance bases, and communication facilities would be located are rural, with 1980 population densities ranging from 0.3 to 9.5 people per square mile. Very little housing exists near the facilities except where the pipeline would skirt Las Vegas and in north-central Utah, where housing is plentiful in the nearby Salt Lake City metropolitan area. In parts of southern Utah, housing is also available because of the tourist industry associated with Bryce Canyon and Zion National Parks and the Cedar Breaks National Monument. The southern 27 miles of the pipeline in California would cross sparsely populated open range. Needles, California, and Bullhead City, Arizona, are the only communities with housing and services within 60 miles of this segment.

The regions which would be affected by the compressor station, pipeline, maintenance base, and communication construction crews and their pertinent socioeconomic characteristics are listed in table 3-13. The regions were defined by the locations of construction spreads, with availability of short-term housing and driving distance also taken into account.

Table 3-14 lists the socioeconomic characteristics of the towns which could be affected by the double-jointing yard crews. These towns were selected on the basis of their proximity to the potential sites. The applicant has stated that these locations are tentative and subject to change. (The figures presented in table 3-14 are part of the total socioeconomic profile presented in table 3-13; they do not represent an addition to the existing socioeconomic base.)

The property tax base would be affected in the counties where the facilities would be located. Recent property tax revenues of these counties are listed in table 3-15.

TABLE 3-13 (REVISED)

REGIONAL SOCIOECONOMIC PROFILE: RMPP

Construction	MP[a]	Region: State	Region: Counties	Estimated 1980 Population	1979 Employment: Total Employed	1979 Employment: Total Unemployed	Total Personal Income (Million $)	Retail Sales 1977 ($1,000)	Medical Facilities: Number of Hospitals	Medical Facilities: Total Beds	Medical Facilities: Total Physicians	Housing: Hotel and Motel Rooms	Housing: Private Campsites with Services	Police (State, County, Local)
RMPP														
Sage Compressor Station	0	Wyoming	Lincoln	85,506	28,951	1,316	283.06	187,299	2	150	51	275	163	111
		Utah	Rich, Cache											
Pipeline Spread 1	0-100	Wyoming Utah	Lincoln, Uinta Rich, Cache, Summit, Weber, Morgan, Salt Lake	839,498	334,847	17,207	4,231.22	2,796,799	11	2,249	971	9,332	1,215	937
Pipeline Spread 2	100-180	Utah	Summit, Salt Lake, Wasatch, Utah, Sanpete, Juab	825,550	360,873	15,940	3,981.32	2,644,835	13	2,204	860	2,055	1,417	1,055
Pipeline Spread 3	180-300	Utah	Utah, Juab, Millard, Sevier, Beaver, Iron 255,350	97,505	4,191	949.88	664,429	10	731	169	3,201	936	338	
Pipeline Spread 4	300-400	Utah	Beaver, Iron, Washington	44,350	17,232	762	161.59	154,406	4	168	32	2,391	665	78
Pipeline Spread 5	400-500	Utah Nevada	Washington Lincoln, Clark	487,859	194,357	11,546	2,391.91	1,793,311	8	1,701	515	[b]33,124	3,162	456
Pipeline Spread 6	500-583	Nevada	Clark	462,012	184,640	11,161	2,299.09	1,708,529	7	1,636	500	[b]32,172	3,274	418
[c]Pipeline Spread 7	583-610	Arizona California	Mohave San Bernardino	23,500	11,153	781	138.73	86,508	2	222	26	557	577	100
[d] **Sanpete Valley Alternative**														
Pipeline Spread 1	0-100	Utah	Utah, Sanpete, Sevier, Piute	234,250	88,281	3,989	868.03	576,654	6	583	153	1,697	549	282
Pipeline Spread 2	100-200	Utah	Millard, Sevier, Garfield, Piute, Beaver, Iron, Washington	74,750	29,551	1,321	271.59	227,373	8	274	46	3,386	861	130
[d] **Sevier-Escalante Desert Alternative**														
Pipeline Spread 1	0-100	Utah	Sanpete, Juab, Sevier, Millard, Beaver, Iron	68,150	26,235	1,357	238.4	183,405	9	264	40	2,159	779	111
Pipeline Spread 2	100-180	Utah	Beaver, Iron, Washington	44,350	17,244	762	161.59	154,406	4	168	32	2,383	665	78
[e]**Maintenance Bases**														
Sage	0	Wyoming Utah	Lincoln Rich, Cache	NP	NP	NP	283.06	187,299	NP	NP	NP	NP	NP	NP
Heber City	NP	Utah	Wasatch	NP	NP	NP	16.488	22,452	NP	NP	NP	NP	NP	NP
Nephi	195	Utah	Juab	NP	NP	NP	11.358	14,406	NP	NP	NP	NP	NP	NP
Cedar City	NP	Utah	Iron	NP	NP	NP	48.334	64,214	NP	NP	NP	NP	NP	NP
Las Vegas	NP	Nevada	Clark	NP	NP	NP	2,316.063	1,708,529	NP	NP	NP	NP	NP	NP

Note: NP means not pertinent because local contractors would be used. Consequently these parameters would not be affected.
[a]Mileposts were projected from the applicant's estimate of 100 miles per spread in rolling terrain and 80 miles per spread in mountainous terrain.
[b]Las Vegas has 31,846 rooms.
[c]Population, employment, personal income, and retail sales data for the Needles and Bullhead City area have been estimated from county data.
[d]The Sanpete Valley and Sevier-Escalante Desert Alternative spreads 1 and 2 would replace pipeline spreads 3 and 4, respectively, of the proposed route.
[e]Because the maintenance bases would be constructed by local contractors, no new construction personnel would be added. Therefore, only income effects are analyzed.

Sources:
American Hospital Association 1980.
Anastassatos 1980.
Arizona Highway Patrol 1980.
BLM 1980a.
California Highway Patrol Department 1980.
Clark County (Nevada) Medical Society 1980.
Connelly 1980.
Evanston (Wyoming) Police Departm[illegible] 1980.
Hardy 1980.
Hobbs 1979.
Hughly 1980.
Jimerson 1980.
Kemmerer (Wyoming) Police Department 1980.
King 1977.
Lamb 1980.
Las Vegas (Nevada) Metropolitan Police Department 1980.
Lincoln County (Wyoming) Sheriff's Office 1980.
Mobil Oil Corporation 1980.
Mohave County (Arizona) Sheriff's Office 1980.
Needles (California) Police Department 1980.
Nevada Highway Patrol 1980.
Oyler 1980.
Pogensee 1980.
San Bernardino County (Wyoming) Sheriff's Department 1980.
Sargent 1980.
Shallenberger 1980.
Uinta County (Wyoming) Sheriff's Office 1980.
U.S. Department of Commerce 1972, 1980a, 1980b, 1980c, 1980d, 1980e.
Utah Industrial Developm[illegible] Division 1980a, 1980b.
Utah State Planning Coordinator 1980.
Wessel 1980.

TABLE 3-14

REGIONAL SOCIOECONOMIC PROFILE: DOUBLE-JOINTING YARD LOCATIONS

Double Jointing Yards	[a]MP	Region			[b]1979 Employment			[c]Total 1977 Personal Income (Million $)	Local 1978 Retail Sales ($1,000)	Medical Facilities			Housing		
		State	Counties	Nearest Town	Estimated 1977 City Population	Total Employed in County	Total Unemployed in County			Number of Hospitals	Total Beds	Total Physicians	Hotel and Motel Rooms	Private Campsites With Services	Police (State, County, Local)
1	50	Wyoming	Uinta	Evanston	4,861	5,091	104	27.60	19,769	1	22	4	360	76	16
2	157	Utah	Utah	Provo	55,577	76,409	3,267	229.37	191,867	1	335	76	850	265	122
3	210	Utah	Juab	Nephi	3,015	1,971	121	11.36	14,406	1	31	3	180	157	16
4	255	Utah	Millard	Fillmore	1,882	3,439	114	7.91	4,248	1	22	3	137	43	14
5	346	Utah	Iron	Cedar City	20,960	7,048	332	48.33	64,214	1	59	14	670	142	26
6	459	Nevada	Clark	Las Vegas	161,086	184,639	11,161	103.32	2,299,090	4	1,636	[d]500	31,846	2,249	418
7	517	Nevada	Clark	Boulder City	6,658	184,639	11,161	53.00	16,504	4	1,636	[d]500	115	75	418
8	599	California	San Bernardino	Needles	3,726	[e]3,750	[e]339	25.27	24,972	1	39	12	326	404	24

[a]The applicant has not finalized its double-jointing yard plans; therefore, these locations are subject to change. Potential railheads for the alternative have not been identified.
[b]County data are used because community data are not available.
[c]Derived by multiplying county per capita income by community population.
[d]Includes all of Clark County.
[e]Estimate of employment in eastern San Bernardino County based on county population/employment ratio.

Sources:
American Hospital Association 1980.
Anastassatos 1980.
Arizona Highway Patrol 1980.
BLM 1980a.
California Highway Patrol Department 1980.
Clark County (Nevada) Medical Society 1980.
Connelly 1980.
Evanston (Wyoming) Police Department 1980.
Hardy 1980.
Hughly 1980.
Jimerson 1980.
Kemmerer (Wyoming) Police Department 1980.
Lamb 1980.
Las Vegas (Nevada) Metropolitan Police Department 1980.
Lincoln County (Wyoming) Sheriff's Office 1980.
Mobil Oil Corporation 1980.
Mohave County (Arizona) Sheriff's Office 1980.
Needles (California) Police Department 1980.
Nevada Highway Patrol 1980.
Oyler 1980.
Pogensee 1980.
San Bernardino County (Wyoming) Sheriff's Department 1980.
Sargent 1980.
Shallenberger 1980.
Uinta County (Wyoming) Sheriff's Office 1980.
U.S. Department of Commerce 1972, 1980a, 1980b, 1980c, 1980d, 1980e.
Utah Industrial Development Division 1980a, 1980b.
Utah State Planning Coordinator 1980.
Wessel 1980.

TABLE 3-15 (REVISED)

PROPERTY TAX REVENUES OF COUNTIES WHICH WOULD BE CROSSED BY THE PROPOSED ROUTE, ALTERNATIVES, AND VARIATIONS[a]

County	State	Tax Receipts, 1979 ($)
RMPP		
Lincoln	Wyoming	8,646,000
Rich	Utah	795,000
Summit	Utah	6,531,000
Wasatch	Utah	1,471,000
Utah	Utah	33,790,000
Sanpete	Utah	1,695,000
Juab	Utah	1,328,000
Millard	Utah	2,280,000
Beaver	Utah	965,000
Iron	Utah	4,358,000
Washington	Utah	4,299,000
Lincoln	Nevada	780,000
Clark	Nevada	90,623,000
San Bernardino	California	177,497,000
Northern Systems Alternative[b]		
Lincoln	Wyoming	8,646,000
Rich	Utah	795,000
Bear Lake	Idaho	2,018,000
Caribou	Idaho	2,803,000
Power	Idaho	3,815,000
Umatilla	Oregon	24,338,000
Morrow	Oregon	7,429,000
Jefferson	Oregon	5,393,000
Klamath	Oregon	20,826,000
Colusa	California	7,003,000
Contra Costa	California	253,796,000
Alameda	California	280,225,000
San Joaquin	California	80,000,000
Stanislaus	California	59,000,000
Merced	California	28,713,000
Fresno	California	136,191,000
San Bernardino	California	177,497,000
Sanpete Valley Alternative		
Sanpete	Utah	1,695,000
Sevier	Utah	2,125,000
Piute	Utah	286,000
Garfield	Utah	821,000
Iron	Utah	4,358,000
Sevier-Escalante Desert Alternative		
Juab	Utah	1,328,000
Millard	Utah	2,280,000
Beaver	Utah	965,000
Iron	Utah	4,358,000

TABLE 3-15 (REVISED) —Continued

County	State	Tax Receipts, 1979 ($)
West Salt Lake Alternative		
Lincoln	Wyoming	8,646,000
Bear Lake	Idaho	1,882,000
Franklin	Idaho	1,800,000
Cache	Utah	7,940,000
Box Elder	Utah	6,572,000
Tooele	Utah	4,430,000
Juab	Utah	1,328,000
Millard	Utah	2,280,000
Provo Canyon Alternative		
Wasatch	Utah	1,471,000
Utah	Utah	33,790,000
Juab	Utah	1,323,000
Thistle Creek Variation		
Utah	Utah	33,790,000
Sanpete	Utah	1,695,000
East Las Vegas Variation		
Clark	Nevada	90,625,000
Fort Mojave Variation		
San Bernardino	California	177,497,000
Mill Creek Variation		
Utah	Utah	33,790,000
Daniels Canyon Variation II		
Wasatch	Utah	1,471,000
Moapa Variation		
Clark	Nevada	90,623,000
West Kamas Valley Variation		
Summit	Utah	6,531,000
Wasatch	Utah	1,471,000

Utah State Tax Commission 1979.

[a]Property tax revenues were not calculated for the Central Nevada Alternative.

[b]The tax receipts for the Northern Systems Alternative are 1980 figures.

Sources:
Bear Lake (Idaho) County Clerk 1980.
Beard 1980.
Bratt and Hudson 1981.
Breon and Guerro 1981.
Conrad 1980.
Franklin (Idaho) County Clerk 1981.
Grunhagen 1980.
Irving 1981.
Lister 1980.
Lum 1981.
Porath 1981.
Prowse 1981.
RMPC 1980b.
Schoman 1981.
Schore 1981.
Skaggs 1981.
Sorenson 1981.
Spann 1981.
Stout 1981.
Teste 1981.
Thornburg 1980.
Townsend 1981.
Utah Industrial Development Division 1980b.

Native American Issues

Two Indian reservations would be crossed by the proposed action.

MOAPA INDIAN RESERVATION

The Moapa Indian Reservation is located in the northeastern part of Clark County, Nevada, 75 miles north of Interstate 15 off Nevada Highway 7 (approximately between MP **265** and MP **475**).

The Moapa tribal employment survey conducted by the personnel manager in September 1978 indicates a potential work force of 119, with 62 people employed full or part time on the reservation and 11 people employed full or part time off the reservation. This indicates a current unemployment rate of 38.7 percent. However, personnel **who were** employed under the Comprehensive Employment Training Act are calculated as unemployed; this adjusted unemployment rate becomes 48 percent (Facilitators 1980). A comparison of earning levels of men and women shows that 71 percent of the men and 47 percent of the women earn over $5,000 annually.

The Moapa Indian Reservation is involved in several tribal enterprises, including farming, a leather shop, a grocery store, and a greenhouse for growing tomatoes (Facilitators 1980). One source of income to the tribe is leasing right-of-way corridors across tribal lands. The tribe is receiving $26,000 annually for an existing high power transmission line that is located within an established utility corridor which crosses the reservation (Facilitators 1980).

FORT MOJAVE INDIAN RESERVATION

The 41,884-acre Fort Mojave Indian Reservation is located along both sides of the Colorado River in Arizona, California, and Nevada. The tribal headquarters is located in Needles, California. That portion of the reservation that would be affected by **5.5** miles of the RMPP construction is located in San Bernardino County, California, between MP 590.9 and MP 595.4.

According to the BIA, there are 650 enrolled Indians on the Fort Mojave Reservation: 383 live on or near the reservation; 147 of the 383 make up the available labor force--88 men, 59 women. Eighty-three of these are permanently or temporarily employed--51 men and 32 women. Sixty-four--43 men and 21 women--or 43.5 percent of the available work force are umemployed.

The reservation is involved with nine commercial and agricultural enterprises, and the long range plans calls for a total of 12 to 15 projects. This would afford job potential for 100 to 150 Indians (BIA 1981).

In 1974, the agricultural land produced $14,720, while the commercial lease produced $157,225. The 1978 tribal income was $300,000; personal income was $600,000 (BIA 1981).

Cultural Resources

This chapter discusses only those cultural resources that may be affected by the proposed project, alternatives, or variations. For a detailed account of the prehistoric and historic cultural resources in the study area refer to the *Cultural Resource Technical Report* (Museum of Northern Arizona 1981).

A summary of the known cultural resources near the proposed action, alternatives, and variations, based on recorded information and previous archaeological studies, is presented in the *Cultural Resources Technical Report*. A listing of recorded properties on or nominated to the National Register of Historic Places is presented in appendix L. Recorded resources not on the National Register of Historic Places have not been evaluated for inclusion in the National Register.

Intensive field surveys have not been made. Should a pipeline route be approved, intensive field inventories would be made during the preliminary pipeline staking to locate, evaluate, and recommend mitigation for cultural resources within the potential impact area.

The discussion of cultural resources for the proposed action also applies to Variations 2, 5, and 6. Other alternatives and variations are discussed where they differ from the proposed action.

The proposed route would traverse areas that have supported extensive human occupation extending from pre Paleo-Indian time to the present. Within this considerable time span, regional population patterns have fluctuated according to environmental and/or socioeconomic constraints. These population patterns have been assigned by prehistorians to one of four cultural periods: Paleo-Indian **about (c.a.)** (12,000 **B.P.** to 8,000 B.P.), archaic (ca. 10,000 B.P. to 2,000 B.P.), formative (ca. 2,000 B.P. to 800 B.P.), and postformative. The manifestations of these cultural periods, however, are not uniform throughout the project area. For example, the formative period occurs primarily in Utah and southern Nevada.

History

During historic times, several ethnic and cultural groups settled the area which would be traversed by the proposed route. Spanish and Mexican explorers came from the south and east, mountain men came to trap fur-bearing animals, and followers of the Church of Jesus Christ of Latter Day Saints came to settle and maintain their religious beliefs. Most of the historic sites remaining are the result of the latter settlement and occupation of Utah. All of these groups represent part of the westward American expansion that crossed the proposed route area in several locations.

Prehistory

Most of the prehistoric cultural resources which would be traversed by the proposed action fall into three major categories: residential sites and base camps, field and temporary camps, and special activity areas such as petroglyph and pictograph locations. The three categories probably include cultural resources representative of all four cultural periods, although petroglyphs and residential sites are not well documented during the Paleo- Indian period.

Previous archaeological studies conducted in the Eastern Great Basin are pertinent to the proposed pipeline route (Fowler *et al.* 1978; Lindsay and Sargent 1979). The studies indicated that a large majority of cultural resources are located near water resources. This includes both extinct and modern water sources, as well as areas containing riparian vegetation, which correspond to a high water table.

Generally, areas around water resources contain numerous residential base camps, which include a variety of artifacts for processing resources, and/or seasonal **use** camps where food processing has occurred. Site type definit are derived from *Cultural Resources Existing Data Inventory: Richfield District* and *Cultural Resources Existing Data Inventory: Salt Lake City District.* (Hull and Avery 1980; James and Singer 1980). Streams and floodplains which would be traversed by the proposed action have been identified. All of these areas have a high potential for cultural resources.

The proposed action would traverse approximately 42 miles o pinyon-juniper vegetation. Previous archaeological studies indicate that areas of this vegetation type contain a high to moderate site density of seasonal use camps (Thomas 1973; Bettinger 1978; Jennings *et al.* 1980). Many of these sites are thought to represent seasonal food procurement stations (Hull and Avery 1980). Estimates of site density are based on large block surveys conducted by D.N. Forsyth (1980) and Halbirt and Gualtieri (1981).

The proposed action would traverse approximately 103 miles of sagebrush, 37 miles of saltbush-greasewood, and 193 miles of creosote bush vegetation. Previous studies indicate a low to moderate site density in these areas. Most sites identified are seasonal **use** camps or field camps. Site density increases with elevation and proximity to water.

The proposed action would traverse approximately 101 miles of mountain brush and 46 miles of forest vegetation types. Previous studies indicate low to moderate site density in these areas. Seasonal campsites are the principal sites found. Estimates are based on surveys conducted by Lindsay and Sargent (1979) and Simms (1979).

Known archaeological sites in the area which would be traversed by the first 50 miles of the proposed action include the Woodruff Bison Kill **site** (Shields 1976), a Fremont-affiliated hunting camp. Data extrapolated from similar upland environments indicate that there should be seasonal hunting and gathering campsites and special **use** sites. A high s density can be projected for the valley slopes of the several perennial streams which would be crossed in this area.

After MP 80, the proposed action would traverse the slopes of the Kamas Valley. Seasonal hunting and gathering camps and special **use** sites would the primary site types whose density depend on elevation. South of the Kamas Valley (near MP 125 to MP 150), the terrain becomes more diverse and probably contains a low to moderate site density. Seasonal hunting and gathering camps should be the principal site types.

The Nephi mounds near MP 196 represent an important Fremont site listed on the National Register of Historic Places (Sharrock and Marwitt 1967). In this area, the pipeline would transect a diverse terrain consisting of mountains and valleys. The site density in the higher elevations is projected as low to moderate, with field camp sites predominating.

Beyond MP 175, known cultural resources indicate Paleo-Indian through Shoshonean occupations. Site types vary; however, in the valley bottoms near water resources, habitation sites (sedentary villages) can be expected. Pharo Village (Marwitt 1968) near MP 230 and Wildhorse Canyon obsidian quarry near MP 300 are listed on the National Register of Historic Places.

The proposed action would cross the Mineral Mountains (near MP 300) in an area as known to contain numerous Archaic sites and a Paleo-Indian site, which contains fluted points. This area should be considered highly sensitive.

The pipeline would follow the Santa Clara River drainage and the edge of the Escalante Desert. The projected site density for these areas is moderate to high, with numerous residential sites. Numerous habitation sites occur along the Santa Clara River.

High site densities have been documented for Meadow Valley and Moapa Valley. The known sites reflect sedentary settlement patterns. Site variability is predicted to be high.

The proposed action would pass near Gypsum Cave in the Frenchman Mountains and the Las Vegas Wash Archaeological District, listed on the National Register of Historic Places. Previous research indicates both a long cultural sequence and high site density for the Las Vegas vicinity.

Geology and Topography

The proposed project and its alternatives and variations would extend across Utah, Nevada, and California and small areas of Oregon, Idaho, and Wyoming. Although these states contain some of the most fascinating geology in the United States, only those features which could pose a hazard to the project are analyzed in detail. The project would have no impact on any geological structures or processes, except landsliding and erosion; consequently, there will be no discussion in this EIS of the environmental consequences to geology. Erosion is discussed in detail in 'Soils.' Geologic hazards which will be analyzed include earthquake-related hazards (ground shaking and faulting), volcanic hazards (lava flows and ash falls), landslides, and subsidence. The discussion of landslides and subsidence will include those which are earthquake-induced.

Earthquakes may affect structures, including pipelines and compressor stations, in several ways. The most widespread damage may result directly from ground shaking or from secondary phenomena caused by shaking such as liquefaction, landslides, and subsidence. Localized damage may result from faulting.

The effect of earthquakes on structures may be described by the observed intensity of damage, represented by the Modified Mercalli Intensity (MMI) Scale of 1931, shown in table 3-16. A more objective means of describing an earthquake's potential damage--ground acceleration--is expressed as a percentage or a fraction of gravity (g). For example, an untethered object subjected to a 100-percent g (1.0 g) vertical earthquake acceleration would be thrown up off the ground.

TABLE 3-16

MODIFIED MERCALLI INTENSITY SCALE OF 1931 (ABRIDGED)

I. Not felt except by a very few under especially favorable circumstances.

II. Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.

III. Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motorcars may rock slightly. Vibrations like passing truck. Duration estimated.

IV. During the day, felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, and doors disturbed; walls make a creaking sound. Sensation like heavy truck striking building. Standing motorcars rocked noticeably.

V. Felt by nearly everyone; many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbance of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.

VI. Felt by all; many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.

VII. Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures. Some chimneys broken. Noticed by persons driving motorcars.

VIII. Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motorcars disturbed.

IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.

X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Water splashed (slopped) over banks.

XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.

XII. Damage total. Waves seen on ground surfaces. Lines of sight and level distorted. Objects thrown upward into the air.

Although ground shaking is seldom of consequence to a buried welded-steel pipeline when it is not associated with secondary effects such as landsliding, it can affect compressor stations and other aboveground appurtenant structures. These facilities would be constructed to at least the requirements of the Uniform Building Code (UBC). The proposed project would cross UBC earthquake risk zones 2 and 3, implying that MMI intensities of VII and above could be expected.

Major hydrocarbon transmission pipelines are frequently designed to continue operation or shut down operations in an orderly manner during an earthquake with a mean recurrence interval of 500 years. Figure 3-2 estimates the accelerations in bedrock which, based on historic earthquakes, have only a 10-percent probability of being exceeded in 50 years and represent the estimated earthquake ground shaking hazards to the proposed project, its alternatives, and the variations. That probability level corresponds to a mean recurrence interval of about 500 years for the ground shaking expected at any given point.

During larger earthquakes (MMI of VII and above), faulting may occur. Published maps of the geology of each state allow identification of presently known geologic faults upon which displacement has occurred within the past 2 million years. These faults are considered potentially active and, consequently, a threat to structures placed on or near them. No estimate has been made of the amount of potential displacement on each fault. Although such estimates would have to be made before the actual pipeline crossing was designed, this information is not necessary to compare the relative hazard along the routes. Within Utah, all but the West Salt Lake Alternative would cross the Wasatch Front and faults related to it; therefore, except for the number of miles of pipeline at risk, the precise characteristics of the faulting are not important to this discussion. The routes may be compared simply by counting the number of faults crossed.

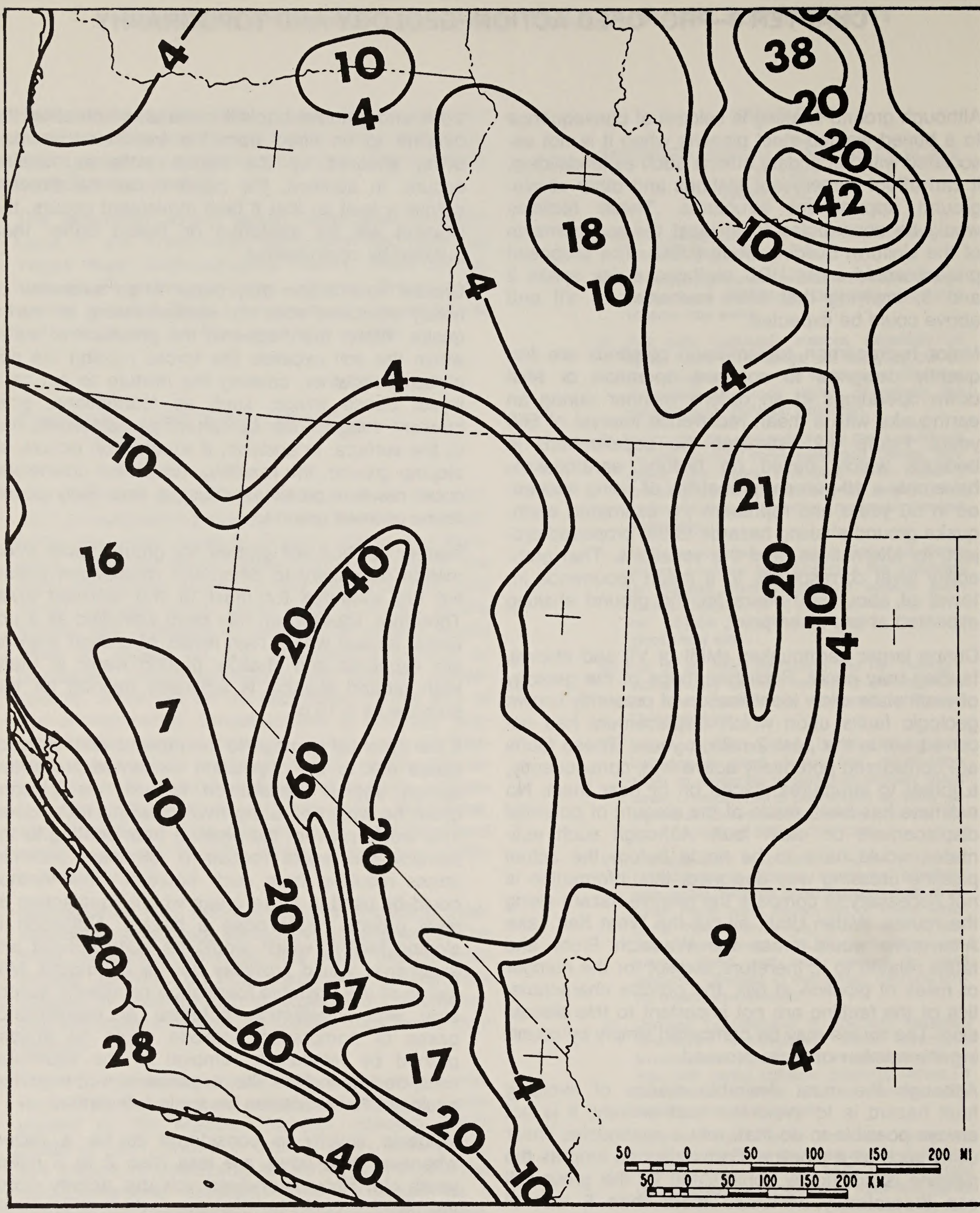
Although the most desirable means of avoiding fault hazard is to avoid the fault entirely, it is not always possible to do that, with a continuous, linear utility such as a pipeline. Fortunately as long as the pipeline is not rigidly constrained by the ground, it can theoretically withstand more than 5 feet of faulting, depending on the specific pipeline design and the nature of the faulting. Special construction techniques to avoid or reduce ground constraints include using both a trench with shallowly dipping sides and granular backfill material, which allow the pipeline to be lifted from the trench rather than being sheared by the trench walls as faulting occurs. In addition, the pipeline can be directed across a fault so that if fault movement occurs, the pipeline will be stretched or flexed rather than buckled by compression.

Ground liquefaction may occur when saturated or nearly saturated soils are shaken during an earthquake. When this happens, the pressure of water within the soil exceeds the forces holding the soil particles together, causing the mixture to act as a liquid: dense things, such as foundations, sink; buoyant things, such as natural gas pipelines, rise to the surface. In addition, if liquefaction occurs on sloping ground, the resulting movement downslope could result in pipeline rupture, a less likely occurrence on level ground.

Neither detailed soil studies nor ground water information necessary to determine liquefaction potential are available for most of the affected area. Therefore, liquefaction has been identified as a potential hazard where high levels of ground shaking are expected and shallow ground water is likely. High ground shaking is arbitrarily defined for this purpose as 0.15 g.

If the potential damage to the pipeline and/or associated risk to the population warranted preventive design against liquefaction hazard, the pipeline could be weighted using river crossing techniques. This would prevent the pipeline from floating to the surface and would reduce or eliminate potential stress resulting from such flotation. This method could be used in those areas where liquefaction on level ground might pose a hazard. Mitigation in sloping terrain, which would be quite difficult and expensive, would probably not be attempted. Mitigation of the unstable foundation conditions associated with liquefaction potential at maintenance bases or compressor stations could be accomplished by relocation, removal of the liquefiable soils, dewatering the site, or placement of important equipment or structures on a pile foundation.

Volcanic activity is considered to be a hazard whenever lava flows are less than 2 to 5 million years old. Should renewed volcanic activity occur, the pipeline could be destroyed where it physically encountered lava or where it was overheated by proximity to lava or related volcanic effects. Although data to determine the potential for such ac-



SOURCE: Algermisson and Perkins 1976.

FIGURE 3-2. HORIZONTAL ACCELERATIONS IN BEDROCK (PERCENT G) WITH 90-PERCENT PROBABILITY OF NOT BEING EXCEEDED IN 50 YEARS tivity are not available, the likelihood for occurrence appears to be slight.

Much of the proposed project and alternatives could be subject to dense ash falls similar to those which occurred following the recent eruptions of Mount St. Helens in Washington. However, such ash falls would not be likely to cause significant operational problems at compressor stations.

Landslide potential has been assessed according to the presence of existing landslides or the regional landslide potential. No attempt was made to identify individual slides or to determine whether construction activities in specific areas could cause landslides. Potential mitigation techniques other than rerouting the pipeline include slope stabilization measures which may not be practical for the pipeline project.

The subsidence to which this project could be subjected includes that related to ground water withdrawal, earthquakes, and surface loading by reservoirs. None of these types of subsidence are likely to be localized enough or occur swiftly enough to significantly affect the proposed project. Therefore, subsidence will not be specifically discussed in the description of each alternative.

Topographic modification resulting from pipeline projects is usually not permanent or significant; consequently, an exhaustive description of the topography in the project area is unnecessary. However, there are areas such as canyons where the topography is so rugged or space so limited that permanent topographic scars may result from construction. The most significant of these areas will be identified.

GEOLOGY

Along the proposed route, the expected maximum earthquake bedrock accelerations would be distributed as follows:

Less than 0.04 g	160 miles
0.04-0.10 g	150 miles
0.10-0.20 g	250 miles
Greater than 0.20 g	50 miles

The final category includes no areas greater than 0.21 g.

The proposed Sage Compressor Station and maintenance base and the Heber City maintenance base could be subjected to 10 to 20 percent g, the Nephi maintenance base to 20 percent g, and the Cedar City and Las Vegas maintenance bases to 4 to 10 percent g.

Several known active faults along the RMPP can be expected to move in the future. These include the Wasatch fault (MP 195), the Elsinore fault (MP 231), and **faults near** MP 293. The crossings of these faults would occur approximately in the center of a zone where faulting may be expected. In addition to these specific crossings, the proposed pipeline would parallel these and related faults in several areas where faulting could occur. In all, about 11 miles of the proposed pipeline could be affected by fault rupture.

A potential for active faulting exists near Nephi and Cedar City. The maintenance bases proposed near these towns would have to be located or designed to avoid or accommodate such faulting.

The applicant has identified a high likelihood of liquefaction along 90 miles of the proposed route where 15 percent g in conjunction with high ground water is expected:

MP 147 - MP 177

MP 185 - MP 195

MP 212 - MP 213

MP 214 - MP 233

MP 235 - MP 265

The sites for the Nephi and Cedar City maintenance bases have yet to be chosen. However, the potential for liquefaction is so widespread in these areas that judicious siting of the bases alone would probably not avoid the problem. The Heber City maintenance base might also face liquefaction problems.

The proposed pipeline would pass through two areas where volcanic activity, including lava flows, has occurred during the past 2 million years. These areas occur in Millard County, Utah, between MP 250 and MP 265, where flows more recent than 10,000 years ago have been dated, and in Washington County, Utah, between MP 370 and MP 405.

In addition to this problem, the southern 270 miles of the route could be subject to dense volcanic ash falls.

Approximately 50 miles of the proposed route are subject to landslide hazard, primarily between MP 145 and MP 195. Landslides already occur along valley walls in this interval; the potential for earthquake ground motion contributes to the potential for future landsliding. **The FS is especially concerned with MP 156 to MP 169. See the FS discussion, appendix M.**

TOPOGRAPHY

The proposed project would lie within two physiographic provinces of western North America--the Middle Rocky Mountains and the Basin and Range. The boundary between the two occurs at the Wasatch Front in Utah near MP 195. The Middle Rocky Mountains province consists of mountain ranges, plateaus, and intermontane basins. The proposed route would cross the westernmost range of this province as well as the highest range of mountains in the project area--the Wasatch Range. North-south trending mountain ranges with intervening basins of similar orientation mark the Basin and Range province.

Difficult terrain would be encountered in the Wasatch Range in the intervals between MP 75-MP 100, MP 150-MP 170, and MP 175-MP 195. Rough topography would also be encountered in the Mineral Mountains, MP 290 to MP 294, and the mountains north of St. George, Utah, MP 365 to MP 406.

Water Resources

According to the National Topographic Maps 1:250,000-scale series, the proposed action would cross 32 intermittent streams and 29 perennial streams. Table 3-17 summarizes the potential stream crossings by flow class. A complete list of the crossings by county, state, and milepost are included in appendix A of the *Water Resources Technical Report* (BLM 1981h).

The proposed pipeline system would cross a floodplain at each stream crossing. The floodplains would vary in width from a few feet on either side of the stream to several thousand feet. All of the aboveground, permanent structures for the proposed action have been generally located, and none would be constructed within these floodplains.

TABLE 3-17 (Revised)

SUMMARY OF STREAM CROSSING DATA[1]

		Total Stream Crossings	Intermittent	Perennial	FWS Stream Classification System[2]				
					I	II	III	IV	UC
Proposed Action		61	32	29	3	9	5	2	42
Alternative A, Northern Systems Alternative	(Best Case)	10	3	7	0	0	4	0	6
	(Worst Case)	36	18	18	0	0	5	1	30
Alternative B, Sanpete Valley Alternative		85	41	44	3	8	11	4	59
Alternative C, Central Nevada Alternative		88	44	44	2	11	5	4	66
Alternative D, Sevier-Escalante Desert Alternative		64	29	35	3	9	5	4	43
Alternative E, West Salt Lake Alternative		45	20	25	1	1	4	5	34
Alternative F, Provo Canyon Alternative		53	28	25	3	2	5	1	42
Variation 2, Thistle Creek Variation		7	2	5	0	0	2	1	4
Variation 3, East Las Vegas Variation		2	2	0	0	0	0	0	2
Variation 4, Fort Mojave Variation		1	1	0	0	0	0	0	1
Variation 5, Mill Creek Variation		1	1	0	0	1	0	0	0
Variation 6-II, Daniels Canyon Variation II		2	2	0	0	0	0	0	2
Variation 7, Moapa Variation		0	0	2	0	0	0	0	0
Variation 8, West Kamas Valley Variation		2	1	1	0	1	1	0	0

[1]The FWS does not have a stream classification system for California. Further research has shown that the California Department of Fish & Game also lacks a stream classification system. Therefore, streams in California were not classified for fisheries (Delisle 1980).

[2]FWS Classes: I=Highest value; II=High priority; III=Substantial; IV=Limited; UC=Unsurveyed or no fishery resource.

Noise Quality

The proposed pipeline would pass through generally rural areas of low population density, although some residential, commercial, and industrial development does occur along the proposed route. The ambient noise levels in rural areas along the proposed right-of-way typically range from 35 to 50 dB(A).

RMPC has not surveyed noise levels near the Sage Compressor Station. Existing sources of noise in the vicinity include Highway 89, about 5 miles south of the proposed site. A Union Pacific Railroad is located about 4 miles to the east. There is also a county road within 0.25 mile of the proposed compressor station. The nearest noise receptor is a ranch house about 3,950 feet to the southeast.

Sound levels are represented as an L_{eq}, sound energy averaged over a 24-hour period, or an L_{dn}, the L_{dq}, with a 10- dB(A) weighting applied to nighttime sound levels (10 p.m. to 7 a.m.). The L_{eq} is an equivalent A-weighted sound level, while the L_{dn} is a day-night sound level. The estimated ambient sound levels for the proposed Sage Compressor Station site are an L_{eq} of 43 dB(A) and an L_{dn} of 49.4 dB(A). The estimated ambient sound levels at the nearby house are an L_{eq} of 45 dB(A) and an L_{dn} of 51.4 dB(A). The higher L_{eq} value at the house is the result of noise generated by ranching activities.

For the remainder of the proposed route, the following estimates of typical background noise levels based on population density may be used (National Research Council 1977).

Location	Persons Per Square Mile	L_{dn}(dB)
Rural--Undeveloped	20	35
Rural--Partially Developed	60	40
Quiet Suburban	200	45
Normal Suburban	600	50
Urban	2,000	55
Noisy Urban	6,000	60
Very Noisy Urban	20,000	65

The alternatives and variations to which this discussion also applies are identified in figure 3-1.

Air Quality

The RMPP would be located in the following air quality control regions (AQCR's):

California	**Southeast Desert Air Basin/ San Bernardino County Air Pollution Control District (APCD)**
Nevada	Clark-Mojave-Yuma Interstate Air Quality Control Region (AQCR 13)
	Nevada Interstate Air Quality Control Region (AQCR 147)
Utah	Four Corners Intrastate (EPA 014)
	Utah Intrastate (219)
	Wasatch Front (220)
Wyoming	Wyoming Intrastate (AQCR 243)

The national primary and secondary standards for air pollutants are presented in table 3-18. The primary standards are levels necessary to protect public health; secondary standards, generally more stringent than primary standards, are designed to protect public welfare from any known or anticipated adverse effect of **criteria pollutants.** The ambient air quality standards for Wyoming, Utah, Nevada, and California are also included in table 3-18.

The ambient air quality along the proposed right-of-way is quite good, largely typical of the sparsely populated nonindustrial areas of the Southwest. However, a few counties along the proposed right-of-way presently violate the NAAQS for total suspended particulates (TSP), CO, **ozone, and nitrogen oxides. Table 3-19 lists the attainment status of each county to be crossed by the proposed pipeline.**

Presently, Utah County, Utah, violates the primary standards for TSP and ozone, while a portion of Iron County, Utah, violates the primary standard for sulfur dioxide (SO_2). The Las Vegas Valley, within Clark County, Nevada, violates the primary standard for CO, TSP, and ozone. San Bernardino County, California, is in nonattainment status for TSP, CO, NO_x, ozone, **and nitrogen oxides.** The attainment status for the remainder of the counties either cannot be classified, is better than national standards, or does not differentiate between the two.

The applicant proposes to install **three 10,600 nominal horsepower gas turbine units** at the Sage Compressor Station in Lincoln County, Wyoming. **The actual site-rated horsepower of each unit would be 7,227. Although three units would be present, only two would be operated simultaneously. Therefore, the installed operating site horsepower would be 14,454. In the future, RMPC may construct three additional 10,600-hp. compressor stations (booster stations) in Summit, Millard, and Iron Counties, Utah. The applicant may also install an additional 21,200 nominal horsepower** of compression at the Sage Compressor Station. Table 3-20 lists the approximate maximum ambient air background levels of pollutants at these sites.

TABLE 3-18 (Revised)

NATIONAL AND STATE AIR QUALITY STANDARDS (Concentrations in micrograms (ug) per cubic meter unless otherwise noted)

Pollutant	Time Period	[a]National Primary Standards	[a]National Secondary Standards	[a]Wyoming	Utah	[b]Nevada	California
Total Suspended Particulates							
	Annual Geometric Mean	75	60	60	75	75	60
	24-Hour Maximum	260	150	150	260	150	100
Sulfur Dioxide							
	Annual Arithmetic Mean	80	-	60	80	80	No annual standard
	24-Hour Maximum	365	-	260	365	365	131
	3-Hour Maximum		1,300	1,300	-	1,300	
	1-Hour	-	-	-	-	-	-
Carbon Monoxide							
	12-Hour	-	-	-	-	-	11mg/cubic meter
	8-Hour Maximum	10 mg/cubic meter	10 mg/cubic meter	10 mg/cubic meter	10 mg/cubic meter	10 mg/cubic meter	7 mg/cubic meter[f]
	1-Hour Maximum	40 mg/cubic meter	40 mg/cubic meter	40 mg/cubic meter	40 mg/cubic meter	40 mg/cubic meter	46 mg/cubic meter
Nitrogen Dioxide							
	1-Hour	-	-	-	-	-	470
	Annual Arithmetic Mean	100	100	[c]100	100	100	No annual standard
Ozone							
	1-Hour Maximum	235	235	235	235	235	200
Hydrocarbons (Nonmethane, $R\text{-}CH_3$)							
	3-Hour (6 to 9 a.m.)	160	160	160	160	160	-
Hydrogen Sulfide							
	0.5 Hour Average	-	-	[d]70	-	-	-
	0.5 Hour Average	-	-	[e]406	-	-	42
	1-Hour						

[a]All national standards, except those based on annual averages or annual geometric mean, are not to be exceeded more than once a year.

[b]Source: Nevada Division of Environmental Protection 1978. The lead standard of 1.5 ug per cubic meter is not included in this table.

[c]Emissions from gas turbines of less than 10,000 horsepower would be required to meet source performance standards based on dry contents of 150 parts per million of NO_x.

[d]Standard not to be exceeded more than two times per year.

[e]Standard not to be exceeded more than two times in any 5 consecutive days.

[f]Applicable only in Lake Tahoe Air Basin

TABLE 3-19

AMBIENT AIR QUALITY ATTAINMENT STATUS ALONG THE PROPOSED RIGHT-OF-WAY

County	State	Total Suspended Particulates	Sulfur Dioxide	Ozone	Carbon Monoxide	Nitrogen Dioxide
Lincoln	Wyoming	[a]B	B	[b]C/B	[b]C/B	C/B
Rich	Utah	B	B	C/B	C/B	C/B
Summit	Utah	B	B	C/B	C/B	C/B
Wasatch	Utah	B	B	C/B	C/B	C/B
Utah	Utah	[c]P	B	P	C/B	C/B
Sanpete	Utah	B	B	C/B	C/B	C/B
Juab	Utah	B	B	C/B	C/B	C/B
Millard	Utah	B	B	C/B	C/B	C/B
Beaver	Utah	B	B	C/B	C/B	C/B
Iron	Utah	B	P	C/B	C/B	C/B
Washington	Utah	B	B	C/B	C/B	C/B
Lincoln	Nevada	C/B	C/B	C/B	C/B	C/B
Clark	Nevada	P	C/B	P	P	C/B
San Bernardino	California	P	B	[d]P	[d]P	[d]P

[a]B--Better than national standards.
[b]C/B--Cannot be classified or better than national standards.
[c]P--Does not meet primary standards under NAAQS.
[d]Only a portion of each county does not meet the primary standards under the national ambient air quality standards.
SOURCE: EPA 1978.

TABLE 3-20

PREDICTED AMBIENT AIR QUALITY BACKGROUND LEVELS AT RMPP COMPRESSOR STATIONS (Values are ug/cubic meter)

Pollutant	Averaging Time	Sage Compressor Station, Lincoln County, Wyoming	Booster Station, Summit County, Utah	Booster Station, Millard County, Utah	Booster Station, Iron County, Utah
Total	Annual				
Suspended	24-hour	12	12	12	12
Particulates	1-hour	30	30	30	30
Sulfur					
Dioxide	24-hour	8	8	8	8
	3-hour	18	18	18	18
	1-hour	20	20	20	20
Carbon					
Monoxide	8-hour	[a]809	809	809	809
	1-hour	1,156	1,156	1,156	1,156
Nitrogen Dioxide	Annual	20	20	20	20

[a]809 ug per cubic meter = 0.809 mg per cubic meter.
SOURCE: EPA 1977.

Class I areas have been defined by the EPA as:

a) International parks.

b) National wilderness areas which exceed 5,000 acres.

c) National memorial parks which exceed 5,000 acres.

d) National parks which exceed 6,000 acres and which were in existence on August 7, 1977.

These areas are given more protection under the Clean Air Act--i.e., the incremental emission allowances are more restrictive for new sources.

The Class I area closest to the Sage Compressor Station would be the combined Yellowstone and Grand Teton National Parks, located about 140 miles northwest of the proposed site. Arches National Park, a Class I area, would be 150 miles southeast of the booster station in Summit County, Utah. Canyonland National Park and Capitol Reef National Park would be located 133 and 66 miles, respectively, to the southeast of the booster station in Millard County, Utah. The third booster station would be located 58 miles west of Bryce Canyon National Park and 35 miles northwest of Zion National Park in Iron County, Utah. Zion National Park would be the Class I area closest to the RMPP in Utah; the San Bernardino National Forest (San Bernardino County, California), 140 miles southwest of Needles, would be the Class I area closest to the RMPP in California.

The alternatives and variations to which this discussion also applies are identified in figure 3-1.

ALTERNATIVE A--NORTHERN SYSTEMS ALTERNATIVE

Vegetation

The worst case of the Northern Systems Alternative would traverse or locate permanent installations upon 10 miles of mountain brush vegetation, 41 miles of sagebrush, 28 miles of creosote brush, and 58 miles of Mediterranean annual grass. The best case for the alternative would traverse 10 miles of mountain brush, 41 miles of sagebrush, and 26 miles of creosote bush. Joshua trees and cactus species are scattered throughout the creosote bush vegetation type. Each vegetation type is described in detail in the *Terrestial and Aquatic Biology Technical Report* (BLM 1981d). General locations of vegetation types adopted from Kuchler (1975) can be found on map S-24 of the *Graphic Supplement*; miles are summarized on table 3-1.

The lands are used largely for livestock grazing, wildlife habitat, recreation, and watershed.

Wildlife

Best- and worst-case possibilities for this alternative are the same for all species except where noted. Habitats are identical for the first 167 miles, the west end to the Pocatello Loop.

BEST CASE

Mammals

Critical deer winter ranges would be traversed by the Northern Systems Alternative for about 10 miles in Wyoming from the Kemmerer Compressor Station along Twin Creek to Boulder Ridge (MP 0 to MP 10). Another deer winter area would then be crossed in Utah from about Rabbit Creek, north along the alternative for about 5 miles to Lake Ridge (MP 15 to MP 20). Construction along approximately 7 miles of the Pegram Loop (MP 33 to MP 40) would cross critical deer winter range and a 5-mile long portion of the Soda Springs Loop extending from the compressor station to about Diamond Gulch (MP 66 to MP 71), which would parallel and lie within 1 mile of deer winter range.

Moose occasionally winter in the Twin Creek area in Wyoming (MP 0 to MP 10) and on North Eden Creek in Utah (MP 23). The alternative would not traverse any known moose ranges in Idaho.

The only known American elk winter ranges that would be encountered by this alternative are located in Wyoming on a 10-mile long strip along Twin Creek west of Kemmerer (MP 0 to MP 10).

Birds

Sage grouse would not be abundant anywhere along this alternative. Although proper sagebrush habitat exists, only small populations are found in Wyoming for about 8 miles west of the Kemmerer Compressor Station (MP 0 to MP 8). A wintering area would be traversed in Utah near the vicinity of Rabbit Creek (MP 15 to MP 19), and a strutting ground might be encountered near South Lake (MP 19). In Idaho, small populations of this bird would be found in the vicinity of the Pegram Compressor Station (MP 33 to MP 36).

The gray partridge is found in some of the drier agricultural areas west of Pocatello, Idaho, but populations would be small and scattered in the vicinity of this alternative.

Sharp-tailed grouse are also found in much the same habitat as the gray partridge, but in even smaller numbers along this alternative west of Pocatello. Ring-necked pheasants could be found on about 43 miles of croplands (521 acres) along this alternative.

The Northern Systems Alternative would encounter waterfowl habitat in the vicinity of South Lake in Utah, along the Bear River in both Utah and Idaho, and through the Soda Point Reservoir area. Other wet habitats could be encountered in scattered areas from the Pocatello Compressor Station west to the vicinity of Cold Water. This waterfowl habitat totals an estimated 41 miles (497 acres) for the best case. Refer to table 3-6 for the locations of these areas.

Both nesting and hunting habitat for raptors is found along Twin Creek in Wyoming where both prairie falcons and ferruginous hawks, as well as marsh hawks, have been reported to be nesting. The alternative in Utah would go through Swainson's red-tailed and marsh hawk habitat. In the vicinity of the Pegram Loop, habitat for ferruginous, marsh, red-tailed and Swainson's hawks would be traversed, while these same species would be found along the alternative from the Soda Springs Compressor Station to Soda Point. The same species might be encountered in a 25-mile long portion of the alternative west of the Pocatello Compressor Station.

While golden eagles are seen occasionally in areas near this alternative, no nests are known to occur within 1 mile of the route.

Reptiles and Amphibians

Reptile and amphibian habitat would be traversed by this alternative in Wyoming, Utah, and Idaho, but populations are scattered and are not expected to be affected by a linear project such as this.

WORST CASE

Mammals

Species and habitats that could be affected by the worst case of this alternative would be the **same** as those affected by the best case of the alternative, because these species do not occur in the portion of California that would be traversed by this alternative.

Birds

Waterfowl habitat would be encountered by this route in the vicinity of South Lake in Utah, along the Bear River in both Utah and Idaho, **and** through the Soda Point Reservoir area. Other wet habitats could be encountered in scattered areas from the Pocatello **Compressor Station,** west to the vicinity of Cold Water.

The Sacramento-San Joaquin Delta that would be traversed by the alternative in California, supports an estimated 10 percent of the wintering waterfowl in the Central Valley. Portions of this area which would be crossed by the route are located between MP 0 and MP 16 in portions of Contra Costa and Alameda Counties.

With the exception of waterfowl and the golden eagle, bird species found along this alternative would be the same as these for the best case, since most of them are not found along the California portion of this alternative. While the golden eagle is occasionally seen on or near this area, no nests are known to occur within 1 mile of this alternative in California.

Reptiles and Amphibians

Reptile and amphibian species and habitats in Wyoming, Utah, and Idaho would remain the same as those for the best-case alternative. However, under the worst-case scenario, the route would cross Kellogg Creek (MP 5) in Contra Costa County, California, an area utilized by both the California tiger salamander and the red-legged frog. These two species are of special concern to the California Department of Fish and Game. As studied, the alternative would also pass near the Coral Hollow Ecological Reserve in San Joaquin County in California (MP 22), which furnishes additional habitat for the red-legged frog.

Federal Listed Species

The black-footed ferret could occur along portions of this alternative in Wyoming and Utah wherever prairie dog colonies are found in historical ferret range. Field surveys would be required to determine the presence or absence of prairie dog colonies along this alternative and presence or absence of black-footed ferrets in any prairie dog colony crossed by the alternative.

The San Joaquin kit fox is found along this alternative from about MP 70 to the end of the pipeline near Panoche Junction. Field surveys would be required to determine the locations of dens and other important habitats.

The blunt-nosed leopard lizard could be encountered by this alternative in Fresno and Merced Counties in California from about MP 60 to the end of the route near Panoche Junction. Field surveys would be required to determine the presence or absence of these lizards along the pipeline right-of-way.

The desert tortoise is not federally listed as either threatened or endangered in California.

Soils

The following soil groups would be most strongly affected by the best case version of the Northern Systems Alternative: 3 miles of Soil Group 1, 7 miles of Soil Group 5, 13 miles of Soil Group 6, 2 miles of Soil Group 8, and 12 miles of Soil Group 9.

The worst-case Northern Systems Alternative would most strongly affect the following soil groups: 3 miles of Soil Group 1, 26 miles of Soil Group 4, 10 miles of Soil Group 5, 49 miles of Soil Group 6, 2 miles of Soil Group 8, and 41 miles of Soil Group 9.

Refer to the discussion of the proposed action and table 3-9 for additional soil information.

Visual Resources

The Northern Systems Alternative would traverse the landscapes of the Middle Rocky Mountains and Basin and Range physiographic provinces. The worst case would also cross the Pacific Border physiographic province. For the best case, landforms vary from the flat to transitional slopes of western Wyoming and southeastern Idaho to the flat to gently rolling areas of the San Joaquin Valley of central California; for the worst case, they would also include the hot flat desert landscape of southern California. Vegetation along the best-case alternative includes diverse areas of sagebrush, mountain brush, pockets of aspen and conifer, and agriculturalized areas in Wyoming and Idaho. In addition, the worst-case area includes the vineyards, orchards, croplands, and natural grasses in central California and the typical hot desert sparse creosote bush and occasional Joshua trees and cactus of the Mojave Desert. Cultural modifications in the area include ranching and agricultural activities, urbanized areas and small communities, highways, recreation areas, and historical features.

The visual resources along the pipeline right-of-way of the alternative route would not be significantly adversely affected.

The analysis of the ancillary facilities includes only the Stanfield Compressor Station as specifically described in table 3-21. (See table 3-11 for a summary of the total number of miles and acres for each VRM Class which would be crossed by the alternative.)

TABLE 3-21 (Revised)

AFFECTED ENVIRONMENT FOR VISUAL RESOURCES: NORTHERN SYSTEMS ALTERNATIVE

MP[1]	VRM Class[2]	Description
Pipeline[3]		
Ancillary Facilities		
Stanfield, Oregon Vicinity	4	Stanfield Compressor Station. Landform consists of a flat to gently rolling landscape. Vegetation consists of cropland species, with occasional interspersed fence line, vegetation, and woodlots. Cultural modifications include occasional rural residences along rural roads with occasional rural structures, two underground pipelines, irrigation canals, primitive roads, and overhead utility lines.

[1]Only those segments and facilities which would be significantly affected by the Northern Systems Alternative are described.
[2]Refer to table 3-10 for definitions of terms.
[3]The pipeline would not significantly affect the visual resources.

Land Uses: Agriculture

The best-case Northern Systems Alternative would traverse 43 miles of cropland. Table 3-12 indicates the total acreages and mileages of cropland which would be affected by the Northern Systems Alternative. The larger part of the cropland would be irrigated, mainly surface irrigation with some areas of sprinkler irrigation. The main crops grown are corn, alfalfa, hay, irrigated pasture, and small grains.

The worst-case alternative would traverse 88 miles of cropland; the larger portion of this cropland would be irrigated.

The main crops grown in the California area include corn, cotton, small grain, vegetables, fruit and nut trees, and grapes. Two areas of orchards and vineyards which would be close to the Brentwood-Panoche Junction segment are located near MP 31 and MP 93.

Socioeconomics

All of the counties that would be affected by construction of this alternative in Wyoming, Utah, Idaho, and Oregon are rural, with population densities ranging from 2.1 to 54.5 per square mile. The economy of the area that would be crossed by the pipeline loops in Idaho is **oriented** toward agriculture, especially beef and dairy farming. The recreation industry is also prominent because of the Caribou National Forest, which comprises a large percentage of southeastern Idaho. Pocatello, the only major municipality near the loops in Idaho, has a large tourist service industry.

The 120-mile long pipeline in California would parallel Interstate 5 through the San Joaquin Valley, a region famous for its highly productive and diversified agriculture. Numerous communities along or near Interstate 5 have traveler services. Four of the counties which would be crossed by this pipeline are urban, with population densities ranging from 175.8 to 1,497.4 people per square mile. However, within 1 mile of the route, population density is low. The 28-mile long pipeline segment along Interstate 15 between Victorville and Barstow, California, is located in the Mojave Desert. Interstate 15 is a major artery between Los Angeles and Las Vegas, and these two towns have a large hotel/motel and traveler services industry. Table 3-22 lists the pertinent socioeconomic characteristics of the regions which would be affected by the pipeline construction; table 3-23 identifies the socioeconomic characteristics of the regions which would be affected by construction of the compressor **stations. Local police and medical services are not quantified. However, the expected impacts are discussed in chapter 4.**

All of the compressor sites are located in remote agricultural areas. Nevertheless, only one, the Delevan Compressor Station, is located more than 60 miles from a large town. Sacramento, California, is about 70 road miles from this compressor station.

To construct this alternative, the applicant would probably **use** double jointing yards to weld sections of pipe before delivering them to the right-of-way. Hypothetical locations of these yards are listed in table 2-1. These locations are presented merely for illustration and may in fact not be feasible because of engineering or logistical considerations; therefore, the socioeconomic characteristics of the sites are not considered in this analysis. New maintenance bases would not be needed because existing ones could be used.

TABLE 3-22

SOCIOECONOMIC PROFILE: NORTHERN SYSTEMS ALTERNATIVE

Construction	MP	Region		Estimated Population, 1980	Average Employment, 1979	Average Unemployment, 1979	Personal Income, 1977 ($1,000)	Retail Sales, 1977 ($1,000)	Hotel and Motel Rooms	Campsites with Hookups
		State	Counties							
Pipeline Spread 1 (Northwest Pipeline Loop)	0-15.0 15-21.7 33.5-40.5 66-88.8 142-166.9	Wyoming Utah Idaho	Lincoln Rich Bear Lake, Caribou Bannock, Power	101,952	42,734	2,193	495,910	332,016	1,310	291
Pipeline Spread 2 PG&E Looping PG&E Tie-in to SoCal	0-120.0 0-28.3	California	[a]Contra Costa, Alameda, San Joaquin, Stanislaus, Merced, San Benito, Madera, Fresno, San Bernardino	3,036,800	1,415,109	109,857	18,806,660	14,688,431	6,749	1,523

[a]Because San Bernardino County is very large and would have only 28.5 miles of pipeline construction, housing data only for the communities closest to the pipeline are included. County population, employment, income, and retail sales are excluded.

SOURCE:
Hardy 1980.
Idaho Department of Employment 1980.
Lamb 1980.
Mobil Oil Corporation 1980.
Sargent 1980.
Severson 1980.
Shallenberger 1980.
Simeral 1981.
Swita 1980.
U.S. Department of Commerce 1972, 1980a, 1980b, 1980c, 1980d, 1980e.
Utah State Planning Coordinator 1980.
Wessell 1980.
Woodall's Campground Directory 1980.

TABLE 3-23

NORTHERN SYSTEMS ALTERNATIVE SOCIOECONOMIC PROFILE: COMPRESSOR CONSTRUCTION

Compressor Station	Location			[a]1977 City Population	[b]1979 Employment		[b]1977 Total Personal Income ($1,000)	[b]1977 Total Retail Sales ($1,000)	[b]Housing	
	State	County	[c]Nearest Towns		Total Employed in County	Total Unemployed in County			Hotel/ Motel Rooms	Private Campgrounds with Services
[d]Stanfield	Oregon	Umatilla	Stanfield Hermiston Pendleton	23,133	24,673	1,857	131,640	145,781	665	41
[e]Ione	Oregon	Morrow Umatilla	Hermiston Pendleton Heppner	23,593	30,623	2,157	137,890	145,781	666	41
[e]Madras	Oregon	Jefferson	[f]Prineville	5,918	5,019	551	30,549	27,198	54	91
[e]Bonanza	Oregon	Klamath	Klamath Falls	17,102	23,287	2,303	105,399	163,533	737	106
[e]Delevan	California	Colusa Colusa Glenn	Colusa Williams Willows	10,488	16,458	1,367	61,016	58,049	23	141

[a]Figures include only the towns listed.
[b]Figures are for the counties listed.
[c]Nearest towns with hotel/motel rooms.
[d]This would be a new compressor station.
[e]This is an existing station which would require additional horsepower.
[f]Prineville is located in Crook County, Oregon.

SOURCES:
Hardy 1980.
Idaho Department of Employment 1980.
Mobil Oil Corporation 1980.
Sargent 1980.
Simeral 1981.
U.S. Department of Commerce 1980a, 1980b, 1980c, 1980d, 1980e.
Wessell 1980.
Woodall's Campground Directory 1980.

Cultural Resources

The best-case Northern Systems Alternative would traverse major streams, the Bear River, and the Snake River Valley. These areas have high site density. In Idaho, site density is projected as moderate to high. Surveys of river valleys in east-central Idaho indicated the presence of numerous base camps including caves and rockshelters. Seasonal **use** camps have been the predominant site type recorded. In higher elevations (near MP 70), site density is projected as low to moderate. Previous research indicates an Archaic through Shoshonean occupation in the area.

The worst case of the Northern Systems Alternative would traverse all of the previously identified areas plus the Mojave River. In the San Joaquin area (MP 0 to MP 120), site types would probably consist of acorn processing stations, hunting camps, and butchering camps. The San Luis Gonzaga Archaeological District (near MP 40) is on the National Register of Historic Places.

Geology and Topography

GEOLOGY

Along the Northwest looping, about 25 miles would be subject to an expected ground motion of less than 0.04 g, 6 miles subject to between 0.04 and 0.1 g, and 46 miles subject to between 0.1 and 0.2 g. There is a potential for fault rupture at MP 3 and near MP 66 and MP 75, and there may be a potential for liquefaction between MP 73 and MP 82.

None of the loops would cross areas with significant landslide potential, nor would significant volcanic ash fall be likely. However, there would be a lava flow hazard between MP 68 and MP 89, where the alternative would cross the southern end of the Blackfoot Lava Field, and on the entire Pocatello Loop. While the latter would not cross old flows, there are extensive flows north of the Snake River adjacent to the whole loop.

The Stanfield Compressor Station at MP 585.8, subject to ground motion of just under 0.1 g, would be in UBC Zone 2. There is a potential for dense ash falls at this location--about 140 miles east-southeast of Mount St. Helens, Washington--but no significant volcanic hazard, fault, liquefaction, or landslide hazard is present.

No significant geologic hazards are present at two of the four compressor stations (Ione and Madras) where additional compression would be required on the PGT and PG&E systems, although both would be subject to ash fall. None of the stations would be subject to landslide hazard; all but Delevan would be subject to an expected ground motion of less than 0.04 g.

The Delevan Compressor Station would be subject to an expected ground motion of about 0.16 g and, depending on the ground water conditions, could be subject to liquefaction. No volcanic hazards other than ash fall would be present.

In addition to potential ash fall, the Bonanza Compressor Station could experience lava flows. It is located near the perimeter of an area which has experienced flows in the geologically recent past.

In California, two segments of pipeline might be required: 120 miles between Brentwood and Panoche Junction and 28.3 miles of looping between Hinkley and Adelanto. Twenty-three miles of the Brentwood-Panoche Junction pipeline could experience ground motion between 0.1 and 0.2 g. Along the remaining 97 miles, ground motion could range from 0.2 to 0.3 g. All of the Hinkley-Adelanto **Loop** would be less than, but near, 0.2 g. Fault hazard would be present where the 120-mile long pipeline crossed the Black Butte fault (MP 20) and where the Hinkley-Adelanto **Loop** crossed the Lockhart and Helendale faults, MP 1 and MP 15, respectively.

Liquefaction potential would be high for both segments wherever high ground water tables exist. For the Hinkley-Adelanto **Loop**, there would be a potential for liquefaction near the Mojave River crossing, MP 4 to MP 7. No specific areas of significant liquefaction potential have been identified for the Brentwood-Panoche Junction pipeline; areas of concern lie between MP 0 and MP 20, MP 65 and MP 80, and MP 107 and MP 120.

No volcanic hazard, other than ash falls, exists along either pipeline. No significant landslides occur along either; however, minor landslides, which have occurred near the existing Brentwood-Panoche Junction pipeline between MP 35 and MP 40, could occur between MP 85 and MP 95.

TOPOGRAPHY

Except for about 1 mile on the Pegram Loop, this alternative would encounter no difficult terrain.

Water Resources

The best-case version of the Northern Systems Alternative would cross three intermittent streams and seven perennial streams. In a worst-case situation, the alternative would cross 18 intermittent streams and 18 perennial streams.

Noise Quality

The existing pipeline systems of Northwest, PGT, and PG&E pass through rural areas of low population density, although some residential, commercial, and industrial development does occur there. The ambient or background noise levels in suburban residential areas range from 48 to 52 dB(A).

Since the location of the Stanfield Compressor Station is not known, the ambient noise levels cannot be established. There are 9 existing compressor stations on Northwest's pipeline system between Kemmerer, Wyoming, and Stanfield, Oregon, and 10 existing compressor stations between Stanfield and PG&E's Delevan Compressor Station in Colusa County, California. These compressor stations are 50 to 60 miles apart. The location of the compressor stations that would be expanded, the **existing** horsepower, and the type of units are listed in table 3-24.

High speed gas-turbine engines, which provide power for compression, are responsible for much of the noise at these stations. Other minor noise contributors located outside compressor buildings include oil cooling fans (where present) and aboveground piping. Also, when a compressor is starting or stopping, high pressure gas is vented to the atmosphere for 5 minutes or less, causing additional noise. The peak noise level generated during venting would not exceed 100 dB(A). Such noise occurs infrequently and briefly; therefore, no significant impact upon the existing noise environment occurs.

While units are operating, noise levels at compressor stations generally range between 45 and 50 dB(A). No background noise levels for the existing compressor stations or the Northwest, PGT, and PG&E pipeline systems are known.

TABLE 3-24

MODIFIED COMPRESSOR STATIONS FOR NORTHERN SYSTEMS ALTERNATIVE

[a]Compressor Station	Number of Units	Type of Units	Total Existing Horsepower	MP	Nearest Dwelling (Miles)	Acoustically Treated Station	Intake and Exhaust Silencers	Venting Silencers	Sound Insulation (Aboveground Piping)
Ione	2	Turbines	41,232	319.5	1.14	No	No	No	No
Madras	2	Turbines	29,240	425.1	3.13	No	No	No	No
Bonanza	2	Turbines	34,624	559.2	0.42	No	Yes	Yes	No
Delevan	2	Turbines	32,950	810.4	0.66	No	Yes	No	No

Ione, Madras, and Bonanza Compressor Stations are on PGT's existing right-of-way in Oregon. The Delevan Compressor Station is on PG&E's existing right-of-way in California.

Source: PGT and PG&E 1974.

Air Quality

The Northern Systems Alternative would be located in the following AQCR's:

Wyoming	Wyoming Intrastate (AQCR 243)
Utah	Four Corners Intrastate (EPA 014)
Idaho	Idaho Intrastate
	Metropolitan Boise Intrastate
Oregon	Eastern Oregon Interstate
California	Sacramento Valley Air Basin
	Northeast Plateau Air Basin

Among the Northern Systems Alternative facilities which would affect air quality would be the new 400-hp. compressor station which would be constructed at Stanfield, Oregon, during the first phase of the alternative. If the Western Leg begins transporting RMPP gas as well as Alaskan gas, additional compression would be added to the system in Morrow, Jefferson, and Klamath Counties, Oregon, and in Colusa County, California. To transport 800,000 Mcfd of RMPP gas along with Alaskan gas, additional compression would be added in Cassia, Bancock, and Elmore Counties, Idaho, along the Northwest pipeline system; Umatilla, Morrow, Sherman, Jefferson, Deschutes, and Klamath Counties, Oregon, along the PGT pipeline system; and Modoc, Shasta, Tehama, and colusa Counties, California, along PG&E's system.

The majority of the existing air quality along the alternative is generally quite good, typical of the nonindustrial areas of the Pacific Northwest. However, a few counties along the existing Northwest, PGT, and PG&E rights-of-way presently violate the NAAQS for TSP, sulfur oxides (SO_x), and **ozone.**

The NAAQS and standards and for the states that would be affected by the Northern Systems Alternative, shown in table 3-25, can be compared to the ambient air quality in the counties where compressor modifications would take place along the Northwest, PGT, and PG&E pipeline systems. The attainment status of each county is identified in table 3-26. Presently **a portion of** Shasta, and **all of** Tehama Counties, California, violate the secondary standard for TSP. The attainment status for the remainder of the counties either cannot be classified or is better than the national standards. A portion of Bancock County, Idaho, violates the primary standard for SO_2 and TSP. Colusa, Tehama Counties, California, violate the primary **and secondary** standards for ozone.

There are no ambient air quality data for the compressor station sites along the Northwest, PGT, and PG&E pipeline systems. However, ambient concentrations of 22 ug per cubic meter for NO_x and an 8-hour average of 809 ug per cubic meter with a 1-hour maximum of 1,156 ug per cubic meter were used for the EIS analysis of CO. These volumes were calculated by assuming that all compressor stations would operate at the full horsepower of the largest compressor station along any of the existing rights-of-way (Delevan Compressor Station on the PGT system in Oregon). The resulting emissions were converted into ambient ground-level concentrations by using EPA's PTMAX computer program. This procedure overestimates the ground-level concentration at each site, representing a worst-case impact.

Along the PGT and PG&E systems, there are three Class I areas. The Class I area nearest the PGT system in Oregon is the Crater Lake National Park, located in Klamath County about 30 miles southwest of Compressor Station 13. In Shasta County, California, there are two Class I areas near the project--Lassen National Park, 30 miles southwest of Gerber Compressor Station, and the Whiskeytown National Recreation Area, 25 miles to the west. The Sawtooth Wilderness Area would be about 50 miles to the northwest of the Mountain Home Compressor Station in Elmore County, Idaho.

TABLE 3-25

NATIONAL AND STATE AIR QUALITY STANDARDS: NORTHERN SYSTEMS ALTERNATIVE (Concentrations in ug/cubic meter unless otherwise noted)[a]

Pollutant	Time Period	[b]National Primary Standards	[b]National Secondary Standards	[c]Idaho	[c]Oregon
Total Suspended Particulates					
	Annual Geometric Mean	75	60	60	60
	24-Hour Maximum	260	150	150	150
Sulfur Dioxide					
	Annual Arithmetic Mean	80		80	80
	24-Hour Maximum	365		365	365
	3-Hour Maximum	[d]	1,300	1,300	1,300
Carbon Monoxide					
	8-Hour Maximum	10 mg/ cubic meter	10 mg/ cubic meter	10 mg/ cubic meter	10 mg/ cubic meter
	1-Hour Maximum	40 mg/ cubic meter	40 mg/ cubic meter	40 mg/ cubic meter	40 mg/ cubic meter
Nitrogen Dioxide					
	Annual Arithmetic Mean	100	100	[d]100	100
Ozone					
	1-Hour Maximum	235	235	235	235
Hydrocarbons (Nonmethane $R-CH_3$)					
	3-Hour (6 to 9 a.m.)	160	160	160	160
Hydrogen Sulfide					
	0.5 Hour Average	-	-	-	-
	0.5 Hour Average	-	-	-	-

[a]See table 3-18 for the Wyoming, Utah, and California air quality standards.

[b]All national standard, except those based on annual averages or annual geometric mean, are not to be exceeded more than once a year.

[c]BLM 1980b.

[d]No standards exists.

[e]Emissions from gas turbines of less than 10,000 horsepower would be required to meet new source performance standards based on dry controls of 150 parts per million of NO_x.

TABLE 3-26

AMBIENT AIR QUALITY ATTAINMENT STATUS ALONG THE NORTHERN SYSTEMS ALTERNATIVE

County	State	Total Suspended Particulates	Sulfur Dioxide	Ozone	Carbon Monoxide	Nitrogen Dioxide
Lincoln	Wyoming	[c]B	B	[b]C/B	C/B	C/B
Rich	Utah	B	B	C/B	C/B	C/B
Cassia	Idaho	B	B	C/B	C/B	C/B
Bancock	Idaho	[a]P	[a]P	[b]C/B	C/B	C/B
Elmore	Idaho	[c]B	B	C/B	C/B	C/B
Umatilla	Oregon	B	B	C/B	C/B	C/B
Morrow	Oregon	B	B	C/B	C/B	C/B
Sherman	Oregon	B	B	C/B	C/B	C/B
Jefferson	Oregon	B	B	C/B	C/B	C/B
Deschutes	Oregon	B	B	C/B	C/B	C/B
Klamath	Oregon	B	B	C/B	C/B	C/B
Modoc	California	B	B	C/B	C/B	C/B
Shasta	California	[e]S	B	P	C/B	C/B
Tehama	California	S	B	[a]P	C/B	C/B
Colusa	California	S	B	P	C/B	C/B

[a]Only a portion of each county does not meet the primary standards under the NAAQS.
[b]C/B--Cannot be classified or better than national standards.
[c]B--Better than national standards.
[d]P--Does not meet primary standard under NAAQS.
[e]S--Does not meet the secondary standard under the NAAQS.

ALTERNATIVE B--SANPETE VALLEY ALTERNATIVE

Vegetation

The Sanpete Valley Alternative would traverse 27 miles of forest land, 69 miles of mountain brush, 45 miles of sagebrush, 191 miles of pinyon-juniper, and 181 miles of creosote bush type vegetation. Joshua trees and cactus species occur within the creosote bush type.

Miles of vegetation types that would be affected are summarized in table 3-1 and located on map S-24. These areas are largely used for livestock grazing, wildlife habitat, recreation and watersheds, and forest products.

Other species that are unique to the creosote bush and greasewood-saltbush vegetation types in the desert biome include Joshua trees and cactus species that are not protected under threatened and endangered species legislation. These are sought for landscaping and collection, and state and/or Federal permits authorizing their removal are required. Populations of these desert plants could be found in numerous locations along the alternative from the southern portion of Utah near St. George to Needles, California. Refer to map S-24 for location of the creosote bush and greasewood-saltbush type.

Wildlife

This discussion concerns only the portion of this alternative which is not identical to the proposed route.

MAMMALS

Deer winter ranges would be found on this alternative from about MP 75 to MP 154; this area encompasses most of the south and southeast facing slopes along the Sevier River where proper winter habitat exists.

BIRDS

Waterfowl habitat would be found along this alternative in the vicinity of the Gunnison Reservoir (MP 39 to MP 44), and along the Sevier River from MP 59 to MP 74 and MP 88 to MP 96. Rocky Ford Reservoir at about MP 70 furnishes more waterfowl habitat in this area. From Beaver Creek to Cottonwood Creek (MP 103 to MP 110) along the Sevier River, there is another waterfowl habitat area. The last waterfowl habitat along the Sevier River is from MP 125 to MP 131 to Circleville Canyon.

The ring-necked pheasant would be found in all agricultural areas between approximately MP 50 and MP 90, south of Gunnison, Utah.

Good raptor habitat occurs between MP 0 and MP 18 and between MP 129 and MP 132 along the Sevier River in Circleville Canyon.

FEDERAL AND STATE LISTED SPECIES

Habitats of the federally listed black-footed ferret and bald eagle would be crossed by this alternative, as described in the proposed action section. Habitat of the state listed and protected populations of the desert tortoise would also be crossed by this alternative, as noted for the proposed action.

Soils

The Sanpete Valley Alternative would most strongly affect the following soil groups: 114 miles of Soil Group 1, 21 miles of Soil Group 2, 34 miles of Soil Group 3, 5 miles of Soil Group 4, 47 miles of Soil Group 5, 17 miles of Soil Group 6, 14 miles of Soil Group 8, and 243 miles of Soil Group 9.

Refer to the discussion of the proposed action in this chapter and table 3-9 for additional soil information.

Visual Resources

The Sanpete Valley Alternative portion which varies from the proposed action would lie entirely within the Colorado Plateaus physiographic province. Landforms vary from flat valley bottoms to the steeper mountainous areas which separate the valleys. Vegetation varies from sagebrush and agricultural plants on the lower areas to juniper and mountain brush at the higher elevations and greasewood and sagebrush along the southernmost portion. Cultural modifications include a number of small communities, ranches, highways, utilities, and a railroad along the alternative. The tabulation in table 3-27 describes those segments of the alternative which would experience significant visual impact. (See table 3-11 for a summary of the total number of miles and acres for each VRM Class which would be crossed by the alternative.)

TABLE 3-27

AFFECTED ENVIRONMENT FOR VISUAL RESOURCES: SANPETE VALLEY ALTERNATIVE

MP	VRM Class [2]	Description
Pipeline[1]		
MP 95-MP 105	2	Landform consists of steep canyon slopes along the Sevier River. Mountain brush is the predominant vegetative species. Cultural modifications are generally limited to U.S. Highway 89 and a railroad.
MP 121-MP 124	4	Landform is steeper transitional terrain. Vegetation is sagebrush with juniper on the higher slopes. Although no cultural modifications are evident, the area can be seen from U.S. Highway 89 and Circleville.
MP 129-MP 131	3	Landform consists of restrictive steep canyon walls along the Sevier River. Sagebrush mixes and juniper are the primary vegetation types. The area is easily viewed from U.S. Highway 89, which traverses the area.
Ancillary Facilities		
Same as the proposed action.		

[1]Only those segments which would be significantly affected by the Sanpete Valley Alternative are described.

[2]Refer to table 3-10 for definitions of terms.

NOTE: To review the total visual resources which would be affected by this alternative, refer to MP 0 to MP 176 and MP 356 to MP 610 of the proposed action, which would correspondingly precede and follow the Sanpete Valley Alternative.

Land Uses: Agriculture

The Sanpete Valley Alternative would traverse 131 miles of cropland producing the same crop types as the proposed action, with the exception that more of the cropland in this area is irrigated. See table 3-12 for acreages and mileages of cropland which would be affected.

The Sage Compressor Station would be located on native grazing land. Land **use** for the remaining surface facility sites is not known because specif locations are not available at this time.

Socioeconomics

The socioeconomic conditions along the Sanpete Valley Alternative are similar to those of the RMPP. They are summarized in tables 3-13, 3-14, and 3-15.

Cultural Resources

The discussion of cultural resources for the proposed action also applies to the portion of the Sanpete Valley Alternative which is identical.

A moderate to high site density is projected where this alternative would traverse the Sanpete Valley. The area in the Sevier River Valley which would be traversed by this alternative has a high site density of significant cultural resources.

Several major Fremont sites have been excavated in the Parowan Valley (between MP 150 to MP 200). These include Paragonah (Meighan *et. al.* 1956), Parowan, Evans Mound (Berry 1972), and Median Village (Marwitt 1970). Paragonah is listed on the National Register of Historic Places; Median Village is listed on the Utah State Register.

Geology and Topography

GEOLOGY

With the exception of the first 10 miles and last 25 miles, this entire alternative would parallel, be adjacent to, or cross active faults. Therefore, most of this 165 miles of the alternative should be considered subject to fault rupture hazard. In addition, the alternative would be nearly parallel to the faulting.

About 145 miles of the alternative would experience an expected peak acceleration of 10 to 20 percent g, with the remainder experiencing 4 to 10 percent g. At least 115 miles of this alternative would be subject to high liquefaction potential.

No significant landslide or volcanic hazards other than ash falls exist for this route.

TOPOGRAPHY

This 200-mile long alternative would cross rougher terrain than the 180 miles of the proposed route (MP 176 to MP 356) it would replace. Specific problem areas include MP 95 to MP 105 and MP 130 to MP 150. The only sidehill construction of potential significance would occur south of the town of Sevier between MP 96 and MP 103 and in Circleville Canyon, MP 128 to MP 131, of the alternative.

Water Resources

The Sanpete Valley Alternative would cross 41 intermittent streams and 44 perennial streams.

ALTERNATIVE C--CENTRAL NEVADA ALTERNATIVE

Vegetation

The Central Nevada Alternative would traverse or have permanent installations on 41 miles of forest, 94 miles of mountain brush, 130 miles of sagebrush, 101 miles of pinyon-juniper, 208 miles of saltbush-greasewood and 181 miles of creosote bush vegetation. Cacti and Joshua trees are scattered throughout saltbush-greasewood and creosote bush vegetation types. Miles of each vegetation type that would be affected are summarized in table 3-1 and located on map S-24. These areas are used largely for livestock grazing, wildlife habitat, recreation, watersheds, and forest products.

There is a population of Rocky Mountain red cedar (*Juniperus scopulorum*) located between MP 162 and MP 165 which would be traversed. This stand is unique because it is outside its normal range.

Wildlife

This discussion concerns only the portion of the Central Nevada Alternative which does not coincide with the proposed route.

According to the Utah Division of Wildlife Resources, this alternative would parallel existing paved highways in Utah and 'No area along this route would be considered critical wildlife habitat, although species typical of the various vegetation types would suffer minor disturbance in the short-term' (Day 1981).

MAMMALS

The Central Nevada Alternative would first encounter winter ranges for mule deer in Nevada near Sacramento Pass in the Snake Range (MP 156 to MP 158), then in the Connors Canyon area (MP 179 to MP 180). In the Murry Summit (MP 205 to MP 207) and Ellison Creek areas (MP 224 to MP 230), the alternative would also cross deer winter ranges. West of Currant Summit, a large area of deer winter range--about 13 miles (MP 234 to MP 247)--would be crossed. As the alternative left Nevada and entered California, it would parallel a small area of deer winter range for about 8 miles at the head of Queen Valley (MP 428 to MP 435). About 7 miles (MP 439 to MP 446) of another winter range area would be crossed in Hammil Valley for about 7 miles (MP 439 to MP 446).

Winter ranges for Tule elk would be traversed west and north of Black Mountain (MP 471 to MP 480), and east of Big Pine, California (MP 487 to MP 490). Important calving areas are found in the Silver Canyon (MP 460 to MP 464), Black Canyon (MP 467 to MP 474), and Harkless Flat areas (MP 487 to MP 490). Because of this species' limited distribution and the high interest placed on it by the State of California, care should be taken not to disturb these animals during critical periods of the year.

Desert bighorn sheep can be found in the Monte Cristo Range west of Tonopah, Nevada. These sheep would migrate across this alternative in two places: from the Monte Cristo Range to Lone Mountain and back (MP 385 to MP 390) and from the Monte Cristo Range to the Emigrant Peak area and back (MP 395 to MP 397).

BIRDS

Sage grouse habitat occurs in Nevada from about Mill Creek to Willow Patch Spring (MP 145 to MP 150). In the Layton Spring area, the alternative would cross sagebrush habitat and pass within 2 miles of a known strutting ground (MP 165 to MP 169). From Cooper Wash to the Murry Canyon area (MP 187 to MP 196), the alternative would traverse known sagebrush habitat, a strutting ground, and a heavily used brood area. From Murry Summit, the alternative route would cross habitat for about 7 miles (MP 200 to MP 207). The Central Nevada Alternative would pass within 2 miles of a strutting ground and through two brood areas in the vicinity of Geroup Wash (MP 206). The last known area of sagebrush habitat for this bird which the alternative would cross **would be** about 8 miles in the vicinity of the Currant Ranch (MP 240 to MP 248). No known strutting grounds or brood areas occur near the alternative.

The alternative would first encounter chukars along Currant Creek about 5 miles west of Currant Summit for about 11 miles (MP 238 to MP 249). The Nevada Department of Fish and Game rates populations low in this area. Another chukar area would be traversed west from about Black Rock Spring for about 8 miles (MP 271 to MP 279). These birds would also be found along the alternative between Palisade Mesa and **Halligan** Mesa (MP 285 to MP 287), the Warm Springs area (MP 310), and near Fivemile Spring (MP 324). Chukar habitat with a low population density rating would be crossed west of Moroni for about 13 miles (MP 325 to MP 338). An 8-mile long stretch of medium density habitat would be encountered in the Slime Wash area (MP 360 to MP 366). Within this area, a 4-mile long section (MP 361 to MP 365) is rated as a high density area. As this alternative approached the Nevada/California border, it would cross a 6-mile long stretch of low density habitat at the head of Queen Valley (MP 421 to MP 427).

This alternative route would traverse nesting habitat for goshawks, Cooper's hawks, and sharp-shinned hawks from about MP 152 through MP 154 (Sacramento Pass area) and from MP 157 through MP 196. Other raptor nesting areas are found from about MP 202 through MP 204, MP 235 through MP 238, and MP 310 through MP 313. Favorable habitat for cliff-nesting raptors can be found in the area from MP 329 through MP 331 and MP 334 through MP 341. For the most part, the alternative would not cross these cliff areas; however it would traverse a cliff-nesting area near MP 340 (McKinney Tanks region).

As this alternative passed along the west side of Owens Lake in California (MP 525 to MP 542), it would be very near wetland habitat **used** by nesting waterfowl species. Tinemaha Reservoir (MP 485 to MP 487) is one of the few remaining wetlands in the Owens Valley and thus winters many ducks and geese. Little Lake is also a favored winter ground for pintail ducks (MP 565 to MP 569).

FEDERAL AND STATE LISTED SPECIES

Habitats of **three** federally listed species would be crossed by this alternative. The black-footed ferret habitat would be crossed in the same areas as along the proposed action. **The habitat of** the Railroad Valley springfish, **a candidate species for Federal listing, could be** crossed by this alternative at Big Spring near Lockes, Nevada, **and bald**

eagle winter habitat would also be crossed by this alternative.

Habitat of the Mohave ground squirrel (state-listed as rare) would be crossed by the alternative in Kern and San Bernardino Counties in California. The general distribution is from about MP 540 to the end of the alternative near Adelanto, California.

This alternative would cross desert tortoise habitat from about the Red Mountain area to about the Fremont Peak area (MP 610 to MP 621), a distance of about 11 miles, and from the Kramer Hills area south to Adelanto, California (MP 641 to MP 661), a distance of about 20 miles. The alternative would also cross tortoise habitat from Adelanto to just north of Helendale, California (MP 0 to MP 15), about 15 miles. This species is listed as protected by the State of California.

Soils

The Central Nevada Alternative would most strongly affect the following soil groups: 102 miles of Soil Group 1, 74 miles of Soil Group 2, 162 miles of Soil Group 3, 66 miles of Soil Group 4, 40 miles of Soil Group 5, 38 miles of Soil Group 6, 8 miles of Soil Group 7, 18 miles of Soil Group 8, and 578 miles of Soil Group 9.

Refer to the discussion of the proposed action in this chapter and table 3-9 for additional soil information.

Visual Resources

The Central Nevada Alternative would cross the distinctive landscapes of the Colorado Plateaus, Basin and Range, and Cascade-Sierra Mountains physiographic provinces and return to the Basin and Range physiographic province, where it would terminate in southern California. Landforms vary from a flat desert landscape with occasional steep slopes in the cross ranges of the Central Nevada mountains to the dramatic valleys of California dominated by the Sierra Nevada Mountains and the flat, hot Mojave Desert of southern California. Vegetation varies equally, from the desert species of sagebrush and saltbush, occasionally interrupted by agricultural areas or juniper or pinyon-juniper-covered ridges, through greasewood, shadscale, and low sagebrush zones. The alternative route would terminate in the hot desert region of sparse creosote bush, with intermingled cacti and occasional Joshua trees. Cultural modifications are dominant, since the alternative would closely parallel U.S. Highway 6 from central Utah westerly across Nevada to Bishop, California, where it would again closely parallel U.S. Highway 395 to its termination at an existing pipeline. Associated communities, utility lines, mining activity, aqueduct systems, and military facilities are found intermingled. The tabulation in table 3-28 describes those segments which contain significant visual impacts. (See table 3-11 for a summary of the total number of miles and acres for each VRM Class and VQO which would be crossed by the alternative.)

TABLE 3-28

AFFECTED ENVIRONMENT FOR VISUAL RESOURCES: CENTRAL NEVADA ALTERNATIVE

MP	VRM Class and/ or VQO[1]	Description
Pipeline[1]		
MP 109-MP 112	3	Landform is a restricted, steep, rugged canyon where U.S. Highway 6/50 is located. Sagebrush and juniper are the dominant vegetative species.
MP 160-MP 163	2	The alternative route would pass through the Swamp Cedar Natural Area.
MP 195-MP 201	2	The alternative would enter the steep, enclosed, and restricted Murry Canyon. Vegetation is pinyon-juniper and sagebrush. The landscape is heavily modified by soil stabilization and range improvement projects, U.S. Highway 6, an aqueduct, local roads, urban fringe development, and the Ward Mountain Recreation Area at MP 200.
MP 232-MP 237	PR	This portion of the Humboldt National Forest is a steep restrictive canyon with pinyon-juniper vegetation. U.S. Highway 6, Currant Creek Campground, a gravel pit, and gold mining are evidenced in the area.

TABLE 3-28—Continued

MP	VRM Class and/ or VQO[1]	Description
MP 268-MP 274	2	Landform consists of a restricted canyon with pinyon-juniper as the vegetative cover. U.S. Highway 6 is located in this canyon.
MP 278-MP 280	2	Landform is gently rolling, covered with low sagebrush and saltbush, and viewed from U.S. Highway 6 which passes through the area.
MP 310-MP 314	2	Landform is a rolling mountain pass covered with juniper. U.S. Highway 6 also occupies the pass.
MP 329-MP 331	R,PR	Landform is gently sloping where the alternative would enter the Toiyabe National Forest. Scattered juniper and low sagebrush are the dominant vegetation types. U.S. Highway 6 passes through the area.
MP 332-MP 338	R,PR	Landform is gently rolling, with scattered juniper and low sagebrush cover. U.S. Highway 6 is parallel to the alternative.
MP 338-MP 341	R,MM	The gently rolling landscape is vegetated with scattered juniper and low sagebrush. U.S. Highway 6 traverses the area, and water tanks are evident.
MP 356-MP 358	2	The gently rolling landscape forms the saddle in a mountainous terrain which supports the City of Tonopah and its urbanized area, as well as U.S. Highway 6. Vegetation consists of juniper and low sagebrush.
MP 546-MP 554	2,3	The alternative lies within a restricted canyon between a transitional slope and reservoir/lake. Creosote bush is the predominant vegetation. Modifications include U.S. Highway 395, a railroad, aqueduct, and transmission line.
MP 569-MP 576	2	Landform consists of a flat valley bottom with portions overlain with a rough lava flow. Creosote bush is the predominant vegetation. U.S. Highway 395, a railroad, and a transmission line dominate the area.
MP 600-MP 606	2,3	The rolling hills are covered by scattered creosote bush and cacti. A substation, transmission line, U.S. Highway 395, railroad, and primitive roads are the modifications.
Ancillary Facilities[3]		
Tonopah, Nevada Vicinity	3	Tonopah Maintenance Base. Landform is flat to gently sloping or steep slopes if located within the Tonopah urbanized area. The vegetative cover consists of a sparse sagebrush pattern. Cultural modifications include the urbanized area of Tonopah and its surroundings, the airport, and growth trends in the vicinity of the airport.
Inyokern, California Vicinity	3	Inyokern maintenance base. The flat valley bottom is agriculturalized in irrigated areas, surrounded by creosote bush. Cultural modifications include U.S. Highway 395, the communities of Inyokern and Ridgecrest, and associated agricultural structures and utilities.

[1]Only those segments and facilities which would be significantly affected by the Central Nevada Alternative are described.

[2]Refer to table 3-10 for definitions of terms.

[3]The Sage Compressor Station and maintenance base are the same as those for the proposed action discussion for location and description of these facilities.

NOTE: To review the total visual resources which would be affected by this alternative, refer to MP 0 to MP 196 of the proposed action, which would precede the Central Nevada Alternative.

Land Uses: Wilderness, Agriculture, and Conflicts with Land Use Plans, Policies, and Controls

WILDERNESS

The Central Nevada Alternative pipeline route would cross the BLM WSA U- 050-078, commonly called the Notch Peak WSA, in west-central Utah approximately between MP 96 and MP 100 (BLM November 1980b). This WSA unit's southern boundary abuts the U.S. Highway 6 right-of-way **for les than 2 miles.** The alternative pipeline route would pass immediately north of the highway, thus crossing WSA U-050-078, shown on map S-20 of the *Graphic Supplement.*

In Nevada, BLM WSA NV-060-059, also known as the Rawhide Mountain WSA, would be crossed by the alternative pipeline route at approximately MP 308 (BLM November 1980a). The southeast corner of the WSA unit abuts the U.S. Highway 6 right-of-way. The alternative pipeline route would be north of the highway, thus crossing this WSA.

No other federally designated Wilderness Areas, WSA's designated by the BLM, the second Roadless Area Review and Evaluation (RARE II) units recommended for wilderness or future planning areas by the FS, or proposed or existing State Wilderness Areas would be crossed by any components of this alternative.

AGRICULTURE

The Central Nevada Alternative would traverse 107 miles of cropland, including small acreages of irrigated cropland used mainly for livestock feed west of Delta, Utah. The immediate area surrounding Delta is an important irrigated agricultural area which produces small grains, alfalfa, and corn as its main crops and, to a limited extent, sugar beets. Much of the area has subsurface drainage systems. See table 3-12 for acreages and mileages of cropland that would be affected.

The Sage Compressor Station would be located on native grazing land. Land **use** for the remaining surface facility sites is not known because specif locations are not available at this time.

The Robinson Canyon Watershed near Ely, Nevada, would be crossed by this alternative pipeline route. The Watershed Project consists mainly of terraces and diversions constructed on steep side slopes to control runoff and reduce flash flooding.

CONFLICTS WITH LAND USE PLANS, POLICIES, AND CONTROLS

The Central Nevada Alternative would pass through the Benton and Owens Valleys in California. The BLM is preparing the Benton-Owens Valley MFP which identifies a transmission line corridor. The Central Nevada Alternative would not follow this corridor.

This alternative would also pass through lands managed under the BLM's California Desert Plan which was finalized in December 1980. The plan designates utility corridors and contingency planning utility corridors. The alternative would not coincide with any utility corridors but would fall within a contingency utility corridor.

In addition, when the whole length of the alternative from Wyoming to California is considered, it, like the proposed action, would not coincide with the Utility Corridor Rule in the proposed Forest Land Management Plan for the Uinta National Forest.

Socioeconomics

Table 3-29 lists the pertinent socioeconomic characteristics of the regions affected by this alternative. All of the counties that would be crossed are rural, with 1977 population densities ranging from 0.2 to 44.1 people per square mile. Most people live in small communities and are typically employed in travel-related services or mining. Because the applicant is not proposing this alternative, it has not provided information on the location of potential construction spreads; instead, they were delineated using the RMPP as a model. For the same reason, the applicant has provided no information on the locations of maintenance bases or double-jounting yards. For this alternative, double-jointing yards could not be located at railheads, since there are no railroads in the vicinity of the alternative. The locations of the maintenance bases and double-jointing yards were also delineated using the RMPP as model. These appear in table 2-2. Because this alternative would **use** the first two spreads of the proposed route, they are omitted from this discussion.

County property taxes and police and medical services are not quantified However, the expected impacts are discussed in chapter 4.

TABLE 3-29

REGIONAL SOCIOECONOMIC PROFILE: CENTRAL NEVADA ALTERNATIVE

Construction	MP	State	County	Estimated 1980 Population	Total 1979 Employment	Personal Income, 1977 (Million $)	Retail Sales, 1977 ($1,000)	Housing	
								Hotel/ Motel Rooms	Campsites with Hookups
Pipeline Spread 1	0-110	Utah	Juab, Millard	15,350	5,645	50.46	34,441	427	230
Pipeline Spread 2	110-220	Utah Nevada	Millard White Pine	17,384	6,663	80.04	58,984	224	176
Pipeline Spread 3	220-330	Nevada	White Pine, Nye	17,280	5,060	86.69	56,151	239	164
Pipeline Spread 4	330-444	Nevada	Nye, Esmeralda, Mineral	16,010	4,630	75.46	33,303	125	76
Pipeline Spread 5	444-564	California	Mono, Inyo	28,200	14,575	148.60	105,929	561	120
Pipeline Spread 6	564-694	California	Inyokern, San Bernardino	1,239,300	770,375	6,181.5	3,854,179	2,122	827

Sources:
Anastassatos 1980.
Hardy 1980.
Hughly 1980.
Mobil Oil Corporation 1980.
Shallenberger 1980.
U.S. Department of Commerce 1972, 1980a, 1980b, 1980c, 1980d, 1980e.
Utah Industrial Development Division 1980a.
Woodall's Campground Directory 1980.

Cultural Resources

The discussion of cultural resources for the proposed action also applies to this alternative where the routes are **identical.**

This alternative would cross the Sevier-Escalante Desert and parallel the Sevier River. Along the Sevier River drainage, the site density is projected as moderate to high, with numerous residential camps. Site density is projected as low to moderate where the alternative would traverse the Sevier- Escalante Desert. A high density of seasonal and special **use** sites are expected where the alternative **would** traverse Steptoe Valley. In Railroad Valley (near MP 260), there are recorded sites representing every period of human occupation from Paleo-Indian to Northern Paiute. There is a high density of sites in Hot Creek Valley.

This alternative would cross the inlet area of the Pleistocene Lake Tonopah (near MP 370). Previous surveys indicate sites representative of the Paleo-Indian period. This area is considered highly sensitive for cultural resources.

Previous studies indicate a high site density for the Owens Valley area which would be traversed by the alternative. Site types are varied and include permanent villages, irrigation canals, seasonal collection sites, hunting, and sacred sites. The alternative would traverse Rose Valley near the Coso Hot Springs sacred area listed on the National Register of Historical Places and the Sugarloaf Mountain obsidian quarry area.

Geology and Topography

GEOLOGY

The Central Nevada Alternative would pass through one of the most tectonically active areas in the United States. Large earthquakes, accompanied by 20 feet of fault displacement, have occurred in Owens Valley in historic times. Geologically recent lava flows abound.

Potentially active faults would be crossed at MP 26, MP 243, MP 270, MP 309, MP 326 to MP 341 (six faults), and MP 439; others might be crossed at MP 393 and between MP 423 and MP 428. In addition, the Garlock fault would be crossed at MP 603. Three faults, including the Lockhart and South Lockhart faults, would be crossed between MP 624 and MP 629. Between MP 642 and MP 644, the Kramer Hills, Spring, and an unnamed fault would be crossed, and at MP 653, the Blake Ranch fault would be crossed.

Although all of these faults would threaten the integrity of a pipeline, the alternative would also parallel the Owens Valley fault zone from MP 431 to MP 577. Historic ruptures have occurred between MP 485 and MP 545, and the last 25 miles of the alternative in this segment would coincide with the location of these ruptures.

As would be expected in an area of this nature, the ground motions generated by earthquakes are quite high. For the entire alternative, they are distributed as follows:

Less than 0.04 g	139 miles
0.04-0.10 g	41 miles
0.10-0.20 g	202 miles
0.20-0.40 g	74 miles
0.40-0.60 g	92 miles
Greater than 0.60 g	118 miles

About 180 miles would be in UBC Zone 2, 230 miles in UBC Zone 3, and 250 miles in UBC Zone 4.

There is liquefaction potential at MP 15 and between MP 30 and MP 46. Specific analysis of liquefaction hazard was not attempted beyond MP 315 because of the limited water table and soils information; whenever the alternative would encounter the water table beyond this point, a high potential for liquefaction is likely because of the high expected ground motion.

There would be a potential for varying severity of volcanic ash fall from MP 108 to the end of the alternative. In the Pancake Range, MP 265 to MP 294, and from MP 415 to MP 421, MP 558 to MP 573, and MP 616 to MP 626, there would be a potential for lava flows.

The potential for landslides exists in the Egan Range, MP 195 to MP 200, and in the Pancake Range, MP 265 to MP 294. There could also be landslide difficulty between about MP 423 and MP 568. In this region, areas of landslide potential closely border the route, and the potential that new and old slides could be activated by earthquakes could affect the reliability of a pipeline along this alternative.

TOPOGRAPHY

This 666-mile long alternative would cross terrain similar to the 414 miles of the proposed route (MP 196 to MP 610) it would replace. While construction difficulty over portions of each route would be similar, the alternative would traverse several mountain passes and canyons and would therefore take more time and be more difficult to construct.

Some sidehill construction would be required in Leamington Canyon, and the presence of the Sevier River, Utah Highway 132, the Union Pacific Railroad, and McIntyre and Central Utah Canals would complicate construction here.

Substantial sidehill construction may also be anticipated in the following mountain ranges: Confusion, Snake, Schell Creek, and Egan.

Water Resources

The Central Nevada Alternative would cross 44 intermittent streams and 44 perennial streams.

Air Quality

The Central Nevada Alternative would be located in the following AQCR's:

Wyoming	Wyoming Intrastate (AQCR 243)
Utah	Four Corners Intrastate (EPA-014)
	Utah Intrastate (219)
	Wasatch Front (220)
Nevada	Nevada Intrastate Air Quality Control Region (AQCR 147)
California	**Southeast Desert Air Basin/San Bernardino County APCD**

The ambient air quality standards for Wyoming, Utah, Nevada, and California can be found in table 3-18. The ambient air quality along the alternative route is generally good. However, a portion of

White Pine County (Steptoe Valley, Nevada) exceeds the primary standard for SO_2 and a portion of Nye County, Nevada, south of the alternative route does not meet the primary standard for TSP. San Bernardino County, California, is the exception to the good air quality in this area. It exceeds the primary standard for TSP, CO, ozone and nitrogen dioxide (NO_2). The attainment status for each county along the alternative right-of-way is shown in table 3-30. The additional compressor stations required to transport 800,000 Mcfd would be located in White Pine, Nye, and Esmeralda Counties, Nevada. All of these counties are in attainment for NO_x, the major gaseous emission from gas-turbine compressors.

The Central Nevada Alternative would require the installation of 25,650 **nominal horsepower (or about 17,442 site rated horsepower)** of compression at the Sage Compressor Station to transport 413,000 Mcfd of natural gas. To transport 800,000 Mcfd, an additional 26,750 **nominal horsepower (or about 18,190 site rated horsepower)** would be required at the Sage Compressor Station. In addition, three compressor stations would have to be constructed in White Pine, Nye, and Esmeralda Counties, Nevada. For this alternative, the ambient air quality at the Sage Compressor Station and booster stations has been assumed to be the same as for the RMPP.

The Class I area nearest the alternative pipeline right-of-way is the Yosemite National Park in Tuolumne County, California, 60 miles away. The Class I area nearest the Sage Compressor Station would be the combined Yellowstone and Grand Teton National Parks, about 140 miles northwest of the proposed site in Teton County, Wyoming. Capitol Reef National Park, a Class I area, would be 150 miles southeast of the proposed site in Wayne and Garfield Counties, Utah. Bryce Canyon and Zion National Parks would be about 130 and 100 miles, respectively, southeast of the compressor station in White Pine County, Nevada. Bryce Canyon National Park is in Garfield and Kane Counties, Utah, while Zion National Park is in Washington County, Utah. The only other Class I area within 150 miles of this alternative would be the Jarbridge Wilderness in Elko County, Nevada. It is located 180 miles north of the compressor station in White Pine County, Nevada.

TABLE 3-30

AMBIENT AIR QUALITY ATTAINMENT STATUS FOR COUNTIES ALONG THE CENTRAL NEVADA ALTERNATIVE

[a]County	State	Total Suspended Particulates	Sulfur Dioxide	Photochemical Oxidants	Carbon Monoxide	Nitrogen Dioxide
Millard	Utah	[b]B	B	[c]C/B	C/B	C/B
White Pine	Nevada	C/B	[d]P	C/B	C/B	C/B
Nye	Nevada	[e]P	B	C/B	C/B	C/B
Esmeralda	Nevada	B	B	C/B	C/B	C/B
San Bernardino	California	P	B	P	P	P

[a]The Central Nevada Alternative would follow the proposed RMPP route for the first 195 miles. The attainment status for these counties appears in the discussion of the RMPP.

[b]B--Better than national standards.

[c]C/B--Cannot be classified or better than national standards.

[d]P--Does not meet primary standards. Only a portion of Steptoe Valley in White Pine County is in nonattainment for SO_2.

[e]Only a portion of Nye County exceeds the primary TSP standard of the NAAQS.

ALTERNATIVE D--SEVIER-ESCALANTE DESERT ALTERNATIVE

Vegetation

The Sevier-Escalante Desert Alternative would traverse or have permanent installations on 32 miles of forest vegetation, 97 miles of mountain brush, 50 miles of sagebrush, 71 miles of pinyon-juniper, 86 miles of saltbush- greasewood, and 200 miles of creosote bush vegetation. Cacti and Joshua trees occur scattered throughout the saltbush-greasewood and creosote bush vegetation types. Miles of each vegetation type that would be affected are summarized on table 3-1 and located on map S-24. These areas are largely used for livestock grazing, wildlife habitat, recreation, watersheds, and forest products.

Wildlife

This discussion addresses only the portion of the Sevier-Escalante Desert Alternative that is not identical to the proposed action (MP 196 to MP 364).

MAMMALS

The Sevier-Escalante Desert Alternative would cross deer winter ranges near Government Spring and also west and south along the alternative to about Furner Ridge (MP 5 to MP 13). The next area of winter range which would be crossed by the alternative is from about Soma, Utah, to Leaminton, Utah (MP 19 to MP 27). The last area of winter range which would be encountered by the Sevier-Escalante Desert Alternative is from about Milford, Utah, to about Thermo Siding (MP 128 to MP 139).

BIRDS

Sage grouse populations would be found in only one area along this alternative along Dog Valley Wash in Utah (MP 11 to MP 19). Except for one area from about MP 45 to MP 47 along Delta Reservoir, waterfowl habitat is lacking along this alternative. Cliff nesting raptors such as golden eagles, great horned owls, and prairie falcons find suitable nesting areas along this alternative in several areas. (These areas are indicated on table 3-7.) There is a golden eagle nest about 2 miles west of the alternative near MP 93 on the slopes of the Cricket Mountains.

FEDERAL AND STATE LISTED SPECIES

The habitats of the federally-listed black-footed ferret and bald eagle would be crossed by this alternative in the same areas discussed for the proposed action. The habitat of the state-listed (Utah and Nevada) and protected (California) desert tortoise would be crossed in the same areas as discussed for the proposed action.

Soils

The Sevier-Escalante Desert Alternative would most strongly affect the following soil groups: 108 miles of Soil Group 1, 19 miles of Soil Group 2, 60 miles of Soil Group 3, 5 miles of Soil Group 4, 47 miles of Soil Group 5, 17 miles of Soil Group 6, 3 miles of Soil Group 7, 14 miles of Soil Group 8, and 280 miles of Soil Group 9. Refer to the discussion of the proposed action in this chapter and table 3-9 for additional soil information.

Visual Resources

The Sevier-Escalante Desert Alternative would be almost entirely within the Basin and Range physiographic province, with only the first 30 miles within the Colorado Plateaus physiographic province. Accordingly, the alternative would begin in a valley with mountainous terrain, while the remaining 150 miles would traverse a flat, broad valley bottom with an occasional variety of gently rolling hills. Likewise, the vegetation consists primarily of juniper and sagebrush in the first 30 miles but modifies to a low sagebrush, shadscale, and greasewood pattern with intermingled agricultural lands as the alternative would proceed southward. Typically, the cultural modifications include Federal, state, and local highways, primitive roads, various-sized communities, utilities, railroads, and agricultural and ranching structures. **The** alternative **would** rejoin the proposed action (MP 364) at the southern end of the Escalante Desert.

The visual resources would not be significantly affected along this alternative. To review the total visual resources which this alternative would affect, refer to MP 0 to MP 196 and MP 364 to MP 610 of the proposed action which would correspondingly preceed and follow the Sevier-Escalante Desert Alternative. (See table 3-11 for a summary of the total number of miles and acres for each VRM Class and VQO which would be crossed by the alternative.)

Land Uses: Agriculture

The Sevier-Escalante Desert Alternative would traverse 84 miles of cropland with the same crop types as the proposed action. See table 3-12 for acreages and mileages of cropland affected. The Sage Compressor Station would be located on native grazing land. Land **use** for the remaining surf facility sites is not known because specific locations are not available at this time.

Socioeconomics

The socioeconomic conditions near the Sevier-Escalante Desert Alternative are similar to those of the RMPP. They are summarized in tables 3-13, 3-14, and 3-15.

Cultural Resources

The discussion of cultural resources for the proposed action and the Central Nevada Alternative also applies to the Sevier-Escalante Desert Alternative where the routes are identical.

Site density is projected as moderate to high where this alternative would parallel the Sevier and Beaver Rivers. Fort Desert, near MP 60, and a Paleo- Indian campsite, near MP 75, are listed on the National Register of Historic Places. Site density is projected as low to moderate where the alternative would cross the Escalante Desert.

Geology and Topography

GEOLOGY

This alternative would cross a portion of the Wasatch Fault Zone at MP 27. No other active faults would be crossed. Expected ground motion values are distributed as follows:

0.04-0.10 g	84.8 miles
0.10-0.20 g	69.5 miles
Greater than 0.20 g	30.5 miles

The last category includes no areas greater than 0.21 g.

Approximately 18 miles of this alternative (MP 30 to MP 50) exhibit high liquefaction potential.

The southern 50 miles of the alternative could be subject to ash falls, and southwest of Delta, Utah, between MP 60 and MP 120, it would pass through an area of potential volcanic activity.

No areas of landslide potential would be crossed.

TOPOGRAPHY

This 182-mile long alternative would cross slightly gentler terrain than the 168 miles of proposed route (MP 196 to MP 364) it would replace. No overall significant difference in construction difficulty because of terrain would be expected. To avoid an imposing ridge of bedrock which the proposed route would cross, the alternative would traverse Leamington Canyon; however, congestion and sidehill construction, described for the Central Nevada Alternative, would be a problem for the alternative.

Water Resources

The Sevier-Escalante Desert Alternative would cross 29 intermittent streams and 35 perennial streams.

ALTERNATIVE E--WEST SALT LAKE ALTERNATIVE

Vegetation

The West Salt Lake Alternative would traverse or have permanent installations located on 16 miles of forest, 8 miles of mountain brush, 145 miles of sagebrush, 133 miles of pinyon-juniper, 86 miles of saltbrush-greasewood, 193 miles of creosote bush, and 85 miles of barren land. Joshua trees and cacti are found scattered in the creosote bush and saltbush-greasewood vegetation types. These areas are largely used for livestock grazing, wildlife habitat, recreation, watersheds, and forest products. Miles of each vegetation type that would be affected are summarized in table 3-1 and located on map S-24.

Wildlife

MAMMALS

The area which would be traversed by the West Salt Lake Alternative in Wyoming from the Kemmerer Compressor Station to the vicinity of Boulder Ridge along Twin Creek (MP 0 to MP 10) is designated as critical deer winter range. The northwestern portion of Utah from Rabbit Creek north to about Lake Ridge (MP 15 to MP 20) and the area of the Pegram Loop in Idaho (MP 33 to MP 40) would cross critical deer winter range for about 7 miles. As this alternative left Idaho and entered Utah, it would first cross deer winter range at the Cache-Box Elder County boundary (MP 64 to MP 70), Blue Spring Hills/West Hills area (MP 73 to MP 86), and a 6-mile long area in the North Promontory Mountains area (MP 96 to MP 102). The area from approximately the Juab-Tooele County boundary south of Erickson Pass northward to about 6 miles north of Erickson Pass (MP 284 to MP 307) is also listed as critical habitat for deer (Day 1981).

Moose are occasionally seen in the Twin Creek area west of the Kemmerer Compressor Station to Boulder Ridge (MP 0 to MP 10). This area is not known as a regular wintering ground for this species, however. There are no known moose populations through the northeast corner of Utah and portions of Idaho where the alternative would pass.

American elk winter along Twin Creek in Wyoming; about 10 miles (MP 0 to MP 10) of their winter range would be crossed. Apparently they do not winter in the areas of Utah or Idaho which this alternative would traverse.

Year-round ranges for pronghorn would be crossed by this alternative from the North Promontory Mountains west across Salt Wells Flat to about Kelton, Utah, and south to about Peplin Flats (MP 102 to MP 141), a distance of about 39 miles. Another area of year-round pronghorn range would be crossed from about the Simpson Mountains to southwest of Sand Mountain (MP 293 to MP 320). From MP 270 to MP 285 on the proposed action portion of this alternative, another pronghorn area would be crossed from White Sage Flats to about Cove Creek.

BIRDS

This alternative would cross minor sage grouse habitat in Wyoming from MP 0 to MP 8 along Twin Creek. Winter concentration areas would be traversed in Utah in the vicinity of Rabbit Creek (MP 15 to MP 18), and a strutting ground might be crossed near South Lake (MP 19). In Idaho, small populations of this bird would be found in the vicinity of the Pegram Compressor Station at about MP 34. As the alternative reentered Utah, it would cross an area of year-long sage grouse habitat from the Hansel Mountains for about 8 miles (MP 120 to MP 128). Another area of year-round range west of the Hogup Mountains would be crossed for about 19 miles (MP 142 to MP 161). A 5-mile long stretch of year- round habitat would be crossed near the Sheep Mountain Area (MP 292 to MP 297).

The gray partridge could occur wherever suitable habitat is found along this alternative for about 110 miles from the Utah/Idaho state line (about MP 53 to about MP 163).

In the north-central portion of Utah where this alternative would enter from Idaho, the ring-necked pheasant would be encountered in all agricultural areas north of Cornish to near Bothwell, Utah (MP 54 to MP 86). A small agricultural area that furnishes habitat for this bird is also located in Blue Creek Valley in Utah (MP 91 to MP 98).

The sharp-tailed grouse would be found along this alternative from about Riverside, Utah, to the Blue Spring Hills (MP 71 to MP 94), an area which furnishes year-round habitat for this species.

The chukar partridge would be found in several areas traversed by this pipeline alternative. Populations occur west and south of Clarkston, Utah, toward Casper Springs (MP 63 to MP 67) and from about Plymouth to the Hansel Mountains (MP 71 to MP 116). The area in the vicinity of the Hogup Mountains (MP 143 to MP 162) is also a good area for these birds. Just west of the Newfoundland Mountains (MP 169 to MP 175), the alternative would cross good chukar habitat, as well as the area west of the Sheeprock Mountains (MP 285 to MP 296).

Marginal waterfowl habitat would be crossed by this alternative from about MP 0 to MP 11 along the Kemmerer Loop (along Twin Creek west of Kemmerer). Higher quality waterfowl nesting areas would be encountered from about MP 11 to MP 21 along the Bear River south of the Utah/Idaho state line.

This alternative would pass within about 1 mile of a good nesting area in the Hogup Mountains from about MP 150 to MP 161. The Newfoundland Mountains from about MP 177 to MP 180 also furnish good raptor nesting habitat.

FEDERAL AND STATE LISTED SPECIES

The black-footed ferret, bald eagle, and desert tortoise, each federally listed species, could all be affected by this alternative in areas identified for the proposed action.

The desert tortoise, a state-listed species which could be affected in Utah, Nevada, and California, is discussed under 'Proposed Action.'

Soils

The West Salt Lake Alternative would most strongly affect the following soil groups: 31 miles of Soil Group 1, 23 miles of Soil Group 2, 73 miles of Soil Group 3, 4 miles of Soil Group 4, 47 miles of Soil Group 5, 35 miles of Soil Group 6, 74 miles of Soil Group 7, 14 miles of Soil Group 8, and 391 miles of Soil Group 9. Refer to the discussion of the proposed action in this chapter and table 3-9 for additional soil information.

Visual Resources

The West Salt Lake Alternative would traverse the Middle Rocky Mountains and Basin and Range physiographic provinces. Landforms vary from flat valleys and transitional slopes along the northern portions of the alternative to broad, expansive flat areas of the distinctive Great Salt Lake Desert and the occasional rolling hills of the intermingled valleys to the south, where the alternative would join the proposed action near Fillmore. Similarly, the vegetation varies from the northern species of high sagebrush, mountain brush, pockets of aspen, conifer, and juniper to the central Utah plants of low growing sagebrush, saltbush, greasewood, and shadscale.

Cultural modifications consist of Federal, state, and local roads, smaller communities, railroads, transmission lines, and agricultural structures. The tabulation in table 3-31 describes those segments which would experience significant visual impacts. (See table 3-11 for a summary of the total number of miles and acres for each VRM Class and VQO which would be significantly affected by the alternative.)

TABLE 3-31 AFFECTED ENVIRONMENT FOR VISUAL RESOURCES: WEST SALT LAKE ALTERNATIVE

MP[1]	VQO[2]	Description
Pipeline[1]		
Beginning at Montpelier, ID		
MP 11-MP 18	R	Landform is rugged mountain slopes with intermingled valleys where the alternative would enter the Caribou National Forest. Vegetation consists of tall conifer and aspen timber types. Modifications consist of State Highway 36, a transmission line and clearing, and recreational **use** areas.
MP 11-MP 18	R	Landform changes to steep dissected canyons with tall conifer and aspen vegetation. State Highway 36, which is used as access for recreation activities, would be paralleled by the alternative.
Ancillary Facilities		
MP 0	4	Montpelier Compressor Station and maintenance base. Landform consists of the flat valley bottom along the Bear River. The area is agriculturalized. Cultural modifications include urban fringe development and agricultural structures and the area can be viewed from the community of Montpelier and U.S. Highways 89 and 30N.

[1]Only those segments and facilities which would be significantly affected by the West Salt Lake Alternative are described. The Visual Resource would not be significantly affected along the Kemmerer Loop (MP 0 to MP 217). The Visual Resource would not be significantly affected along the Pegram Loop (MP 33.3 to MP 40.5).

[2]Refer to table 3-10 for definitions of terms.

NOTE: To review the total visual resources which would be affected by this alternative, refer to MP 254 to MP 610 of the proposed action, which wou follow the West Salt Lake Alternative.

Land Uses: Recreation Resources, Agriculture, and Conflicts with Land Use Plans, Policies, and Controls

RECREATION RESOURCES

The West Salt Lake Alternative would follow the general alignment of State Highway 36 (also known as the Emigration Canyon Road) through approximately 12 miles of the Caribou National Forest in southeastern Idaho (located approximately between MP 10 and MP 22). The area surrounding the highway in the canyon has a high recreational **use** (FS 1978). Such recreational experiences as hunting and fishing (Strawberry Creek), gathering firewood along the highway, viewing scenery (Emigration, Williams, and Strawberry Canyons), and camping at the Emigration Pass campground are noted for this area. **(FS 1978).**

The alternative would also cross the Desert Mountain area, southwest of the Great Salt Lake, a popular ORV 'free play' and organized events area.

AGRICULTURE

The West Salt Lake Alternative would traverse 87 miles of cropland which produces crops similar to those of the proposed project area. See table 3-12 for acreages and mileages of cropland that would be affected.

Estimates of surface facility sites for this alternative which might affect agricultural lands (including a proposed compressor station in the vicinity of Montpelier, Idaho) are indicated in table 3-12.

CONFLICTS WITH LAND USE PLANS, POLICIES, AND CONTROLS

No known conflicts with land **use** plans or policies would be caused by West Salt Lake Alternative. However, when the total length from Wyoming to California is considered, it, like the proposed action, would not coincide with the 3,000-foot wide BLM utility corridor through 70,000 acres transferred from BLM administration to the Moapa Indian Reservation.

SOCIOECONOMICS

Most of the counties that would be affected by the construction of the West Salt Lake Alternative are rural, with population densities ranging from 1.3 to 13.4 people per square mile. The exception is Cache County, Utah, which has a population density of 48.7 people per square mile. The small economy of the two counties that would be crossed by the alternative in Idaho- -Bear Lake and Franklin--is oriented toward agriculture, especially beef and dairy farming. The alternative area in Cache County, which lies south of Franklin County, is also agricultural. The recreation industry is prominent here because of the Caribou National Forest, which comprises a large percentage of southeastern Idaho. The remainder of the alternative would cross the Great Salt Lake Desert, which is virtually unpopulated. The counties here are Box Elder, Tooele, Juab, and Millard. Table 3-32 identifies the socioeconomic characteristics of the five regions which would be affected by this alternative; table 3-15 identifies the county property tax revenues in the alternative area.

0Property taxes of the counties traversed by this alternative are quantified in table 3-15. Police and medical services are not quantified; however, expected impacts are discussed in chapter 4.

To construct and operate the West Salt Lake Alternative, the applicant might **use** the double-jointing yard locations listed in table 2-2. These locations are presented merely for illustration and may in fact not be feasible because of engineering or logistical considerations; therefore, the socioeconomic characteristics of the sites are not considered in this analysis.

TABLE 3-32

SOCIOECONOMICS PROFILE: WEST SALT LAKE ALTERNATIVE

Construction	MP	State	Counties	Preliminary Population, 1980	Average Employment, 1979	Personal Income, 1977 ($1,000)	Retail Sales, 1977 ($1,000)	Housing: Hotel/ Motel Rooms	Housing: Campsites with Hookups
[a]Montpelier Compressor Station	0	Idaho	Bear Lake	3,114	2,492	15,295	[b]13,473	128	64
[c]Pipeline Spread 1	0-80	Idaho Utah	Bear Lake Franklin, Cache, Box Elder	106,465	44,925	426,630	259,650	521	207
Pipeline Spread 2	80-200	Utah	Box Elder, Tooele	59,224	23,719	266,410	128,040	556	90
Pipeline Spread 3	200-300	Utah	Tooele, Juab	31,528	10,027	139,090	66,734	682	157
Pipeline Spread 4	300-363	Utah	Millard	8,736	3,439	31,220	18,724	247	73

[a]Because this construction work force would be stationary and near Montpelier, most of the impact would occur in Montpelier. Therefore, data are for Montpelier only.

[b]Derived by multiplying county retail sales by 0.75 to reflect sales in Montpelier. Multiplier is an estimate based on Montpelier's role as the trade center of the county.

[c]This spread would also construct 28 miles of pipeline loop along the Northwest pipeline between Kemmerer, Wyoming, and Montpelier, Idaho. Because this route would be the same as the Northern Systems Alternative, the socioeconomic profile of the Northern Systems Alternative is adopted by reference.

Sources: Idaho Department of Employment 1980. Mobil Oil Corporation 1980. Sargent 1980. Smith 1980. U.S. Department of Commerce, 1972, 1980a, 1980d, 1980e. Utah Industrial Development Division 1979. *Woodall's Campground Directory* 1980.

Cultural Resources

The discussions for the proposed action and Alternative A also apply to the West Salt Lake Alternative where the routes are identical.

This alternative would transect Bear Lake and Cache Valleys and associated drainages. In those areas, site density is projected as moderate to high with numerous residential or field camps (DeLisio 1971).

Site density is projected as low to moderate where the alternative would cross the flats of the Great Salt Lake, except where special **use** sites a located. Hogup Cave near MP 150 (Aikens 1970), is listed on the National Register of Historic Places.

Geology and Topography

GEOLOGY

Approximately 100 miles of this alternative would experience an expected ground motion of 0.20 to 0.21 g. Of the remaining route, 203 miles would fall between 0.1 g and 0.2 g; 60 miles would fall between 0.04 g and 0.1 g. Virtually the entire alternative would be in UBC Zone 3.

Potential fault hazard exists on the west side of Bear Lake Valley from MP 12 to MP 13, and faults which might pose a threat occur between MP 27 and MP 36 in the Bear River Range. Definite fault hazard would be present between MP 66 and MP 69 and between MP 111 and MP 113 in the Hansel Mountains.

Liquefaction potential exists in Bear Lake Valley (MP 0 to MP 7), in Cache Valley (MP 40 to MP 63), and probably between MP 70 and MP 80, MP 94 and MP 95, and MP 107 and MP 110. Additional areas of concern are the mud flats of the Great Salt Lake near Kelton (MP 125 to MP 135) and from MP 156 to MP 225, the western and southern portions of the Skull Valley (near MP 260), and the crossing of the Sevier River (MP 329 to MP 334).

Hazard from lava flows would be present at MP 122 and MP 140. No significant ash falls are likely. Landslides have not been reported along the alternative.

TOPOGRAPHY

Portions of the Kemmerer and Pegram Loops (28.7 miles), already described for the Northern Systems Alternative, and the area between about MP 10 and

MP 25 of this alternative would traverse rough terrain.

Water Resources

The West Salt Lake Alternative would cross 20 intermittent streams and **25** perennial streams.

Noise Quality

The noise environment adjacent to the Montpelier Compressor Station would be similar to that discussed for the RMPP. Existing sources of noise emissions in the vicinity are Idaho State Highways 10, 30N, and 89. The exact distance from each of these highways to the compressor station cannot be determined. The nearest residence to the Montpelier Compressor Station is also not known. However, the ambient noise levels at this site **should** be similar to the values for the Sage Compressor Station.

Air Quality

The West Salt Lake Alternative would be located in the following AQCR's:

Wyoming	Wyoming Intrastate (AQCR 243)
Idaho	Idaho Intrastate
Utah	Four Corners Intrastate (EPA-014)
	Utah Intrastate (219)
	Wasatch Front (220)
Nevada	Clark-Mohave-Yuma Interstate
	Nevada Interstate
California	South Coast Air Quality Management Districts

The ambient air quality along this alternative route is generally good, typical of the nonindustrial areas of the Southwest. However, Bear Lake County, Idaho, exceeds the primary standard for TSP. The remainder of the counties along the West Salt Lake Alternative which do not coincide with those which the RMPP would traverse meet the primary and secondary standards for all criteria pollutants. The attainment status for each county along the West Salt Lake Alternative is shown in table 3-33. The status of the remainder of the counties, the same as those for the RMPP, can be found in table 3-19.

The alternative would install 23,350 **nominal horsepower** of compression **(about 15,878 site rated) at the Montpelier Compressor Station (about 15,878 site-rated horsepower) at the Montpelier Compressor Station in Bear Lake County, Idaho. In** the future to transport 800,000 Mcfd, the alternative would require the addition of 29,050 **nominal horsepower (19,754 site rated)** to the Montpelier Compressor Station **along with three booster stations in Box Elder (18,800 nominal horsepower/12,838 site), Millard (19,200 nominal horsepower/13,056 site), and Washington (9,050 nominal horsepower/6,154 site) Counties, Utah. Table 3-20 lists the approximate maximum ambient air quality levels at these sites.**

No Class I areas in Nevada and California would be affected because they would be more than 150 miles from the alternative compressor stations. The Class I area closest to the Montpelier Compressor Station would be the combined Yellowstone and Grand Teton National Parks, about 150 miles northeast of the compressor station. The compressor station in Millard County, Utah, would be located 60 miles to the northwest of Capitol Reef National Park in Utah. Zion National Park, the Class I area closest to the alternative route, would be located 35 miles due east of the compressor station in Washington County, Utah.

ALTERNATIVE F--PROVO CANYON ALTERNATIVE

Vegetation

The Provo Canyon Alternative would traverse or have permanent installations on 5 miles of forest, 45 miles of mountain brush, 133 miles of sagebrush, 87 miles of pinyon-juniper, 57 miles of salt-

TABLE 3-33 (REVISED)

AMBIENT AIR QUALITY ATTAINMENT STATUS FOR COUNTIES ALONG THE WEST SALT LAKE ALTERNATIVE

[a]County	State	Total Suspended Particulates	Sulfur Dioxide	Ozone	Carbon Monoxide	Nitrogen Dioxide
Lincoln	Wyoming	B	B	C/B	C/B	C/B
Rich	Utah	B	B	C/B	C/B	C/B
Bear Lake	Idaho	[b]P	[c]B	[d]C/B	C/B	C/B
Box Elder	Utah	C/B	C/B	C/B	C/B	C/B
Tooele	Utah	C/B	P	C/B	C/B	C/B
Juab	Utah	C/B	C/B	C/B	C/B	C/B

[a]The West Salt Lake Alternative would follow the proposed RMPP route from MP 225. The attainment status for these counties appears in the discussion of the RMPP.

[b]P--Does not meet primary standards. Only a portion of Steptoe Valley in White Pine County is in nonattainment for SO_2.

[c]B--Better than national standards.

[d]C/B--Cannot be classified or better than national standards.

bush-greasewood, and 193 miles of creosote bush vegetation. Joshua trees and cacti are scattered throughout saltbush-greasewood and creosote bush vegetation types. Mileages of each vegetation type that would be affected are summarized in table 3-1 and located on map S-24. These areas are largely used for livestock grazing, wildlife habitat, recreation, watersheds, and forest products.

Wildlife

MAMMALS AND BIRDS

The first deer winter range which would be encountered by this alternative after it left the proposed route is near Dutch Hollow Creek (MP 11). This area of winter range continues about 28 miles to near Mahogany Mountain northeast of American Fork (MP 39). Deer winter ranges would not be crossed again until the alternative neared Buckhorn Mountain (MP 87); this area of winter range would then continue along the alternative until it rejoined the proposed action at MP 115 near Mills Valley.

Habitat suitable for sagegrouse would be encountered by this alternative at about MP 93 at the head of Kimball Creek near the Utah-Juab County line.

Suitable cliff nesting habitat for raptors such a golden eagles, prairie falcons, and great horned owls would be found in a 19-mile long stretch of the Provo Canyon Alternative (MP 5 to MP 24). No golden eagle nests are known to be closer than 2 miles to **this** alternative.

FEDERAL AND STATE LISTED SPECIES

The federally listed black-footed ferret, bald eagle, and desert tortoise could all be affected by this alternative in the areas affected by the proposed action.

The state-listed desert tortoise would be affected in the areas of Utah, Nevada, and California noted for the proposed action.

Soils

The Provo Canyon Alternative would most strongly affect the following soil groups: 61 miles of Soil Group 1, 24 miles of Soil Group 2, 35 miles of Soil Group 3, 5 miles of Soil Group 4, 47 miles of Soil Group 5, 16 miles of Soil Group 6, 4 miles of Soil Group 7, 17 miles of Soil Group 8, and 232 miles of Soil Group 9. Refer to the discussion of the proposed action in this chapter and table 3-9 for additional soil information.

Visual Resources

The Provo Canyon Alternative would be within the Colorado Plateaus and Basin and Range physiograph provinces. Landform is characterized by transitional to steep, mountainous slopes of the Wasatch Range, with interspersed intermountain valleys and plateaus. Vegetation ranges from sagebrush on the valley bottom to juniper on the intermediate slopes and mountain brush and mixed conifer and aspen stands on the higher slopes. Cultural modifications range from large communities and cities, Federal and state highways, primitive roads, utilities, railroads, and ranching structures. Table 3-34 describes those segments which would experience significant visual impact. (See table 3-11 for a summary of the total number of miles and acres for each VRM Class and VQO which would be crossed by the alternative.)

TABLE 3-34

AFFECTED ENVIRONMENT FOR VISUAL RESOURCES: PROVO CANYON ALTERNATIVE

MP	VRM Class and/ or VQO[2]	Description
Pipeline[1]		
MP 7-MP 15	2	Landform is a flat valley bottow with transitional slopes. Vegetation consists of sagebrush and agricultural areas. Cultural modifications are dominant and consist of Heber City and the surrounding urbanized area, U.S. Highway 40, and State Highway 233. The alternative would border the Wasatch Mountain State Park between MP 9 and MP 11.
MP 15-MP 21	2	The steep side slopes extend upward from the Deer Creek Reservoir shoreline and are covered by sagebrush. Modifications include a scenic railroad line. The area borders the Wasatch Mountain State Park. The area can be viewed from Heber City and environs, the state park, and the railroad.
MP 21-MP 30	R	The alternative route would follow the steep, rugged, and confined landform of the Provo Canyon sculptured by the Provo River as it enters the Uinta National Forest. Vegetation consists of a sagebrush, conifer and deciduous mixture, riparian, and domesticated species. Cultural modifications have extensively changed the character of the natural landscape and include U.S. Highway 189, a scenic railroad line, an aboveground water pipeline, a power generation plant and substation, gravel pits, the community of Olmstead, State Highway 52, many landform scars, recreation sites, Bridal Veil Falls recreation site, and numerous other urbanization modifications. The area is highly sensitive from all viewing positions.
MP 30-MP 32	R,2	The transition to steep mountainous slopes is covered with juniper higher up. The area is viewed from the Orem urbanized area.
MP 32-MP 33	PR,3	The steep slopes are covered with sagebrush, with juniper on the higher slopes. Cultural modifications include an aqueduct and primitive roads; the alternative right-of-way would be visible from the urbanized area.
MP 33-MP 35	R,PR	The steep, mountainous slopes are vegetated with sagebrush and juniper. Primitive roads, an aqueduct, and a transmission line are visible modifications. The area is viewed from the urbanized areas and nearby estates.
MP 35-MP 38	PR,2	Landform consists of mountainous terrain with sagebrush and juniper vegetation. Cultural modifications include an aqueduct, primitive roads, and a transmission line. The area is viewed from the urbanized area.
MP 38-MP 53	2	The landform varies from steep slopes, through transitional grades, to the flat valley bottom. Vegetation consists primarily of sagebrush. The alternative would be routed within an urbanized area surrounding the American Falls region.
Ancillary Facilities Same as the proposed action.		

[1]Only those segments which would be significantly affected by the Provo Canyon Alternative are described.

[2]Refer to table 3-10 for definitions of terms.

NOTE: To review the total visual resource which would be affected by this alternative, refer to MP 0 to MP 108 and MP 214 to MP 610 of the proposed action which would correspondingly precede and follow the Provo Canyon Alternative.

Land Uses: Agriculture and Conflicts with Land Use Plans, Policies, and Controls

AGRICULTURE

The Provo Canyon Alternative would traverse 99 miles of cropland similar to that along the proposed action, with the exception of the area surrounding the city of Provo, which includes areas of fruit orchards ranging from 1 to 10 acres. See table 3-12 for acreages and mileages of cropland affected.

The Sage Compressor Station would be located on native grazing land. Land **use** for the remaining surface facility sites is not known because specif locations are not available at this time.

CONFLICTS WITH LAND USE PLANS, POLICIES, AND CONTROLS

No known conflicts with lands **use** plans or policies would be caused b Provo Canyon Alternative. However, when the whole length of the alternative is considered, this alternative would not follow the 3,000-foot wide BLM utility corridor through the 70,000 acres transferred from BLM administration to the Moapa Indian Reservation.

Socioeconomics

Table 3-35 lists the pertinent socioeconomic characteristics of the region that would be affected by the Provo Canyon Alternative. Table 3-15 identifies the property taxes in counties that would be crossed by the alternative. This alternative would diverge from the proposed route near Heber City, Utah, cross the Wasatch Range through Provo Canyon, circumvent the Provo-American Fork area, and connect with the proposed route near Mills, Utah. Most of the area is rural, with population densities ranging from 1.6 to 7.2 people per square mile. **Police and medical services are not quantified. However the expected impacts are discussed in chapter 4.**

Provo Canyon is a scenic tourist attraction in Utah. The canyon is also a major utility corridor, containing three municipal water pipelines, an aqueduct for a power company, two canals, a road, and a railroad. Because the canyon is narrow, it is congested by these utilities.

The town of Springdell, comprised mainly of recreational and seasonal homes, is also in Provo Canyon. The town's zoning ordinance prohibits the installation of high-pressure gas pipelines **without a special use** permit. North of Orem, the alternative would cross the municipal boundaries of either Cedar Hills, Highland, or Alpine City. The local zoning ordinances of these towns are unknown.

To construct this alternative, the applicant might **use** the double-jointing yards and maintenance bases are listed in table 2-2. These locations are presented merely for illustration and may in fact not be feasible because of engineering or logistical considerations; therefore, the socioeconomic characteristics of the sites are not considered in this analysis.

TABLE 3-35

SOCIOECONOMIC PROFILE: PROVO CANYON ALTERNATIVE

Construction	MP	State	Counties	Estimated Population, 1980	Average Employment, 1979	Average Unemployment, 1979	Personal Income, 1977 ($1,000)	Retail Sales, 1977 ($1,000)	Housing	
									Hotel/ Motel Rooms	Campsites with Hookups
Pipeline Spread 1	0-100	Utah	Summit, Wasatch, Utah, Salt Lake, Juab.	857,141	355,519	15,506	3,934,710	2,610,818	9,709	1,276

Sources: Mobil Oil Corporation 1980. Sargent 1980. U.S. Department of Commerce, Bureau of the Census 1972, 1980a, 1980d, 1980e. Utah Industrial Development Division 1980a. *Woodall's Campground Directory* 1980.

Cultural Resources

The discussion for the proposed action also applies to the Provo Canyon Alternative where the routes are identical.

This alternative would transect the perimeter of Heber and Goshen Valleys and be routed near Lake Utah. These areas are projected to have moderate to high site densities. The alternative would traverse the area near the old town of Goshen (MP 80). Petroglyph and pictograph sites have been recorded in this area.

Geology and Topography

The first 40 miles of this alternative would be subject to an expected ground motion of between 10 and 20 percent g. The remaining 75 miles would be subject to 20 to 21 percent g. Between MP 32 and MP 40, the alternative would parallel **and cross** the Wasatch fault and be subject to fault rupture hazard; high potential for liquefaction occurs between MP 46 and MP 50 and for the last mile of the route.

No hazard from volcanic activity is present, but landsliding hazard exists between MP 27 and MP 30.

With the exception of Provo Canyon (alternative MP 20 to MP 32), topographic constraints on construction should be minimal. However, within the canyon, severe construction constraints would be imposed by the topography--exacerbated by the presence of the **Wasatch City Mountain Railway; Provo River; U.S. Highway 189; the Provo City water pipelines; the Alta Springs and Canyon Springs water pipelines (Orem City); the Murdock Canal; and the Salt Lake City and Union** (Utah Power and Light) Aqueducts. Side slopes of 60 percent to more than 100 percent are domunant in this area.

Water Resources

The Provo Canyon Alternative would cross 28 intermittent streams and 25 perennial streams.

VARIATION 2--THISTLE CREEK VARIATION

Vegetation

The Thistle Creek Variation would traverse 13 miles of sagebrush and 9 miles of pinyon-juniper vegetation. Miles of each vegetation type that would be affected are identified in table 3-1 and located on map S-24. These areas are used largely for livestock grazing, wildlife habitat, recreation, and watersheds.

Wildlife

Deer winter ranges would be encountered along this variation in two locations, MP 0 to MP 2 and MP 9 to MP 27, for a total of 20 miles of winter range. (Refer to table 3-3 for additional information.)

Sagegrouse habitat would be encountered along this variation near the Utah-Sanpete County line (approximately MP 22).

Suitable cliff nesting habitat for raptors such as golden eagles, prairie falcons, and great horned owls would be found in a 9-mile long stretch of this variation. No golden eagle nests are known to occur in areas closer than 2 miles to the route.

Soils

The Thistle Creek Variation would traverse 19 miles of Soil Group 1, which would be strongly affected by project construction. Refer to the discussion of the proposed action in this chapter and table 3-9 for additional soil information.

Visual Resources

The Thistle Creek Variation would lie entirely within the Middle Rocky Mountains physiographic province. The physical characteristics are described in table 3-36 which illustrates how the variation would significantly affect the visual environment. (See table 3-11 for a summary of the number of miles and acres of each VRM Class which would be crossed by the variation.)

TABLE 3-36

AFFECTED ENVIRONMENT FOR VISUAL RESOURCES: THISTLE CREEK VARIATION

MP	VRM Class and/ or VQO[2]	Description
Pipeline[1]		
MP 0-MP 10	2	Landform consists of the steep, restricted Soldier Creek Canyon through mountainous terrain. Vegetation consists of sagebrush with juniper on higher slopes. The variation would follow U.S. Highway 6/50, a railroad, and Soldier Creek and would bypass the community of Thistle.
MP 10-MP 19	3	Landform is a steep, restricted canyon. Vegetation consists of sagebrush with juniper on the upper slopes. The route would follow a river, U.S. Highway 89, and a railroad.

[1]Only those segments which would be significantly affected by the Thistle Creek Variation are described. The ancillary facilities would not significantly affect the visual resource.

[2]Refer to table 3-10 for definitions of terms.

NOTE: The affected visual resources of this variation would replace the proposed action between MP 156 and MP 176.

Land Uses: Agriculture and Conflicts with Land Use Plans, Policies, and Controls

AGRICULTURE

The Thistle Creek Variation would traverse approximately 6 miles of meadow lands used for hay and pasture. See table 3-12.

CONFLICTS WITH LAND USE PLANS, POLICIES, AND CONTROLS

The proposed action would cross the T and S zone of the Utah County Land Use Plan in the Thistle and Sheep Creek areas. The T and S zone designates roadside business. It limits gas pipelines to 16 inches in diameter and 600 poundes per square inch of pressure.

Geology and Topography

This entire variation would be subject to an expected ground motion of 10 to 20 percent g; however, it would cross no active faults. No significant liquefaction potential exists along this variation, nor is there any hazard of volcanic activity. Between MP 11.6 and MP 14.6, there is a moderate potential for landsliding.

The variation, 27 miles long and about 7 miles longer than the stretch of proposed route (MP 156 to MP 176) it would replace, would require sidehill construction along about 50 percent of its length. While the entire variation would be within 200 feet of 5,800 feet in elevation, it would have to be constructed in narrow canyons already occupied by either Soldier or Thistle Creeks, U.S. Highways 6 or 89, and the Denver and Rio Grande Western Railroad. This portion of the proposed route would require sidehill construction on less than 20 percent of its length.

Water Resources

The Thistle Creek Variation would cross two intermittent streams and five perennial streams.

VARIATION 3--EAST LAS VEGAS VARIATION

Vegetation

The East Las Vegas Variation would traverse 59 miles of creosote bush vegetation. Joshua trees and cacti occur scattered within creosote bush vegetation along the variation. Acreages and mileages of each vegetation type that would be affected are identified in table 3-1 and located on map S-24. These areas are used largely for recreation, wildlife habitat, and livestock grazing.

Wildlife

The Dry Lake Range furnishes habitat for desert bighorn sheep which occasionally move into this area from the Muddy Mountains (about MP 488 of the proposed action). The East Las Vegas Variation would cross sheep range at the extreme western edge of the Sunrise Mountains (MP 14). It would cross a migration route between the River Mountains and the McCullough Range (MP 28) as well as sheep habitat on the lower slopes of the McCullough Range (MP 28 to MP 30). Farther to the south, the variation would cross a migration route for sheep between the McCullough Range and the River Mountains (MP 32) and another migration path between the Highland Range and the Eldorado Mountains near the southern end of this variation at about MP 53.

The East Las Vegas Variation would cross feral horse range just east of the McCullough Range south of Las Vegas (MP 32 to MP 44).

The state listed desert tortoise could be affected over the entire length of this variation.

Soils

The East Las Vegas Variation would most strongly affect 17 miles of Soil Group 5 and 59 miles of Soil Group 9. Refer to the discussion of the proposed action in this chapter and table 3-9 for additional soil information.

Visual Resources

The East Las Vegas Variation would lie entirely within the Basin and Range physiographic province. The landform is predominantly a flat broad desert landscape with occasional transitional slopes and steep mountainous areas. Vegetation consists of the typical hot desert species of creosote bush growing in a sparse, well-spaced pattern, with occasional Joshua trees and cacti. Cultural modifications include the urbanized areas of Las Vegas and Henderson, Nevada, a number of Federal and state highways, high voltage transmission lines, and other utilities. Table 3-37 more explicitly describes areas which would be affected. (See table 3-11 for a summary of the total number of miles and acres for each VRM Class which would be crossed by the variation.)

TABLE 3-37

AFFECTED ENVIRONMENT FOR VISUAL RESOURCES: EAST LAS VEGAS VARIATION

MP	VRM Class and/ or VQO[2]	Description
Pipeline[1]		
MP 3-MP 8	2	Landform is a flat desert covered with a sparse pattern of creosote bush. The variation would cross the Las Vegas Dunes Recreation Area established by the BLM.
MP 27-MP 42	2	The flat to gently rolling terrain is vegetated with creosote bush and is located within the proposed McCullough Mountain National Natural Landmark (Heritage Conservation and Recreation Service (HCRS)). The northern portion is near an established housing subdivision, and high voltage transmission lines cross the southern portion. The area is viewed from U.S. Highways 95 and 93 and the urbanized area of Henderson.

[1]Only those segments which would be significantly affected by the East Las Vegas Variation are described. The ancillary facilities would not significantly affect the visual resource.

[2]Refer to table 3-10 for definitions of terms.

NOTE: The affected visual resources of this variation would replace the proposed action between MP 488 and MP 544.

Land Uses: Recreation Resources, Conflicts with Land Use Plans, Policies, and Controls, and Las Vegas Area Land Use Conflicts

RECREATION RESOURCES

The East Las Vegas Variation would cross the heart of the Las Vegas Sand Dunes Recreation Land (MP 3 to MP 8). This BLM-designated area is the annual site of nearly 30 ORV events, as well as typical free play ORV activity. The variation would also cross a popular spectator vista used to view ORV events, including the Mint 400 ORV event. (See 'Proposed Action' for more information on the Mint 400 event.)

CONFLICTS WITH LAND USE PLANS, POLICIES, AND CONTROLS

The East Las Vegas Variation corridor would pass through land administered by the Clark County Sanitation District. The District maintains existing sanitation facilities and plans to expand within the mile-wide corridor.

LAS VEGAS AREA LAND USE CONFLICTS

The East Las Vegas Variation would cross the one-mile width between Nellis Air Force Base and Lake Mead Base which is controlled by the U.S. Air Force (between MP 12 and MP 13). At present, two water wells are located in this area.

The variation would conflict with the 112-foot wide right-of-way for Sloan's ditch (from approximately MP 14 to MP 21). The ditch, trapezoidal in shape and earthen-lined would be used for flood control. A 12-foot wide service road parallels the ditch.

In addition, Clark County Sanitation District proposed an effluent export pipeline from Clark County sewage dipsosal plant to the planned Harry Allen Station in the Dry Lake Valley area between the Sloan's ditch and Nellis Air Force Base. However, urban growth, including large lot, custom-built houses and higher density dwellings, has overtaken the area in the last several years. The Sanitation District now feels it would be difficult to obtain the required 50-foot wide right-of-way for the effluent export pipeline on the segment between the sewage disposal plant and Nellis. The East Las Vegas Variation would overlay Sloan's ditch and closely parallel the original proposed location of the effluent export pipeline.

The variation would traverse the SW 1/4 of section 26, T21S, R62E, parallel to the lower western boundary of the proposed Clark County Wetlands Park. This particular area is approved for a mobile home park. The mile wide corridor would also cross at least one subdivision in the Henderson area.

Cultural Resources

The East Las Vegas Variation would traverse the Las Vegas Wash vicinity. A long cultural sequence and high site density have been recorded in this area. The variation would pass near the Big Spring site on the National Register of Historic Places.

Geology and Topography

In a 50-year period, about 37 miles of this variation would be expected to experience no more than 4 percent g, the remainder no more than 10 percent g. No fault hazard, liquefaction hazard, or landslide hazard is present. The only potential volcanic hazard would be ash fall.

This 59-mile long variation would be 3 miles longer than the section of proposed route (MP 488 to MP 544) it would replace. It would also cross somewhat gentler terrain. However, neither route would experience significant topographic constraints on construction.

Water Resources

The East Las Vegas Variation would cross two intermittent streams and no perennial streams.

VARIATION 4--FORT MOJAVE VARIATION

Vegetation

The Fort Mojave Variation would traverse 10 miles of creosote bush vegetation, including numerous scattered Joshua trees and cacti. The miles of this vegetation type which would be affected are summarized in table 3-1 and located on map S-24. These areas are used largely for recreation, wildlife habitat, and livestock grazing.

Wildlife

STATE LISTED SPECIES

This variation would cross habitat of the desert tortoise throughout its entire length of 10 miles. Densities of tortoises in this area are an estimated 50 to 100 per square mile.

Soils

The Fort Mojave Variation would most strongly affect the following soil groups: 2 miles of Soil Group 2, 1 mile of Soil Group 4, 9 miles of Soil Group 6, 2 miles of Soil Group 8, and 10 miles of Soil Group 9. Refer to the discussion of the proposed action in this chapter and table 3-9 for additional soil information.

Cultural Resources

This variation would traverse the edge of the Dead Mountains. Native Americans of the Mohave, Chemehuevi, and Quechan (Yuma) Indian tribes had prehistoric and historic **use** rights and religious traditions attached to area. These tribal groups are today represented by descendents living on the Fort Mojave Indian Reservation, the Colorado River Indian Reservation, the Chemehuevi Indian Reservation, and locations off the reservation as well. Avikwamme (Mt. Newberry), **15 miles from the variation,** at the north end of the Dead Mountains is the single, most important mythical location in all Mojave religion; it is also considered sacred by the Chemehuevi and Quechan. A report detailing the ethnography of this area is included as an appendix to the *Cultural Resources Technical Report* (Museum of Northern Arizona 1981).

Water Resources

The Fort Mojave Variation would cross one intermittent stream and no perennial streams.

VARIATION 5--MILL CREEK VARIATION

Vegetation

The Mill Creek Variation would traverse 2 miles of forest vegetation, 13 miles of mountain brush, 2 miles of sagebrush, and 4 miles of pinyon-juniper. Miles of each vegetation type that would be affected are identified in table 3-1 and located on map S-24. These areas are used largely for recreation, wildlife habitat, livestock grazing, and transportation corridors.

Wildlife

Deer winter ranges would be crossed by the Mill Creek Variation throughout its entire length of 21 miles from where it left the proposed action (MP 156) until it rejoined the proposed action (MP 169). Some waterfowl habitat would be crossed by this variation between about MP 3 and MP 7 and 10-13 for a total of 7 miles.

Soils

The Mill Creek Variation would traverse 21 miles of Soil Group 1, which would be most strongly affected by project activities. Refer to the discussion of the proposed action in this chapter and table 3-9 for additional soil information.

Visual Resources

The Mill Creek Variation would lie entirely within the Colorado Plateaus physiographic province. The physical characteristics which distinguish this mountainous region from other neighboring provinces is evidenced by the description in table 3-38. Only that segment of the route which would place a significant impact on the landscape is narrated. (See table 3-11 for a summary of the total number of miles and acres for each VRM Class which would be crossed by the variation.)

TABLE 3-38

AFFECTED ENVIRONMENT FOR VISUAL RESOURCES: MILL CREEK VARIATION

MP	VRM Class and/ or VQO[2]	Description
Pipeline[1]		
MP 0-MP 6	2	Landform consists of a steep, confined canyon. Vegetation is chiefly sagebrush, with juniper on the upper slopes. The canyon is presently dominated by Soldier Creek, U.S. Highway 6/50, a railroad, and utility lines.

[1]Only those segments which would be significantly affected by the Mill Creek Variation are described. The ancillary facilities would not significantly affect the visual resource.

[2]Refer to table 3-10 for definitions of terms.

NOTE: The affected visual resources of this variation would replace the proposed action between MP 156 and MP 169.

Geology and Topography

The last 0.3 mile of this variation could experience fault rupture. The expected peak ground motion for the whole variation is 10 to 20 percent g. There is no significant potential for liquefaction or volcanic hazards other than ash fall. Moderate potential for landsliding exists for about 8 miles south of MP 13.

This 20.7-mile long variation would replace MP 156.8 to MP 168.7 of the proposed route. The northernmost 4 miles would extend east along Soldier Creek, remaining at an elevation of between 5,800 and 6,400 feet.

The variation, although in rough terrain, would be easier to construct **than** the proposed route, **because** the existing road along Dairy Fork, West Lake Fork, and Little Clear Creek could not be used for the RMPP.

Water Resources

The Mill Creek Variation would cross one intermittent stream and no perennial streams.

VARIATION 6-II--DANIELS CANYON VARIATION II

Vegetation

The Daniels Canyon Variation II would traverse 3 miles of forest vegetation types, 3 miles of mountain brush, and 1 mile of sagebrush. Miles of each vegetation type that would be affected are identified in table 3-1 and located on map S-24. These areas are used largely for recreatrion, wildlife habitat, livestock grazing, and forest products.

No additional threatened and endangered species would be affected by this variation.

Wildlife

No deer winter ranges would be encountered by this variation, nor would sagegrouse or waterfowl habitat be disturbed. Small mammal and bird habitat totaling an estimated 85 acres (7 miles) would be disturbed along this variation. Raptor habitat is also found along the 7 miles of this variation.

Soils

The Daniels Canyon Variation II would traverse 7 miles of Soil Group 1, which would be most strongly affected by project activities. Refer to the discussion of the proposed action in this chapter and table 3-9 for additional soil information.

Visual Resources

The Daniels Canyon Variation II would lie entirely within the Colorado Plateaus physiographic province. The physical characteristics which distinguish this mountainous region, with intermingled narrow valleys and rugged slopes from adjacent physiographic provinces are illustrated in table 3-39. Only those segments of the variation which would place significant impacts on the visual landscape are narrated. (See table 3-11 for a summary of the total number of miles and acres for each VQO which would be crossed by the variation.)

TABLE 3-39

AFFECTED ENVIRONMENT FOR VISUAL RESOURCES: DANIELS CANYON VARIATION II

MP	VQO[2]	Description
Pipeline[1]		
MP 0-MP 1	M,PR	The landform consists of rolling slopes to steep ridges with a mixture of sagebrush and mountain brush vegetation. The variation alignment would be viewed from the Indian Creek Road and local primitive roads.

[1]Only those segments which would be significantly affected by the Daniels Canyon Variation II are described. The ancillary facilities would not significantly affect the visual resource.

[2]Refer to table 3-10 for definitions of terms.

NOTE: The affected visual resources of this variation would replace the proposed action between MP 144 and MP 150.

Land Uses: Agriculture

The Daniels Canyon Variation II would not traverse any cropland.

Cultural Resources

The Daniels Canyon Variation II is expected to have a low site density of low significance for prehistoric resources. The variation is considered highly sensitive with respect to historic and ethnographic resources.

Water Resources

The Daniels Canyon Variation II would cross two intermittent streams and no perennial streams.

VARIATION 7--MOAPA VARIATION

Vegetation

The Moapa Variation would traverse scattered Joshua trees and cacti along approximately 29 miles of creosote bush vegetation. Acreages and mileages of each vegetation type that would be affected are identified in table 3-1 and located on map S-24. These areas are used largely for recreation, wildlife habitat, and livestock grazing.

Wildlife

MAMMALS AND BIRDS

Numerous species of small burrowing rodents would be found in creosote bush vegetation along the approximately 31-mile long route. Population levels of these species are cyclic, and numbers are highly variable from year to year. Numerous small desert-dwelling passerine birds also occupy these habitat types, as well as a few species of raptors.

REPTILES AND AMPHIBIANS

Reptiles, common in desert shrub habitas, can be found along the entire length of this variation. The state-listed desert tortoise is also found in small numbers along the 31-mile length of this variation.

Soils

The Moapa Variation would most strongly affect the following Soil Groups: 1 mile of Soil Group 2, and 3 miles of Soil Group 3. In addition all 31 miles are in Soil Group 9, soils of low rainfall. Refer to the discussion of the proposed action in chapter 3 and table 3-9 for additional soil information.

Land Uses: Recreation Resources and Agriculture

RECREATION RESOURCES

For its entire length (approximately 31 miles), the Moapa Variation would cross the Dry Lake Valley area northeast of Las Vegas, where several annual organized, competitive ORV events as well as noncompetitive free play ORV activity occur. The most publicized ORV event in Dry Lake Valley is the annual running of the Mint 400 (first weekend in May). See discussion of this event for the proposed action for further details. The Mint 400 ORV race course would also be within the approximately 3,000-foot wide energy corridor which crosses the Moapa Indian Reservation. The energy corridor was established in early 1981 by Congress under P.L. 96-491. (See map 3-3, 'Clark County Recreation Lands,' for the location of the ORV race course in relation to the variation.)

AGRICULTURE

The Moapa Variation would traverse 2 miles of cropland; the crop types affected would be the same as those traversed by the proposed action. See table 3-12 for acreages and mileages of cropland which would be affected.

Cultural Resources

Variation 7, the Moapa Variation, is expected to have a very high site significance and cultural sensitivity for prehistoric resources. Since the variation would traverse the Moapa Indian Reservation, it is likely that sacred sites may be affected. The variation would be highly sensitive with respect to historic and ethnographic resources.

VARIATION 8--WEST KAMAS VALLEY

Vegetation

The West Kamas Valley Variation would traverse 14 miles of sagebrush vegetation in the West Hills area. Acreages of each vegetation type that would be affected are identified in table 3-1 and located on map S-24. These areas are used largely for livestock grazing, wildlife habitat, recreation, and watersheds.

Wildlife

Numerous species of small and medium-sized mammals would be encountered in sagebrush habitat along this approximately 15-mile long variation. Some of the more common small mammals include various species of mice, shrews, ground squirrels, chipmunks, gophers, rats, voles, bats, rabbits and hares, moles, weasels, skunks, coyotes, and bobcats. All of the small burrowing rodents have extremely high reproductive rates. Population levels are cyclic; numbers are highly variable from year to year.

Various species of raptorial birds would also be encountered along this route, including, among others, marsh hawks, ferruginous hawks, American kestrel, and Swainson's hawks. Numerous small passerine birds are also found along the route in appropriate habitat areas.

Soils

The West Kamas Valley Variation would most strongly affect 11 miles of Soil Group 1. Refer to the discussion of the proposed action in chapter 3 and table 3-9 for additional soil information.

Visual Resources

The West Kamas Valley Variation would lie entirely within the Middle Rocky Mountains physiographic province. The physical characteristics described in table 3-40 illustrate how the variation would significantly affect the visual environment. (See table 3-11 for a summary of the number of miles and acres of each VRM Class which would be crossed by the variation.)

TABLE 3-40

AFFECTED ENVIRONMENT FOR VISUAL RESOURCES: WEST KAMAS VALLEY VARIATION

MP	VRM Class and/ or VQO[2]	Description
Pipeline1		
MP 0- MP 3	2	Landform consists of gently rolling to steep terrain through the Brown Canyon area. Vegetation consists of sagebrush, with aspen, oakbush, and confier pockets on higher slopes. U.S. Highway 189, Highway 302, and a secondary road are located within the area, which can be viewed from these roads and rural residences.

[1]Same as those for the proposed action.

[2]Only those segments which would be significantly affected by the West Kamas Valley Variation are described. The ancillary facilities would not significant affect the visual resource.

[3]Refer to table 3-10 for definitions of terms.

NOTE: The affected visual resources of this variation would replace the proposed action between MP 96 and MP 108.

Land Uses: Agriculture

The West Kamas Valley Variation would traverse 1 mile of cropland with the same crop types as those which would be found along the proposed action. See table 3-12 for acreages and mileages of cropland which would be affected.

Cultural Resources

Variation 8, the West Kamas Valley Variation, is expected to have a low site density of low significance for prehistoric resources. However, the variation is considered moderately sensitive with respect to historic and ethnographic resources as it would traverse an area of historic Mormon settlement.

Geology and Topography

The entire variation would be subject to ground motion of 0.10 to 0.20 g; no other significant geological hazards would be present. Topographic constraints would not be great because no significant areas of slideslope construction and no areas of steep slopes would be crossed.

Chapter 4
Environmental Consequences

The environmental consequences are those impacts resulting from implementing the proposed action or any of the alternatives or variations. The environment that would be affected (affected environment) is discussed in its current state in chapter 3.

Mitigating Measures

Impact analysis in this chapter is based on the assumption that mitigation would alleviate or minimize environmental impacts which would occur as a result of implementing the proposed action or any of the alternatives and variations. Measures which are proposed in order to achieve this for the RMPP are broken into five categories. The impact analysis assumes that the measures proposed by the applicant or required by Federal agencies on Federal lands (the first four categories) **would be implemented.** Therefore, any impacts discussed in this document would occur after these measures were applied.

The first category of mitigation includes those measures automatically required by jurisdictional agencies as part of permits issued to the RMPC. These requirements are further discussed in 'Authorizing Actions and Permits' in appendix D.

The remaining categories of mitigating measures are discussed in appendix C. They include general mitigation (general construction and resource protection procedures) proposed by the applicant that apply to all lands that would be affected by the project; the Erosion Control, Revegetation, and Restoration Guidelines submitted by the RMPC for **use** on all lands that would be affected by the project; and the Erosion Control, Revegetation, and Restoration Guidelines for **use** on Federal lands which would be affected by the project. These Federal guidelines would become stipulations incorporated into the applicant's right-of-way grants. The final type of mitigation--mitigating measures resulting from impact assessment--includes site-specific measures which would minimize or alleviate any impacts identified in chapter 4. These measures are intended as special stipulations to the applicant's permits; they would be enforceable only on Federal lands.

Impact assessment considered the construction, operation, and maintenance of the proposed project. All analyses assume a 100-foot wide construction right-of-way, as proposed by the applicant.

For the proposed action and the alternatives, the environmental consequences are discussed for the entire project, including the complete pipeline and any related facilities. Thus, impacts analyzed for the alternatives include any effects from implementing portions of the proposed action plus the alternative segments. For example, environmental consequences as a result of implementing Alternative B, the Sanpete Valley Alternative, are considered from MP 0 in Wyoming to MP 610 in California, with only MP 176 to MP 356 of the proposed action being replaced by the Sanpete Valley Alternative. Impacts of the entire project incorporating each alternative have been calculated.

Since the variations, which are relatively short, would not significantly change the impact of the total pipeline system, only the impact of the variations themselves is discussed. For example, the environmental consequences as a result of incorporating Variation 2, the Thistle Creek Variation, are discussed only for the segment that would differ from the proposed action, MP 156 to MP 176.

The detail of the impact discussion corresponds to the severity or degree of impact. Thus, significant impacts are discussed in detail; insignificant impacts are summarized in the EIS and discussed in detail only in supplementary material. Background information and analyses of impacts for some resources are contained in the technical reports and files. (To obtain copies of these documents, refer to the preface.)

Significance Criteria

The following criteria were developed by the EIS team to determine the significance of impacts on each resource.

VEGETATION

Impacts to vegetation due to removal of cover and surface disturbance would be significant if it would take more than 5 years following construction to reestablish preconstruction conditions. Impacts would also be significant if implementation of the proposed action, alternatives, or variations would allow poisonous or exotic plants to invade more than 10 percent of a specific vegetation type along the right-of-way.

WILDLIFE

Impacts to wildlife species would be significant if any crucial habitat (i.e., winter ranges, calving/fawning areas, leks, brooding areas, etc.) was disturbed during the normal season of use. In addition, impacts would be significant if more than 1 percent of the total habitat available within a 1-mile wide corridor was disturbed.

AQUATIC BIOLOGY

Downstream impacts to aquatic species would be significant if sediment from construction persisted in the flowing stream for more than 8 hours and occurred within 2,000 feet of spawning areas. Spawning areas would be significantly affected if they **were** crossed by the pipeline trench.

THREATENED OR ENDANGERED SPECIES

Impacts to threatened or endangered species would be significant if the biological assessment required for the project finds that a species is in a *may affect* category. **The FWS's biological opinion appears in appendix H.**

SOILS

Impacts to soils from expected increases in erosion rates and reduction of soil productivity (as a result of soil disturbance and alteration caused by construction of the proposed action, alternatives, or variations) would be significant if the loss of soil and reduction of soil productivity would prevent successful restoration and recovery to near preconstruction conditions.

VISUAL RESOURCES

Impacts would be significant if modification in the landform and vegetation or the addition of a structure would not meet the standards of the VRM Class or VQO in which the portion of the project would be located. The Contrast Rating System, which analyzes contrast in form, line, color, and texture of the landscape and the duration before the impact would be reduced to an acceptable condition (discussed in further detail in appendix I), was used to determine significance.

RECREATION RESOURCES

Impacts as a result of implementing the proposed action or any of the alternatives or variations would be significant if either or both of the following criteria were to be met:

If the public's short term sensitivity and perceived concerns from construction through one recreation season beyond completion of construction would be high (thereby diminishing the quality of recreation experiences).

If the public's long term (1 year through the life of the project, 20 years) sensitivity and perceived concerns would be medium to high (where the quality of the recreation experience would fail expectations).

Short-term or long-term impacts to recreation experiences of little public concern (such as an area not regularly used or dispersed recreation areas with ample space) would be insignificant.

WILDERNESS

Impacts would be significant if any components of the proposed action, alternatives, or variations would cross the boundary of a Wilderness Area, a BLM WSA, an FS second Roadless Area Review and Evaluation unit (RARE II) **area** recommended either for wilderness designation or a further planning area, or a proposed or existing state wilderness area.

TRANSPORTATION NETWORKS

Impacts would be significant if the traffic increase, particularly over the long term, would cause an instability of traffic flow, noticeable congestion, and/or a substantial increase in average travel time. Traffic delays of more than 60 minutes during low-use periods and more than 30 minutes during normal traffic flow would be significant. Impacts would also be significant if there would be any permanent impact to roads or rail networks, other pipeline systems, or electrical power transmission systems.

AGRICULTURE

Impacts to agricultural lands would be significant if more than 5 acres of land would be irreversibly converted to other **uses** (as a result of placing permanent facilities) or if the viability of any of the lands would be significantly diminished by the project.

LIVESTOCK GRAZING

Impacts would be significant if the forage quantities lost as a result of constructing the proposed action, alternatives, or variations would reduce livestock stocking on the pastures which would be crossed by the pipeline.

FORESTRY RESOURCES

There are two types of forest resources--commercial timber and fuelwood. Impacts to commercial timber would be significant if conifers lost or cut prematurely as a result of clearing the right-of-way exceeded 1 percent of the annual timber harvest for a particular national forest. Aspen is currently considered only a fuelwood, although it will continue to gain importance for pulp and paper markets, and thus will eventually be considered commercial timber.

Currently, pinyon-juniper, aspen, and oak (including oak/brush) are used for fuelwood. Loss or premature cutting of these would be significant if it were to exceed 1 percent of the total resource in a national forest or BLM district. Future demands (for the next 10 years) could change the significance criteria to less than 1 percent.

CONFLICTS WITH LAND USE PLANS, POLICIES, AND CONTROLS

All known conflicts with land **use** constraints prescribed by legislative, regulatory, or planning processes of local, state, and Federal governments are identified.

SOCIOECONOMICS

Impacts would be significant if they would exceed the following criteria:

Demand for permanent or temporary housing exceeding 10 percent of the existing vacancies.

Permanent demand on other infrastructure greater than 10 percent of the current level of demand, temporary demand exhausting the excess capacity in the areas where the crews would live, or a change in local tax revenues greater than 10 percent.

An increase in total employment greater than 5 percent or an increase in retail sales greater than 15 percent.

NATIVE AMERICAN ISSUES

Impacts to Native Americans would be significant if the proposed action or any of the alternatives or variations would pass through more than 2.5 miles of a reservation, if Native Americans were hired for labor, or revenues were contributed to the reservation from right-of-way income.

CULTURAL RESOURCES

Impacts to cultural resources would be significant if an historical or archaeological property included on or eligible for inclusion on the National Register of Historic Places would be altered, damaged, or destroyed by the proposed action or any of the alternatives or variations.

GEOLOGY AND TOPOGRAPHY

Geological impacts would be significant if extensive subsurface disturbance would occur as a result of implementing the proposed action, alternatives, or variations. Topographic impacts would be significant if major, long-term changes to the topography would be necessary to construct the proposed action, alternatives, or variations.

WATER RESOURCES

Ground Water

Impacts would be significant if deep excavations would be required, thus affecting deep ground water reservoirs.

Surface Water

Impacts to streams would be significant if construction-induced sediment smothered downstream aquatic life and spawning areas. Impacts would also be significant if construction-induced contaminants (lubricants and fuels) reached levels lethal to aquatic life.

Floodplains

Impacts would be significant if aboveground permanent facilities would be located on any 100-year floodplains.

NOISE QUALITY

Impacts would be significant if estimated noise emissions from compressor stations exceeded a day-night sound pressure level average of 55 dB(A) at the nearest residence.

AIR QUALITY

Impacts to air quality would be significant if they met one of the following criteria:

Emissions for any criteria pollutant exceeded 250 tons per year at any new compressor station.

Estimated emissions from expansion of existing compressor stations exceeded 100 tons per year of CO, 40 tons per year of NO_2, 40 tons per year of SO_2, or 25 tons per year of TSP.

Predicted ambient pollutant concentrations exceeded the NAAQS at any of the expanded or proposed compressor stations.

PIPELINE SAFETY (RUPTURES AND EXPLOSIONS)

Impacts would be significant if the RMPP, alternatives, or variations were located on known active faults in populated areas with a reasonably high probability that earthquakes could induce a rupture. Impacts would also be significant if the pipeline were located on any known landslides in populated areas where special construction measures would not be sufficient to reduce potential risk from ruptures caused by landslides.

Insignificant Impacts

To reduce repetition, insignificant impacts **and** impacts similar to those created by the proposed action are not discussed for each alternative or variation. Figure 3-1 identifies by resource and alternative how and why impacts are discussed in detail in chapter 3 and this chapter. The following resources would sustain insignificant impacts from at least some of the alternatives and variations, as well as from the proposed action.

VEGETATION

Invasion of poisonous or exotic plants would be insignificant as long as the Erosion Control, Revegetation, and Restoration Guidelines are implemented.

AQUATIC BIOLOGY

For a linear project such as the proposed pipeline, the impacts to aquatic biology would be short term, minor, and insignificant.

At stream crossings, removal of streambank vegetation for a 100-foot wide construction right-of-way would not open the shade canopy sufficiently to affect the water temperature and quality. Calculations made for the water resources analysis show that sediment would be transported only a short distance downstream. This would not be extensive enough to harm aquatic life. Routes paralleling streams would not be expected to parallel them close enough to cause earth to spill into the streams. Therefore, no impacts to aquatic biology are discussed for the proposed action or any of the alternatives or variations.

VISUAL RESOURCES

Insignificant impacts to visual resources, both long and short term, would result from implementing Variation 4, the Fort Mojave Variation, **and Variation 7, the Moapa Variation;** therefore, visual resource impacts are not discussed for Variation 4 or Variation 7.

RECREATION RESOURCES

The proposed action and all alternatives and variations would have some insignificant impacts to the recreation resource. These include minor, short-term construction impacts such as dust, noise, and visual intrusions on recreational experiences. These insignificant impacts would result from implementing Alternative A, Alternative C, Alternative F, and Variations 2, 3, 4, 5, **6-II, and 8.** Impacts which would result from alternatives B and D would be similar **to** the proposed action. Therefore, impacts to recreation are not discussed for alternatives A, B, C, D and F, nor Variations 2, 3, 4, 5, **6II** and 8.

WILDERNESS

No designated or proposed wilderness areas would be crossed by any components of the proposed action, alternatives, or variations, except for Alternative C, the Central Nevada Alternative. This evaluation includes Wilderness Areas, and WSA's designated by BLM, units from RARE II and further planning designated by the FS, and any proposed or existing state wilderness areas.

Some minor, short-term construction impacts such as noise, dust, and visual intrusions would occur to lands along the boundary of a WSA along Variation 4.

However, these impacts would be insignificant. Therefore, impacts to the wilderness resource are not discussed for the proposed action; Alternatives A, B, D, E, and F; nor Variations 2 through **8.**

TRANSPORTATION NETWORKS

Disruptions to railroads, other pipeline systems, and electrical power transmission systems would not occur as a result of the proposed action, alternatives, or variations. Construction of the proposed action, alternatives, or variations would create minor traffic disruptions due to slow moving equipment or one-lane closings. An unquantifiable amount of minor road deterioration might also occur.

In addition, the proposed action, Alternatives C, E, and F, and Variation 2 would cause minor traffic disruptions on **canyon roads** which they would parallel. Traffic could be disrupted from 5 to 30 minutes along the canyons. At a maximum, the state highway departments would allow canyon highway closings for only short durations during blasting, probably for no more than 30 to 60 minutes during low-use periods of the day (West 1981). Such road closures could take place along the proposed action and Central Nevada Alternative in canyon areas; the Provo Canyon Alternative in Provo Canyon; the West Salt Lake Alternative in Emigration, Williams, and Strawberry Canyons; **and** the Thistle Creek Variation in Thistle Creek Canyon; **Daniels Variation II is no longer Daniels Canyon.**

Because traffic disruptions are considered insignificant, this resource is not described further in the EIS.

LIVESTOCK GRAZING

Loss **of** livestock grazing capacity (measured in animal unit months (AUM's)) would generally be insignificant if the proposed action, alternatives, or variations were implemented. More significant impacts could occur in some areas where rehabilitation would be more difficult and erosion control structures would interfere with normal livestock use. **This could occur on mountainous areas of the Uinta, Manti-LaSal and Dixie National Forests in Utah where management practices to control erosion could include fencing portions of the right-of-way.** Refer to appendix J for **impacts to livestock grazing, including** the amounts of AUM's which could be lost due to pipeline construction.

FORESTRY RESOURCES

Quantities of wood products that would be affected by the proposed action, alternatives, or variations would be small and insignificant when compared to the total wooded areas. In addition, the applicant would pay fair market value for all timber lost. Appendix K and the comparative analysis in chapter 2 identify the board feet, cords of wood, and values of wood that would be affected by the proposed action, alternatives, and variations.

NATIVE AMERICAN ISSUES

Alternative C and Variations 2 through **8** would not pass across any reservation lands; thus, they would not significantly affect Native Americans. Variation 4, the Fort Mojave Variation, would pass near the Fort Mojave Indian Reservation and could therefore increase employment within the tribe. **The proposed action, along with Variation 7 and Alternatives B, D, E, and F, could also increase employment and provide additional income through a right-of-way lease within the over** 3,000-foot wide utility corridor that crosses the Moapa Indian Reservation. Therefore, impacts to Native Americans are not discussed for any of the alternatives or variations.

CULTURAL RESOURCES

Certain resources are not examined in depth because the exact location of the routes would not be known until the project is staked on the ground. At that time, compliance with historic preservation legislation would occur. This would include a cultural resources survey of the route and development of mitigation for anything which could be affected The preliminary Memorandum of Agreement between the involved Federal agencies and the Advisory Council of Historic Preservation describes this process of ensuring that impacts to cultural resources are determined and then mitigated. Thus, detailed descriptions of imapcts to cultural resources including national historic, trails like the Dominquez.

GEOLOGY AND TOPOGRAPHY

In general, because the RMPP, alternatives, and variations would cause little subsurface disturbance, no significant disruptions to geologic formations would occur. **In certain areas, identified in chapter 3 and appendix M, the RMPP could be endangered by construction induced landslides.**

Although various kinds of minerals may be present under some affected lands, implementation of the RMPP, alternatives, or variations would not preclude further development of these resources. Therefore, no geological or mineral withdrawal impacts are discussed.

The impact to topography as a result of constructing a pipeline would generally be minor and short term; consequently, little description of topography is provided. Areas where topography would impose severe construction constraints are identified.

Existing **topography** and impacts to it are briefly discussed, except for the Fort Mojave **and Moapa Variations,** which would be similar to the RMPP. Because the Sevier-Escalante Desert Alternative, **the** East Las Vegas Variation, **the Daniels Canyon Variation II, and the West Kamas Valley Variation** would require no sidehill construction, they **also** are not discussed.

Potential erosion impact is discussed in 'Soils.' Visual impact as a result of scars on the landscape is discussed in 'Visual Resources.'

WATER RESOURCES: GROUND WATER AND WETLANDS

The proposed action or various alternatives and variations would not cause deep subsurface disturbance, and no impacts would occur to ground water. Thus, no ground water impacts are discussed in the EIS. Impacts from constructing the pipeline across streams and wetlands would be of low significance. Numbers of stream crossings are given in chapter 3 for all routes, and impacts are described in chapter 4 for the proposed action. The Water Resources Technical Report lists stream crossings. Executive Order 11990 requires consideration of wetlands, thus when a stream requires a COE section 404 permit, FWS considers the stream and its wetland area in light of the Executive Order.

Executive Order 11988 requires that Federal agencies make every effort to avoid locating aboveground structures in 100-year floodplains. Since no aboveground permanent structures would be constructed within a 100-year floodplain, no property damage from such a flood would result. The pipeline would be buried in the 100-year floodplain at each stream crossing. However, since existing regulations require that the proposed pipeline be buried below the maximum scour depth, there would be no effects at flood stage.

Withdrawal and discharge of water from streams for hydrostatic testing would be carried out under permit from the various states. In Utah, the Division of Water Resources would issue such permits in the Department of Natural Resources. These permits include stipulations which regulate locations and rates of withdrawal and discharge requirements.

AIR QUALITY

No significant long-term impact should result from construction; only temporary violations could occur. Impacts from Alternatives B, D, and F and all variations would be similar to those which would result from the proposed action; therefore **they** are not discussed.

URBAN CONFLICTS

An area which is not treated separately because it is shared by alternatives and variations and because it occurs with construction of any pipeline system is the impact to urban areas and small rural towns. RMPC would have to negotiate rehabilitation and reimbursement terms with all landowners who would be affected by the pipeline. For the proposed action, this would be required primarily for a few small towns along the right-of- way; more extensive negotiations would be necessary in the Las Vegas **and Searchlight areas.** Alternatives C, D, and E would also affect small rural towns, with a concentration around Delta, Utah. Alternative B would encounter more small towns than the proposed action, thus requiring more coordination by the applicant. Alternative F would require more extensive right-of-way negotiations because the right-of-way would pass through several housing and industrial areas in the Provo, Utah, vicinity. Variation 3 would pass through the Las Vegas area, but it would generally follow gaps in the urban areas left by other transportation projects. **It would conflict with the Clark County Sanitation District facilities. Alternative A would pass by a few small towns where some negotiations would be necessary. Variations 2, 4, 5, 6-II, 7, and 8 would require either few negotiations because they would affect few small towns or no differences from what would be required for the proposed action in those segments.**

The remainder of this chapter discusses in detail impacts not excluded in figure 3-1. These impacts are compared in the 'Comparative Analysis of the Proposed Action, Alternatives and Variations' in chapter 2.

PROPOSED ACTION

Vegetation

GENERAL IMPACTS

The EIS analyzes the impact of a 100-foot width **right-of-way** as proposed by the RMPC; this includes **a permanent right-of-way** up to 50- foot wide, plus a **temporary construction right-of-way** up to 50-feet wide. However, on slopes of about 10 percent and less, some vegetation would probably not be removed. The 50-foot right-of-way **might** be cleared of vegetation, but the remaining 50 feet used for pipe assembly and equipment movement would only need sufficient scraping and clearing to provide working room, thus leaving roots and low plant crowns. See map S-24 in the *Graphic Supplement* **and table 3-1** for the acres of each vegetation type removed along the proposed route, alternatives, and variations.

Forest The applicant's construction procedures through forest vegetation would require that all trees within the construction right-of-way be removed. No trees would be allowed to grow on an approximate 50-foot width over the pipeline. Therefore, only the understory and low growing shrubs less than 2 inches in diameter would vegetate this area for the life of the project (20 years). Grasses and forbs would reach their preconstruction dimensions within 1 to 5 years, while trees outside the pipeline area would require from 20 to 150 years to achieve preconstruction dimensions.

Mountain Brush Mountain brush vegetation would be removed from the width of the right-of-way. Species such as oak that grow larger than 2 inches in diameter would not be allowed to regrow within a 50-foot wide section immediately over the pipeline. Over the remainder of the right-of-way, brush would require 20 to 50 years to regrow to original dimensions.

Sagebrush Sagebrush would be removed to the extent that it would interfere with construction but would be allowed to revegetate over the entire right-of-way. Regrowth would require 10 to 25 years.

Pinyon-Juniper The applicant proposed to remove pinyon-juniper vegetation from the width of the right-of-way with trees restricted from growing on an approximately 50-foot wide section over the pipeline (as in the forested areas). Tree growth would require 100 years or more to attain preconstruction dimensions.

Saltbush-Greasewood Vegetation would be cleared only to facilitate construction activities, although construction equipment would break stems and crush vegetation within the construction right-of-way. Overstory vegetation would require from 20 to 40 years to grow to preconstruction dimensions.

Creosote Bush This vegetation would be removed only to facilitate construction, although construction equipment would most likely crush all vegetation within the right-of-way. Dry growing conditions associated with the species, would slow recovery of vegetation to preconstruction dimensions and density by 100 or more years.

Riparian Vegetation Riparian vegetation associated with moist or wet areas would be removed at stream crossings, as necessary. Growth would be restored within 1 to 5 years except for brush or tree species which would require from 10 to 25 years to grow to preconstruction dimensions. Trees over 2 inches in diameter would not be allowed to revegetate in the area directly over the pipeline.

Annual Grass Vegetation Annual grass and forb species called 'Mediterranean Annuals' are found along the California segment of the Northern Systems Alternative. These species would reestablish ground cover to preconstruction densities within 1 year from disturbance.

Barren Land Barren land refers to the Great Salt Lake and other salt flats where very little vegetative cover is found except for sparse populations of highly salt-tolerant plants (including pickleweed). These generally occur around the edges of salt flats or in slightly elevated hummocks. After disturbance, the salt-tolerant plants will revegetate over a period of several years.

Species of Environmental Concern Joshua trees and several species of cacti, primarily associated with the creosote bush and saltbush-greasewood vegetative types, would be crushed or removed during construction activities. Regrowth could require 100 years or more. A unique stand of Rocky Mountain red cedar, *(Juniperus scopulorum)*, **would be traversed disturbed by the Central Nevada Alternative.**

Impacts of the Proposed Action

Granting a right-of-way for the proposed action would affect **6,331** acres of vegetation. Of this total acreage, the understory vegetation would return to preconstruction densities and reach stabilization within 5 years after construction if the Erosion Control, Revegetation and Restoration Guidelines proposed by the RMPC and the Erosion Control, Revegetation and Restoration Guidelines for Use on Federal Lands presented in appendix C were to be implemented. The overstory vegetation would require longer than 5 years to reestablish. Joshua trees and cacti scattered in 2,789 acres of creosote bush and saltbush-greasewood vegetation types could be affected, and 14 acres of riparian vegetation could be affected. See table 3-1 for acres of each vegetation type which could be disturbed.

RMPC **requirements and practice** do not allow trees or brush over 2 inches in diameter to revegetate on an approximately 50-foot wide strip directly over the pipeline. This would result in a loss of 573 acres of forest, mountain brush, and pinyon-juniper types along the proposed route for the life of the project (20 years).

Wildlife

Impacts to animals, birds, reptiles, and amphibians that were examined included harassment, short- and long-term destruction of vegetation used for food and cover, temporary blockage of migration routes, and increases in illegal or random killing.

Background information supporting the impact analysis is contained in two technical reports for the RMPP: the *Terrestrial and Aquatic Biology Technical Report and Threatened and Endangered Species Technical Report* (BLM 1981d, BLM 1981e).

MAMMALS

The proposed route would cross approximately 157 miles of critical big game winter range throughout its entire length. (Refer to table 3-3 for more detail.) Although the RMPC propose to construct the pipeline between May and October, if the schedule were to slip, animals on big game winter range could be affected. Impacts that could occur on these winter ranges include clearing vegetation (i.e., habitat and food) from the right-of-way, harassment of wintering big game animals due to human presence, and activities around the construction sites and harassment of wintering big game animals because of increased human access afforded by construction roads. Impacts to wintering big game animals would include losses caused by poaching and wildlife/vehicular accidents.

Vegetation removed from 157 miles of pipeline right-of-way would total an estimated 1,903 acres. This acreage would not be in one wintering area, so the impact of reduced winter forage to wintering big game animals would not be significant.

A significant impact to wintering big game animals would be the effect of harassment on animals already in stress situations. Harassment resulting from noise and people in the vicinity of construction could lower animal reproduction. Energy expended by stressed animals to escape such harassment could cause weight losses which would result in lowered productivity (Preobrazhenskii **1962,** Geist 1974). In extreme cases of weight loss, death of adult animals could also result (Geist 1974). The magnitude of these effects cannot reliably be estimated; however, they could result in significant reductions in young-of-the-year. These effects could be expected to occur to all species of big game animals wintering in areas which would be traversed by this pipeline route.

The proposed action would pass near eight desert bighorn sheep areas and would intersect approximately five sheep migration routes (as noted in table 3-4).

Harassment of desert bighorn sheep around water sources would result from construction workers camping or parking near these areas. From mid-May through mid-September, water is vital to the survival of these animals. Any activity within 2 miles of a water source (Janke 1980) may cause these animals to abandon the water source (Leslie and Douglas 1980) and move to other areas that may be less favored but are removed from human activity. Impacts caused by deprivation of water include dehydration and possible loss of young animals as well as resorption of embryos, both reducing the species production.

In addition to problems for wintering big game animals, other impacts caused by construction workers could include direct losses of animals caused by poaching and random killing, and possible increases in animal/automobile collisions due to increased traffic flow around construction sites. The increase in traffic volume cannot be quantified. There would be an increase for a short time, and animal/vehicular collisions could increase for that period.

Removing topsoil and storing it for later reclamation would kill small burrowing rodents. Losses due to these procedures as well as other pipeline construction activities would not only result in direct mortality but would also displace more mobile animals. However, since the reproductive rates of these animals are so high and population turnover is so rapid, large numbers (not quantifiable with present data) of these animals are produced and lost each year under natural conditions. The high reproductive potential and natural cyclic population fluctuations of these animals indicate that rapid repopulation in these disturbed areas would take place (BLM 1978a).

Destroying about 5,773 acres of brushland habitat (including mountain brush, sagebrush, pinyon-juniper, saltbush, greasewood, and creosote bush types) would **affect** an unquantifiable number of cottontail rabbits along the proposed **route.** The magnitude of these losses would be **in significant, compared to the total local population and** the high reproductive potential of these animals to repopulate the disturbed areas quickly after reclamation was complete.

BIRDS

A large variety of small songbirds would be affected by the removal of brush, trees, and topsoil from the pipeline right-of-way. The best population density estimates currently available indicate that there are an average of 21 breeding pairs of small birds per 100 acres in the various vegetative types which would be found along the right-of-way. Populations of these small birds tend to average a complete population turnover every 3 years, with each nesting pair fledging an average of three young per nest (Schroeder 1981).

Reclamation plans propose to return the vegetation to perennial grasses, forbs, and shrubs. This change in vegetation could alter the species of the small bird population because habitat for brush-loving species would not be present. However, since this is a linear project, no such impacts are anticipated.

Sage grouse are the major game bird to be encountered along the proposed route. The route would pass through or near (within 2 miles) an unknown number of leks (strutting grounds) and a total of about 33 miles of occupied sagebrush habitat (about 400 acres). Table 3-5 lists the milepost locations. Surveys for strutting ground locations have not been completed in many areas of Utah, but sage grouse strutting grounds are suspected to occur in many of these areas (Day 1981). Impacts to this ground-nesting species would include direct mortality to nesting hens, harassment of strutting males on the leks, disturbance of wintering flocks, and removal of sagebrush overstory upon which this species is virtually 100-percent dependent. All of these impacts would have the same result: a reduction in reproduction during the year the pipeline would be constructed. Harassment of strutting males on the leks would probably have the greatest impact on total production, since it would disrupt breeding activities. Actual mortality of nesting hens or destruction of nests on the pipeline right-of-way would be the second greatest impact. Sagebrush removal along the narrow right-of-way would have the least effect because only a small percentage of total available sagebrush would be removed along the route.

Sandhill cranes would be affected if the marshy areas they use were drained to construct the pipeline and remained dry after the construction was completed. Since their habitat is limited in this area, any reduction in total habitat acres would be detrimental.

Impacts to Gambel's quail would be significant if pipeline construction occurred during the dry summer period from mid-May through mid-September and, in addition, if construction took place in nesting habitat within 2 miles of gallinaceous guzzlers. During the nesting season, along the drier southern portions of the proposed route, these birds concentrate their nesting activities within 2 miles of these guzzlers (Janke 1980). Construction disturbances could result in nest abandonment, thus reducing production, or nesting hens could be killed and their nests destroyed by construction machinery.

Scattered populations of ring-necked pheasants might be affected by the proposed route near agricultural areas in northern and central Utah. Nesting hens could be affected directly by construction machinery, and nests could be destroyed if they were located within the staked pipeline right-of-way. These impacts could lead to a slight reduction in production during the year construction was undertaken. Because of the nature of pipeline disturbance in agricultural areas, no long-term losses in pheasant production would be anticipated. If construction were to take place outside of the critical nesting period, impacts to pheasants probably would not occur.

There would be at least nine areas along the proposed route (see table 3-7) that furnish nesting and hunting habitat for the many species of raptors. Nesting raptors are very susceptible to disturbance, and nest abandonment at any stage of incubation is very common if the birds are disturbed. Some of the species of raptors found in this area have a low population, and abandonment of nests would lower production for that year, thus maintaining the low population.

Any golden eagle nests found within 1 mile of the pipeline route would have to be protected from disturbances because of provisions of the Bald Eagle Act, which requires protection of the golden eagle and its nests. These large birds are quick to abandon their nests if disturbed; lowered production is the result. Once the right-of-way was staked, a survey would be made to determine the location of active golden eagle nests so that disturbances could be minimized. If construction did not occur during the critical nesting period, the only adverse impact which might occur would be illegal killing.

Waterfowl habitat would be crossed by this route for an estimated 34 miles (412 acres). The March 15 to June 15 period is the most critical time of year for these species. Disturbance of wetlands areas during this time of year could result in lowered production as there is not an abundance of waterfowl production areas along this route and any disturbance during the nesting period could reduce production for that year.

AQUATIC SPECIES

According to the Utah Division of Wildlife Resources, no impacts to aquatic resources are anticipated at any of the stream crossings as long as management practices as defined in Title 33 CFR, 1980.ed., part 323 are followed (Nish 1981).

REPTILES AND AMPHIBIANS

Reptile and amphibian numbers appear to be low in the area along the proposed route. There is some riparian vegetation and free water along the route which provide amphibian habitat. Reduction of riparian habitat could reduce populations of these animals. However, reproduction levels of these species are high enough so that repopulation would be rapid once reclamation was completed.

FEDERAL LISTED SPECIES

Under provisions of the Endangered Species Act of 1973, **adverse** impacts to federally listed species cannot be allowed. **The** biological assessment of the impact of **this** proposed project determined that the project may affect a particular listed species; **thus**, formal section 7 consultation with the FWS is required. The FWS **submitted to BLM** a biological opinion. The opinion includes recommendations to alleviate impacts to threatened or endangered species. All recommendations contained in the opinion will be acted on by BLM. **See appendix H for the requests for lists from FWS, the request for the section 7 biological opinion, and the biological opinion.**

Desert Tortoise

The critical habitat designated in the southwestern corner of Utah (an estimated 24,960 acres) harbors only an estimated total population of 350 tortoises (Bender 1980). The proposed pipeline would cross within 3 miles of this population.

Black-footed Ferret

Impacts to the black-footed ferret would include direct mortality to any ferrets hiding underground in the path of construction machinery. Both adult ferrets or any litters that might be present would be killed.

Bald Eagles

Impacts to bald eagles should not occur because the proposed pipeline would be constructed during the summer when the birds are not present in the area. There are no known bald eagle nesting areas near the proposed route, so impacts to nesting eagles would not occur. Also, no known winter roost trees occur near any of the proposed stream crossings, so impacts to these important roost trees would not be anticipated.

STATE LISTED SPECIES

The desert tortoise is protected by state laws in Nevada and California. Impacts to the tortoise would include direct mortality from crushing of burrows by heavy machinery, population reductions if construction workers illegally collect the animals, and possible mortality from tortoises falling into an open trench. Any of these impacts would significantly reduce an already low population.

Soils

GENERAL IMPACT

Proposed construction would alter and disturb soil within the pipeline right-of-way, at surface facility sites, and along access roads. These impacts would include disturbance of topsoil, soil compaction, disturbance of the desert pavement condition in the arid and desert areas, sidehill cuts in steep mountain slope areas; alterations of the soil profile along the excavated pipeline trench resulting in accelerated soil erosion, and reduction in soil productivity. These impacts would affect runoff, water erosion, sediment yield, wind erosion, and soil stability, as well as affect the soil as a medium for plant growth.

Impacts to soils would result primarily from an increased susceptibility to erosion or displacement. The degree of susceptibility to erosion would vary according to soil erodibility characteristics, topography, surface roughness, and the presence or absence of protective soil cover such as vegetation, plant residues, gravel cobble, or rock. The amount of erosion would be related to the time between the disturbance and reestablishment of vegetation or implementation of erosion control measures. Soil productivity could be reduced by either the loss of topsoil or the mixing of topsoil with substratum materials excavated from the trench that are high in salinity, alkalinity, other toxic materials, or unweathered parent materials.

Impacts on soils within the pipeline right-of-way would be generally insignificant and temporary if erosion control and revegetation of the disturbed areas were successful. With implementation of the Erosion Control Restoration, and Revegetation Guidelines outlined in appendix C (to be added as a stipulation in the right-of-way grant), successful erosion control and reclamation should occur on all croplands and in areas of native vegetation where climatic and soil conditions are more favorable for plant growth.

Soil impact potential would be greater in areas with less favorable soil and climatic conditions where soils are more susceptible to erosion hazards and have a lower revegetation potential. Nine soil groups with properties considered most susceptible to impact are described in chapter 3 and identified and quantified in table 3-9. Intensive implementation of measures outlined in the Erosion Control, Revegetation, and Restoration Guidelines in appendix C would minimize soil impacts in areas more susceptible to impacts, returning erosion rates to near preconstruction levels generally within 1 to 5 years.

Final pipeline alignment would tend to avoid, where possible, highly erodible slopes and potential slide areas. This would reduce the potential for accelerated erosion and other impacts. A few small areas where adequate vegetation could not be established and maintained would require continuing erosion control measures. **In addition to soil and slope conditions, areas of active stream cutting, large gullies, and head cuts such as the Las Vegas Wash area, are identified as "critical erosion areas." Intensive implementation of applicable measures outlined in the Erosion Control, Revegetation, and Restoration Guidelines in appendix C would control accelerated erosion and minimize impacts caused by pipeline construction crossing these areas.** Effects of potential impacts to soils are discussed in more detail in the *Soils and Agriculture Technical Report* (BLM 1981).

The FS is concerned that the soils of the Manti-LaSal and Uinta National Forests are more susceptible to erosion and revegetation problems than has been assessed in this document. Two documents identifying its position have been placed in appendix M.

IMPACTS OF THE PROPOSED ACTION

The proposed action would disturb a total of 7,395 acres of soils. The soils with greater impact potential total 3,056 acres and are discussed in the following sections.

Soil Group 1

In Soil Group 1, 1,382 acres would be disturbed by construction. This would be one of the main soil groups affected by pipeline construction. These shallow to deep soils on the steep sloping mountain areas which receive an annual precipitation of 14 inches or more have specific locations susceptible to poor slope stability and high erosion hazards. Sidehill cuts and fills would cause structural soil changes resulting in mass movement, slides, an increase in surface disturbance, and soil erosion. A more detailed review **of soil information provided by the FS** indicates approximately 10 to 30 percent of the areas would be subject to slides. These soils occur from MP 65 to MP 79, MP 80 to MP 170, and MP 176 to MP 192. Areas of Soil Group 1 are identified on maps S-2 through S-19 in the *Graphic Supplement*. No other soil groups are shown on the base maps.

In addition to slope, properties of the underlying geologic formation would also strongly influence impacts from project construction. The Green River and Uinta formations are unstable formations, and the soils derived from them inherit properties and behavorial characteristics that adversely affect revegetation potential.

A preconstruction field review to determine final pipeline alignment and site-specific mitigation measures proposed by the applicant and required by the authorizing agencies (identified in appendix C) would reduce the potential high impacts in the mountain soil areas.

Soil Group 2

Construction would disturb 170 acres of Soil Group 2. These shallow to deep, moderately steep to steep soils of the mountains and plateaus in areas with annual precipitation of 14 inches and less are subject to moderate to high erosion hazards and low revegetation potential.

Soil Group 3

There would be 436 acres of Soil Group 3 disturbed by construction. These strongly saline and alkaline soils would cause erosion and revegetation problems. Most commonly, these areas are sparsely vegetated and have a low revegetation potential. However, soil losses due to project construction would be minimal, considering the nearly level to gentle slope areas, the preconstruction vegetation cover condition, and limited erosion.

Soil Group 4

Sixty-one acres of sandy and loamy sand soils in areas with an annual precipitation of less than 16 inches would be disturbed. These soils have a low revegetation potential and are highly susceptible to accelerated wind erosion. Wind erosion would cause air pollution from fugitive dust until stabilization by mulches and other special erosion control treatments was achieved.

Soil Group 5

Construction would disturb 570 acres of Soil Group 5, consisting pre- dominantly of shallow soils over bedrock and soils with duripans and hardpans. These soils have a low vegetation density and revegetation potential. The effects of disturbance would be minimized in less than 3 years after restoration measures were applied.

Soil Group 6

Construction would disturb 206 acres of Soil Group 6. These soils occur on side slopes, ridges, and fans with slopes of 15 to 25 percent (including some areas of 9- to 15-percent slope), but this does not include mountain soils. These soils are susceptible to a high erosion hazard and are more difficult to reclaim. Intensive application of erosion control and reclamation measures (appendix C) would limit erosion loss to near preconstruction levels.

Soil Group 7

Construction activities would disturb 61 acres of playas, Soil Group 7. Physical and chemical properties of these soils would strongly affect construction and maintenance of the project. Erosion hazard would be slight; runoff would be slow or ponded.

Soil Group 8

Construction of the pipeline would disturb 170 acres of rock land and barren land, Soil Group 8, subject to high sediment yield and gully erosion. Rockland areas would require special construction techniques such as blasting.

Soil Group 9

There would be 2,811 acres of Soil Group 9 disturbed by construction activities. These areas with annual precipitation less than 8 to 10 inches are more susceptible to erosion and would require more intensive application of restoration measures to attain preconstruction conditions due to the low revegetation potential and disturbance of desert pavement surfaces. The baseline condition of these areas is sparse; vegetation consists mainly of shrubs and forbs. Reseeding is more difficult and generally not successful. Intensive application of mitigation measures (appendix C) would reduce accelerated erosion and would prevent rills and gullying along the steeper slopes along the right-of-way which could result from short, intense rain storms characteristic of this climate.

Soil impact potential would be similar for the alternatives and variations, since they generally would traverse similar soil conditions. As table 3-9 indicates, the alternatives and variations differ mainly in the extent and occurrence of soil types they would cross.

Visual Resources

CRITERIA FOR ANALYSIS

The impact of the contrasts which could be observed in the landscape as a result of implementing the RMPP are based on the BLM VRM System and FS VQO's **VMS** (BLM 1978b). Refer to **the methodologies discussed in** appendix I, "Visual Resource Management," and the *Visual Resources Technical Report* for further explanation (BLM, 1981g). A contrast rating was determined by evaluating the extent to which construction of the proposed action, alternatives, and variations would contrast with the form, line, color, and texture of the existing landscape. The extent of contrast was then translated into either adverse or beneficial impacts.

The basis for applying the contrast rating was the VRM Classes and VQO's described in chapter 3. Potential areas of impact and typical viewing points along the routes and near ancillary facilities were determined based upon scenic quality or visual variety of the landscape, visual sensitivity, and viewing distance.

The duration of viewing, number of viewers, viewer attitude toward changes in the landscape, angle of observation, ease of recontouring and revegetation, and construction and restoration methods (discussed in chapter 2 and appendix C) were all considered in analyzing the degree of contrast. Cumulative development was considered where further development would heighten contrast from existing rights-of-way for utilities and highways in narrow canyon areas. The impact of other proposed projects was also considered.

The contrast evaluation was concerned only with the residual effects of construction such as surface scars, removal of vegetation, and placement of permanent structures in viewed areas. All other impacts were considered insignificant because construction crews and equipment would be visible only temporarily and would not place significant impact on the visual resources of any area. Pipeline and ancillary facility operation, maintenance, and abandonment would have little or no adverse effect on the visual landscape.

The length of time the impact could be viewed was assessed in determining the contrast rating for the various VRM Classes and VQO's. Changes directly related to vegetation that would be mitigated through revegetation, as described for the proposed action, and within one or two growing seasons (e.g., cropland or areas of natural grasses) were considered to be temporary and thus insignificant. The same rationale applies to landforms which would be recontoured during construction or immediately upon completion; these changes would be temporary and insignificant. In other areas which would not recover easily, significant visual contrasts would remain longer. These would include steep, rocky areas where landform changes would remain longer and steep, dry slopes or any areas of low precipitation where revegetation would be difficult. Modifications which would be noticeable for 2 to 5 years would be short term; those that would be noticeable from 5 years through the project life of 20 years or longer would be long term. Long-term contrasts created by vegetative clearing for the RMPP facilities and the addition of structures would be the predominant adverse impact of the pipeline.

The distinct pattern of shrub types such as sagebrush, creosote bush, and shadscale-greasewood would be easily affected by the straight lines created by the right-of-way clearing. Because of the regenerative nature of these species coupled with poor growing conditions, such impacts would generally be long term. The VRM Class or VQO where the change would occur determine final significance. Revegetation would produce color contrast with existing vegetation, emphasizing the contrast in line.

Visual impacts which would be directly related to the addition of physical structures (ancillary facilities) to the landscape would be significant only if they contrasted with the natural setting determined by the contrast rating system. Such structural impacts would be limited to compressor stations and maintenance yards, where cleared vegetation and the scale and design configuration of the facilities would make them highly visible; the resulting visual contrasts would detract from the natural landscape setting. Block valves, access roads, and cathodic protection stations would place equal impacts on all routes analyzed; these impacts would be insignificant because of the facilities' relatively small size and scale within the landscape. Further analysis would be necessary during the permit granting and monitoring to minimize visual impact on Federal lands.

Communication sites were not analyzed since the numbers of sites and their locations have not been determined. While the RMPC indicates that a majority of the project's communications needs can be met by using existing systems, new facilities might create significant adverse visual contrasts in areas where they would be placed. (Communication towers are normally located on higher landforms where they may be seen from many viewing points.) Additionally, the landforms in these areas are usually of higher scenic value, which contributes toward classifying the areas in a more restrictive VRM class or VQO).

IMPACTS OF THE PROPOSED ACTION

The visual resources of the areas identified in table 4-1 would undergo significant adverse impacts as a result of the proposed action. The placement of the pipeline in these areas would exceed the allowable levels of contrast for each VRM Class or VQO established for the particular segment of the pipeline corridor. Areas where impacts would exceed the acceptable levels of contrast for a specified VRM Class are placed in VRM Class 5 (indicating rehabilitation would be necessary). Areas where impact would exceed levels of contrast for a specified VQO are labeled Unacceptable Modification (also indicating rehabilitation would be necessary).

The total number of miles and acres of significant adverse visual resource impacts from the proposed action, alternatives, and variations are summarized by VRM Class and VQO in table 4-2.

TABLE 4-1

SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS OF THE PROPOSED ACTION

MP	Affected Landscape Feature[1]	Critical Viewpoint[2]	Duration of Impact[3]	Contrast Rating Feature Score[4]	VRM Class and/or VQO[5]
PIPELINE					
MP 85-MP 110	Vegetation	Interstate 80	Long Term	-/22/-	2
MP 118-MP 123	Vegetation	Access to proposed Currant Creek Recreation Area	Long Term	-/27/-	R,PR
MP 130-MP 133	Vegetation	U.S. Highway 40	Long Term	-/22/-	R
MP 133-MP 137	Vegetation	Recreation Areas	Long Term	-/18/-	PR
MP 137-MP 144	Vegetation	Recreation Areas	Long Term	-/15/-	R
MP 153-MP 158	Landform, vegetation	U.S. Highway 6	Long Term	15/19/-	2,R,PR
MP 183-MP 190	Vegetation	Highway 132	Long Term	-/23/-	3
MP 190-MP 195	Landform, vegetation	Nephi, Highway 132	Long Term	22/19/-	3
MP 232-MP 235	Landform, vegetation	Interstate 15	Long Term	26/22/-	2
MP 370-MP 395	Landform, vegetation	Highway 18	Long Term	17/17/-	3,R,PR
MP 495-MP 505	Landform, vegetation	Frenchman Mountain-Rainbow Gardens	Long Term	17/18/-	3
ANCILLARY FACILITIES					
Sage Compressor Station and maintenance base:					
MP 0	Vegetation, structure	Highway 51/89 and Highway 89/30N	Long Term	-/21/29	
Cedar City maintenance base:					
Cedar City, Utah Vicinity	Vegetation, structure	Cedar City, Interstate 15	Long Term	-/22/26	3

[1]The composition of the characteristic landscape would be modified by changing the landform, water form, or vegetation or by adding a structure to the landscape.

[2]A critical viewpoint is the point where the proposed change would be most apparent.

[3]Duration of impact can be described as:
Temporary--During construction through first or second growing season.
Short term--For 2 to 5 years following construction.
Long term--5 years to project life of 20 years or longer.

[4]Contrast Rating Feature Score is a value which the contrast of a specific area could not exceed without creating a significant adverse visual impact.
VRM Class 2 and VQO R both have a Feature Score of 12.
VRM Class 3 and VQO PR both have a Feature Score of 16.
VRM Class 4 and VQO M,and M both have a Feature Score of 20.
See appendix I for further explanation.

[5]See table 3-10 for definitions of terms.

TABLE 4-2 (Updated)

SUMMARY OF SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS BY PROPOSED ACTION, ALTERNATIVES, AND VARIATIONS

Route	Number of Miles and Acres in Each VRM Class/VQO[1]																			
	Class 1		Class 2		Class 3		Class 4		P		R		PR		M		MM		Totals	
	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres
PIPELINE																				
Proposed Action	-	-	30	364	29	352	-	-	-	-	20	242	18	216	-	-	-	-	97	1,176
Alternative A, Northern Systems	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Alternative B, Sanpete Valley	-	-	37	449	19	230	3	36	-	-	20	243	18	218	-	-	-	-	97	1,176
Alternative C, Central Nevada	-	-	64	775	22	267	-	-	-	-	21	255	16	194	-	-	1	12	124	1,503
Alternative D, Sevier-Escalante Desert	-	-	27	327	29	352	-	-	-	-	20	242	18	218	-	-	-	-	94	1,139
Alternative E, West Salt Lake	-	-	-	-	17	206	-	-	-	-	17	206	11	133	-	-	-	-	45	545
Alternative F, Provo Canyon	-	-	67	812	17	206	-	-	-	-	7	85	14	170	-	-	-	-	105	1,273
Variation 2, Thistle Creek	-	-	10	121	9	109	-	-	-	-	-	-	-	-	-	-	-	-	19	230
Variation 3, East Las Vegas	-	-	15	182	5	60	-	-	-	-	-	-	-	-	-	-	-	-	20	242
Variation 4, Fort Mojave	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Variation 5, Mill Creek	-	-	6	73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	73
Variation 6-II, Daniels Canyon II	-	-	-	-	-	-	-	-	-	-	-	-	1	12	-	-	-	-	1	12
Variation 7, Moapa	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Variation 8, West Kamas Valley	-	-	3	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	36
ANCILLARY FACILITIES																				
Proposed Action	-																			20
Compressor Station (1)	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-
Maintenance Bases (4)	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alternative A, Northern Systems	-																			15
Compressor Station (1)	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-
Alternative B, Sanpete Valley	-																			20
Compressor Station (1)	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-
Maintenance Bases (4)	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alternative C, Central Nevada	-																			30
Compressor Station (1)	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-
Maintenance Bases (6)	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alternative D, Sevier-Escalante Desert	-																			20
Compressor Station (1)	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-
Maintenance Bases (4)	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alternative E, West Salt Lake	-																			20
Compressor Station (1)	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-
Maintenance Bases (4)	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alternative F, Provo Canyon	-																			20
Compressor Station (1)	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-
Maintenance Bases (4)	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-

[1]Refer to table 3-10 for definitions.

NOTES: Acreage figures are based upon a 100-foot wide construction right-of-way. Summaries for the alternatives include those portions of the proposed action which precede and follow the alternative, whereas summaries for the variations include only those portions which deviate from the proposed action.

*NO SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS.

Land Uses: Recreation Resources, Agriculture, Conflicts with Land Use Plans, Controls, and Constraints, and Las Vegas Area Land Use Conflicts

RECREATION RESOURCES

Criteria for Analysis

Impacts related to any components of the proposed action, alternatives, or variations are categorized as short-term and long-term. Short-term impacts **would** commence with the construction of the proposed pipeline, alternatives, or variations and associated facilities and continue up to one season beyond construction completion. Long-term impacts would last from 1 year to the life of the proposed project (20 years).

The significance of the impact is determined by the length of impact (short term versus long term) in relation to the public's sensitivity and perception of the impact. For recreationists, this sensitivity and perception can be low, medium, or high, depending on their expectations. For example, a hiker expecting a pristine hiking experience could be highly offended when confronted with pipeline construction; this would produce a high sensitivity level. A hiker who expects to be periodically confronted with humanity's influences upon the environment (i.e., a view of a road, marina, or parking lot) and yet desires a seminatural experience would probably not be offended when confronted with pipeline construction. A hiker on a paved trail within a municipal park expecting an urban experience would also not be offended by pipeline construction. To analyze impacts, the following matrix was used:

		Length of Impact	
		Short Term	Long Term
Public Sensitivity and Perception	Low	Not Significant	Not Significant
	Medium	Not Significant	Significant
	High	Significant	Very Significant

Impacts of the Proposed Action

Construction of the pipeline in the vicinity of the Strawberry Reservoir Recreation area would create noise, dust, visual impact, and possibly some traffic disruption along the west shore road. **Although** since the construction area would **cross the major access road several times in one area and would** be 1 to 1.5 miles west of the major access road **for the rest of the reservoir area (See map 3-2, "Recommended Plan (Strawberry Reservoir Enlargement-1978)"), the majority of the users would not be affected. Because few people would be affected and the duration of impact would be short term (4 to 6 weeks), these impacts would be insignificant. Public sensitivity would probably be low to medium, since intrusions upon the recreational experience in the area (e.g., developed campgrounds, motorboats, Phillips Petroleum drill rig, automobile traffic on the west shore road, etc.) are common and expected.**

Pipeline construction could affect the **use** of several summer homes or lodges in this area, authorized by the FS under special **use** permits. Noi dust, and odor created by adjacent pipeline construction would create a high public concern. Normal access to the summer homes could also be temporarily modified, however; ingress and egress would be maintained.

Construction would significantly affect competitors and spectators at the annual Mint 400 ORV event in the Dry Lake Valley **(in** Nevada **at approximately MP 480 to MP 487)** by creating a serious safety hazard. The Mint 400 schedule would conflict with the proposed pipeline construction schedule. This safety impact (conflict with numbers of people and vehicles) would last approximately **2** weeks during construction and would be perceived with high sensitivity by ORV competitors and spectators.

Similar impacts for ORV events and general free play ORV activity could occur in the Las Vegas Sand Dunes Recreation Area.

There would be short-term (4 to 6 weeks) significant impacts from the proposed construction on the proposed Frenchman Mountain-Rainbow Gardens National Natural Landmark and proposed Clark

County Wetlands Park. Public sensitivity to visual intrusions, noise disruptions, construction equipment, odors, and generated dust would be high for more pristine areas where passive recreational **uses** take place.

Additionally, there could be a long term reduction in scenic quality enjoyed by recreationists in the area. (See 'Visual Resources' for additional information.)

No recreational experiences would be affected by project ancillary facilities (e.g., Sage Compressor Station, maintenance bases, meter station, etc.), since none would be located near formally managed recreation areas.

AGRICULTURE

General Impacts

The main concerns related to construction, operation, and maintenance of the proposed action, alternatives, and variations on agricultural lands are: (1) loss of crop production during the construction year, (2) restoration of crop production, (3) reduction of grazing until areas are restored, (4) disturbance of topsoil and soil compaction, (5) disturbance to irrigation systems during irrigation season, (6) disturbance of subsurface drainage systems, and (7) long-term land use changes at surface facility sites.

Most impacts to agricultural land would be insignificant and short term (1 or 2 years) because restoration should be successful. The Erosion Control, Revegetation, and Restoration Guidelines proposed by RMPC (appendix C) would assure successful restoration of all prime agricultural land, other cropland, and native rangeland. These guidelines are discussed in more detail in the *Soils and Agriculture Technical Report* (BLM 1981c).

Irrigation water delivery systems and subsurface drainage systems could be disrupted by pipeline construction. With the appropriate timing of construction to avoid crucial irrigation periods and the implementation of restoration measures (proposed by the applicant and presented in appendix C), this impact would be minimized.

Impacts to fruit orchards would be significant due to the length of time required to restore production to preconstruction conditions and the requirement that trees would not be allowed to grow over a 25-foot wide section of the pipeline right-of-way. However, the limited number of orchards and onsite realignment of the pipeline would minimize this impact.

A significant agricultural concern is land **use** change which would occur where permanent surface facilities changed agricultural land to industrial **use** for the life of the project. The result would be a loss of crop production for the life of the project (20 years). This potential loss would be significant where cropland areas 5 acres or larger would be required for surface facility sites. Where surface facility sites were located on native range areas used for grazing, impacts would be insignificant.

For discussion and analysis of livestock grazing impacts refer to appendix J, Livestock Grazing.

Impacts of the Proposed Action

Construction of the proposed action would disturb 1,065 acres of cropland for one growing season. Of the surface facilities, the Sage Compressor Station would be located on native grazing land, and one maintenance base could be built on 5 acres of agricultural land somewhere along the proposed route. Table 3-12 shows the acres of agricultural land which would be disturbed by the proposed action, alternatives, and variations.

Agriculture experiment station officials have indicated that right-of-way alignment would minimize the impacts to the station near Nephi, Utah (Van Eppes 1981).

CONFLICTS WITH LAND USE PLANS, POLICIES, AND CONTROLS

The proposed action would conflict with the Utility Rule of the proposed Forest Land Management Plan for the Uinta National Forest. This would violate the intent of the plan in designating lands suitable for utility corridors and **create** a new *de facto* corridor susceptible to use by other utilities.

The proposed action would not follow the over 3,000-foot wide corridor administered by BLM through the 70,000 acres transferred from BLM administration to the Moapa Indian Reservation. The BLM policy is to follow this corridor wherever possible. If the proposed route is authorized, the RMPC would have to negotiate a right-of-way with the tribal council for passage through the new reservation lands. If a new *de facto* corridor is created, there would be two corridors across the reservation which could be considered by sponsors of future utility projects: one on public lands, for which BLM would grant rights-of-way, and one on reservation lands, which would require right-of-way negotiation.

At this time, it is unknown whether or how the proposed action would conflict with the Draft Management Master Plan for the proposed Clark County Wetlands park in southern Nevada.

In the Thistle and Sheep Creek areas of Utah, the proposed action would conflict with the T

and S zone of the Utah County Land Use Plan. This zone, which limits the size and pressure of gas pipelines, affects 5-acre tracts scattered along the roadways in Utah County. However, the impact would not be significant because the alignment of the pipeline centerline within the 1- mile wide corridor could probably avoid the 5-acre parcels.

LAS VEGAS AREA LAND USE CONFLICTS

The proposed action would adversely affect three areas with land use or administrative problems. The proposed route would cause long-term adverse impact to the positioning of planned recreational facilities in the Clark County Wetlands Park area. The route could also increase the soil erosion and headcutting problems which already exist in this area.

Pipeline placement through Henderson, Nevada, could significantly conflict with the urban subdivisions and the Henderson Planning Commission's plans for expansion. In 1981, because of these plans, the commission denied the IPP's request for a land use permit to construct a high voltage transmission system. The original IPP alignment would parallel east of the proposed action corridor. The proposed route would be severely affected should the Henderson Planning Commission also deny a land use permit to the RMPC.

Pipeline construction adjacent to U.S. Highway 95 within the area slated for transfer to the State of Nevada could conflict with the projected commercial/industrial development occurring along both sides of the highway (Stonehocker 1981).

Socioeconomics

CONSTRUCTION SCHEDULE

Employment for RMPP construction would occur from mid-April through October 1982, with peak employment commencing in mid-June and ending in early September. Figures 4-1 and 4-2 show the labor requirements for each type of pipeline construction spread. Seven spreads would work simultaneously to complete the project. (Table 2-3 lists the number of employees for this proposal.) Each pipeline spread would have at least one double-jointing yard where pipe segments delivered by railroad would be coated and welded in two- or three-piece lengths. RMPC estimates that 21 percent of each spread's peak work force would be located at these yards. The crews performing these functions, unlike their associates on the right-of-way, would be living in one location for up to 5 months. Since these workers are part of each pipeline spread, their impact is included in the following regional analysis. However, because they would be largely in one location for a protracted period, their impact would be focused on specific towns.

Separate construction work forces would be used for the Sage Compressor Station and maintenance base, the four other maintenance bases, and the communication network. The compressor station and maintenance base at Sage, Wyoming, would be built in 6 months; the initial crew of 60 workers would peak in the third month at about 100 workers. Peak construction would last only 1 month. Local contractors would construct the four maintenance bases (Heber City, Nephi, Cedar City, and Las Vegas), employing an average of 12 workers each during construction. A peak force of 20 workers would be used for 2.5 months. Erection of the communication system would employ two 6-person crews for 4 months and two 3-person crews for 2 months thereafter.

PIPELINE WORK FORCE

At its peak, the project would employ 2,402 workers. This peak would last from 2.5 to 3 months. Local resources would provide 20 percent of the construction force; the remaining 80 percent would come from nonlocal labor pools. The average wage would be $119 per worker per day.

Previous studies examining the impact of pipelines and similar construction projects on economic and social conditions conclude that little or no significant adverse impact results from such construction (BLM 1979, 1980a, 1980e). Given the quick pace, short duration, and linear spacing of pipeline construction, the level of socioeconomic impact is low. This differs from the impact normally encountered with large fixed-site construction projects, where large numbers of workers remain in one location for long periods of time. Because of this difference, the following discussion examines the impact of transitory pipeline workers and the impact of workers at the compressor station and double-jointing yards separately.

On the right-of-way, there would be a peak work force of between 230 and 277 workers per spread, depending on whether the terrain was smooth or mountainous. Each of the seven construction spreads would move 1/3 to 1 mile per day, depending on terrain. Each crew would build approximately 100 miles of pipeline, except for spread 7, which would build 27 miles of pipeline. Because

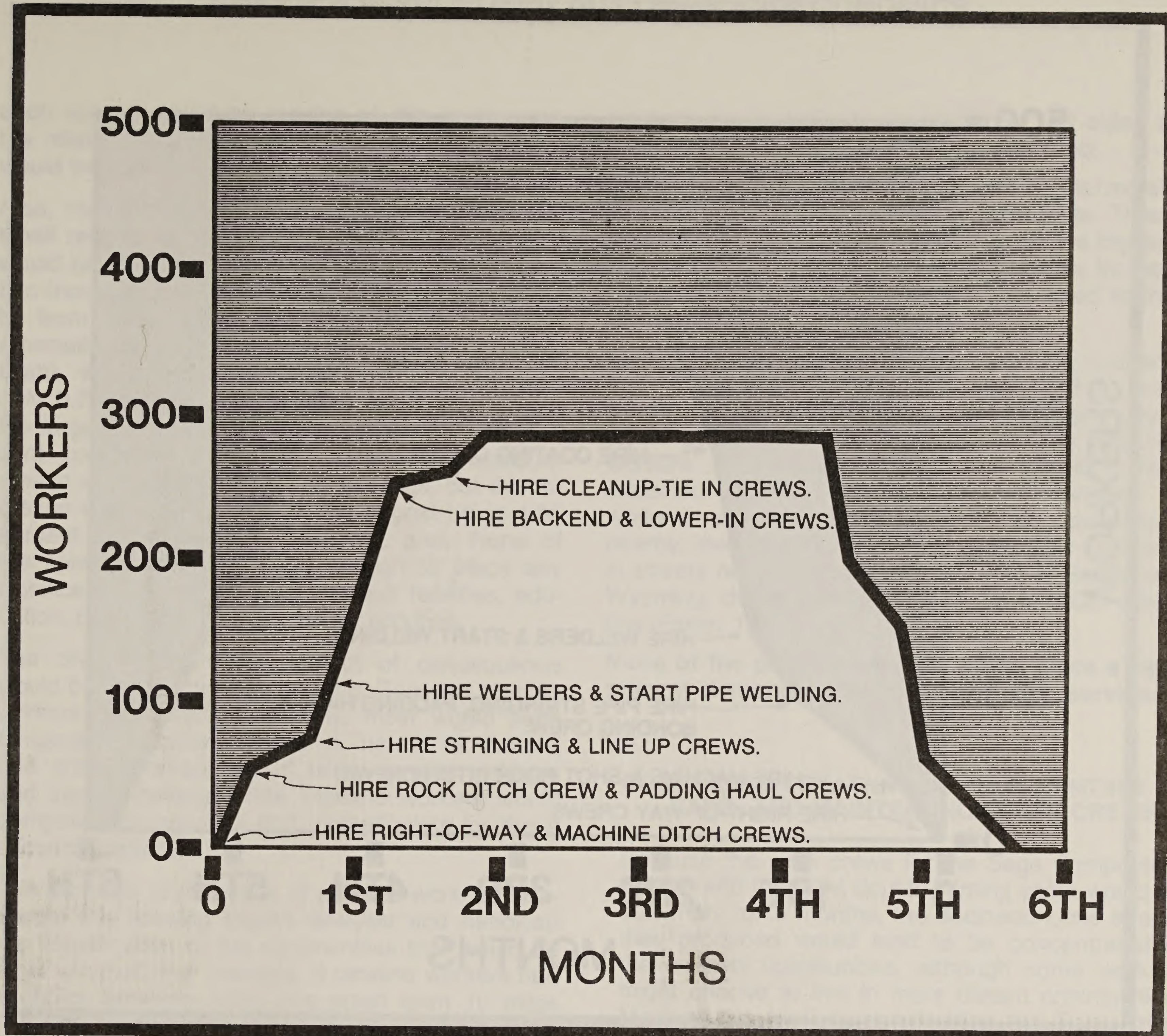


FIGURE 4.1. EMPLOYMENT SCHEDULE: ROLLING COUNTRY

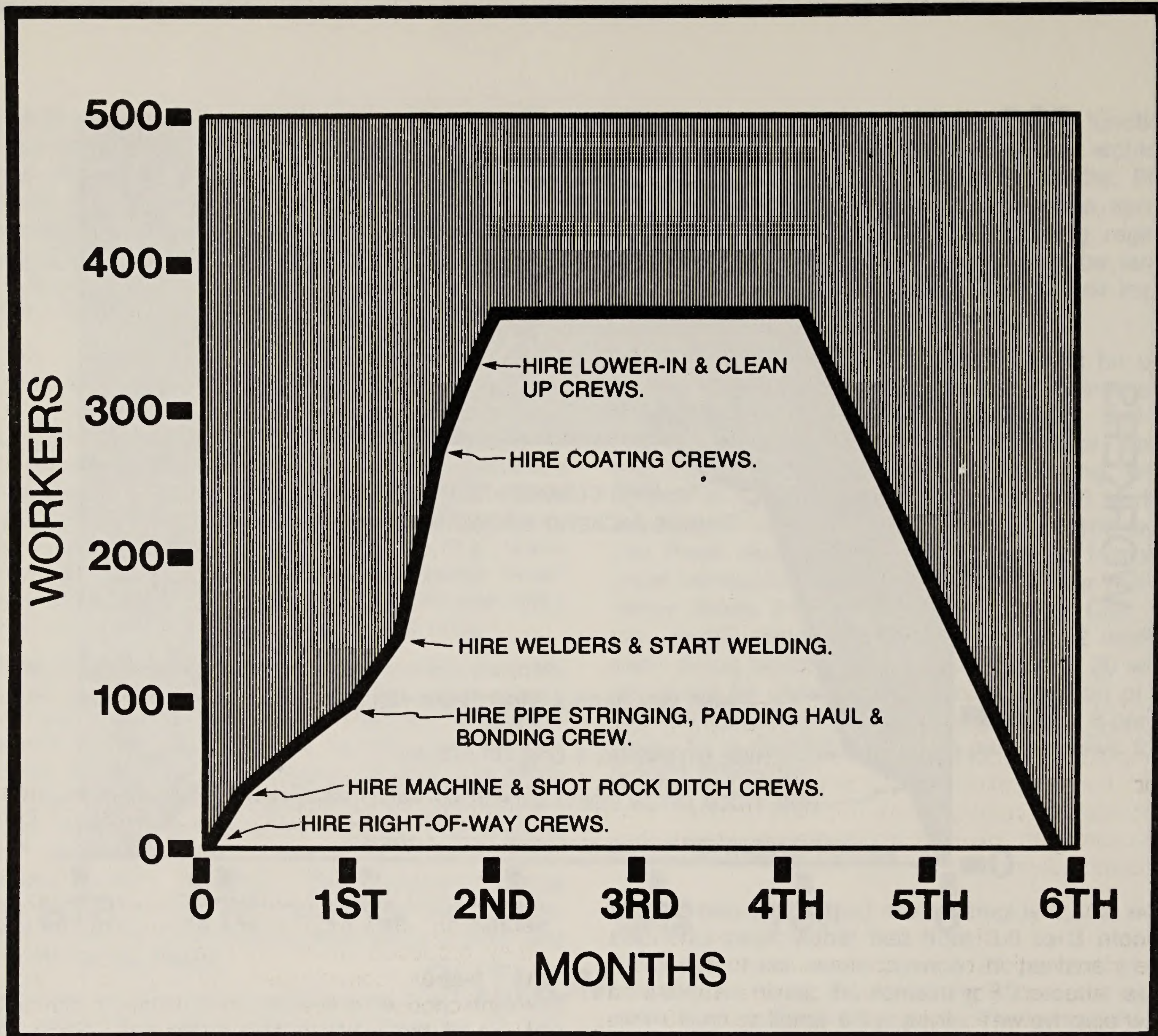


FIGURE 4.2. EMPLOYMENT SCHEDULE: ROUGH MOUNTAINOUS TERRAIN

each spread would be moving at this rapid pace, the related socioeconomic impact in any one area would be transitory.

Also, the number of construction workers is very small relative to the population of the regions that would be affected. For example, the largest population increase that would occur in any region would be from spread 2 of the Sevier-Escalante Desert Alternative (Beaver, Iron, and Washington Counties, Utah), which would increase local population by only 0.75 percent. This spread would also create the largest increase in total employment, 1.48 percent. Local retail sales during construction would increase as workers spent their earnings, but this increase would also be small, the largest being 4.85 percent in the Needles, California, area. None of the spreads would be large enough to place any significant demand on local medical facilities, education, police, fire, or other public services.

The only worker-related impact of consequence would be the demand on housing. Because pipeline workers move fairly frequently, most would seek temporary accommodations in hotels or motels, and some workers would bring camper vehicles and stay in campgrounds. Pipeline workers would compete with travelers and recreationists for these accommodations.

The personal preferences of pipeline workers complicate the housing impact analysis and handicap the identification of the communities that would be most affected. For example, if pipeline workers had a choice between living in a small town 10 miles from the route or a large town 20 miles from the route, they might choose to live in the large town if the entertainment or the quality of accommodations were better. However, in general, the demand for housing should have a cascade-like effect on towns near the pipeline route: the accommodations nearest the pipeline would fill up first; the overflow workers would be forced to seek housing farther from the pipeline.

While housing in the immediate vicinity of the pipeline tends to be scarce--because the RMPP would be constructed largely through rural areas--large blocks of housing are available within easy commuting distance. For most of the construction spreads, there would be no need for commuters to travel more than 40 miles to obtain accommodations. Indeed, within 40 road miles of the proposed route, the amount of housing is quite large. Most of the pipeline spreads would require only 2 to 9 percent of existing hotel and motel rooms and 4 to 11 percent of the campsites with services. The exceptions would be the northern half of pipeline spread 1 in northeast Utah, and all of spread 7 in San Bernardino County, California. In these areas, pipeline workers would have to travel 60 to 100 miles to obtain housing once local housing was filled.

Table 4-3 lists the communities with hotels/motels located within 20 miles of the pipeline route. These communities would probably experience the highest demand for housing, while the communities located 20 to 40 miles from the pipeline, also listed **in** the table, would experience a lesser demand.

Temporary housing in one town near the northern half of spread 1-- Randolph, Utah--and in two towns near spread 7--Needles and Bullhead City--would probably be filled to capacity with pipeline workers. This would inconvenience travelers who expected to stay in those locations overnight. If workers with campers did not find campsites nearby, they might be inclined to park their vehicles in streets near or in town, as occurred in Evanston, Wyoming, during construction of the MAPCO pipeline (Farley 1981).

None of the pipeline spreads would place a significant demand on hospital or police services.

COMPRESSOR STATION, DOUBLE-JOINTING YARD, AND MAINTENANCE BASE CREWS

Because the work crews for the Sage Compressor Station and the eight double-jointing yards would be stationary for 5 months, the socioeconomic effects they produced would tend to be concentrated in the nearest communities, although some workers might choose to live in more distant communities. Most of the workers constructing the Sage Compressor Station would probably commute 60 miles or more to Logan, Tremonton, or Brigham City, Utah, because the closer communities have little or no available housing. Since the populations of these more distant towns are relatively large, the workers would have little impact on population, employment, retail sales, or police and medical services. Nevertheless, up to 17 percent of the hotel and motel rooms and 12 percent of the campsites in the area (Lincoln County, Wyoming, and Rich and Cache Counties, Utah) would be necessary to house RMPP personnel during the peak month of construction.

Long commuting might also be required for workers at the Evanston and Nephi double-jointing yards. The town of Evanston, Wyoming, is 10 miles east of the Evanston yard site; the double-jointing yard workers would require 11 percent of the hotel/motel rooms and 21 percent of the campsites there. However, Evanston currently has almost no hotel/motel vacancies because of the influx of workers from recent petroleum and mineral developments in the area. RMPP workers would have to commute 70 miles to Ogden, Utah, to find housing.

TABLE 4-3

TOWNS WITH HOUSING ALONG THE PROPOSED ACTION

Construction	Communities With Accommodations Within 20 Miles of the Pipeline	Communities With Accommodations 21 to 40 Miles From the Pipeline
Sage Compressor Station	Evanston Randolph	Kemmerer Garden City [a]Logan
Pipeline Spread 1	Evanston Randolph Coalville Park City	Kemmerer Garden City [a]Logan Morgan Ogden Salt Lake City South Salt Lake
Pipeline Spread 2	Park City Heber City Nephi	Salt Lake City South Salt Lake Gunnison Mt. Pleasant Orem Lindon Pleasant Grove Payson Provo Springville
Pipeline Spread 3	Nephi Fillmore Beaver Milford	Payson Provo Springville Delta Monroe Richfield Salina
Pipeline Spread 4	Beaver Milford Cedar City Parowan St. George Washington	
Pipeline Spread 5	St. George Washington Logandale Moapa Las Vegas North Las Vegas Boulder City	Mesquite
Pipeline Spread 6	Las Vegas North Las Vegas	
Pipeline Spread 6	Boulder City Searchlight Laughlin Bullhead City	
Pipeline Spread 7	Bullhead City Needles	Havasu City

[a]Logan is approximately 70 miles from the proposed Sage Compressor Station and 55 miles from the pipeline.

Alternatively, some workers might elect to rent apartments or houses for the 5 months of construction.

If all the Nephi double-jointing yard workers were to live in Nephi, they would require 22 percent of the hotel and motel accommodations and 10 percent of the campsites with services there. (Retail sales would increase by almost 6 percent during construction.) Because of this high demand for housing in Nephi, some of the workers might live in Provo, a much larger town 40 miles away. However, because Provo is larger and has a larger entertainment industry, workers might choose to live there regardless of housing in Nephi.

The remaining double-jointing yard crews would probably live in the towns where the yards were located. These towns include Provo, Fillmore, and Cedar City, Utah; Las Vegas and Boulder City, Nevada; and Needles, California. The smallest towns, Fillmore and Needles, are relatively isolated, with the nearest alternative housing 60 to 100 miles away. If workers stayed in these towns, they would require a substantial portion of the hotel/motel rooms--28 percent in Fillmore and 12 percent in Needles. This would inconvenience travelers hoping to stay overnight at these locations. If all the workers were located in these towns, they would generate an 8-percent increase in retail sales in Fillmore and a 3-percent increase in Needles. The towns of Provo, Cedar City, **Boulder City**, and Las Vegas, which are larger, would not be significantly affected.

None of the double-jointing yard work forces would place a significant demand on hospital or police services. Because the work would be done by local contract construction firms, construction of the maintenance bases would not result in any deleterious socioeconomic impact.

OPERATION AND MAINTENANCE

The RMPC would permanently employ about 68 people to operate and maintain its system. Of these, 27 would be employed at the operating headquarters in Salt Lake City; the remaining 41 employees would be spread among the five maintenance bases. This small work force would not significant socioeconomic ramifications.

The anticipated project property taxes for the first year of operation are compared with existing county property tax revenues in table 4-4. **The project could dramatically increase the property tax revenues in Rich County, Utah, mainly because its existing tax bases are low.** Other counties could also benefit substantially from the project tax revenues. However, these revenues would decrease every year because of depreciation.

In Utah, the amount a pipeline depreciates each year depends on various factors such as productivity of the gas field, gas throughput, relationship between salvage value and earnings, and maintenance costs. Generally, a pipeline does not depreciate more than 80 percent by the end of its useful life (approximately 20 years) if the throughput is maintained. However, if the volume decreases, so does the value of the pipe (Sugino 1981). Depreciation in Nevada and California is currently based solely on the expected life of the pipeline (DuPaul 1981, Wilcox 1981).

TABLE 4-4

PIPELINE PROPERTY TAX IMPACT OF THE PROPOSED ROUTE, ALTERNATIVES, AND VARIATIONS[a]

County	State	Property Tax Payments to County ($)	Property Tax Payments as Percent of County Property Tax Receipts
RMPP			
Lincoln	Wyoming	301,000	3.5
Rich	Utah	414,000	52.1
Summit	Utah	402,000	6.2
Wasatch	Utah	409,000	27.8
Utah	Utah	175,000	0.5
Sanpete	Utah	77,000	4.5
Juab	Utah	306,000	23.0
Millard	Utah	502,000	22.0
Beaver	Utah	291,000	30.2
Iron	Utah	355,000	8.1
Washington	Utah	395,000	9.2
Lincoln	Nevada	145,000	18.6
Clark	Nevada	980,000	1.1
San Bernardino	California	208,000	0.1
Northern Systems Alternative			
Lincoln	Wyoming	150,000	1.7
Rich	Utah	30,000	3.8
Bear Lake	Idaho	96,000	4.8
Caribou	Idaho	133,000	4.7
Power	Idaho	216,000	5.7
Umatilla	Oregon	4,000	b
Morrow	Oregon	64,000	0.9
Jefferson	Oregon	14,000	0.3
Klamath	Oregon	7,000	b
Colusa	California	58,000	0.8
Contra Costa	California	88,000	b
Alameda	California	31,000	b
San Joaquin	California	171,000	0.2
Stanislaus	California	251,000	0.4
Merced	California	282,000	1.0
Fresno	California	252,000	0.2
San Bernardino	California	208,000	0.1
Sanpete Valley Alternative			
Sanpete	Utah	170,000	10.0
Sevier	Utah	516,000	24.3
Piute	Utah	205,000	71.7
Garfield	Utah	102,000	12.4
Iron	Utah	4,000	12.5
Sevier-Escalante Desert Alternative			
Juab	Utah	256,000	19.3
Millard	Utah	672,000	29.5
Beaver	Utah	291,000	30.2
Iron	Utah	331,000	7.6
West Salt Lake Alternative			
Lincoln	Wyoming	13,000	0.75
Rich	Utah	58,000	7.3
Bear Lake	Idaho	20,000	1.1
Franklin	Idaho	51,000	2.8
Rich	Utah	58,000	7.3
Cache	Utah	24,000	0.3
Box Elder	Utah	247,248	3.8
Tooele	Utah	191,000	4.3
Juab	Utah	265,000	20.0
Millard	Utah	595,000	26.1
Provo Canyon Alternative			
Wasatch	Utah	251,000	17.1
Utah	Utah	577,000	17.1
Juab	Utah	337,000	25.4
Thistle Creek Variation			
Utah	Utah	239,000	0.7

TABLE 4-4—Continued

County	State	Property Tax Payments to County ($)	Property Tax Payments as Percent of County Property Tax Receipts
Sanpete	Utah	73,000	4.3
East Las Vegas Variation			
Clark	Nevada	1,001,000	1.1
Fort Mojave Variation			
San Bernardino	California	c	c
Mill Creek Variation			
Utah	Utah	241,000	0.7
Daniels Canyon Variation II			
Wasatch	Utah	67,700	4.6

[c]This variation is the same length as the portion of the proposed route it would supercede; therefore, there would be no difference in county tax receipts.

Sources: RMPP 1980. Estimates for San Bernardino County and all alternatives and variations based on estimated value of facilities and county tax rate.

Native American Issues

Pipeline construction spread 7 would cross 4.5 miles of the Fort Mojave Indian Reservation. The 27-mile long spread would have a peak work force of 290 and an average work force of 150. According to the applicant, 20 percent of the work force would be local hires; this could have a short-term, positive impact on the 64 unemployed Fort Mojave Tribal members.

The income from leasing the 4.5 miles of pipeline right-of-way would provide long-term beneficial income to the Fort Mojave Tribe, but there is no way to quantify the total income, since the amount would be negotiated between the tribal council and PG&E and PLS.

The **proposed action would cross the** Moapa Indian Reservation, since the legislation which expands the reservation by approximately 70,000 acres **(P.L. 96-491) has recently passed.**

Pipeline construction spread 5 would cross 6.5 miles of the Moapa Indian Reservation. The 100-mile long spread would have a peak work force of 320 with an average of 150. According to the applicant, 20 percent of the work force (30 to 64) would be local hires; this could have a short-term, positive impact on the 30 unemployed Moapa tribal members.

The income from leasing the 6.5 miles of pipeline right-of-way would provide long-term, beneficial income to the Moapa tribe, but there is no way to quantify the total income, since the amount would be negotiated between the tribal council and RMPC.

Cultural Resources

The proposed pipeline route, alternatives, and variations have the potential for both beneficial and adverse impacts to cultural resources. The following discussion of impacts applies to the proposed action and all alternatives and variations. The various occurrences of cultural resources are described in chapter 3.

After a final route has been selected, additional inventories which **might** cause an indirect beneficial impact would be made. Such studies should provide data on previously unrecorded sites, many of which are currently being affected by ORV's, vandals, and artifact collectors. Another indirect beneficial impact on cultural resources that **may** occur would be the recovery of information from significant sites found during the cultural resource inventory or during construction monitoring.

Adverse impacts to cultural resources would occur during ground disturbing activities associated with construction of the pipeline. Construction could alter, damage, or destroy cultural resources which could result in the loss of: specific scientific and cultural information, physical representation of the resource, a portion of the resource base for future research, and artifact materials.

A Memorandum of Agreement (MOA) will be developed with the Advisory Council of Historic Preservation, the State Historic Preservation Offices (SHPO's) of the states involved with the project, and the Federal agencies with compliance responsibility for this project, in accordance with the procedures outlined in 36 CFR, Part 800, 'Protection of Historic and Cultural Properties.' The MOA will outline responsibilities for full and complete inventory, evaluation, and mitigation of cultural resources.

The MOA will recommend that the project be designed to avoid cultural resources that appear to meet the criteria for inclusion on the National Register of Historic Places. If this avoidance procedure is neither prudent nor feasible, plans for mitigation would be developed according to the procedures outlined in the MOA. Avoidance would specifically be recommended for the significant cultural resources identified in appendix L. Additional cultural resources requiring compliance procedures could also be identified by the field inventory.

Indirect adverse impacts could occur from construction workers (or others) participating in unauthorized artifact collecting. Alteration, damage, or destruction of cultural resources could occur if more people entered the area because of easier access. However, few new roads are anticipated for this project; therefore, this would not be a significant adverse impact.

The magnitude of impact on cultural resources cannot be absolutely determined until an alignment is chosen and a centerline is staked and examined for cultural resources. However, estimates can be made on the expected density and significance of cultural resources from existing data. Table 2-11 summarizes the estimated density and significance for prehistoric sites along the proposed route, alternatives, and variations. The assumptions and methods employed to make these estimates are detailed in the *Cultural Resources Technical Report (Museum of Northern Arizona 1981).*

Geology and Topography

GEOLOGY

No geological impact would result from this project. (Geologic hazards to the project are discussed in chapter 3.) Nevertheless, significant hazards to the project exist because of faults, ground liquefaction, and landslides. Because the pipeline would cross the Wasatch fault near populated areas, the FERC staff recommends in chapter 5 that the project incorporate certain design measures.

The applicant would avoid areas of high liquefaction potential and landslides to the maximum extent feasible. Mitigation measures other than avoiding these hazards are not likely to be effective or economically feasible. For this reason and because the areas of potential liquefaction do not coincide with populated areas, the FERC staff recommends no special design measures for these problems.

Volcanic and subsidence hazards would be insignificant for all routes analyzed.

TOPOGRAPHY

The primary topographic impact from a pipeline project results from construction; there is no topographic impact related to operation, although minor secondary impact resulting from project-initiated erosion could occur. This type of erosion impact is discussed in 'Soils' and 'Vegetation.'

Long-term impact would be limited to areas where excavation or fill would be required--most frequently at compressor stations, maintenance bases, or material stockpiling sites. Where a right-of-way must be placed perpendicular to a slope--sidehill construction--or where cliffs or ravines must be crossed, excavation is generally required to create a level working surface. Depending on the severity of the terrain, a permanent scar may result--especially if the right-of-way is underlain by bedrock.

In general, however, after a pipeline trench has been backfilled, the only topographic evidence of the pipeline is the berm--about 12 inches high, tapering to grade at the edges of the filled trench. This berm should disappear within a few years. Unless specified otherwise in right-of-way agreements, bedrock removed from the trench during RMPP construction would be left along the edge of the right-of-way, creating an unnatural but generally inconsequential row of rocks.

Where the bottom of a trench is in bedrock, it is generally necessary to protect the pipe coating by providing a pad of select backfill under the pipeline. If trench spoil could not be used, the excavation of such padding would also create topographic impact. For instance, the applicant has estimated that 534,000 cubic yards of clean dirt or sand would be required as padding. The applicant states that this material should be available from commercial sources. However, if it were not available and the total amount had to be taken from new pits, approximately 60 acres would be excavated to a depth of about 6 feet. (These numbers are illustrative only.)

The maintenance bases and compressor stations would be located on fairly level ground, minimizing the need for substantial modification to the topography. This would also be true for double-jointing yards located at railroad sidings. Double-jointing yards located along the right-of-way itself might not be on level ground, but since each yard would encompass only about 20 acres, very little grading should be required.

The topographic impact from construction along the pipeline, as well as from double-jointing yards and the maintenance bases, would generally be minimal, particularly if double-jointing yard and maintenance base sites were chosen to avoid difficult terrain. Therefore, only those portions of the proposed route and its alternatives where excavation is likely to create an irreparable scar are discussed. This would be the case whenever sidehill construction took place on side slopes greater than approximately 30 percent (3 vertical to 10 horizontal), or where a near-vertical surface (slope greater than 100 percent) had to be crossed at right angles. All sidehill construction over 1 mile long has been considered. For a 30-percent slope, the right-of-way excavation would involve a total of at least 20 feet of cut face--assuming the hill could support a vertical face. The vertical height of the excavation would be 23 feet if the hill could support only a 1-to-1 slope. These figures assume a two tiered working surface 36 feet wide uphill from the pipe for tractors and 19 feet wide for strung pipe and trench. If vertical cuts were involved, the total disturbed area, including the temporary spoil pile, would be 100 feet wide.

The RMPP would require about **32** miles of sidehill construction on slopes of about 30 percent. There are at least three areas where slopes of greater than 100 percent would be crossed at right angles: the Mineral Mountains (MP 292), Beaver Dam Wash (MP 415), and Toquop Wash (MP 432). The sidehill areas are:

Mp	Area
54-55	South of Wasatch
68-69, 71-73, 75, 80-81[a]	Chalk Creek Canyon
152, 154,	North of Spanish Fork
157-167	Dairy Fork, West Lake Fork, Little Clear Creek
184-185	Water Hollow
190-196[a]	Salt Creek Canyon
373-375	Holt Canyon
387, 393	Near Veyo

[a]Approximately 1 mile of discontinuous side hill construction near MP 75.

Water Resources

GENERAL IMPACTS

The flow characteristics and the bed composition of the streams which would be crossed by the alternatives and variations are similar to those of the proposed action; therefore, the impacts from construction of crossings would be the same. The only difference would be how many streams were crossed. For the numbers and types of streams crossed, refer to chapter 3. For listings of streams, refer to the *Water Resources Technical Report*.

IMPACTS OF THE PROPOSED ACTION

The proposed action would cross **at least 32 intermittent and 29 perennial** streams. Construction would disturb both the banks and the beds, thus raising the amount of suspended sediments to unquantifiable levels higher than normal. This construction-induced load would be transported downstream and affect aquatic life to an insignificant degree. The calculated distances which the various percentages of construction-induced sediment would be transported are shown in the following list. The list is based upon two types of typical streams: those with a cobbly or gravelly bottom and those with a sandy type bottom.

Streams which have a cobbly or gravelly bottom would deposit their sediments in the following pattern:

Sediment	Percent of Load Lost	Distance (Feet)
Sand and Gravel	50	5
Silt	90	2,000
Clay	100	200,000

Streams which do not have a cobbly or sandy type bottom would deposit their sediments in the following pattern:

Sediment	Percent of Load Lost	Distance (Feet)
Sand and Gravel	50	25
Silt	80	2,000
Clay	100	200,000

The majority of the construction-induced sediment would be transported e such a short distance that the effects would be insignificant.

Noise Quality

The Noise Control Act of 1972 assigns the primary responsibility for noise control to state and local governments, with assistance and guidance from the Federal Government. In response to this act, EPA published guidelines in March 1974, 'Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety,' which evaluate the effect of various levels of environmental noise. EPA emphasizes that the identified levels discussed in the document should not be interpreted as a Federal ambient noise standard, since they consider neither cost nor technical feasibility. Rather, the guidelines provide information for state and local governments to **use** in developing their own ambient n standards. These levels are summarized in table 4-5. There are no state regulations governing noise **levels** during construction or operation of the proposed project. (See figure 3-1 to determine discussion of noise quality by alternative.)

Pipeline construction would cause a temporary impact on noise quality. The specific noise levels would depend on the equipment involved; the impact would depend on the location of the potential receptors. Noise levels from construction machinery would be typical of those associated with shallow digging and earthmoving operations. Typical noise levels for the various kinds of construction equipment to be used are presented in table 4-6. Typical noise levels attributable to a construction spread are about 70 dB(A) at 250 feet from the pipeline and 50 dB(A) at 2,500 feet. Any receptor adjacent to the right-of-way would be affected only while a spread was working in the area.

TABLE 4-5

SAFE NOISE LEVELS RECOMMENDED BY EPA

Effect	24-Hour Average Noise Level
Hearing Loss	70 dB(A)
Outdoor Activity Interference and Annoyance	55dB(A)
Indoor Activity Interference and Annoyance	45 dB(A)

TABLE 4-6

TYPICAL PIPELINE CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment	dB(A) at 50 Feet
Side Boom	78-92
Backhoe	80-92
Bulldozer	82-95
Ditching Machine	80-90
Motor Crane	78-87
Dragline	80-90
Backfiller	82-95
Welding Rig	72-82
Air Compressor	85-91
Jack Hammer	88-98
Trucks (Heavy Duty)	82-92
Pickup Trucks	70-85
Automobile	65-76
Pile Driver	95-105
Scraper Grader	80-94
Generator	71-82

At selected locations along the proposed right-of-way, controlled blasting would be required to fracture hard rock formations. This would elevate sound levels temporarily. Blasting would be conducted only during daylight hours to reduce possible disturbance.

Construction of the proposed Sage Compressor Station would take about 6 months. During this time, noise levels would vary with the type of activity and the actual equipment being used. The noise reaching nearby noise-sensitive receptors would be attenuated by distance, topography, air, and vegetation.

The 31,800 **nominal horsepower** of compression installed at the Sage Compressor Station would be the major source of noise emissions during the pipeline's operation. The applicant proposes to conduct a baseline noise monitoring survey at the Sage Compressor Station and booster station sites. The ambient noise data and distances to the nearest residences would be used in designing noise-suppression equipment for the compressor stations.

RMPC has provided sound spectrum data for gas turbine units similar to the proposed compressor units. If ambient noise levels at the Sage Compressor Station site are estimated as an L_{eq} of 43 dB(A) and an L_{dn} of 49.4 dB(A), operational noise levels within the proposed plant boundary would exceed 70 dB(A). However, because of air absorption and distance attenuation, the nearest residence, 3,950 feet to the southeast, would experience an L_{eq} of only **43.3** dB(A) and an L_{dn} of only **49.7** dB(A). These values were obtained by A- weighting the applicant's sound spectrum data.

Since vegetative absorption and natural or artificial barriers were not included in these calculations, the values are conservative. **Since the noise levels at this nearest residence are almost equal to an L_{eq} of 45 dB(A) and an L_{dn} of 51 dB(A), the noise levels generated by the Sage Compressor Station would not be perceptable over the ambient background levels (Arthur D. Little, Inc. 1977).**

The EPA has identified an L_{dn} of less than or equal to 55 dB(A) as necessary to protect public health and welfare from all known adverse effects of noise and has established this level as its long term goal. Its short term goal is an L_{dn} of 65 dB(A). These goals are not Federal regulations, merely desired objectives. Although the L_{dn} at the nearest receptor during operation of the Sage Compressor Station might be only **49.7** dB(A), the RMPC has not specified the type of natural gas compressors that it plans to **use** at the Sage Compressor Station. Therefore, it is not possible to determine if the equipment eventually installed would conform to the specifications submitted by the applicant for similar units.

Air Quality

CONSTRUCTION-RELATED IMPACT

Pollutant **emitted** during construction of the proposed pipeline, compressor stations, and ancillary facilities would depend upon the type and amount of equipment used and the extent of its use. Ground-level concentrations of pollutants would depend on the relative locations of the construction. Generally, the emissions resulting from pipeline construction include **nonmethane** hydrocarbons (HC's), NO_x, CO, SO_x, TSP, and water vapor. Dispersion of these pollutants would depend upon local atmospheric stability and meterological conditions. (See figure 3-1 to determine discussion of air quality by alternative.)

Construction would cause temporary and minimal deterioration of the ambient air quality. It would also cause localized, short-term dust conditions, since almost all surface construction produces varying amounts of dust, depending upon soil moisture conditions, wind velocity, and the activity taking place. There is currently no EPA-approved model for calculating dust dispersion from construction vehicles along a pipeline right-of-way. While the severity and duration of any potential impact is difficult to predict, fugitive dust should not be a significant problem for the RMPP.

However, if proper dust suppression techniques were not implemented, some minor violations of the NAAQS for TSP could occur. The most likely places for this problem would be Utah County, Utah; Clark County, Nevada; and San Bernardino County, California. Each of these counties is in non-attainment status for TSP. Public use of the access roads and right-of-way by ORV's could aggravate the surface disturbance.

Open burning of vegetation along the proposed route might be necessary to dispose of some debris resulting frcm clearing operations. If this were done, the applicant would be required to obtain the appropriate state and Federal permits.

OPERATIONAL IMPACT

The operational air impact of the proposed project would depend upon the gas volumes transported in the system. Initially, the applicant proposes to transport 413,000 Mcfd of natural gas. If new gas supplies develop, the RMPC might transport up to 800,000 Mcfd to markets in California and the Southwest.

Emissions from the Sage Compressor Station, the major source of air emissions **related** directly to the operation of the proposed project, are listed in table 4-7. The compression facilities necessary to expand the system are also included in the table. All of the compressors would **use** natural gas as their fuel source.

Table 4-7 shows that **no pollutants would be** emitted in excess of 250 tons per year, the EPA criterion of a new major emitting source under prevention of significant deterioration (PSD) regulations, **if only two of the three installed compressors were operated simultaneously. However, if all three compressors were operated the Sage Compressor Station would be classified as a new major source of air pollutants for NO_x.** Therefore, the only pollutant analyzed for the proposed 413,000-Mcfd volume **is NO_x** (primarily NO_2).

TABLE 4-7

POTENTIAL ANNUAL AIR EMISSIONS FROM RMPP COMPRESSION FACILITIES

Volume	Compressor Station	Number of Units	Installed Horsepower[a]	Emissions (Tons/Year)[b]				Annual Operation (Days/Year)	Fuel Requirements (Million Cfd)
				NO_x	CO	HC	SO_2		
413,000 Mcfd	[c]Sage	3	21,681	275	104	2	0.37	365	4.37
	[c]Sage	2	14,454	184	70	1	0.25	365	2.91
800,000 Mcfd	[c]Sage	5	36,135	459	174	3	0.63	365	7.10
	Compressor Station 1	1	7,227	92	35	1	0.13	365	1.49
	Compressor Station 2	1	7,227	92	35	1	0.13	365	1.50
	Compressor Station 3	1	7,227	92	35	1	0.13	365	1.47

[a]Gas turbine units, installed site rated horsepower.

[b]Emissions calculated by the potential to emit, according to EPA-AP-42, compilation of emission factors. Particulate matter emissions cannot be calculated because the emission factor is not available.

[c]Total emissions do not include startup cycle for emergency gas generator.

If the Sage Compressor Station were classified as a major source, it would require approval of EPA's PSD program prior to construction and operation of the new source. Under EPA's current program, the EPA or the appropriate state agency PSD authority would issue a PSD applicability determination or conduct a PSD review. If an applicability determination is issued no PSD review would be conducted. However, if a PSD review were required for the proposed project, the Wyoming Department of Environmental Quality would perform it. PSD regulations require the application of the best available control technology (BACT) to reduce pollutants with the potential to exceed 250 tons per year. BACT is determined on a case-by-case basis by the appropriate reviewing authority. BACT for gas turbine compressors less than 10,000 horsepower would be based on dry controls.

The 800,000-Mcfd proposal would require two additional **7227**-hp. gas turbine compressors at the Sage Compressor Station and the simultaneous operation of all five compressor units. Total potential emissions would then increase to **459** tons per year of NO_x A PSD **determination or** review would be required at this time if it had not been conducted previously. However, if a PSD **determination or** review had already been conducted, the initial and incremental emission increases of NO_x would have been examined in the initial review.

To transport the additional volumes of gas for the future, three additional compressor stations would have to be constructed in Summit, Millard, and Iron Counties, Utah. The applicant would install **7227** hp. of compression at each station. The potential emissions from each booster station are shown in table 4-7. None of the three stations would be classified as a major source of air emissions; therefore, no PSD review would be required before their construction and operation. **However, the appropriate state construcion and operational permits must be obtained. At this time, there are no definite plans to expand the Sage Compressor Station or to construct the booster stations.**

All of the compressor stations would have to comply with the NAAQS for NO_x--an annual arithmetic mean of 100 ug per cubic meter. **In addition, the new source performance standards which EPA has proposed for stationary gas turbines would limit NO_x** emissions to 150 parts per million (ppm) based on dry controls from turbines of less than 10,000 hp. These standards would apply to all new sources that will be constructed after October 3, 1982. Therefore, if constructed after RMPP construction begins after this date, the new compressors would have to meet these standards.

Operation of the proposed Sage Compressor Station would increase the annual arithmetic mean NO_x concentrations, predicted according to EPA's **Users Network for Applied Modeling of Air Pollution** models, by a maximum of **1.49** ug per cubic meter about 456 meters from the source **if only two compressors were operated. If three compressors were operated the annual arithmetic mean would increase to a maximum of 2.22 ug per cubic meter.** If the additional 21,200 **nominal horsepower (14,454 site rated) of compression were installed, the total annual arithmetic mean NO_x** concentration would increase to **3.72** ug per cubic meter about 456 meters from the source. Assuming that the rural area surrounding the proposed compressor station has a background NO_x level of 20 ug per cubic meter, as suggested by EPA's Ambient Monitoring Guidelines for Prevention of Significant Deterioration, the operation of the proposed facility would produce NO_x concentrations of **21.49, 22.22, and 23.72** ug per cubic meter, respectively. The ground-level concentration of NO_x would not exceed the NAAQS.

The major air emission from the **additional compressor** stations would be NO_x; the primary pollutant would be NO_2. The maximum increase in the annual arithmetic mean for NO_x would be less than 1 ug per cubic meter. Assuming a background level of 20 ug per cubic meter, the total potential impact of operating **these compressor** stations would be 21 ug per cubic meter. No PSD **applicability determination or** review would be necessary for any of **these compressor** stations because their total emissions would not exceed 250 tons per year for any criteria pollutant.

Table 4-8 compares the NAAQS with the potential ground-level concentrations produced by Sage Compressor Station and **additional compressor** station operations.

The applicant has indicated that the only gas conditioning plants related to the RMPP would be those being constructed by Amoco Production Company and Chevron U.S.A., Inc., near Evanston, Wyoming. These facilities, the subject of previous BLM environmental review, have been authorized to begin construction (BLM 1980d). If any more processing plants are proposed to treat gas from the Rocky Mountain region, they would have to be authorized by the appropriate Federal, state, and local authorities before construction and operation.

No impact upon any Class I area is expected from construction and operation of the proposed project. The operation of the Sage Compressor Station would produce an NO_x ground-level concentration of **either 1.49 or 2.22** ug per cubic meter 456 meters from the source **depending upon the number of compressor units that were operated.** The 800,000-Mcfd level would produce an NO_x ground-level concentration of 5.45 ug per cubic meter about 456 meters from the source. Therefore, the nearest Class I area, 150 miles north of the Sage Compression Station, would not experience any ground-level impact. This result would also be expected for each of the **additional compressor** stations because the potential ground-level impact from each station would be less than 1 ug per cubic meter 456 meters from the source. The Class I area nearest any of **these** stations would be Zion National Park, 35 miles southeast of the **compressor** booster station in Iron County, Utah.

TABLE 4-8

COMPARISON OF AIR QUALITY STANDARDS AND EMISSIONS FROM COMPRESSOR STATIONS (ug per cubic meter)

Volume	Significant Pollutant	Averaging Time	National Standard		Wyoming Standard	Utah Standard	Ambient Background[a]	Increment Resulting From Sage	Increment Resulting From Additional Compressor Stations - 1, 2, and 3	New Ambient Level With Sage and Boosters
			Primary	Secondary						
413,000 Mcfd	NO_x (Primarily NO_2)	Annual	100	100	100	100	20	[b]1.49 [c]2.22	--	21.49 22.22
800,000 Mcfd	NO_x	Annual	100	100	100	100	20	3.72	1.0	23.72/21

[a]Ambient background from EPA 1978.
[b]Two 7,227-horsepower units.
[c]Three 7,227-horsepower units.

Pipeline Safety

Transportation of natural gas by pipeline involves the risk of an accident and subsequent loss of product. For natural gas, the greatest hazard is an explosion or fire following the rupture of a pipeline.

Construction of the pipeline would conform to the safety requirements of DOT--including minimum burial depth (depending upon local jurisdiction) and block valve spacing. These requirements are intended to ensure adequate protection from catastrophic pipeline failures. DOT requirements also include minimum material design requirements for piping components, corrosion control, testing requirements, and provisions for operation and maintenance.

Classification (i.e., population density **in an area that extends 220 yards on either side of the centerline of any continuous** 1-mile **length** of pipeline) determines additional safety measures--such as pipeline wall thickness, pipeline yield strength, and maximum design operating pressure--which must be incorporated during design and construction of all natural gas pipelines. In addition, special boring procedures must be followed at railroad and highway crossings. There are four **classes** for all onshore natural gas pipelines:

Class 1--A location that has 10 or fewer buildings intended for human occupancy.

Class 2--A location that has more than 10 but less than 46 buildings intended for human occupancy.

Class 3--A location that has 46 or more buildings intended for human occupancy or an area where the pipeline lies within 100 yards of any building occupied by 20 or more persons. **Also a small well-defined outside area occupied by 20 or more persons during normal use such as a playground, recreation area, outdoor theater, or other place of assembly.**

Class 4--A location where buildings with four or more stories aboveground are prevalent.

Since February 9, 1970, all gas transmission companies have been required to notify the Office of Pipeline Safety Operations of any "reportable" incident, defined by the CFR, Title 149, Part 191, and to submit a report (Form DOT F7100.2) within 20 days of the incident. Reportable incidents are defined by the Office of Pipeline Safety Operations as those which:

Resulted in a death or injury requiring hospitalization;

Required the removal from service of any segment of transmission pipeline;

Resulted in gas ignition;

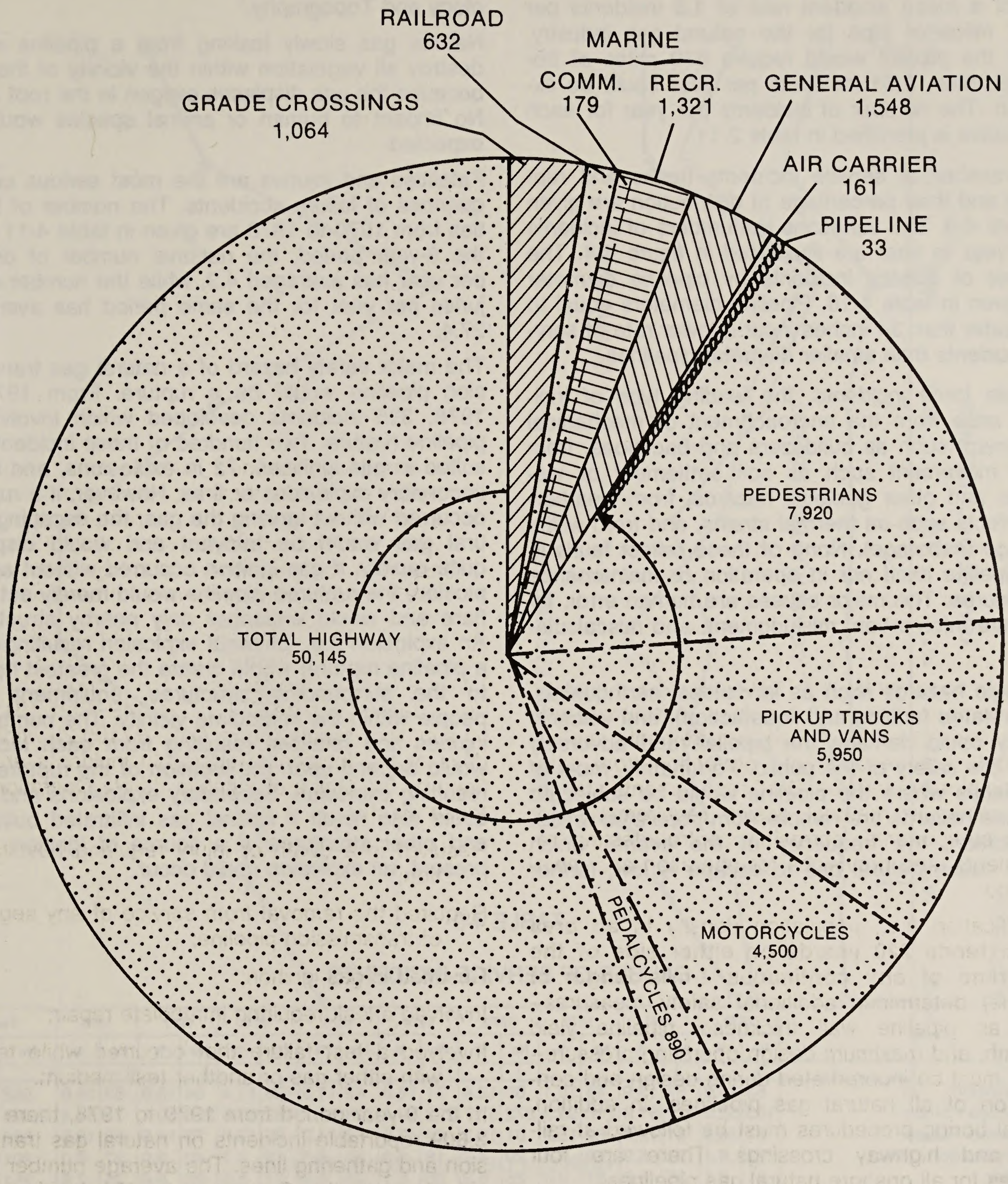
Involved a leak requiring immediate repair;

Involved a test failure that occurred while testing with either gas or another test medium.

In the 9-year period from 1970 to 1978, there were **3,609** reportable incidents on natural gas transmission and gathering lines. The average number of incidents over the 9 years was 401 incidents per year; the maximum was 471, the minimum 255. In addition to the service failures, 1,797 test failures were reported. The test failures removed defects from the pipelines before service failures occurred; hence, these failures contributed to the safety of pipelines.

As figure 4-3 illustrates, the overall safety record of the natural gas transmission industry is excellent

TOTAL TRANSPORTATION FATALITIES IN 1978: 55,083



SOURCE: AGA 1980.

FIGURE 4-3. COMPARISON OF 1978 TRANSPORTATION FATALITIES compared to the records of other transportation-related industries. The applicant expects to have 0.42 repair incidents per year. Independent calculations predict a mean accident rate of **1.3** incidents per 1,000 miles of pipe for the natural gas industry. Since the project would require 610 miles of 36-inch pipeline, **0.81** incidents per year could be expected. The number of incidents per year for each alternative is identified in table 2-11.

The number of service incidents (leaks and ruptures) and their percentage of distribution are given in table 4-9. The variations in numbers of incidents from year to year are illustrated in figure 4-4. The number of service incidents by pipeline diameter are given in table 4-10. Pipeline diameters equal to or greater than 34 inches incur a lower rate of service incidents than smaller diameter pipelines.

Outside force incidents, the leading type of incident, arise from the encroachment of mechanical equipment such as bulldozers and backhoes, from earth movement such as soil settlement or washouts and other geologic hazards, from weathering effects such as thermal strains, and from willful damage (sabotage). None of these reflect faults in the pipeline itself nor in operation or maintenance procedures. The major causes are human error, inaccurate information, misjudgment, and miscalculation.

Geologic hazards such as landslides, earthquakes, (with related faulting and liquefaction), and volcanic activity could damage the pipeline and adversely affect the safety of the public. Fortunately, most of the places where the pipeline would be subjected to these hazards are remote from populated areas. In addition, the frequency of the events which would cause natural gas to escape is low, further reducing the risk. Specific areas where significant risk to the public would result from location of the project near a geologic hazard are identified in 'Geology and Topography.'

Natural gas slowly leaking from a pipeline would destroy all vegetation within the vicinity of the leak because the gas displaces oxygen in the root zone. No impact to human or animal species would be expected.

Fatalities and injuries are the most serious consequences of failure accidents. The number of fatalities from 1970 to 1978 are given in table 4-11 Over the 9-year period, the national number of deaths per year has averaged 4.3, while the number of injuries per year for the same period has averaged 27.4.

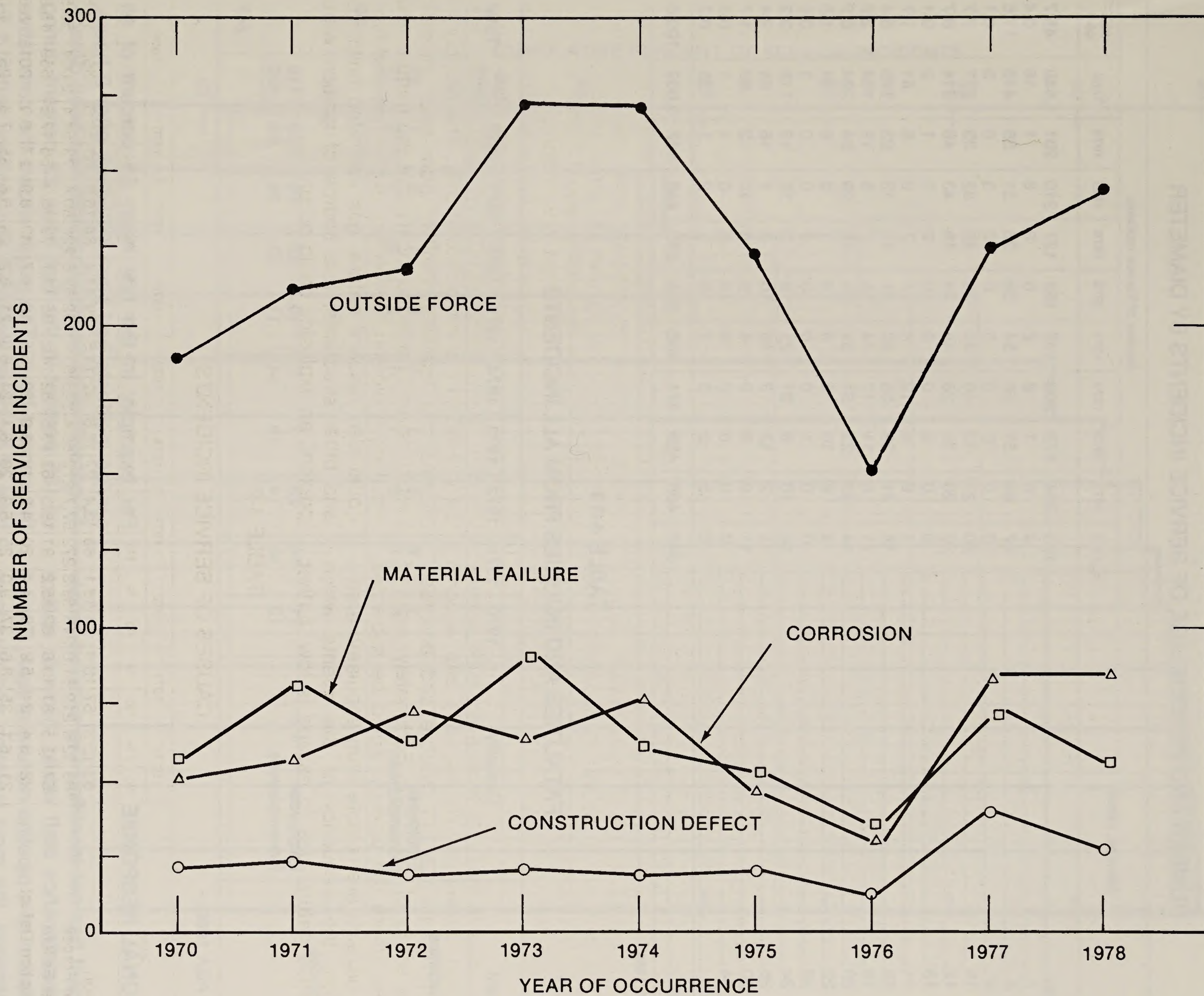
The major safety hazard of a natural gas transmission pipeline would be a rupture. From 1970 to 1978, 335 incidents developed which involved a pipeline rupture. Two hundred of these incidents resulted in gas ignitions, 72 in explosions, and 63 in secondary explosions or fires. However, if a rupture occurred without igniting the gas, the escaping natural gas would be buoyant and would disperse quite rapidly. If gas ignition occurred without an explosion, the ruptured pipeline would merely act as a flare and would endanger only nearby structures. An explosion (i.e., physical explosion resulting from a pipeline rupture) would create the greatest hazard to the surrounding structures, equipment, and people within the immediate vicinity. The number of injuries and fatalities resulting from each incident would depend upon the location of the rupture and resulting explosion. Secondary explosions and fires could also result if natural gas infiltrated buildings and other structures; if a source of ignition were present, an explosion could occur.

TABLE 4-9

CAUSES OF SERVICE INCIDENTS

Cause	1970		1971		1972		1973		1974		1975		1976		1977		1978		Total	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Corrosion	53	15.3	57	13.9	74	18.1	63	13.4	77	16.8	42	11.5	29	11.4	84	18.8	83	18.6	562	15.6
Outside Forces	183	52.9	212	51.8	218	53.3	272	57.7	272	59.4	226	61.7	152	59.6	226	50.4	73	54.4	2,004	55.5
Material Failure	57	16.5	81	19.8	62	15.2	91	19.3	62	13.5	52	14.2	35	13.7	73	16.3	56	12.5	569	15.8
Construction Defect	22	6.4	24	5.9	18	4.4	20	4.2	18	3.9	20	5.5	12	4.7	40	8.9	27	6.0	201	5.6
Other	21	6.1	35	8.6	37	9.0	25	5.3	28	6.1	24	6.6	21	8.2	25	5.6	35	7.8	251	7.0
Construction Defect or Material Failure	10	2.9	0	0	0	0	0	0	1	0.2	2	0.5	6	2.4	0	0	3	0.7	22	0.6
TOTAL	346	9.6	409	11.3	409	11.3	471	13.1	458	12.7	366	10.1	255	7.1	448	12.4	447	12.4	3,609	100.0

Source: AGA 1980.



SOURCE: AGA 1980.

FIGURE 4-4. CAUSES OF SERVICE INCIDENTS

TABLE 4-10

NUMBER AND PERCENTAGE OF SERVICE INCIDENTS BY DIAMETER

Diameter, Inches	Number of Service Incidents										
	1970	1971	1972	1973	1974	1975	1976	1977	1978	Total	Per-cent
6 and less	165	204	179	209	192	162	127	210	201	1,649	45.7
7	4	0	1	2	2	0	0	6	1	16	0.4
8	37	48	51	56	54	38	26	51	55	416	11.5
9	0	0	0	0	0	0	0	3	0	3	0.1
10	20	27	33	40	40	30	22	32	33	277	7.7
12	30	26	38	28	48	34	19	43	48	314	8.7
13	0	0	0	0	0	0	0	1	1	2	0.1
14	1	9	6	12	4	7	7	9	6	61	1.7
16	18	21	29	35	20	21	15	13	23	195	5.4
18	11	8	11	17	14	15	7	8	13	104	2.9
20	14	32	23	31	31	25	15	29	24	224	6.2
22	4	8	10	5	9	4	1	5	8	54	1.5
23	0	0	1	0	0	0	0	0	0	1	0.0
24	14	10	8	21	21	9	3	19	13	118	3.3
26	12	2	12	3	18	10	6	7	16	86	2.4
30	11	9	5	9	4	6	6	10	3	63	1.7
34	0	0	0	0	0	0	0	0	1	1	0.0
36 and up	5	5	2	3	1	5	1	2	1	25	0.7
Total	346	409	409	471	458	366	255	448	447	3,609	100.0

Source: AGA 1980.

TABLE 4-11

FATALITIES AND INJURIES FROM ALL INCIDENTS

Event	Casuality	1970	1971	1972	1973	1974	1975	1976	1977	1978	Sub-total	Total
Number of Fatalities												
	Employees	1	2	3	1	1	5	1	5	1	20	
	Nonemployees	0	1	3	1	3	2	6	3	0	19	
												39
Number of Injuries												
	Employees	11	14	23	3	7	10	22	10	15	115	
	Nonemployees	13	10	14	16	14	11	23	16	15	132	
												247

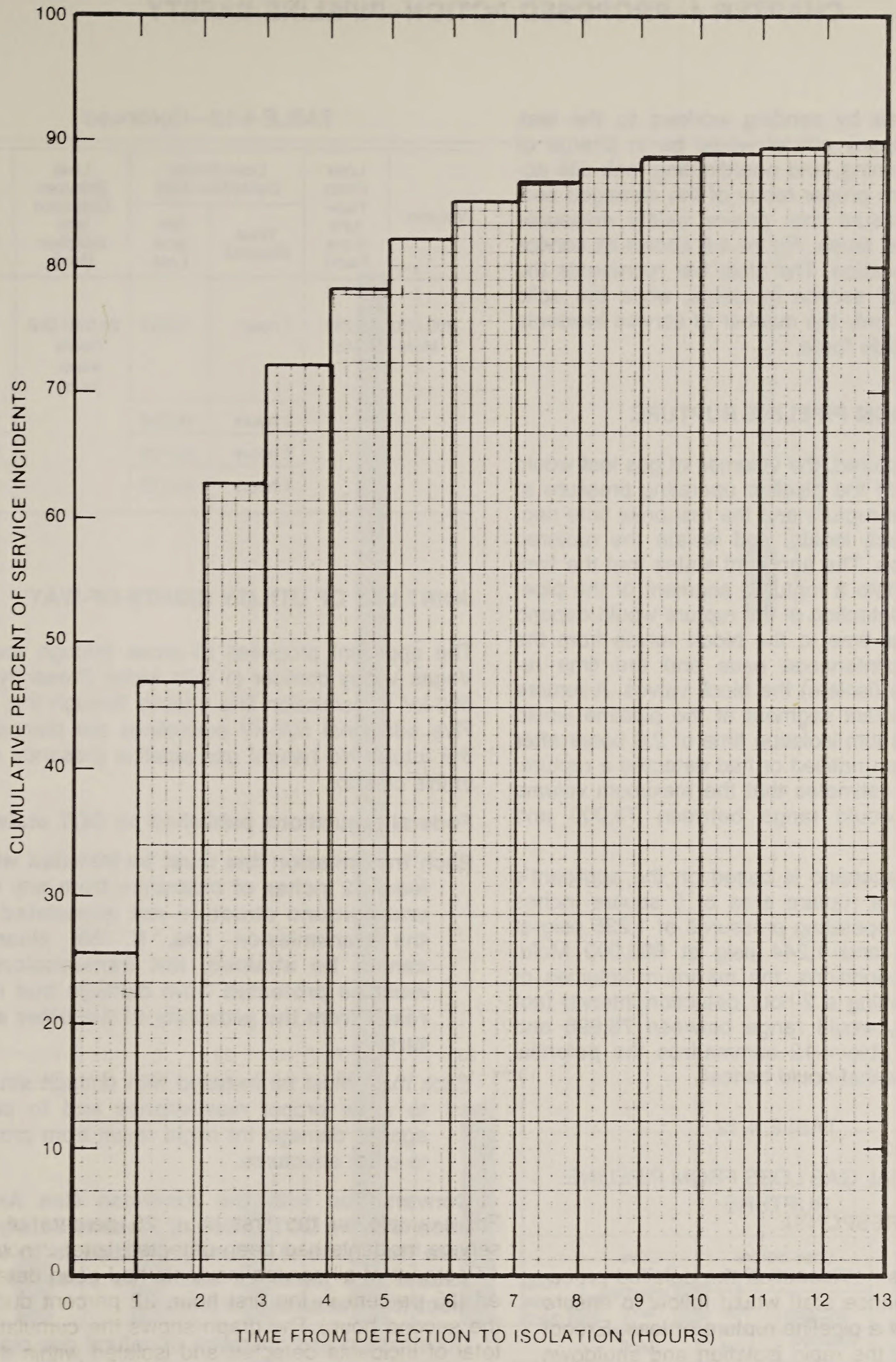
Source: AGA 1980.

OPERATIONAL RESPONSE

The applicant has not identified the detailed procedures its maintenance staff would follow to ensure proper isolation of a pipeline rupture or leak. Except in rare instances, the rapid isolation and shutdown of a ruptured or leaking transmission pipeline is necessary to eliminate combustible gas, to prevent wasting a valuable resource, and to begin restoring the facility to its normal operating condition. For the 3,609 incidents reported from 1970 through 1978, the time required to shut down the facilities after an incident was detected is shown in figure 4-5.

For example, in the first hour, 25 percent of all service incidents had been detected; after 2 hours, 47 percent of all service incidents had been detected (25 percent in the first hour, 22 percent during the second hour.) The graph shows the cumulative total of incidents detected and isolated within 1 to 13 hours. Incidents which are not detected within 13 hours are usually slow leaks or unknown losses.

The RMPC operations center in Salt Lake City would initiate the proper sequential procedures to shut down the pipeline. After a leak was discovered, the control center operator would shut down the compressor station. After the compressors had been shut down, maintenance personnel would



SOURCE: AGA 1980.

FIGURE 4-5. ELAPSED TIME TO ISOLATION OF PIPELINE LEAKS 1970-1978 secure the area by sending workers to the leak site. One company official would be in charge of evaluating, planning, and coordinating leak site activities to ensure proper repair of the damaged section and to ensure that proper safety measures were used at all times. Figure 4-6 shows all service incidents by location. The clear bar represents the total number of service incidents, while the solid bar represents only the number of service incidents caused by outside force.

GAS LOSS FROM PIPELINE RUPTURE

If a pipeline ruptured, the volumes of gas lost would be a function of the pipeline operating pressure at the point of the rupture and the response time necessary to detect, locate, and isolate the ruptured segment of pipe. The applicant states that the time required to isolate a ruptured segment of the pipeline following detection of the rupture would depend upon the travel time to the block valves from the appropriate maintenance base and the time required to close (isolate) the block valves. A rupture in the most distant segment of the pipeline would require a maximum isolation time of 2.6 hours after RMPC had been notified or had detected a rupture. The applicant estimates that the maximum volume of gas lost would range between 73,000 and 90,000 Mcf.

A worst-case scenario is based on the applicant's assumption of a rupture area of 5 square inches and maximum operating pressures of 1,235 psig at 413,000 Mcfd and 1,244 psig at 800,000 Mcfd. Under these conditions, the maximum volumes of gas lost, assuming a 2-hour detection interval (not isolation time), would range between 75,898 and **80,417** Mcf. Table 4-12 summarizes the potential volumes of gas that could be lost.

TABLE 4-12

POTENTIAL GAS LOSS FROM PIPELINE RUPTURE

Volume	Loss From Rupture (Line Pack)	Loss Before Detection (Mcf)		Loss Between Detection and Isolation (Mcf)	Total Loss (Mcf)
		Time Elapsed	Volume Lost		
413,000 Mcfd	38,958 Mcf	1 hour	8,030	20,880 (2.6 hours maximum)	67,868
		2 hours	16,060		75,898
		3 hours	24,090		83,928
		4 hours	32,120		91,958

TABLE 4-12—Continued

Volume	Loss From Rupture (Line Pack)	Loss Before Detection (Mcf)		Loss Between Detection and Isolation (Mcf)	Total Loss (Mcf)
		Time Elapsed	Volume Lost		
800,000 Mcfd	43,291 Mcf	1 hour	8,043	21,040 (2.6 hours maximum)	72,374
		2 hours	16,086		80,417
		3 hours	24,129		88,460
		4 hours	32,172		96,503

JOINT USE OF UTILITY RIGHTS-OF-WAY

The applicant proposes to cross through the Las Vegas Valley corridor (1 mile wide). Presently, one 500-kV transmission line passes through this area. Five additional 500-kV powerlines are planned for the future. No natural gas pipeline presently exists in this corridor.

Federal regulations published by DOT state that

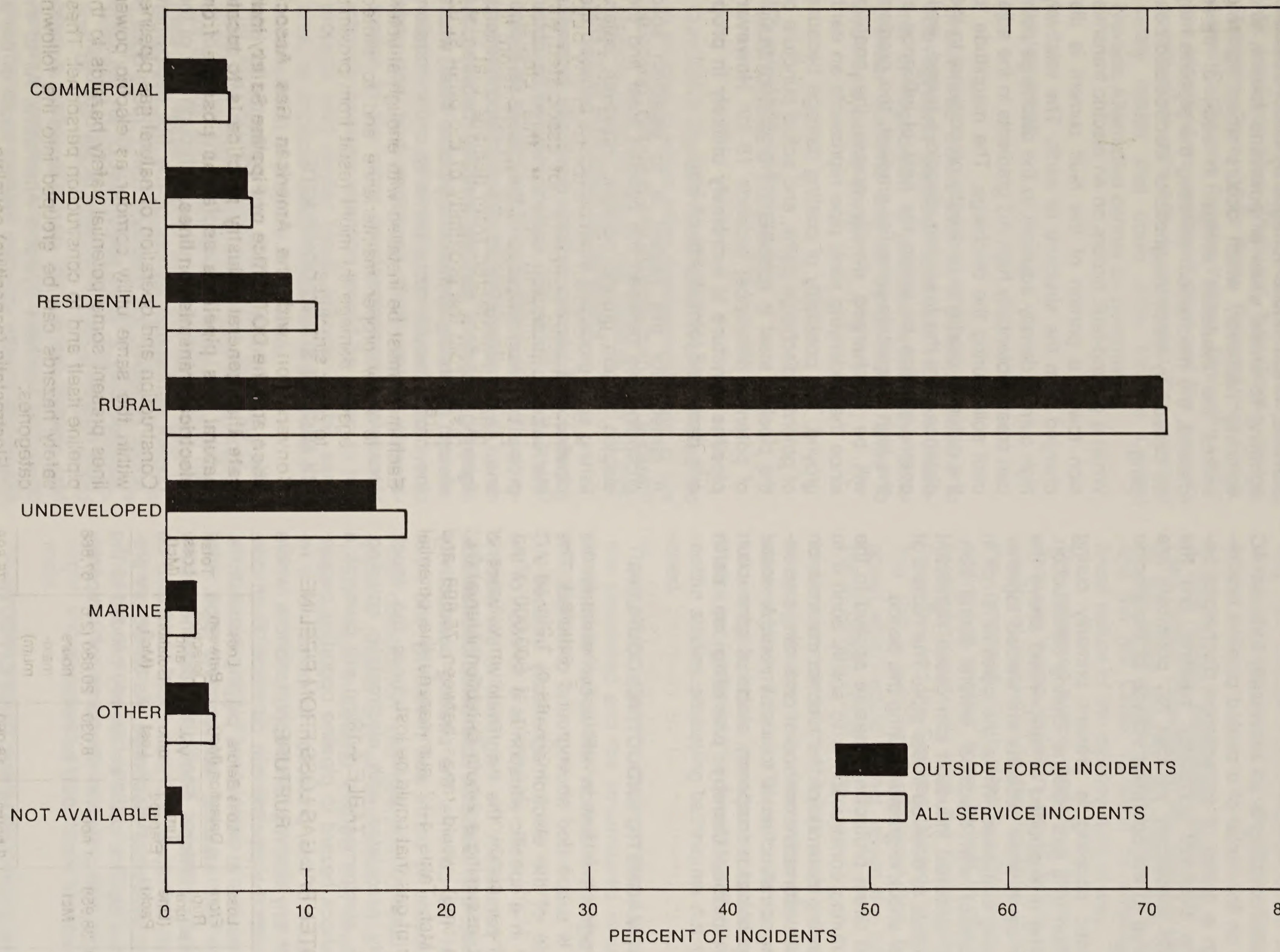
Each transmission line must be installed with at least 12 inches of clearance from any other underground structure not associated with the transmission line. If this clearance cannot be attained, the transmission line must be protected from damage that might result from the proximity of the other structure.

Each main must be installed with enough structure to allow proper maintenance and to protect against damage tht might result from proximity to other structures.

Conversation with the American Gas Association and the DOT Office of Pipeline Safety indicate that general industry practice is to locate natural gas pipelines as far as possible from electrical transmission lines.

Construction and operation of natural gas pipelines within the same utility corridor as electric powerlines present some potential safety hazards to the pipeline itself and to construction personnel. These safety hazards can be grouped into the following categories:

Electrostatic (capacitive) coupling
Electromagnetic (inductive) coupling
Lightning (ground-faulting) effects



SOURCE: AGA 1980.

FIGURE 4-6. DISTRIBUTION OF SERVICE INCIDENTS BY AREA

ELECTROSTATIC (CAPACITIVE) COUPLING

Electrostatic coupling is an electrically induced AC potential on the metal of a coated pipeline that results from a series of capacitance discharges between the electrical conductor, pipeline, and the earth. The electrically induced AC potentials are proportional to the operating voltage of the electric powerline.

Electrostatic coupling is present primarily during construction of a gas pipeline. During construction, the pipeline is supported or suspended above the trench or earth while sections are welded together and coating is applied. While the pipeline is not in direct contact with electrical towers during construction, electrical induction can cause significant AC potentials to develop in the pipe. The hazard of personnel shock is greatest during this period.

The most direct protective measure applied to the pipeline during construction is to solidly bond it to the grounding network of the electric transmission system. An alternative method of protecting personnel during construction is to install portable metal mats capable of a temporary electrical connection to the pipeline, **thereby providing an earth ground.**

ELECTROMAGNETIC (INDUCTIVE) COUPLING

Electromagnetic induction will occur whether the pipeline is suspended aboveground or buried. The magnitude of the electromagnetically induced AC potential in a specific situation is a function of the length of parallelism, the magnitude of the **electric potentials, the distance between conductors, phase of the** currents, the **coating conductivity** of the pipeline to earth, **soil resistivity** and other factors. Burial of the pipeline reduces the shock probability associated with electrostatic coupling. However, electromagnetic coupling still presents a serious shock hazard to pipeline operating personnel Because of this, protection for personnel is required at any aboveground appurtenances where contact with the pipeline can be made. Such contact is possible at line valves, pigging installations, corrosion test stations, aboveground pipe, **and compressor stations.** Should the pipeline require excavation for repair, the work crew could also be subject to **electrical discharge**. As temporary protection, the pipeline could be directly bonded to the electric grounding system structures, or temporary gradient control mats could be installed.

LIGHTNING (GROUND-FAULTING) EFFECTS

There are two main classes of lightning effects (ground-faulting) which influence underground pipelines located on common rights-of-way: transient currents, which induce voltages by direct strikes of lightning to shield wires or powerline towers, and lightning flashover, which occurs when lightning strikes the insulation strings. In each of these classes, the mechanism affecting the pipeline may be caused by electromagnetic or electrostatic coupling.

When a ground-fault occurs on an electric transmission tower, a portion of the fault current is discharged from the structure to earth. The relatively high current density adjacent to the discharge point can create potentially high AC gradients in the adjacent soils during the discharge. The magnitude to the potential gradients is directly proportional to the distance from the tower leg. Should a buried, well-coated pipeline be within the field of influence of the high magnitude potential gradient, the gradient will be **discharged** directly across the coating, since the underlying steel pipe represents an earth ground. The possibility of coating damage because of potential discharge paths, and actual puncture of the pipeline steel is possible if the gradient (a unit of potential difference) exceeds 15 kV. **However, pipeline puncture is extremely unlikely in properly designed joint rights-of-way.**

A remedy for this hazard is to establish solid grounding ties between the pipeline steel and the electric system ground network. However, establishing solid grounding interconnectors between the pipeline and electric system drastically increases the cathodic protection current required to obtain proper corrosion mitigation of the coated steel pipeline. As an alternative to direct interconnections, lightning arrestors can be installed between the electric grounding system and pipeline steel, where the hazard would occur primarily under transient electric system fault conditions and not under steady-state operations.

MX MISSILE SITING CONFLICTS

The U.S. Air Force (USAF) was contacted for information on the proposed siting of the MX missile system. The USAF indicated that the routing of the proposed RMPP would not pass through any of the current conceptual layouts of the MX deployment areas. However, the proposed RMPP route does lie approximately 2 miles **southeast** of an MX candidate operating base southwest of Milford, Utah.

No conflict with the MX system would be expected from the Northern Systems Alternative. All of the candidate missile sites are located south of the alternative. Also, no conflicts are expected to develop with the West Salt Lake Alternative. The majority of its route would follow the RMPP. However, the Central Nevada Alternative would pose numerous potential conflicts. It would cross the following MX candidate sites: Whirlwind, Tule, Snake, Spring, Steoptoe, Cave, White River, Railroad, Hot Creek, Stone Cabin, and Ralston Valleys. Since the USAF has identified no preferred sites and the project's construction schedule is unknown, the potential safety issues that could arise for the Central Nevada Alternative cannot be determined.

BRUSH FIRES

Brush fires would also be a potential hazard to aboveground pipeline facilities. However, control of vegetation is planned around the compressor stations and at other facility sites to provide a buffer zone.

Cumulative Impacts

Cumulative impacts result when a project is added to an area in which other developments exist or are proposed. Although the impacts from the separate projects might be minor, the impacts from all projects in an area could be significant.

The only resources which would sustain noteworthy cumulative impacts from the addition of RMPP would be visual resources and recreation. Visual resources could be affected in various ways by an accumulation of developments in an area. Impacts from RMPP could be lessened because a new development in an **already developed area** would not cause as high a level of impacts, or **drew** attention to the other developments. Impacts could intensify because attention **would be** drawn to two projects with similar visual impacts in the same area, **or** impacts could remain as if there were no accumulation of projects in the area.

The aboveground structures and large areas of ground disturbance associated with the Roosevelt Hot Springs and Thermal Hot Springs, would minimize the visual effects from the RMPP and the Sevier-Escalante Desert Alternative. The same would **be true of RMPP's visual effect** at the Newcastle Geothermal Resource project. Construction of the Martin-Marietta Cement Plant would have a similar effect on the Central Nevada and Sevier- Escalante Desert Alternatives. The ground disturbance associated with the construction of the IPP Powerplant might also lessen the impacts which would be caused by the proposed action, the Central Nevada, Sevier-Escalante Desert, and West Salt Lake Alternatives. The expansion of U.S. Highway 189 through Provo Canyon could lessen the visual impacts caused by the Provo Canyon Alternative.

If they closely **paralleled** each other, the Moon Lake Project transmission line would draw attention to the visual impacts associated with the RMPP and the Mill Creek Variation by emphasizing the linear nature of the pipeline right-of-way.

The proposed action, and, to a lesser extent, the East Las Vegas Variation, would further reduce the quality of recreation in the Rainbow Gardens and the proposed Clark County Wetlands park by adding yet another linear project to the two utility lines which currently exist, the Navajo- McCullough Powerline and the Southern Nevada Water Project. The IPP is another transmission line being proposed which would further lessen the natural and scenic quality of the area.

Implementation of the project could potentially destroy some unknown subsurface historical or archaeological remains. There could be a loss of knowledge because any sites excavated as a result of the project would be precluded from future scientific studies employing techniques not yet developed.

The various stream crossings would disturb both the streambed and the streambanks resulting in a small amount of additional sediment being added to the streams.

Unavoidable Adverse Impacts

The construction and operation of the proposed pipeline project and all alternatives and variations would result in several impacts that would remain after mitigation.

Some wildlife and aquatic animals would be lost during right-of-way clearing and construction at stream crossings. These losses would be unavoidable since these species have a small home range and are not mobile. Illegal collection of desert tortoises would be an unavoidable **impact** causing adverse impacts to populations of this rare animal. The loss of woodland habitat for the life of the project would also be unavoidable, and **therefore** a slight impact would occur to forest-dwelling animals.

Accelerated erosion would occur along the right-of-way during construction. Project construction would result in an unavoidable loss of crop production for one growing season and the disruption of farming operations where the right-of-way would cross croplands.

The visual resource would be unavoidably affected to varying degrees depending upon the number and location of aboveground permanent structures such as compressor stations and maintenance bases along the various routes. Vegetation and land form changes along the routes which would also affect the visual resources could not be avoided.

Irreversible/Irretrievable Commitment of Resources

Construction and operation of the proposed pipeline project and all alternatives and variations **may** result in either the irreversible or irretrievable commitment of certain resources. An irreversible commitment of a resource is one which cannot be changed once it occurs; an irretrievable commitment means the resource cannot be recovered or reused.

Cultural resources which are accidentally destroyed or which are salvaged **before** construction are irreversibly and irretrievably lost.

Relationship Between Short-term Uses of Man's Environment and the Maintenance and Enhancement of Long-term Productivity

Short term is defined for this project as the 20-year lifetime of the proposed pipeline. Neither the proposed pipeline nor any of the alternatives or variations would decrease the long-term productivity of the environment and resources which it would cross. **The short-term and long-term impact of the project on various resources is illustrated in the following chart.**

RESOURCE	IRREVERSIBLE IMPACTS	IRRETRIEVABLE IMPACTS	RELATIONSHIP OF SHORT-TERM USE OF ENVIRONMENT AND LONG-TERM PRODUCTIVITY
Vegetation	No	Yes	Most vegetation could be restored to a preconstruction condition and the long-term productivity would not be impaired.
Wildlife	No	Yes	Short-term decreases in the local populations of small mammals and birds could occur. Long-term productivity would not be impaired.
Soils	No	Yes	Increased erosion would gradually return to normal rates, as revegetation would take place. Long-term productivity would not be impaired.
Grazing	No	Yes	Destruction of forage would be a temporary impact that could change grazing patterns or alter management systems for one to three grazing seasons.
Cultural Resources	Yes	Yes	Disturbance or destruction of cultural resources could result in the loss of some scientific understanding, which would irretrievable.
Visual Resources	No	Yes	Some visual impacts would remain for the life of the project.

For specifics on the units of these resources that would be affected by the various pipeline routes, see the comparative analysis, the appropriate EIS section, or the appropriate technical report.

ALTERNATIVE A--NORTHERN SYSTEMS ALTERNATIVE

Vegetation

The Northern Systems Alternative would affect between 931 acres (best case) and 1,662 acres (worst case) of vegetation. Of this acreage, the understory would be capable of returning to preconstruction densities within 5 years after completion of construction. The overstory would require longer, as already described for the proposed action.

The acres of vegetation which would be temporarily removed by the Northern Systems Alternative are shown in table 3-1. Approximately 2 acres of riparian vegetation would be temporarily lost in the best-case evaluation, 8 acres in the worst case. There would be a loss of 60 acres (10 miles) of forest, pinyon-juniper, and mountain brush vegetation in an approximately 50-foot wide segment over the pipeline for the life of the project (20 years) for both the best and worst **cases.**

Joshua trees and various species of cacti occur scattered throughout the creosote bush vegetation type; 312 acres of potential Joshua tree and cacti habitat would be crossed by the best-case and 339 acres by the worst-case situation. For a description of the impact potential, refer to the discussion of each vegetation type in the discussion of vegetation for the proposed action.

Wildlife

BEST CASE

Except for the order of magnitude (determined by miles of range crossed), the best-case impacts to the various big game animals found along the Northern ge dp1:358075.142Systems Alternative (mule deer, American elk, pronghorn, and moose) would be the same as those noted for the proposed action. This alternative would cross 27 miles (327 acres) of big game winter range. The type of impact (i.e., harassment) would be the same as that detailed for the proposed route.

Impact to sage grouse would occur along about 17 miles (206 acres) of habitat on the alternative route. Ring-necked pheasants could be affected on about 43 miles (521 acres) of cropland along this alternative. Gambel's quail would not be found along this alternative. Waterfowl habitat in this area would include approximately 30 percent more acres than would be found along the proposed action (41 miles or 497 acres versus 34 miles or 412 acres). Raptor habitat would occur along an estimated 54 miles (654 acres) of the Northern Systems Alternative.

WORST CASE

The worst-case impact to big game mammals would be the same as that for the best case because there are no big game winter ranges in the California portion of the worst-case route.

This alternative would affect an estimated 17 miles (206 acres) of sage grouse habitat. The types of impacts would be the same as those noted for the proposed action. Ring-necked pheasants would be found along approximately 88 miles (1,065 acres) of cropland along this alternative. The types of impacts to pheasants would be the same as those noted for the proposed action. Gambel's quail do not occur along this alternative route. The types of impacts to waterfowl habitat under this case would be the same as those noted for the proposed action and would occur along 57 miles or 691 acres. The types of impacts to raptors from this alternative would be the same as those noted for the proposed action and would occur along **120** miles or **1,454** acres.

FEDERAL AND STATE LISTED SPECIES

Except for on the order of magnitude, impacts to the black-footed ferret and the bald eagle would be the same as those detailed for the proposed action. The San Joaquin kit fox could be affected if construction machinery destroyed its dens, if it were shot by construction workers, or if it were involved in motor vehicle accidents caused by increased traffic during construction.

Impacts to the blunt-nosed leopard lizard would include direct mortality to animals crushed by machinery or destruction of occupied dens or resting areas. These impacts are not quantifiable with present knowledge.

Soils

The best-case Northern Systems Alternative would disturb 937 acres of soils. The following would be most strongly affected by the project: 36 acres of Soil Group 1, 315 acres of Soil Group 4, 85 acres of Soil Group 5, 158 acres of Soil Group 6, 145 acres of Soil Group 9.

The worst-case Northern Systems Alternative would disturb 2,728 acres of soils. The following would be most strongly affected: 36 acres of Soil Group 1, 315 acres of Soil Group 4, 121 acres of Soil Group 5, 594 acres of Soil Group 6, 24 acres of Soil Group 8, and 497 acres of Soil Group 9. Refer to the discussion of the proposed action in this chapter and table 3-9 for additional soil information.

Visual Resources

No significant adverse visual resources would be affected along the Northern Systems Alternative right-of-way. However, an analysis of the impacts which may occur as a result of constructing ancillary facilities indicates that the Stanfield Compressor Station will create a significant adverse visual impact, as described in table 4-13.

TABLE 4-13

SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS OF THE NORTHERN SYSTEMS ALTERNATIVE

MP	Affected Landscape Feature[1]	Critical Viewpoint[2]	Duration of Impact[3]	Contrast Rating Feature Score[4]	VRM Class[5]
PIPELINE					
No Significant adverse visual resource impacts.					
ANCILLARY FACILITIES					
Stanfield, OR Vicinity	Vegetation, structure	rural homes and roads	Long Term	-/15/29	4

[1]The composition of the characteristic landscape would be modified by changing the landform, water form, or vegetation or by adding a structure to the landscape.

[2]A critical viewpoint is the point where the proposed change would be most apparent.

[3]Duration of impact can be described as:
Temporary--During construction through first or second growing season.
Short term--For 2 to 5 years following construction.
Long term--5 years to project life of 20 years or longer.

[4]Contrast Rating Feature Score is a value which the contrast of a specific area could not exceed without creating a significant adverse visual impact. VRM Class 2 and VQO R both have a Feature Score of 12. VRM Class 3 and VQO PR both have a Feature Score of 16. VRM Class 4 and VQO M, and MM both have a Feature Score of 20. See appendix I for further explanation.

[5]See table 3-10 for definitions of terms.

Land Uses: Agriculture

The best case of the Northern Systems Alternative would temporarily disturb 521 acres of cropland. The cropland would be successfully restored within 1 to 2 years if the revegetation and restoration guidelines identified in appendix C were implemented.

The worst case of the Northern Systems Alternative pipeline right-of-way would temporarily disturb 1,065 acres of cropland. With the possible exception of the two orchard and vineyard areas in the Brentwood-Panoche segment near MP 31 and MP 93, the cropland would be successfully restored within 1 to 2 years. Impact to the orchard and vineyard areas would be significant because of the time required to restore production to preconstruction conditions and the requirement that trees not be allowed within an approximately 25-foot wide strip over the pipeline. However, the right-of-way could be aligned to minimize this impact.

Socioeconomics

The worst-case alternative could be constructed by two pipeline spreads and five compressor station construction crews. Spread 1 (320 workers) would construct the pipeline loops in Wyoming, Utah, and Idaho; spread 2 (290 workers) could construct the pipeline segments in California. Construction in California might not be required; however, the worst-case analysis assumes it would be. (See chapter 2 for further information on the need for California construction.) The compressor station construction crews would probably be smaller than the Sage Compressor Station crew, since all but one of the alternative compressors would only be additions to existing stations, much smaller than the Sage Compressor Station. Compressor station construction would require 15 persons in the first month, 60 persons during the peak 2- month period, and 15 persons for the remaining month of construction. Therefore, if all construction occurred simultaneously, 910 workers would be employed during peak construction **for the worst case.** The best-case alternative would not require constructing pipeline in California. The peak construction work force for the best case would be 620. Existing maintenance bases would be used for both the worst and best cases.

Both pipeline spreads would be divided into two work crews. During peak construction, spread 1 would have 252 working on the right-of-way and 67 working in a double-jointing yard; spread 2 would have 229 working on the right-of-way and 61 working in a double-jointing yard.

Population and employment increases that would occur during construction of the alternative pipeline would be minor, no more than 0.33 and 0.75 percent, respectively, for both pipeline spreads. Increases in retail sales would be correspondingly small, less than 1 percent. However, spread 1 pipeline workers would **use** a significant portion of existing accommodations during the 3 peak months; 11 percent of the hotel/motel rooms and 21 percent of the campsites would be needed. This would probably inconvenience other travelers and campers. Spread 2 would **use** less than 4 percent of existin accommodations.

Population and employment increases that would occur during construction of all compressor stations would be 1.2 percent or less. Increases in retail sales would be correspondingly small; the largest increase--about 1.19 percent--would occur at the Madras Compressor Station in Oregon. Three of the compressor crews--Stanfield, Ione, and Bonanza--would require only 4 percent of existing hotel/motel rooms, but they would need 11 to 29 percent of the campsites. This would probably inconvenience other campers. The Madras Compressor Station crew would need 52 percent of the local hotel rooms; the Delevan Compressor Station crew would need more rooms than exist in nearby towns. Construction personnel for the Delevan Compressor Station could find housing 70 miles away in Sacramento, but the Madras Compressor Station crew would probably try to live near the site because there is virtually nowhere else within a reasonable driving distance. This would probably absorb all of the local vacancies and inconvenience other travelers who would expect to stay in the area.

The labor requirements of the RMPP suggest that the operation work force for the Northern Systems Alternative would require, at most, five additional employees at the Stanfield Compressor Station. It is possible to operate a compressor of this size remotely, in which case no additional workers would be required. The existing maintenance bases might need additional personnel to maintain the proposed looping, although existing personnel might be able to handle the incremental increase. At most, the existing maintenance bases would not need more than a few additional employees. Other than this, existing personnel could operate the additional facilities.

This alternative would increase county property tax revenues in all counties crossed except those in Idaho. In Idaho, new revenues are used to reduce property taxes paid by existing property owners. The increased county revenues and the decreased tax burden in Idaho would be beneficial to the localities.

Because on the project's extremely low demand on hospital and police services, there should be little impact on these services in the alternative's project area.

Topography

For both cases of the Northern Systems Alternative, only about 1 mile of sidehill construction, located between MP 38 and MP 39 on the Pegram Loop, might be necessary.

Noise Quality

Noise resulting from the operation of compressor stations is principally a function of source characteristics (number and horsepower of compressor units, number of blowdowns, suction inlet pressure, and the direction of the receptor from the source).

Although the construction of a 400-hp. compressor station at Stanfield, Oregon, for the Northern Systems Alternative would affect the local environment, the exact impact cannot be quantified because the exact location of this station is undetermined. New compressor units similar to those at the existing compressor stations along the PGT and PG&E transmission systems would be installed with noise suppression equipment designed to meet the latest noise level limits in effect when they are purchased. Assuming that the same type of units are installed at each compressor station, doubling the compressor station horsepower would not double the noise level. According to the addition principle of acoustics, two equal sources at the same location would produce a sound level 3 dB(A) higher than the original noise level. The impact on noise quality would be the same for the best and worst cases of this alternative.

Air Quality

CONSTRUCTION-RELATED IMPACT

During construction of the looping, compressor station modifications, and ancillary facilities, pollutant emissions would depend upon the type and amount of equipment used and the extent of its use. The worst case would create more temporary unquantified impact on air quality than the best case, since it would require more pipeline construction. Generally, the emissions resulting from pipeline construction and compressor station modifications include **nonmethane** HC's, NO_x, CO, SO_x, TSP, and water vapor. Concentrations of pollutants would depend on relative locations of construction; dispersion would depend upon local atmospheric stability and meterological conditions.

Construction would cause temporary and minimal deterioration of the ambient air quality. Localized, short-term dust conditions produced by construction could create a temporary nuisance in dry and windy weather. The most likely place for this impact would be Bannock County, Idaho. Additional construction-related impact would be similar to that from the RMPP.

OPERATIONAL IMPACT

The operational impact of the Northern Systems Alternative, the same for both cases, would depend upon the volumes of gas transported through it. All of the compressor stations along this alternative **use** natural gas as the fuel source.

Operation of the 400-hp. compressor station at Stanfield, Oregon, would cause only minor impact to the existing air quality because only 5 tons of NO_x would be emitted per year. Maximum ground-level concentration **of** NO_x from operation of the Stanfield Compressor Station would be negligible--far below an annual arithmetic mean of 1 ug per cubic meter. No PSD **applicability determination or** review would be necessary because the Stanfield Compressor Station would not be considered a major source.

The addition of 8,975 hp. at the Ione Compressor Station, 1,450 **horsepower** at the Madras Compressor Station, 1,375 **horsepower** at the Bonanza Compressor Station, and **8,450 horsepower** at the Delevan Compressor Station to transport both RMPP and Alaskan gas would increase emissions to the levels shown in table 4-14. The addition of compressor units at any of the existing compressor stations would constitute a major modification under the PSD-State Implementation Plan *de minimis* regulations (issued by EPA August 7, 1980) if total emissions of NO_x (primary pollutant) exceeded 40 tons per year. Additional compression eventually installed at the Ione Compressor Station in Morrow County, Oregon, and the Delevan Compressor Station in Colusa County, California, to transport RMPP and Alaskan gas would require a PSD **applicability determination or** review. However, if the EPA had conducted a PSD **applicability determination or** review for any of these sources before their construction, an additional PSD **applicability determination or** review might not be necessary, since a source is allowed to expand to the limits of its operational air permits without further review.

To transport 800,000 Mcfd of RMPP gas along with the Alaskan gas volumes, 2,100 horsepower would be added at Lava Hot Springs, 1,950 **horsepower** at Burley, 400 **horsepower** at Mountain Home, and 4,050 **horsepower** at Stanfield along the Northwest pipeline system. Compression would also be added at all the compressor stations between Ione and Delevan along the PGT and PG&E systems. A PSD **applibility determination or** review would be required for the additions to the Burley and Mountain Home Compressor Stations; a PSD **applibility determination or** review would also be necessary for all of the additions to the compressor stations on PGT's and PGE's systems if they had not been examined in a previous review. The amount of horsepower added and the resulting increase in emissions are listed in table 4-14.

Increases in ground-level NO_x concentrations for all phases of the Northern Systems Alternative appear in table 4-15.

No impact on any Class I area is expected from the operation of the Northern Systems Alternative. Operating at the 800,000-Mcfd level, Diamond Junction Compressor Station 30 miles east of Crater Lake National Park, a Class I area, would increase NO_x emissions by 19 ug per cubic meter. This would not significantly affect the Crater Lake National Park because of the easterly dispersion characteristics at the compressor station. The other Class I area near a Northern Systems Alternative facility is Whiskeytown National Recreation Area, 31 miles west of the Burley Compressor Station. The ground-level NO_x increment from operation of the compressor station would be an annual arithmetic mean of 16.86 ug per cubic meter at 658 feet from the compressor station. The ground-level incremental impact from operation of the compressor station on this Class I area cannot be determined because the EPA-approved air dispersion models are only valid for up to 50 kilometers (EPA 1980a).

TABLE 4-14

EMISSIONS RESULTING FROM THE INCREMENTAL EXPANSION OF THE NORTHERN SYSTEMS ALTERNATIVE

Gas Volume	Compressor Station	County/State	Required Horsepower (Totals)	Existing Horsepower	Additional Horsepower	[a]Existing Emissions at Time of Modification (Tons/Year)				[a]Incremental Increase in Emissions (Tons/Year)				PSD Review
						NO_x	CO	HC's	SO_2	NO_x	CO	HC's	SO_2	
Case I: 413,000 Mcfd	Stanfield	Umatilla, Oregon	400	0	400	0	0	0	0	5	2	0.045	-	No
Case II: 413,000 Mcfd plus 640,000 Mcfd Alaskan Gas	Ione	Morrow, Oregon	50,207	41,232	8,925	524	199	3.6	0.72	113	43	0.8	0.15	Yes
	Madras	Jefferson, Oregon	30,690	29,240	1,450	371	141	2.6	0.51	18	7	0.1	0.03	No
	Bonanza	Klamath, Oregon	35,999	34,624	2,375	440	167	3.0	0.61	30	11	0.1	0.04	No
	Delevan	Colusa, California	41,700	32,950	8,450	419	159	2.9	0.57	107	42	0.8	0.10	Yes
Case III: 800,000 RMPP Gas plus Alaskan Gas	Lava Hot Springs	Bancock, Idaho	5,830	3,730	2,100	47	18	0.3	0.06	27	10	0.2	0.03	No
	Burley	Cassia, Idaho	7,950	6,000	1,950	632	81	25.4	0.10	204	28	8.3	0.03	Yes
	Mountain Home	Elmore, Idaho	6,400	6,000	400	631	81	25.4	0.10	204	26	8.3	0.03	Yes
	Stanfield	Umatilla, Oregon	4,450	400	4,050	57	21	0.4	0.67	51	20	0.4	0.07	No
	Ione	Morrow, Oregon	74,707	50,207	24,500	638	242	4.4	9	311	118	2.1	0.43	Yes
	Kent	Sherman, Oregon	45,732	38,482	7,250	489	185	3.4	0.67	92	35	0.6	0.12	Yes
	Madras	Jefferson, Oregon	45,340	30,690	14,650	390	148	2.7	0.53	186	71	1.3	0.25	Yes
	Paulina	Deschutes, Oregon	48,923	37,723	11,200	479	182	3.3	0.66	142	54	1.0	0.19	Yes
	Diamond Junction	Klamath, Oregon	44,054	36,054	8,000	458	174	3.6	0.63	102	39	0.7	0.14	Yes
	Bonanza	Klamath, Oregon	54,419	35,999	18,420	457	173	3.2	0.63	234	89	1.6	0.32	Yes
	Tionesta	Modoc, California	26,110	20,860	5,250	265	101	1.8	0.36	67	25	0.5	0.09	Yes
	Burney	Shasta, California	39,400	32,150	7,250	408	155	2.8	0.56	92	35	0.6	0.12	Yes
	Gerber	Tehama, California	33,170	23,720	9,450	301	35	0.6	0.12	120	46	0.8	0.16	Yes
	Delevan	Colusa, California	52,230	32,950	18,980	416	159	2.9	0.57	241	91	1.7	0.33	Yes

[a]Particulate matter emissions cannot be calculated because the emission factor is not calculable.

ALTERNATIVE B--SANPETE VALLEY ALTERNATIVE

Vegetation

The Sanpete Valley Alternative would affect 6,215 acres of vegetation. The understory would be capable of returning to preconstruction densities within 5 years after completion of construction. The overstory would require longer than 5 years to reestablish, as described for the proposed action.

The acres of vegetation which would be temporarily or permanently removed by the Sanpete Valley Alternative are shown in table 3-1. There would be a loss of **1,738** acres of forest, pinyon-juniper, and mountain brush types in an approximately 50-foot wide segment over the pipeline for the life of the project (20 years). Approximately 19 acres of riparian vegetation would be temporarily lost. Various species of desert cacti and Joshua trees are scattered throughout creosote bush and saltbush-greasewood vegetation types; 2,194 acres of creosote bush would be crossed by the Sanpete Valley Alternative.

TABLE 4-15

GROUND-LEVEL IMPACT RESULTING FROM OPERATION OF NORTHERN SYSTEMS ALTERNATIVE (ug Per Cubic Meter)

Gas Volumes	Compressor Station	Background NO_x	Additional NO_x 1[a]	Total NO_x Ground-level Concentration[b]
Case II: 413,000 Mcfd RMPP Gas Plus 640,000 Mcfd Alaskan Gas	Ione	22	21.5	44.0
	Madras	22	13.13	35.00
	Bonanza	22	15.32	37.00
	Delevan	22	17.81	40.00
Case III: 800,000 RMPP Gas plus Alaskan Gas	Lava Hot Springs	22	2.50	24.50
	Burley	22	28.17	50.00
	Mountain Home	22	28.17	50.00
	Stanfield	22	2.09	22.00
	Ione	22	32.01	54.00
	Kent	22	19.64	42.00
	Madras	22	19.42	41.00
	Paulina	22	21.00	43.00
Case III: 800,000 RMPP Gas plus Alaskan Gas	Diamond Junction	22	19.00	41.00
	Bonanza	22	23.13	45.00
	Tionesta	22	11.19	33.00
	Burney	22	16.86	39.00
	Gerber	22	14.20	34.00
	Delevan	22	22.25	44.00

[a]All values were calculated by using EPA's approved PTMAX computer program.

[b]This ground-level concentration would occur 658 feet (200.5m) from the source.

Wildlife

MAMMALS AND BIRDS

Big game winter ranges that would be crossed by the Sanpete Valley Alternative total an estimated 203 miles (2,460 acres). The types of impacts would be similar to those discussed for the proposed action.

This alternative would cross an estimated 59 miles (715 acres) of sage grouse range, about 75 miles (909 acres) of waterfowl habitat, and an estimated 102 miles (1,236 acres) of raptor habitat. The types of impacts for all of these bird habitat areas would be similar to those discussed for the proposed action.

FEDERAL AND STATE LISTED SPECIES

If this alternative were chosen, impacts to black-footed ferrets would be identical to those identified for the proposed route, since the alternative would leave the proposed route south of the area where the proposed action could encounter this species. The alternative would affect the bald eagle in the same manner as the proposed action, although the order of magnitude could differ.

Impacts to the Utah prairie dog are not expected to occur, because none of its known distributions are in proximity to this alternative.

Impacts to the desert tortoise would be the same as those identified for the proposed action, since this alternative would rejoin the proposed action north of known habitat for this species.

Soils

The Sanpete Valley Alternative would disturb 7,636 acres of soils. Of this acreage, the following would be most strongly affected: 1,382 acres of Soil Group 1, 255 acres of Soil Group 2, 412 acres of Soil Group 3, 61 acres of Soil Group 4, 570 acres of Soil Group 5, 206 acres of Soil Group 6, 170 acres of Soil Group 8, and 2,945 acres of Soil Group 9. Refer to the discussion of the proposed action and table 3-9 for additional soil information.

Visual Resources

Similar to the proposed action, the significant adverse visual resource impacts caused by the Sanpete Valley Alternative would include contrasts in modifications of landform, vegetation, and the addition of structures, as noted in table 4-16. Refer to the proposed action discussion for a further explanation and to table 4-2 for a summary of impacts by VRM Class.

TABLE 4-16

SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS OF THE SANPETE VALLEY ALTERNATIVE

MP	Affected Landscape Feature[1]	Critical Viewpoint[2]	Duration of Impact[3]	Contrast Rating Feature Score[4]	VRM Class[5]
PIPELINE					
(Refer to proposed action discussion between MP 0 and MP 176)[6]					
MP 95-MP 105	Landform, vegetation	U.S. Highway 89	Long Term	26/18/-	2
MP 121-MP 124	Vegetation	U.S. Highway 89, Circleville	Long Term	-/22/-	4
MP 129-MP 131	Landform, vegetation	U.S. Highway 89	Long Term	22/22/-	3
(Refer to proposed action discussion between MP 356 and MP 610)					
ANCILLARY FACILITIES					
Same as those for the proposed action.					

[1]The composition of the characteristic landscape would be modified by changing the landform, water form, or vegetation or by adding a structure to the landscape.

[2]A critical viewpoint is the point where the proposed change would be most apparent.

[3]Duration of impact can be described as:
Temporary--During construction through first or second growing season.
Short term--For 2 to 5 years following construction.
Long term--5 years to project life of 20 years or longer.

[4]Contrast Rating Feature Score is a value which the contrast of a specific area could not exceed without creating a significant adverse visual impact. VRM Class 2 and VQO R both have a Feature Score of 12. VRM Class 3 and VQO PR both have a Feature Score of 16. VRM Class 4 and VQO M and MM both have a Feature Score of 20. See appendix I for further explanation.

[5]See table 3-10 for definitions of terms.

[6]Mileposts indicate where Alternative B would leave and rejoin the proposed action.

Land Uses: Agriculture and Conflicts with Land Use Plans, Policies, and Controls

AGRICULTURE

The Sanpete Valley Alternative route would temporarily disturb 1,585 acres of cropland. Assuming the implementation of the revegetation and restoration guidelines identified in appendix C, successful restoration of all croplands could be expected within 1 or 2 years.

The Sage Compressor Station would be located on native grazing land. Land use for the remaining surface facility sites is not known because specif locations have not yet been identified.

CONFLICTS WITH LAND USE PLANS, POLICIES, AND CONTROLS

The Sanpete Valley Alternative, like the proposed action, would conflict with the Utility Corridor Rule of the proposed Forest Land Management Plan for the Uinta National Forest. It also would not follow the **more than** 3,000-foot wide corridor administered by BLM through the 70,000 acres transferred from BLM administration to the Moapa Indian Reservation. See the discussion for the proposed action for the implications of these conflicts.

At this time, it is unknown whether or how the Sanpete Valley Alternative would conflict with the Draft Management Master Plan for the proposed Clark County Wetlands Park in southern Nevada.

Socioeconomics

This alternative would parallel the RMPP route between MP 176 and MP 356. The employment and construction schedules would be the same as those for the proposed route. Table 2-3 lists the number of employees required to construct this alternative. The region of impact also would be similar to RMPP spreads 3 and 4. Regional socioeconomic impact would be insignificant. Local impact to towns nearer this alternative would also be minor, the main difference being that accommodations in these towns might be more desirable because of their proximity to the construction site. Table 4-17 lists the towns with accommodations that are within 20 road miles of the Sanpete Valley Alternative.

Operation and maintenance of this alternative would not differ from that of the proposed route. However, county property tax revenues would be different, as shown in table 4-4.

TABLE 4-17

TOWNS WITH HOUSING ALONG THE SANPETE VALLEY ALTERNATIVE

Construction	Communities With Accommodations Within 20 Miles of the Pipeline	Communities With Accommodations 21 to 40 Miles from the Pipeline
Pipeline Spread 3	Mt. Pleasant Manti Gunnison Marysvale Circleville Richfield	Nephi Beaver Panguitch
Pipeline Spread 4	Maryville Circleville Beaver Parowan Cedar City St. George Washington Panguitch	

Topography

The Sanpete Alternative would encounter about 8 miles of sidehill construction--about 6 miles in the canyon of the Sevier River south of Sevier and 2 miles between MP 129 and MP 131 in Circleville Canyon.

ALTERNATIVE C--CENTRAL NEVADA ALTERNATIVE

Vegetation

The Central Nevada Alternative would affect 9,149 acres of vegetation. The understory vegetation would be capable of returning to preconstruction densities within 5 years after construction was completed; the overstory vegetation would require longer, as described for the proposed action. Joshua trees and cacti (scattered within 4,713 acres of creosote bush and saltbush-greasewood vegetation types) could be affected. A loss of **1,430** acres of forest, pinyon-juniper, and mountain brush vegetation would occur for the life of the project (20 years). Approximately 20 acres of riparian vegetation would be temporarily lost. **The unique stand of Rocky Mountain Red cedar (*Juniperus scopulorum*) would be traversed and disturbed by the Central Nevada Alternative.**

Wildlife

MAMMALS, BIRDS, REPTILES, AND AMPHIBIANS

Big game winter ranges would be traversed by the Central Nevada Alternative for an estimated 131 miles (1,588 acres). This alternative would disturb an estimated 7 miles (85 acres) of desert bighorn sheep habitat.

This alternative would cross an estimated 66 miles (800 acres) of sage grouse habitat, 72 miles (873 acres) of waterfowl habitat, **95** miles (**1,151** acres), of raptor nesting and hunting habitat, and 2 miles (24 acres) of golden eagle nesting areas. Impacts to all of these areas would be the same as those noted for the proposed action.

This alternative would affect about 46 miles (558 acres) of desert tortoise range. Impacts would be the same as those for the proposed action.

FEDERAL AND STATE LISTED SPECIES

Since this alternative would leave the proposed route south of where the RMPP would encounter the black-footed ferret, impacts to this species would be the same as those identified for the proposed action. Utah prairie dogs would not be affected by the Central Nevada Alternative because their distribution does not coincide with the alternative route.

Except for the order of magnitude, impacts to bald eagles would be the same as those discussed for the proposed action.

The Railroad Valley springfish could be affected by this alternative if its habitat at Big Spring near Lockes, Nevada, were to be disturbed. Any disturbance of this species' habitat would result in lowered production.

The Mohave ground squirrel, a state listed species, would suffer direct mortality and displacement into less favored habitats. Both of these impacts could reduce populations. Except for the order of magnitude, impacts to the state-listed desert tortoise would be the same as those noted for the proposed action.

Soils

The Central Nevada Alternative would disturb 10,447 acres of soils. Of this acreage the following amounts would be most strongly affected: 1,236 acres of Soil Group 1, 897 acres of Soil Group 2, 1,963 acres of Soil Group 3, 800 acres of Soil Group 4, 485 acres of Soil Group 5, 461 acres of Soil Group 6, 97 acres of Soil Group 7, 218 acres of Soil Group 8, and 7,005 acres of Soil Group 9. Refer to the discussion of the proposed action and table 3-9 for additional soil information.

Visual Resources

Similar to the proposed action, the significant adverse visual resource impacts for the Central Nevada Alternative would include contrasts from modifications of landform, vegetation, and the addition of structures, as noted in table 4-18. Refer to the proposed action discussion for a further explanation and to table 4-2 for a summary of such impacts by VRM Class and VQO.

TABLE 4-18

SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS OF THE CENTRAL NEVADA ALTERNATIVE

MP	Affected Landscape Feature[1]	Critical Viewpoint[2]	Duration of Impact[3]	Contrast Rating Feature Score[4]	VRM Class[5]
PIPELINE					
(Refer to proposed action discussion between MP 0 and MP 176)[6]					
MP 109-MP 112	Landform, vegetation	U.S. Highway 6/50	Long Term	26/18/-	3
MP 160-MP 163	Vegetation	Swamp Cedar Natural Area	Long Term	-/25/-	2
MP 195-MP 201	Landform, vegetation	U.S. Highway 6, Ely Recreation Site	Long Term	22/17/-	2
MP 232-MP 237	Landform, vegetation	U.S. Highway 6, Currant Creek Campground	Long Term	22/18/-	PR
MP 268-MP 274	Vegetation	U.S. Highway 6	Long Term	-/22/-	2
MP 278-MP 280	Vegetation	U.S. Highway 6	Long Term	-/18/-	2
MP 310-MP 314	Vegetation	U.S. Highway 6	Long Term	-/22/-	2
MP 329-MP 331	Vegetation	U.S. Highway 6	Long Term	-/18/-	R,PR
MP 332-MP 338	Vegetation	U.S. Highway 6, Roadside Reststop	Long Term	-/18/-	R,PR
MP 338-MP 341	Vegetation	U.S. Highway 6	Long Term	-/18/-	R,MM
MP 356-MP 358	Landform, vegetation	Tonopah	Long Term	22/17/-	2
MP 546-MP 554	Vegetation	U.S. Highway 395	Long Term	-/18/-	2,3
MP 569-MP 576	Vegetation	U.S. Highway 395	Long Term	-/20/-	2
MP 600-MP 606	Vegetation	U.S. Highway 395	Long Term	-/17/-	2,3
ANCILLARY FACILITIES					
Sage Compressor Station and maintenance base and the Heber City and Nephi maintenance bases are the same as the proposed action.					
Tonopah Maintenance Base:					
Tonopah, Nevada Vicinity	Vegetation, structure	Tonopah, U.S. Highway 6	Long Term	-/16/27	3

TABLE 4-18—Continued

MP	Affected Landscape Feature[1]	Critical Viewpoint[2]	Duration of Impact[3]	Contrast Rating Feature Score[4]	VRM Class[5]
Inyokern Maintenance Base:					
Inyokern, California Vicinity	Vegetation, structure	Inyokern, U.S. Highway 395	Long Term	-/20/27	3

[1]The composition of the characteristic landscape would be modified by changing the landform, water form, or vegetation or by adding a structure to the landscape.

[2]A critical viewpoint is the point where the proposed change would be most apparent.

[3]Duration of impact can be described as:
Temporary--During construction through first or second growing season.
Short term--For 2 to 5 years following construction.
Long term--5 years to project life of 20 years or longer.

[4]Contrast Rating Feature Score is a value which the contrast of a specific area could not exceed without creating a significant adverse visual impact. VRM Class 2 and VQO R both have a Feature Score of 12. VRM Class 3 and VQO PR both have a Feature Score of 16. VRM Class 4 and VQO M and MM both have a Feature Score of 20. See appendix I for further explanation.

[5]See table 3-10 for definitions of terms.

[6]Mileposts indicate where Alternative C would leave and rejoin the proposed action.

Land Uses: Wilderness, Agriculture, and Conflicts with Land Use Plans, Controls, and Constraints

WILDERNESS

The Central Nevada Alternative would enter the Rawhide Mountains WSA (NV- 060-059) in Nevada and the Notch Peak WSA (U-050-078) in Utah, causing significant impacts (BLM 1980a, 1980b). **The Rawhide Mountains WSA abuts the U.S. Highway 6 right-of-way for approximately 2 miles. It could cause significant impact to as much as 640 acres of the** 64,000 acres **in** this WSA. The construction **and** operation of the alternative would permanently impair the wilderness values **of those portions of the WSA's in conflict with the alternative** by clearing vegetation, disturbing soil and wildlife, and degrade noise and air quality. This would violate section 603(c) of **the Federal Land Policy and Management Act (FLMPA).** The natural pristine characteristics and solitude that were the reason for designating these two units as WSA's would also be impaired. Wilderness suitability would be permanently impaired. **(BLM 1981a)**

AGRICULTURE

The Central Nevada Alternative would affect 1,295 acres of cropland. Assuming implementation of the revegetation and restoration guidelines proposed by the applicant and listed in appendix C, successful restoration of all croplands would be expected within 1 to 2 years. An exception would be the need to schedule construction to avoid disturbing irrigation and subsurface drainage systems, especially in the Delta, Utah, area.

Impacts to the Robinson Canyon Watershed Project (P.L. 566) near Ely, Nevada, would be short term and insignificant due to the anticipated successful restoration using the erosion control structures, revegetation, and critical erosion control treatment measures outlined in appendix C.

The Sage Compressor Station would be located on native grazing land. Land **use** for the remaining surface sites is not known because specific locati are not known at this time.

CONFLICTS WITH LAND USE PLANS, POLICIES, AND CONTROLS

The Central Nevada Alternative would conflict with the draft Benton-Owens Valley MFP because it would not follow the designated transmission corridor. However, the MFP did not consider pipelines for inclusion in the corridor. Because the plan is a draft and the pipeline would be buried, the pipeline would not violate the intent of the MFP nor interfere with other designated land **uses** (Morrison 1980).

This alternative would not follow the utility corridors designated by the BLM California Desert Plan. However, since it would follow a contingency utility corridor for which the plan contains an amendment procedure, the placement of this alternative would not violate the intent of the California Desert Plan. As would the proposed action, this alternative would also conflict with the Utility Corridor Rule discussed in the proposed Forest Management Plan for the Uinta National Forest. See the discussion for the proposed action in this chapter for the implications of the conflicts.

Socioeconomics

Constructing this alternative could be accomplished using six construction spreads between Nephi, Utah, and Adelanto, California. The first three spreads would work through rough terrain; the final three spreads would be in rolling country. The Sage Compressor Station and pipeline spreads 1 and 2 of the RMPP would still be required for this alternative. Total employment during the peak construction period would be **2,570** workers; if the **six additional** maintenance bases listed in table 2-4 were also constructed, an additional **120** workers would be employed during the peak period. Table 2-3 lists the number of employees required for this alternative. Each peak pipeline spread would be divided into two work crews-- 79 percent working on the right-of-way, 21 percent working in double-jointing yards.

Because this alternative would be located in remote parts of Utah, Nevada, and eastern California, regional population and employment increases would be relatively high for a pipeline project, averaging 1.5 and 3.4 percent, respectively, for all spreads. Pipeline spreads 1, 4, and 5 would generate a 10- to 12-percent increase in retail sales during the construction period. (See table 3-29 for the locations of these spreads.) Only one--pipeline spread 6 in southern California--would generate less than a 6-percent increase. Demands for available housing would be very high for spreads 1 through 5. Of these, the lowest demand on hotel/motel rooms would occur from spread 5, which would require 24 percent of the existing rooms; the highest would occur with spread 4, which would require more rooms than exist in the region. A large percentage of the available campsites would also be required, ranging from 20 percent for spread 1 to 75 percent for spread 4. Spread 6 would require only 7 percent of the existing hotel/motel rooms and campsites.

At the same time that pipeline workers for spreads 2 through 5 would be looking for housing, other development projects in the area will have filled all of the vacancies. Under construction will be the White Pine coal-fired powerplant near Ely, Nevada, and two mines near Tonopah, Nevada. Ely and Tonopah are the only towns where housing would exist for spreads 2 through 5. In addition to these projects, the potential construction of the MX missile system could have more dramatic impact on many towns, including Delta, Ely, and Tonopah. This possibility is described more fully in the USAF's EIS evaluating the project (USAF 1980).

Because of these other development projects, the applicant would need to construct work camps to house the pipeline work force. Potential locations for these work camps are shown in table 2-2. Each spread would need a work camp that supplied housing, food, water, and sewerage. The camps could include barracks, mess halls, and showers, or they could be mobile home parks where workers had more private accommodations. An ambulance at each work camp would be advisable. Local police, fire, and medical facilities would still be required from local communities; these local services would probably be strained because of the other developments in the vicinity.

The Central Nevada Alternative would probably be operated and maintained by the same size work force as the RMPP, except that two additional maintenance bases might be necessary, requiring an additional 14 employees. The small operating work force of 82 people would not present significant socioeconomic ramifications, except that the 14 workers for the Ely and Tonopah maintenance bases might not be able to find housing. If they could not, permanent housing, water, and sewerage would be needed at the maintenance bases to accommodate the workers.

This alternative would increase county tax revenues in the counties crossed. This would be a long-term benefit. However, these benefits would not occur in time to offset the costs associated with construction-related demands on infrastructure.

Topography

The Central Nevada Alternative would require about 5 miles of sidehill construction: 1 mile in Kings Canyon (MP 109 to MP 110), 2 miles in Murry Canyon (MP 196 to MP 198), and 2 miles at the southern end of Rose Valley (MP 565 to MP 567).

Air Quality

During construction of the Central Nevada Alternative pipeline, compressor stations, and ancillary facilities, pollutant emissions would depend upon the type and amount of equipment used and the extent of its use. Impact would depend on relative locations of construction. Generally, the emissions resulting from pipeline construction include **non-methane** HC's, NO_x, CO, SO_x, TSP, and water vapor. Dispersion of these pollutants would depend upon local atmospheric stability and meterological conditions.

Construction would cause temporary and minimal deterioration of the ambient air quality. It would also cause localized, short term dust conditions which could pose a temporary nuisance in dry and windy weather. The most likely places for this would be Nye County, Nevada, and San Bernardino County, California. Additional construction-related impact is discussed in the air quality analysis for the RMPP.

The stack parameters for the compressor at the Sage Compressor Station were used for modeling emissions from future compressor stations along this alternative. Estimated air emissions during operation of the Sage Compessor Station, the major source of air emissions directly related to the operation of this alternative, are listed in table 4-19. The compression facilities necessary to expand this system to 800,000 Mcfd and the emissions they would produce are also included in the table. All of the compressors would **use** natural gas as their fuel.

TABLE 4-19 (REVISED)

POTENTIAL ANNUAL AIR EMISSIONS FROM THE CENTRAL NEVADA ALTERNATIVE

Volume	County, State	[a]Compressor Station	Required Site Rated Horsepower	[b]Potential Increase in Emissions (Tons/Year)				Annual Operation (Day/Year)	[c]PSD Review	Fuel Required (Million cfd)
				NO_x	CO	HC	SO_2			
413,300 Mcfd	Lincoln, Wyoming	Sage	17,442	222	84	2	0.31	365	No	3.52
800,000 Mcfd	Lincoin, Wyoming	Sage	35,632	452	172	3	0.62	365	Yes	7.02
	Millard, Utah	Station 1	15,538	197	75	2	0.27	365	No	3.21
	White Pine, Nevada	Station 2	17,442	222	84	2	0.31	365	No	3.60
	Esmeralda, Nevada	Station 3	13,124	167	3	1	0.22	365	No	2.71

[a]Gas-turbine units are assumed to be installed at each compressor station.

[b]Emissions calculated by the potential to emit, using EPA's compilation of emission factors. All emissions are in tons/year. Particulate matter emissions cannot be calculated because the emission factor is not available. However, these emissions would be negligble.

[c]EPA 1980b.

The ground-level impact from operation of the Sage Compressor Station and booster stations would be quite similar to the ground-level impact expected from operation of the RMPP at **the** 413,000- or 800,000-Mcfd levels. The ground-level concentration of NO_x would not exceed an annual arithmetic mean of **1.79** ug per cubic meter at 456 meters from the source. Assuming a background concentration of 20 ug per cubic meter, a ground-level NO_x concentration of **21.79** ug per cubic meter would be expected. At a throughput of 800,000 Mcfd, the NO_x ground-level emissions at the Sage Compressor Station would not exceed an annual arithmetic mean of **3.66** ug per cubic meter 456 meters from the source.

The specific ground-level impact for each of the required compressor stations would depend upon the horsepower required for each station. The compressor station in Millard County, Utah, would require **15,538 horsepower**. The potential NO_x ground-level concentration would produce an annual arithmetic mean of about **1.60** ug per cubic meter 456 meters from the source, a total annual ground-level concentration of **21.60** ug per cubic meter.

The compressor station in White Pine County, Nevada, would require **17,442 horsepower**. The potential NO_x ground-level concentration from its operation would produce an annual arithmetic mean of about **1.79** ug per cubic meter 456 meters from the source; the potential total ground-level concentration would be about **21.79** ug per cubic meter.

The compressor station in Esmeralda County, Nevada, would require **13,124 horsepower** The potential NO_x ground-level concentration produced by booster station operations would result in an annual arithmetic mean of **1.35** ug per cubic meter 456 meters from the source. The potential total ground-level concentration would be about **21.35 ug per cubic meter.**

All levels of emissions from operation of the compressor stations would be well below the NAAQS.

For a throughput of 413,00 Mcfd, **none of the compressor stations** would require a PSD **applicability determination or** review by the State of Wyoming, **Department of Environmental Review.** However, at 800,000 Mcfd, **compressor station** would require a PSD **applicability determination or** permit. **None of the booster stations would have to comply with the PSD regulations because none of them would be classified as a major source of air emissions.**

ALTERNATIVE D--SEVIER-ESCALANTE DESERT ALTERNATIVE

Vegetation

The Sevier-Escalante **Desert** Alternative would affect 6,495 acres of native vegetation. (See table 3-1.) Of this acreage, the understory would be capable of returning to preconstruction densities within 5 years after completion of construction. The overstory vegetation would require longer than 5 years to reestablish.

The acres (by vegetation type) which would be temporarily or permanently removed by the Sevier-Escalante Desert Alternative are shown in table 3-1. A loss of **1,212** acres of forest, pinyon-juniper, and mountain brush vegetation type would occur for the life of the project (20 years). Approximately 14 acres of riparian vegetation would be temporarily lost. Joshua trees and cacti scattered within creosote bush and saltbush-greasewood vegetation types could be affected over a total of 3,464 acres.

Wildlife

MAMMALS AND BIRDS

The Sevier-Escalante Desert Alternative would cross about 158 miles (1,915 acres) of big game winter range. The discussion of the proposed action details the type of impacts that would occur.

This alternative would cross an estimated 41 miles (497 acres) of sage grouse habitat, 51 miles (618 acres) of waterfowl habitat, 49 miles (594 acres) of raptor habitat and 23 miles (279 acres) of golden eagle nesting areas. The proposed action discussion details the type of impacts which could be expected in all these bird habitats.

FEDERAL AND STATE LISTED SPECIES

The black-footed ferret and bald eagle, both federally listed species, would be affected in the same areas and in the same manner discussed for the proposed action.

The state listed desert tortoise would be affected by this alternative in the same areas and ways as noted for the proposed action.

Soils

The Sevier-Escalante Desert Alternative would disturb 7,539 acres of soils. Of this acreage, the following amounts would be most strongly affected: 1,309 acres of Soil Group 1, 230 acres of Soil Group 2, 727 acres of Soil Group 3, 61 acres of Soil Group 4, 570 acres of Soil Group 5, 206 acres of Soil Group 6, 36 acres of Soil Group 7, 170 acres of Soil Group 8, and 3,394 acres of Soil Group 9. Refer to the discussion of the proposed action and table 3-9 for additional soil information.

Visual Resources

No significant adverse visual resource impacts would occur along the Sevier-Escalante Desert Alternative between alternative MP 96 and alternative MP 394 (the portion that would deviate from the proposed action). However, significant adverse impacts would occur along those portions of the proposed action which preceed and follow the alternative routing. Refer to the proposed action discussion for a further explanation and to table 4-2 for a summary of VRM Class and VQO impacts along the proposed action.

Land Uses: Agriculture and Conflicts with Land Use Plans, Policies, and Controls

AGRICULTURE

The Sevier-Escalante Desert Alternative would temporarily disturb 1,016 acres of cropland. Assuming the Erosion Control, Revegetation, and Restoration Guidelines outlined in appendix C were implemented, successful restoration of all croplands would be expected within 1 to 2 years. The Sage Compressor Station would be located on native grazing land. Land **use** for remaining surface facility sites is not known because specific locations for the sites have not yet been identified.

CONFLICTS WITH LAND USE PLANS, POLICIES, AND CONTROLS

The Sevier-Escalante Desert Alternative, like the proposed action, would conflict with the Utility Corridor Rule of the proposed Forest Land Management Plan for the Uinta National Forest. It also would not follow the **more than** 3,000-foot wide corridor administered by BLM through the 70,000 acres transferred from BLM administration to the Moapa Indian Reservation. See the discussion for the proposed action for the implications of these conflicts.

At this time, it is unknown whether or how the Sevier-Escalante Desert Alternative would conflict with the Draft Management Master Plan for the proposed Clark County Wetlands park in southern Nevada.

Socioeconomics

This alternative would parallel the RMPP route between MP 196 and MP 364. The employment and construction schedules would be the same as those of the proposed route. Table 2-3 lists the number of employees required to construct this alternative. The region of impact would be similar to RMPP spreads 3 and 4. Regional socioeconomic impact would be insignificant. Local impact to towns nearer this alternative route would also be minor, the main difference being that accommodations in these towns might be more desirable **than those near the RMPP** because of their proximity to the construction site. Table 4-20 lists towns with accommodations that are within 20 road miles of the Sevier-Escalante Desert Alternative.

Operation and maintenance of this alternative would not differ from that of the proposed route. However, county property tax revenues would be different, as shown in table 4-4.

TABLE 4-20

TOWNS WITH HOUSING ALONG THE SEVIER-ESCALANTE DESERT ALTERNATIVE

Construction	Communities With Accommodations Within 20 Miles of the Pipeline	Communities With Accommodations 21 to 40 Miles From the Pipeline
Pipeline Spread 3	Nephi Delta Milford	Payson Provo Springville Beaver Fillmore
Pipeline Spread 4	Milford St. George Washington	Beaver Parowan Cedar City

ALTERNATIVE E--WEST SALT LAKE ALTERNATIVE

Vegetation

The West Salt Lake Alternative would affect 8,071 acres of vegetation. Of this acreage, the understory vegetation would be capable of returning to preconstruction densities within 5 years after construction; the overstory vegetation would require longer to reestablish. Pickleweed and other saline plants would reinvade within the following 1 to 2 years, and 1,030 acres of barren land would remain basically barren.

The acres of each vegetation type which would be temporarily and permanently removed by the West Salt Lake Alternative are shown in table 3-1. A loss of 744 acres of forest, pinyon-juniper, and mountain brush vegetation types would occur for the life of the project (20 years). Joshua trees and cacti (scattered within 3,380 acres of creosote bush and saltbush- greasewood vegetation types) could be affected. Approximately 10 acres of riparian habitat would be temporarily lost.

Wildlife

MAMMALS AND BIRDS

The West Salt Lake Alternative would cross 120 miles (1,454) acres of big game winter range. The type of impacts to big game animals are similar to those discussed in the analysis of the proposed action.

The proposed route below where this alternative would rejoin it would pass near eight desert bighorn sheep areas and would intersect approximately five sheep migration routes (table 3-4).

Harrassment impacts to desert bighorn sheep around water sources would result from construction workers camping or parking near these areas. From mid-May through mid-September, water becomes vital to the survival of these animals. Any activity within 2 miles of a water source may cause these animals to abandon the water source (Leslie and Douglas 1980, Janke 1980) and move to other areas that may be less favored but are removed from human activity. Impacts caused by deprivation of water include dehydration and possible loss of young animals, the possible resorption of the embryo, and a resulting reduction in production.

An estimated 25 miles (303 acres) of desert bighorn sheep range would be crossed by this alternative. If it passe within 2 miles of a water source used by bighorns during the critical May 15 to September 15 period (table C-6). The serious impacts noted previously could occur.

Sage grouse habitat would be crossed by this alternative for an estimated 46 miles (558 acres) along the route (table 3-5). Sage grouse areas should be avoided during the critical time of the year from March 1 through June 30 (table C-6). The types of impacts expected and their results are the same as those detailed in the proposed action discussion.

This alternative would cross or disturb an estimated 29 miles (351 acres) of raptor habitat (table 3-7). The critical period of the year that raptor areas should be avoided is March 1 through June 30 (table C-6). Impacts to these species will not occur if active nests are not disturbed during this period or if construction activities take place more than 1 mile from active nests. The types of impacts expected if disturbances do occur are noted in the proposed action section discussion.

This alternative would cross about 21 miles (254 acres) of waterfowl habitat. The types of impacts to these species are identical to those discussed in the proposed action analysis.

FEDERAL AND STATE LISTED SPECIES

The federally listed black-footed ferret and bald eagle would be affected by construciton of this alternative in the same areas and in the same manner as by the proposed action. The state listed desert tortoise would also be affected in the same areas and in the same manner.

Soils

The West Salt Lake Alternative would disturb 9,053 acres of soils. The following amounts would be most strongly affected: 376 acres of Soil Group 1 (including a narrow steep canyon in the Caribou National Forest, MP 11 to MP 23); 279 acres of Soil Group 2; 885 acres of Soil Group 3; 48 acres of Soil Group 4; 570 acres of Soil Group 5; 424 acres of Soil Group 6; 897 acres of Soil Group 7 (including a large playa area from MP 157 to MP 225); 170 acres of Soil Group 8; and 4,739 acres of Soil Group 9. Refer to the discussion of the proposed action and table 3-9 for additional soil information.

Visual Resources

Similar to the proposed action, the significant adverse visual resource impacts from the West Salt Lake Alternative would include contrasts from modifications of landform, vegetation, and the addition of structures noted in table 4-21. Refer to the proposed action discussion for a further explanation and to table 4-3 for a summary of VRM Class and VQO impacts.

TABLE 4-21

SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS OF THE WEST SALT LAKE ALTERNATIVE

MP	Affected Landscape Feature[1]	Critical Viewpoint[2]	Duration of Impact[3]	Contrast Rating Feature Score[4]	VRM Class or VQO[5]
PIPELINE					
Beginning at Montpelier, Idaho					
MP 11-MP 18	Vegetation	State Highway 36	Long Term	-/29/-	R
MP 18-MP 23	Landform, vegetation	State Highway 36	Long Term	22/27/-	R
(Refer to proposed action discussion between MP 254 and MP 610)[6]					
ANCILLARY FACILITIES					
Montpelier Compressor Station and Maintenance Base					
MP 0	Vegetation, structure	Montpelier, U.S. Highway 30N and 89	Long Term	-/15/29	4

[1]The composition of the characteristic landscape would be modified by changing the landform, water form, or vegetation or by adding a structure to the landscape.

[2]A critical viewpoint is the point where the proposed change would be most apparent.

[3]Duration of impact can be described as:
Temporary--During construction through first or second growing season.
Short term--For 2 to 5 years following construction.
Long term--5 years to project life of 20 years or longer.

[4]Contrast Rating Feature Score is a value which the contrast of a specific area could not exceed without creating a significant adverse visual impact. VRM Class 2 and VQO R both have a Feature Score of 12. VRM Class 3 and VQO PR both have a Feature Score of 16. VRM Class 4 and VQO M and MM both have a Feature Score of 20. See appendix I for further explanation.

[5]See table 3-10 for definitions of terms.

[6]Mileposts indicate where Alternative E would join the proposed action.

Land Uses: Recreation Resources, Agriculture, and Conflicts with Land Use Plans, Policies, and Controls

RECREATION RESOURCES

The construction of the pipeline along the alignment of State Highway 36 would create noise, odor, and dust from construction equipment, visual impairment, and traffic delays. These construction impacts would be short term (6 to 8 weeks) and significant, since the quality of the recreation experiences enjoyed on lands buffering the highway would be diminished. Public sensitivity toward these impacts would be high, especially if the alternative crossed the Emigration Pass Campground or degraded the hunting and fishing experiences within the canyon.

The potential for short-term (4 weeks) safety hazards to ORV enthusiasts in the Desert Mountain Area would exist during pipeline construction.

AGRICULTURE

The West Salt Lake Alternative would temporarily disturb 1,053 acres of cropland. Assuming the Erosion Control, Revegetation, and Restoration Guidelines outlined in appendix C were implemented, successful restoration of all croplands would occur within 1 to 2 years.

CONFLICTS WITH LAND USE PLANS, POLICIES, AND CONTROLS

The West Salt Lake Alternative, like the proposed action, would not follow the 3,000-foot wide utility corridor administered by BLM through the 70,000 acres transferred from BLM administration to the

Moapa Indian Reservation. See the discussion of the proposed action in this chapter for the implications of this conflict.

The West Salt Lake Alternative, like the proposed action, would pass through the area covered by the proposed Clark County Wetlands Park in southern Nevada. The county issued a Draft Management Master Plan in 1981.

Socioeconomics

Construction of this alterative would require a compressor station construction crew and four pipeline spreads. If constructed, the alternative would replace the Sage Compressor Station and pipeline spreads 1, 2, and half of 3 of the RMPP. The labor requirements and construction schedule for the compressor station and each pipeline spread would be the same as those of the RMPP. Therefore, a total of **2,540** workers would be employed during the peak construction period. However, if the **four additional** maintenance bases listed in table 2-4 were also constructed, an additional **80** workers would be employed during the peak period. Table 2-3 lists the number of employees required to implement this alternative. Each peak pipeline spread would be divided into two work crews--79 percent working on the right- of-way, 21 percent in double-jointing yards.

A relatively large increase in county population and employment would occur during peak construction along the fourth spread in Millard County, Utah. The population would increase 3.46 percent, and the number of employed people would increase 8.43 percent. Retail sales would increase by 13.31 percent over the entire 6-month period. Workers would need 54 and 77 percent, respectively, of the existing hotel/motel rooms and campsites.

Regional population increases from the first three spreads would be less than 1 percent; increases in employment and retail sales would also be small. However, these three spreads would need between 20 and 60 percent of the existing accommodations. Like spread 4, they would fill most of the vacancies in the region, inconveniencing other travelers and campers during the peak months of construction. The towns most likely to be affected by the housing demand are listed in table 4-22.

Because the compressor station for the West Salt Lake Alternative would be constructed near Montpelier, Idaho, and there are no major municipalities nearby, most of the workers would probably want to live in Montpelier. This would increase population 5.8 percent and the number of employed 3.2 percent. Retail sales would increase 7.6 percent during the 6-month construction period. Thirty-five percent of the hotel/motel rooms and 30 percent of the campsites would be required by construction workers. Pipeline workers from spread 1 would also want to live in Montpelier, further increasing the socioeconomic impact. They would probably fill all the vacancies in town, inconveniencing other travelers and campers hoping to stay overnight.

Operation and maintenance of this alternative would not differ from that of the proposed route. Maintenance bases probably would be located at Montpelier, Idaho, and at Lucin and Dugway, Utah; seven workers would be employed at each. Tax payments would accrue to additional counties in both Idaho and Utah, as shown in table 4-4.

Since the RMPP would have an extremely low leve of impact on local police and medical services, it is expected that this alternative would have a similarly low impact.

TABLE 4-22

TOWNS WITH HOUSING ALONG THE WEST SALT LAKE ALTERNATIVE

Construction	Communities With Accommodations Within 20 Miles of the Pipeline	Communities With Accommodations 21 to 40 Miles From the Pipeline
Montpelier Compressor Station	Montpelier	
Pipeline Spread 1	Kemmerer Randolph Montpelier Logan Tremonton	Garden City Brigham City Willard
Pipeline Spread 2		Tremonton Wendover [a]Grantsville [b]Tooele
Pipeline Spread 3	Delta	[a]Wendover [b]Grantsville [c]Tooele [d]Eureka
Pipeline Spread 4	Delta Fillmore	Nephi

[a]Grantsville is approximately 60 miles from the alternative.
[b]Tooele is approximately 70 miles from the alternative.
[c]Tooele is approximately 55 miles from the alternative.
[d]Eureka is approximately 45 miles from the alternative.

Topography

The West Salt Lake Alternative would require about 4 miles of sidehill construction. About 3 miles in the Williams Canyon area (MP 13 to MP 14 and MP 20 to MP 22) and 1 mile in the Gunsight Peak area (MP 66) would be affected.

Noise Quality

Pipeline construction along this alternative would cause the same types of impact as those discussed for the RMPP.

Operation of the Montpelier Compressor Station would be the major source of noise emissions during the pipeline's operation. The alternative would install 23,350 **horsepower** of compression. The resulting noise impact of the maximum horsepower upon the nearest residence **is unknown.**

Compressor station design would include noise suppression equipment to : meet the noise limits in effect at the time the compressors were purchased.

Air Quality

CONSTRUCTION-RELATED IMPACT

Pollutant emissions during construction of the West Salt Lake Alternative compressor stations and ancillary facilities would depend upon the type and amount of equipment used and the extent of its use. Generally, the emissions resulting from pipeline construction include HC's, NO_x, CO, SO_x, TSP, and water vapor. Ground-level concentrations of pollutants would depend upon relative locations of construction. Dispersion of these pollutants would depend upon local atmospheric stability and meterological conditions.

Construction would cause temporary and minimal deterioration of the local ambient air quality. It would cause localized, short-term dust conditions which could pose a temporary nuisance during dry and windy weather. The most likely places for this to occur would be Bear Lake County, Idaho, Clark County, Nevada, and San Bernardino County, California.

OPERATION IMPACT

Emissions from the Montpelier Compressor Station, the major source of air emissions directly related to the operation of the West Salt Lake Alternative, are listed in table 4-23. The compression facilities necessary to expand the system to transport 800,000 Mcfd are also included in the table. All of the compressors would **use** natural gas as their fuel. The S **compressor station** stack parameters were used to model the air quality impact of the Montpelier compressor station and compressor stations along the West Salt Lake route.

The ground-level impact resulting from operation of the Montpelier Compressor Station would be similar to the ground-level impact expected from operation of the proposed Sage Compressor Station at design flow rates of 413,000 and 800,000 Mcfd. The initial ground-level concentration of NO_x for the 413,000-Mcfd volume would produce an annual arithmetic mean of **1.63** ug per cubic meter 456 meters from the source. Assuming a background NO_x concentration of 20 ug per cubic meter, the resulting ground-level concentration would be **21.63** ug per cubic meter.

At 800,000 Mcfd, the NO_x ground-level impact at the Montpelier Compressor Station would not exceed an annual arithmetic mean of **3.66** ug per cubic meter.

The ground-level impact for **the other** compressor station would depend upon the horsepower required for each station. The first compressor station, located in Box Elder County, Utah, would require the installation of **12,784 horsepower**. Its potential ground-level NO_x emissions would produce an annual arithmetic mean of **1.30** ug per cubic meter 456 meters from the source, resulting in a total ground-level concentration of **21.30** ug per cubic meter. Nevertheless, the maximum increase in the annual arithmetic mean for NO_2 would be about **1.0** ug per cubic meter.

The second compressor station in Millard County, Utah, would require the installation of **12.056 horsepower**. Its potential ground-level NO_x concentration would produce an annual arithmetic mean of **1.34** ug per cubic meter 456 meters from the source. The potential ground-level concentration, including background levels, would be about **21.34** ug per cubic meter.

The third compressor station in Washington County, Utah, would require the installation of **6,154 horsepower**. Potential NO_x ground- level impact from its operation would produce an annual arithmetic mean of **0.63** ug per cubic meter. The total potential NO_x ground- level impact would be about **20.63** ug per cubic meter. Nevertheless, all of these values for all the compressor stations for both pollutants are well below the levels set under NAAQS to protect public health and welfare.

No impact upon any Class I area would be expected from construction and operation of the West Salt Lake Alternative. The operation of the Montpelier Compressor Station would produce ground-level NO_X concentrations of only $_{1.63}$ ug and 3.66 ug per cubic meter for the 413,000- and 8000,000-Mcfd cases, respectively. Therefore, the nearest Class I area, 140 miles north of the Montpelier Compressor Station, would not experience any ground-level impact. This would also be the case for each of the other compressor stations, because the potential ground-level impact from each station would be less than 2 ug per cubic meter 456 meters from the source. The Class I area nearest any of the booster stations would be Zion National Park, 30 miles due east of the compressor station in Washington County, Utah.

TABLE 4-23

POTENTIAL ANNUAL AIR EMISSIONS FROM THE WEST SALT LAKE ALTERNATIVE

Volume	[a]Compressor Station	Required Site Rated Horsepower	County, State	[b]Potential Emissions (tons/year)				Annual Operation (Days/Year)	[d]PSD Review Required	Fuel Requirement (Mcfd)
				NO_x	CO	HC	[c]SO_2			
413,000 Mcfd	Montpelier	15,878	Bear Lake, Idaho	202	77	2	0.28	365	No	3.20
800,000 Mcfd	Montpelier	35,632	Bear Lake, Idaho	453	172	3	0.62	365	Yes	7.02
	Station 1	12,738	Box Elder, Utah	163	63	2	0.22	365	No	2.63
	Station 2	13,056	Millard, Utah	166	63	2	0.23	365	No	2.19
	Station 3	6,154	Washington, Utah,.	78	30	1	0.10	365	No	1.27

[a]Gas-turbine units are assumed at each compressor station.

[b]Particulate matter emissions cannot be calculated because the emission factor is not abailable. However, these emissions would negligible for natural gas fuel gas turbines.

[c]Emissions calculated by the potential to emit, according to EPA's compilation of emission factors.

[d]EPA 1980b.

ALTERNATIVE F--PROVO CANYON ALTERNATIVE

Vegetation

The Provo Canyon Alternative would affect 6,300 acres of vegetation. The understory would be capable of returning to preconstruction densities within 5 years after completion of construction; the overstory would require longer.

A loss of **822** acres of forest, pinyon-juniper, and mountain brush types would occur for the life of the project (20 years). Joshua trees and cacti (scattered within 3,028 acres of creosote bush and saltbush-greasewood vegetation types) could be affected. Approximately 12 acres of riparian vegetation would be temporarily lost.

Wildlife

MAMMALS AND BIRDS

An estimated 186 miles (2,254 acres) of big game winter range would be crossed by the Provo Canyon Alternative and other parts of the proposed action, as noted in table 3-3). The types of impacts would be identical to those discussed for the proposed action.

The proposed action below this alternative would pass near eight desert bighorn sheep areas and would intersect approximately five sheep migration routes (as noted in table 3-4). A total of 25 miles (303 acres) of sheep range could be affected. Harassment of desert bighorn sheep around water sources would result from construction workers camping or parking near these areas. From mid-May through mid-September, water is vital to the survival of these animals. Any activity within 2 miles of a water source (Janke 1980) may cause these animals to abandon the water source (Leslie and Douglas 1980) and move to other areas that may be less favored but are removed from human activity. Impacts caused by deprivation of water include dehydration and possible loss of young animals as well as resorption of embryos, both reducing the species production.

This alternative would disturb or cross an estimated 25 miles (303 acres) of sage grouse habitat (table 3-5). The critical time of the year that should be avoided in sage grouse areas is March 1 through June 30 (table C- 7). The types of impacts expected and their result would be the same as those discussed for the proposed action.

This alternative would cross about 45 miles (545 acres) of raptorial bird nesting and hunting habitat. The types of impacts would be the same as those discussed for the proposed action. Waterfowl nesting areas would be crossed by the proposed action portion of the route for an estimated 24 miles (291 acres) along the route (table 3-6). The most critical time to avoid this type of nesting habitat March 15 to June 15; this is when the peak of breeding and nesting occurs (table C-7).

FEDERAL AND STATE LISTED SPECIES

Impacts to the black-footed ferret might occur, since this species could be found north of where the Provo Canyon Alternative left the proposed action. Impacts to the bald eagle would be identical to those noted for the proposed action. Impacts to the desert tortoise in Utah, Nevada, and California would be the same as those noted for the proposed action.

Soils

The Provo Canyon Alternative would disturb 7,502 acres of soils. The following amounts would be most strongly affected: 739 acres of Soil Group 1, 291 acres of Soil Group 2, 424 acres of Soil Group 3, 61 acres of Soil Group 4, 570 acres of Soil Group 5, 194 acres of Soil Group 6, 48 acres of Soil Group 7, 206 acres of Soil Group 8, and 2,811 acres of Soil Group 9. Refer to the discussion of the proposed action and table 3-9 for additional soil information.

Visual Resources

Similar to the proposed action, the significant adverse visual resource impacts from the Provo Canyon Alternative would include contrasts produced by modifications of landform, vegetation, and the addition of structures, as noted in table 4-24. Refer to the proposed action discussion for a further explanation and to table 4-2 for a summary of VRM Class and VQO impacts.

TABLE 4-24

SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS OF THE PROVO CANYON ALTERNATIVE

MP	Affected Landscape Feature[1]	Critical Viewpoint[2]	Duration of Impact[3]	Contrast Rating Feature Score[4]	VRM Class and/ or VQO[5]
PIPELINE					
(Refer to proposed action discussion between MP 0 and MP 108)[6]					
MP 7-MP 15	Vegetation	Heber City area	Long Term	-/18/-	2
MP 15-MP 21	Landform, vegetation	Heber City area, Wasatch Mountain State Park	Long Term	24/15/-	2
MP 21-MP 30	Landform, vegetation	Deer Creek Reservoir U.S. Highway 189	Long Term	16/12/-	R
MP 30-MP 32	Landform, vegetation	Urbanized areas	Long Term	15/17/-	R,2
MP 32-MP 33	Vegetation	Urbanized areas	Long Term	-/18/-	PR,3
MP 33-MP 35	Vegetation	Urbanized areas	Long Term	-/18/-	R,PR
MP 35-MP 38	Vegetation	Urbanized areas	Long Term	-/18/-	PR,2
MP 38-MP 53	Landform, vegetation	Urbanized areas	Long Term	13/18/-	2
(Refer to proposed action discussion between MP 214 and MP 610)[6]					
ANCILLARY FACILITIES					
Same as the proposed action.					

[1]The composition of the characteristic landscape would be modified by changing the landform, water form, or vegetation or by adding a structure to the landscape.

[2]A critical viewpoint is the point where the proposed change would be most apparent.

[3]Duration of impact can be described as:

Temporary--During construction through first or second growing season.
Short term--For 2 to 5 years following construction.
Long term--5 years to project life of 20 years or longer.

[4]Contrast Rating Feature Score is a value which the contrast of a specific area could not exceed without creating a significant adverse visual impact. VRM Class 2 and VQO R both have a Feature Score of 12. VRM Class 3 and VQO PR both have a Feature Score of 16. VRM Class 4 and VQO M and MM both have a Feature Score of 20. See appendix I for further explanation.

[5]See table 3-10 for definitions of terms.

[6]Mileposts indicate where Alternative F would leave and rejoin the proposed action.

Land Uses: Agriculture and Conflicts with Land Use Plans, Policies, and Controls

AGRICULTURE

The Provo Canyon Alternative would temporarily disturb 1,198 acres of cropland. Assuming the Erosion Control, Revegetation, and Restoration Guidelines outlined in appendix C were implemented, successful restoration of all croplands would occur within 1 to 2 years, with the exception of the fruit orchards in the Provo area. Onsite adjustment during right-of-way alignment would minimize this impact. The Sage Compressor Station would be located on native grazing land. Specific **locations** for the remaining surface facility sites are not yet known.

CONFLICTS WITH LAND USE PLANS, POLICIES, AND CONTROLS

The Provo Canyon Alternative would not follow the 3,000-foot wide utility corridor administered by BLM through the 70,000 acres transferred from BLM administration to the Moapa Indian Reservation. See the discussion of the proposed action in this chapter for the implications of this conflict.

At this time, it is unknown whether and how the Provo Canyon Alternative, like the proposed action, would conflict with the June 1981 Draft Management Master Plan for the proposed Clark County Wetland Park in southern Nevada.

Socioeconomics

This alternative would replace pipeline spread 2 of the RMPP; therefore, the employment and construction schedules could be the same as those of the proposed route. Table 2-3 lists the number of workers required to implement this alternative.

The spread would be divided into two work crews--252 employees would work on the right-of-way, 67 in a double-jointing yard.

Although most of the alternative would traverse rural land, part of it would be close to the Provo-Orem metropolitan area. Table 4-25 lists the communities within 40 miles of the alternative. The Provo-Orem area, within commuting range of all points along the alternative, would probably be the area pipeline workers would choose to live. The population and employment increases in the alternative area would be minor--about 0.03 percent for population and 0.07 percent for employment. The increase in retail sales would be about 0.15 percent. The pipeline workers would only require 1.5 percent of the hotel/motel rooms and 4.8 percent of the campsites.

TABLE 4-25

TOWNS WITH HOUSING ALONG THE PROVO CANYON ALTERNATIVE

Communities With Accommodations Within 20 Miles of the Pipeline	Communities With Accommodations 21 to 40 Miles From the Pipeline
Heber City	Park City
Lindon	Salt Lake City
Orem	South Salt Lake
Pleasant Grove	Payson
Provo	Spanish Fork
Springville	
Eureka	
Nephi	

A more significant short-term impact of this alternative could occur to the tourist industry. If the pipeline were laid in the existing railroad right-of-way through Provo Canyon, the 'Heber Creeper,' a tourist train, might have to be closed during construction. In addition to the loss of the proprietor's revenues, secondary losses could occur to other retail establishments. If blasting were required during construction, all access through the canyon would be periodically restricted for safety.

A long-term effect of this alternative would be crowding in Provo Canyon, which is already congested with other utilities. **Another long-term effect would be to the zoning ordinance of Vivian Park in the T and S** zone, which prohibits gas pipelines from crossing this boundary. Special use permits would be required for the pipeline to cross this municipality. Springdell and Wildwood (in Provo Canyon) zoning laws allow pipeline construction, provided necessary conditional **use** permits are obtained.

The operation and maintenance of this alternative would be the same as spread 2 of the RMPP. Tax payments would be different, as shown in table 4-4.

Because of the extremely low impact the RMPP would have an local police and medical services, it is expected that this alternative would have a similarly low impact.

Topography

The Provo Canyon Alternative would encounter approximately 6 miles of sidehill construction as well as crossing a steep slope as it exited the western end of the canyon. Using the roadbed or shoulder as the right-of-way might reduce the amount of sidehill construction necessary, but it might also require aboveground construction modes and/or tunnelling through rock.

VARIATION 2--THISTLE CREEK VARIATION

Vegetation

The Thistle Creek Variation would affect 266 acres of vegetation. The understory would be capable of returning to preconstruction densities within 5 years; the overstory would require longer to reestablish.

The acres of each vegetation type which would be temporarily or permanently removed by the Thistle Creek Variation are shown in table 3-1. A loss of **54** acres of pinyon-juniper vegetation types would occur for the life of the project (20 years). Approximately 2 acres of riparian vegetation would be temporarily lost.

Wildlife

The Thistle Creek Variation would cross about 20 miles (242 acres) of big game winter range, while the portion of the proposed route it replaced would cross an estimated 16 miles (194 acres). The types of impacts would be the same as those discussed for the proposed action.

This variation would cross about 19 miles (230 acres) of raptor habitat while the portion of the proposed action it replaced would cross only 6 miles (73 acres) of raptor range. Anticipated impacts would be the same as those discussed for the proposed action.

Soils

The Thistle Creek Variation would disturb 327 acres of soils. Most strongly affected would be 230 acres of Soil Group 1. This variation would traverse a mountain valley consisting of a narrow floodplain and smoother sloping toe slopes from the bordering steeper mountain slopes. Refer to the discussion of the proposed action and table 3-9 for additional soil information.

Visual Resources

Similar to the proposed action, the significant adverse visual resource impacts for the Thistle Creek Variation would include contrasts from modifications of landform and vegetation, as noted in table 4-26. No impacts would occur from the addition of structures. Refer to the proposed action discussion for a further explanation and to table 4-2 for a summary of VRM Class impacts.

TABLE 4-26

SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS OF THE THISTLE CREEK VARIATION

MP	Affected Landscape Feature[1]	Critical Viewpoint[2]	Duration of Impact[3]	Contrast Rating Feature Score[4]	VRM Class[5]
PIPELINE					
MP 0-MP 10	Landform, vegetation	U.S. Highway 6/50	Long Term	26/22/-	2
MP 10-MP 19	Landform, vegetation	U.S. Highway 89	Long Term	22/18/-	3
ANCILLARY FACILITIES					
No ancillary facilities along the variation would create any significant adverse impacts.					

[1]The composition of the characteristic landscape would be modified by changing the landform, water form, or vegetation or by adding a structure to the landscape.

[2]A critical viewpoint is the point where the proposed change would be most apparent.

[3]Duration of impact can be described as:
Temporary--During construction through first or second growing season.
Short term--For 2 to 5 years following construction.
Long term--5 years to project life of 20 years or longer.

[4]Contrast Rating Feature Score is a value which the contrast of a specific area could not exceed without creating a significant adverse visual impact. VRM Class 2 and VQO R both have a Feature Score of 12. VRM Class 3 and VQO PR both have a Feature Score of 16. VRM Class 4 and VQO M and MM both have a Feature Score of 20. See appendix I for further explanation.

[5]See table 3-10 for definitions of terms.

NOTE: Variation 2 would deviate from the proposed action between MP 156 and MP 176.

Land Uses: Agriculture and Conflicts with Land Use Plans, Policies, and Controls

AGRICULTURE

The Thistle Creek Variation would temporarily disturb 61 acres of cropland, which would be successfully restored within 1 to 2 years.

CONFLICTS WITH LAND USE PLANS, POLICIES, AND CONTROLS

The proposed action would conflict with the T and S zone of the Utah County Land Use Plan in the Thistle and Sheep Creek areas. This zone, which limits the size and pressure of gas pipelines, affects 5-acre tracts scattered along the roadways on Utah County. However, the impact is not significant because the pipeline could be shifted within the 1-mile wide corridor to avoid the 5-acre parcels.

Topography

The Thistle Creek Variation could encounter approximately 4 miles of sidehill construction in Soldier Creek Canyon.

Forest Service Position

The FS comment letter on the DEIS (see chapter 6) stated the following position on the Thistle Creek Variation:

The existing land uses (D&RGW Railroad and U.S. Highway 6/50) and Soldier Creek would be heavily impacted by construction of the proposed natural gas pipeline in the Spanish Fork Canyon bottom if MP 0 to MP 8 were used. Construction of the pipeline on the slopes of the canyon (in an appempt to avoid canyon bottom conflicts) would cause many unacceptable environmental impacts. The engineering feasibility of construction on these slopes is questionable.

The FS finds that when compared to the total length of the Mill Creek Variation, construction, operation, and maintenance of the pipeline within the first 8 miles of the Thistle Creek Variation would cause resource imacts that would be unacceptable to the general public and local, state, and Federal land management agencies.

VARIATION 3--EAST LAS VEGAS VARIATION

Vegetation

The East Las Vegas Variation would affect 715 acres of vegetation. The understory could be capable of returning to preconstruction densities within 5 years of construction. The overstory vegetation of the creosote bush type (715 acres) would require longer than 5 years to return to preconstruction proportions.

The acres of each vegetation type which would be temporarily or permanently removed by the East Las Vegas Variation are shown in table 3-1. Joshua trees and cacti (scattered within the 715 acres of creosote bush vegetation type) could be affected. One-half acre of riparian vegetation would be crossed.

Wildlife

Desert bighorn sheep ranges would be affected by the East Las Vegas Variation for an estimated 5 miles (61 acres), while the portion of the proposed action it would replace would cross an estimated 6 miles (73 acres) of sheep range. The types of impacts would be the same as those noted for the proposed action.

Soils

The East Las Vegas Variation would disturb 715 acres of soils. **Most** strongly affected would be 206 acres of Soil Group 5, 73 acres of Soil Group 6, and 715 acres of Soil Group 9. This variation would cross the Las Vegas Wash area in a broader floodplain than would the proposed action, but it would avoid the portion requiring critical erosion treatment. Refer to the discussion of the proposed action and table 3-9 for additional soil information.

Visual Resources

Similar to the proposed action, the significant adverse visual resource impacts from the East Las Vegas Variation would include contrasts created by modification of vegetation, as noted in table 4-27. No significant impacts would occur from the addition of structures or landform modification. Refer to the proposed action discussion for further explanation and to table 4-2 for a summary of VRM Class impacts.

TABLE 4-27

SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS OF THE EAST LAS VEGAS VARIATION

MP	Affected Landscape Feature[1]	Critical Viewpoint[2]	Duration of Impact[3]	Contrast Rating Feature Score[4]	VRM Class[5]
PIPELINE					
MP 3-MP 8	Vegetation	Las Vegas Dunes Recreation Lands	Long Term	-/16/-	3
MP 27-MP 42	Vegetation	Proposed McCullough National Natural Landmark	Long Term	-/16/-	2
ANCILLARY FACILITIES					
No ancillary facilities along the variation would create any adverse significant impacts.					

[1]The composition of the characteristic landscape would be modified by changing the landform, water form, or vegetation or by adding a structure to the landscape.

[2]A critical viewpoint is the point where the proposed change would be most apparent.

[3]Duration of impact can be described as:
Temporary--During construction through first or second growing season.
Short term--For 2 to 5 years following construction.

Long term--5 years to project life of 20 years or longer.

[4]Contrast Rating Feature Score is a value which the contrast of a specific area could not exceed without creating a significant adverse visual impact. VRM Class 2 and VQO R both have a Feature Score of 12. VRM Class 3 and VQO PR both have a Feature Score of 16. VRM Class 4 and VQO M and MM both have a Feature Score of 20. See appendix I for further explanation.

[5]See table 3-10 for definitions of terms.

NOTE: Variation 3 would deviate from the proposed action between MP 488 and MP 544.

Land Uses: Recreation Resources, Agriculture, Conflicts with Land Use Plans, Policies, and Controls, and Las Vegas Area Land Use Conflicts

RECREATION RESOURCES

Construction through the Las Vegas Sand Dunes Recreation Lands would have a significant adverse impact on ORV users (between MP 3 and MP 8) by creating a potential safety hazard. This hazard (conflict between numbers of people and vehicles) would last approximately 2 weeks during pipeline construction. It would be perceived with high sensitivity by ORV recreationists using these recreation lands.

CONFLICTS WITH LAND USE PLANS, POLICIES, AND CONTROLS

Construction along the East Las Vegas Variation corridor through the Clark County sanitation district wastewater treatment facilities would be difficult. The sanitation district facilities, both existing and planned, take up all of the west side of the mile-wide corridor. Although the gas pipeline could be constructed through the east side of the corridor, it would traverse a marshy area next to the proposed Clark County Wetlands Park, which is used for land injection (sludge drying). This area contain large buried sewage pipelines in addition to the sludge drying activities on the surface.

LAS VEGAS AREA LAND USE CONFLICTS

The East Las Vegas Variation would traverse several areas with land use or adminstrative problems including the Nellis Air Force Base controlled area, Sloan's ditch, and some subdivisions and a mobile home park in Henderson, Nevada. (Refer to chapter 3 for details).

Pipeline construction could affect daily base operations or future USAF development plans near Nellis Air Force Base. The Nellis Air Force Base Command Facilities Board would determine the variation's compatibility with its own uses before issuing or denying a permit.

The variation would closely parallel the Sloan's ditch which is being rapidly encroached upon by residential development (Faircloth 1981). Because of the locations and density of present and proposed urban development, acquisition of a right-of-way for the East Las Vegas Variation along the ditch appears to be difficult if not impossible to obtain.

The variation would also conflict with the newly approved mobile home park site and several subdivision in Henderson, Nevada.

VARIATION 4--FORT MOJAVE VARIATION

Vegetation

The Fort Mojave Variation would affect 120 acres of vegetation. The understory vegetation would be capable of returning to preconstruction densities within 5 years; the overstory of creosote bush vegetation type (120 acres) would require longer to reestablish.

The acres of each vegetation type which would be temporarily or permanently removed by the Fort Mojave Variation are shown in table 3-1. A loss of less than 1 acre of riparian vegetation would occur for the life of the project (20 years). Joshua trees and cacti (scattered within 120 acres of creosote bush vegetation) could be affected.

Wildlife

Except for magnitude, impacts to the state listed desert tortoise from the construction of this variation would be the same as those noted in the discussion of the proposed action.

Soils

The Fort Mojave Variation would disturb 121 acres of soils. The following acreages would be most strongly affected: 24 acres of Soil Group 2, 12 acres of Soil Group 3, 109 acres of Soil Group 6, 24 acres of Soil Group 8, and 121 acres of Soil Group 9. Refer to the discussion of the proposed action and table 3-9 for additional soil information.

VARIATION 5--MILL CREEK VARIATION

Vegetation

The Mill Creek Variation would affect 253 acres of vegetation. The overstory (253 acres) would require longer than 5 years to return to preconstruction densities. A loss of 57 acres of forest, pinyon-juniper, and mountain brush vegetation types would occur for the life of the project (20 years). Approximately 0.2 acres of riparian vegetation would be temporarily lost.

Wildlife

The Mill Creek Variation would cross about 21 miles (253 acres) of big game winter ranges, while the portion of the proposed action it replaced would cross about 11 miles (133 acres) of big game range. Harassment would be the same as that discussed for the proposed action.

Soils

The Mill Creek Variation would disturb 255 acres of soils in Soil Group 1. The variation would generally be similar to the proposed action, except that it would disturb areas of smoother toe slopes along a mountain valley and smooth sloping mountain ridges to its intersection **with** the proposed action. This area would be less susceptible to erosion and landslide potential. Refer to the discussion of the proposed action and table 3-9 for additional soil information.

Visual Resources

Similar to the proposed action, the significant adverse visual resource impacts from the Mill Creek Variation would include contrasts caused by modifications of landform and vegetation, as noted in table 4-28. No significant impacts would occur from the addition of structures. Refer to the proposed action discussion for a further explanation and to table 4-2 for a summary of VRM Class impacts.

TABLE 4-28

SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS OF THE MILL CREEK VARIATION

MP	Affected Landscape Feature[1]	Critical Viewpoint[2]	Duration of Impact[3]	Contrast Rating Feature Score[4]	VRM Class[5]
PIPELINE					
MP 0-MP 6	Landform, vegetation	U.S. Highway 6/50	Long Term	22/ 16/-	2
ANCILLARY FACILITIES					
No ancillary facilities along the variation would create any adverse significant impacts.					

[1]The composition of the characteristic landscape would be modified by changing the landform, water form, or vegetation or by adding a structure to the landscape.

[2]A critical viewpoint is the point where the proposed change would be most apparent.

[3]Duration of impact can be described as:
Temporary--During construction through first or second growing season.
Short term--For 2 to 5 years following construction.
Long term--5 years to project life of 20 years or longer.

[4]Contrast Rating Feature Score is a value which the contrast of a specific area could not exceed without creating a significant adverse visual impact. VRM Class 2 and VQO R both have a Feature Score of 12. VRM Class 3 and VQO PR both have a Feature Score of 16. VRM Class 4 and VQO M and MM both have a Feature Score of 20. See appendix I for further explanation.

[5]See table 3-10 for definitions of terms.

NOTE: Variation 5 would deviate from the proposed action between MP 156 and MP 169.

Topography

The Mill Creek Variation could require about 1 mile of sidehill construction **on the south side of** Spanish Fork Canyon. An additional mile of sidehill construction would be needed between about MP 11 and MP 12.

VARIATION 6-II--DANIELS CANYON VARIATION II

Vegetation

The Daniels Canyon Variation II would affect 85 acres of vegetation. The overstory of all vegetation types would require longer than 5 years to return to preconstruction densities. A loss of 32 acres of forest and mountain brush vegetation would occur for the life of the project (20 years).

Wildlife

The Daniels Canyon Variation II would disturb about 7 miles (85 acres) of small mammal and bird habitat, while the portion of the proposed action route it replaced would encounter about 6.5 miles (79 acres) of similar habitat. The types of impacts expected would be the same as those discussed for the proposed action. The 7 miles (85 acres) of this variation, classified as raptor habitat, would experience the same type of impacts as those discussed for the proposed action.

Soils

The Daniels Canyon Variation II would disturb 85 acres of Soil Group 1. This variation is similar to the proposed action, except that it would disturb areas with smoother slopes and avoid the narrow drainageway and steep side slopes of Indian Creek. This area would be less susceptible to erosion and landslides. Refer to the discussion of the proposed action and table 3-9 for additional soil information.

Visual Resources

Similar to the proposed action, the significant adverse visual resource impacts for the Daniels Canyon Variation II would include contrasts caused by modifications of landform and vegetation, as noted in table 4-29. No significant impacts would occur from the addition of structures. Refer to the proposed action discussion for further explanation and to table 4-2 for a summary of VQO impacts.

TABLE 4-29

SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS OF THE DANIELS CANYON VARIATION II

MP	Affected Landscape Feature[1]	Critical Viewpoint[2]	Duration of Impact[3]	Contrast Rating Feature Score[4]	VQO Class[5]
PIPELINE					
MP 0-MP 1	Vegetation	Indian Creek Road	Long Term	-/19/-	M,PR
ANCILLARY FACILITIES					
No ancillary facilities along the variation would create any adverse significant impacts.					

[1]The composition of the characteristic landscape would be modified by changing the landform, water form, or vegetation by adding a structure to the landscape.

[2]A critical viewpoint is the point where the proposed change would be most apparent.

[3]Duration of impact can be described as:
Temporary--During construction through first or second growing season.
Short term--For 2 to 5 years following construction.
Long term--5 years to project life of 20 years or longer.

[4]Contrast Rating Feature Score is a value which the contrast of a specific area could not exceed without creating a significant adverse visual impact. VRM Class 2 and VQO R both have a Feature Score of 12. VRM Class 3 and VQO PR both have a Feature Score of 16. VRM Class 4 and VQO M and MM both have a Feature Score of 20. See appendix I for further explanation.

[5]See table 3-10 for definitions of terms.

NOTE: Variation 6-II would deviate from the proposed action between MP 108 and MP 156.

VARIATION 7--MOAPA VARIATION

Vegetation

The Moapa Variation would affect 352 acres of vegetation. The understory vegetation would be capable of returning to preconstruction densities within 5 years; the overstory of creosote bush vegetation type (352 acres) would require longer to reestablish with natural reseeding.

The acres of each vegetation type which would be temporarily or permanently removed by the Moapa Variation are shown on table 3-1. A temporary loss of less than 1 acre of riparian vegetation would occur and cacti scattered along the variation route could be affected.

Wildlife

If this variation were constructed, direct mortality to small burrowing rodents would result on an estimated 373 acres of desert habitat and agricultural land along the right-of-way. Population losses of these animals would be short-term, localized, and insignificant. The acreage which would be disturbed is a small percentage of the total habitat available.

Some ground nesting birds and their nests would be destroyed if this variation were constructed. However, these species have high reproductive potential, and population losses would be short-term, localized, and insignificant.

Some losses or reptiles and amphibians would be expected if this variation were constructed. They would be short-term, localized, and insignificant. Once the pipeline is completed in the small area, repopulation of the species would be rapid.

Soils

The Moapa Variation would disturb 376 acres of soils. The following acreages would be most strongly affected: 12 acres of Soil Group 2, 36 acres of Soil Group 3, and 376 acres of Soil Group 9. Refer to the discussion of the proposed action and table 3-9 for additional soil information.

Land Uses: Recreation Resources and Agriculture

RECREATION RESOURCES

Pipeline construction could disrupt the annual Mint 400 ORV event between MP 11 and MP 14 (race course miles 45 through 48). This disruption, including certain health and safety hazards, would last approximately 8 to 10 days due to the conflict in schedules between prerunners, the event itself, and postrunners of the ORV race and the pipeline construction. Because of these conflicts and hazards, the public (competitors, spectators, and pit crews) would probably perceive the construction activity with high sensitivity.

AGRICULTURE

The Moapa Variation would temporarily disturb 24 acres of cropland. Assuming the Erosion Control, Revegetation, and Restoration Guidelines outlined in appendix C were implemented, successful restoration of all cropland would occur within 1 to 2 years.

VARIATION 8--WEST KAMAS VALLEY VARIATION

Vegetation

The West Kamas Valley Variation would affect 180 acres of vegetation. The understory would be capable of returning to preconstruction densities within 5 years; the overstory would require up to 20 years to reestablish with natural reseeding.

One hundred and eighty acres of sagebrush vegetation would be temporarily removed by the West Kamas Valley Variation. Approximately 2 acres of riparian vegetation would be temporarily lost.

Wildlife

Construction of this variation would result in direct mortality to many species of small burrowing rodents on an estimated 148 acres of habitat. Population losses of these animals would be short-term, localized, and insignificant compared with the total species population in the West Hills area. Since these species have a very high reproductive rate, repopulation would be rapid once construction was completed.

Pipeline construction in this area would directly affect ground nesting species of birds by destroying nests which are hidden in the pipeline right- of-way area. Population losses from pipeline construction **would** be short-term, localized, and insignificant because of the high reproductive potential of these species, and the small area disturbed (148 acres) compared to the total habitat available.

Soils

The West Kamas Valley Variation would disturb 182 acres of soils; most strongly affected would be 133 acres of Soil Group 1. Refer to the discussion of the proposed action and table 3-9 for additional soil information.

Visual Resources

Similar to the proposed action, significant adverse visual resource impacts from the West Kamas Valley Variation would include constrasts from modifications of landform and vegetation, as noted in table 4-30. No impacts would occur from the addition of structures. Refer to the proposed action discussion for further explanation and to table 4-2 for a summary of VRM Class impacts.

TABLE 4-30 (New).

SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS OF THE WEST KAMAS VALLEY

MP	Affected Landscape[1]	Critical Viewpoint[2]	Duration of Impact[3]	Contrast Rating Feature Score[4]	VRM Class[5]
Pipeline					
MP 0-MP 3	Landform, vegetation	U.S. Highway 189	Long Term	17/18/-	2
Ancillary Facilities					
No ancillary facilities along the variation would create any significant adverse impacts.					

[1]The composition of the characteristic landscape would be modified by changing the landform, water form, or vegetation by adding a structure to the landscape.

[2]A critical viewpoint is the point where the proposed change would be most apparent.

[3]Duration of impact can be described as:
Temporary--During construction through first or second growing season.
Short term--For 2 to 5 years following construction.
Long term--5 years to project life of 20 years or longer.

[4]Contrast Rating Feature Score is a value which the contrast of a specific area could not exceed without creating a significant adverse visual impact. VRM Class 2 and VQO both have a Feature Score of 12. VRM Class 3 and VQO PR both have a Feature Score of 16. VRM Class 4 and VQO M.MM and have a Feature Score of 20. See appendix I for further explanation.

[5]See table 3-10 for definitions of terms.

NOTE: Variation 8 would deviate from the proposed action between MP 96 and MP 108.

Chapter 5
Conclusions, Recommendations, and Preferred Alternative

FERC ENVIRONMENTAL STAFF CONCLUSIONS AND RECOMMENDATIONS

Information provided by the applicant and further developed from field investigations, literature research, special studies, and contacts with local, state, and Federal agencies indicates that the construction and operation of the RMPP would have a limited adverse environmental impact and that the proposed project is environmentally acceptable, assuming the FERC finds there is a need for it.

Several total system alternatives to the RMPP were investigated. The Northern Systems Alternative would **use** the reversible flow capability of Northwest's facilities and would take advantage of the spare capacity available in the 42-inch diameter Western Leg system. It is the only total system alternative that is preferable environmentally to the proposed project. It would require significantly less pipeline construction than the RMPP. To transport 413,000 Mcfd, the Northern Systems Alternative would require construction of 76.8 miles of pipeline and perhaps another 148.3 miles of pipeline south of Antioch, California. This alternative might require that 380 miles of 42-inch diameter pipeline for the Western Leg of the ANGTS be prebuilt. Any prebuilt portion of the Western Leg is not considered to be attributable to the Northern Systems Alternative because the Western Leg will eventually be built as part of the ANGTS.

The construction of 76.8 miles of pipeline and at most 225.1 miles is clearly superior to the minimum facility requirement--610 miles of pipeline--for the proposed project. The Northern Systems Alternative is also superior to the proposed project because it would be constructed entirely on or adjacent to existing pipeline rights-of-way, whereas the RMPP would have to establish a new utility corridor through many areas.

However, the Northern Systems Alternative would consume more fuel to transport the gas than the RMPP. If the Western Leg were prebuilt, the alternative would consume 17,160 Mcfd of fuel gas, 5.9 times more fuel than the proposed project. Following completion of the Western Leg, it would require 27,780 Mcfd of fuel gas, 9.55 times more. The FERC environmental staff believes the potential fuel **use** penalty does not represent a significant deterrent to the Northern Systems Alternative at the 413,000-Mcfd level for the following reasons. First, worst-case assumptions were used to derive the fuel **use** figures. These figures could decrease because of gas supply uncertainties, such as the lack of any significant gas supply to support the RMPP, the prospect of reduced deliveries from Canada after 1982, and the potential impact of reduced demand when gas prices are deregulated. Second, there is a lack of information about the actual facility and fuel requirements on Northwest's system.

The FERC environmental staff believes that fuel use is primarily an economic issue. The cost of fuel must be compared to the capital cost differential of the alternative versus the RMPP. Such a comparison is beyond the scope of this EIS. The relative economics of the Northern Systems Alternative versus the RMPP, the gas supply available to the project, and other factors will be given full consideration in the later phases of the certification process before the FERC.

There are numerous and significant environmental advantages to the alternative. For example, facilities for the Northern Systems Alternative could be constructed as they are needed, i.e., in phases as gas supply develops. **For the best case of the alternative,** no facilities--except for prebuilt portions of the Western Leg--would be required until after 330,000 Mcfd of Rocky Mountain gas become available. This is environmentally preferable because it would significantly reduce the environmental impact that would occur if the volume of gas proposed for this project did not materialize. Additional information comparing the proposed project to the Northern Systems Alternative appears in the 'Comparative Analysis of RMPP and Alternatives' in chapter 2.

Therefore, the FERC environmental staff finds that the Northern Systems Alternative is a significantly superior alternative to the proposed project. The FERC environmental staff believes that unless it can be demonstrated that the alternative is economically or otherwise inferior, the proposed project should not receive FERC approval since it is not environmentally equivalent to or better than the Northern Systems Alternative. Selecting the Northern Systems Alternative would not foreclose the possibility of constructing the RMPP in the future. It would only delay the commitment to construct another totally new pipeline system from the Rocky Mountain region. Furthermore, since the applicant has not identified the availability of any gas that cannot be moved by other means at this time, no delivery of gas would be foreclosed.

However, if throughput levels for the RMPP were to reach a higher level such as 800,000 Mcfd, the FERC environmental staff concludes that both the Northern Systems Alternative and the RMPP would be environmentally acceptable transportation systems. The proposed system would be more fuel efficient than the alternative, but the Northern Systems Alternative would be at least 153.7 miles shorter than the proposed project. The environmentally preferable system would still be the Northern Systems Alternative; however, at this level, factors such as economics and fuel use could override the environmental advantages of this alternative.

The Fort Mojave Variation within California falls under the jurisdiction of the CPUC. However, the FERC environmental staff has analyzed both the proposed route and this variation and believes that both routes are environmentally acceptable.

The East Las Vegas Variation was examined mainly because of the local controversy surrounding the proposed projects crossing of the Frenchman Mountain-Rainbow Gardens area and the proposed Clark County Wetlands Park. The Clark County Department of Comprehensive Planning and the Las Vegas Wash Development Committee recommended the use of the variation. However, the Clark County Sanitation District has identified several problems with the route in its comment letter, dated August 21, 1981. Additional information, obtained since the DEIS was issued, shows that the existing and expanding residential development north of the expanding waste treatment facilities precludes further consideration of this variation as a reasonable alternative to the RMPC proposed route.

The West Kamas Valley Variation would avoid most of the farmland crossed in Kamas Valley, Utah (12 versus 104 acres) and the potentially disruptive impact to the irrigation system used in this region. RMPC has indicated that it is willing to double-ditch to save topsoil, to restore underground drainage systems, irrigation pipelines, and canals, to compensate landowners for any loss of crops, and to work with the landowners on a continuing basis. The landowners in Kamas Valley have expressed their concerns about the ability of RMPC to restore the pipeline right-of-way. Agricultural areas are routinely crossed by pipelines. However, if the applicant cannot successfully restore the right-of-way, a long-term adverse impact would **occur.** The variation would be 3 miles longer than the **corresponding** segment of the RMPP, and it would cross rougher terrain. The variation would cross fewer streams and more natural vegetation than the proposed route, and it **would** avoid the sandhill crane habitat in the Kamas Valley. The environmental staff believes that both routes are environmentally acceptable; however **because of** the additional length of the variation and **because** pipeline crossings of agricultural land **generally create insignificant impact,** the proposed route is preferrable.

The Moapa Variation is 2 miles longer than the corresponding segment of the RMPP. Both routes would cross the Muddy River. **The variation would also cross the Meadow Valley Wash.** The only advantage of the variation is that it would not conflict with BLM's policy to follow the 3,000-foot wide corridor through the Moapa Indian Reservation. In all other significant categories of environmental impact, the variation is either worse than or equivalent to the proposed route. Since the variation offers no significant environmental benefits except the concurrence with a policy, the Moapa Variation should not be used if the RMPC can obtain a right-of-way from the Moapa Indians.

If the proposed project is certificated, the environmental staff recommends that the following conditions be included in the FERC's certificate to further mitigate the environmental impact.

1. To guard against pipeline rupture resulting from fault displacement at the crossing of the Wasatch fault, the applicant shall use appropriate design measures and construction techniques including, but not limited to, shallowly dipping trench walls, granular backfill, and fault crossing orientation to avoid pipeline compression during faulting. The magnitude of fault displacement used for system design shall be at least as great as the largest single historic displacement on any portion of the fault and should be equivalent to the displacement having a mean recurrence interval of 10,000 years.
2. The applicant shall apply to the Wyoming Department of Environmental Quality, Division of Air Quality, for a PSD applicability determination for the Sage Compressor Station. The results of this determination shall be filed with the FERC, along with a copy of any required PSD application.
3. To avoid conflicts with planned water pipeline construction, the applicant shall contact the North Las Vegas Department of Public Works before construction begins.
4. RMPC shall design and construct the Sage Compressor Station so that noise impact at nearby existing residences will not exceed an L_{dn} of 55 dB(A).

5. The proposed project shall not be constructed until the RMPC has firm transportation contracts in excess of at least 100,000 Mcfd of gas for the life of the project. (See chapter 2, 'Low Flow Alternative,' for a discussion of existing transmission capacity.)
6. **RMPC shall obtain a permanent right-of-way across private lands no greater than 50 feet wide, rather than its proposed 100-foot wide right-of-way.**

DOI PREFERRED ALTERNATIVE

The Federal land managing agencies are responsible for assessing the environmental impacts which could occur as a result of implementing the proposed action or any of the alternate routes and granting rights-of-way across the Federal lands after the BLM Director has made a decision on the right-of-way application. The DOI agency preferred alternative which is required by the Council on Environmental Quality regulations is based upon environmental, socioeconomics, political, and other considerations. It will not necessarily be selected by the decisionmaker at the decision stage, but it will be among the options for selection.

Based on the assessment of all routes and other considerations, including the needs of the applicant and the public, the DOI land managing agencies have found the proposed action, with the inclusions of the following variations, to be the preferred alternative.

-West Kamas Valley Variation (Variation 8).

-Mill Creek Variation (Variation 5). Any one of the four possible routes included within the Mill Creek Variation II. The final selection will be made by the FS after a site-specific environmental assessment.

-Daniels Canyon Variation II (Variation 6-II).

-Moapa Variation (Variation 7).

-East Las Vegas Variation (Variation 3).

The Northern Systems Alternative, like the proposed action, is environmentally acceptable.

The proposed action is preferred over any of the alternatives; there are no fatal environmental, or socioeconomic flaws with it, and it appears to best meet the applicant's needs for a right-of-way. The federal agencies may consider the possibility of variable width rights-of-way where necessary to reduce conflicts and impacts.

The West Kamas Valley Variation is preferred over the portion of the proposed action which would traverse Kamas Valley in northern Utah. The local people are quite concerned that their marginal farmland not be traversed. This land is not plowed because the surface layer of soil is underlain by a rocky strata which comes to the surface with plowing. Some of this land is irrigated by ditches that release water to flow by gravity across the surface of the meadow hay and alfalfa fields. Some fields are subirrigated part of the year; water flows downhill beneath the surface but above the rocky substrata.

It is recognized that agricultural areas are routinely crossed by pipelines, especially flat valley areas which consist of regularly plowed fields irrigated by sprinkler or furrow systems. It is also recognized that with continued efforts RMPC could probably relevel and recontour the meadows and fields in Kamas Valley so that the water would flow somewhat evenly across them again. However, during the construction period and the period of rehabilitation and maintenance, the local farmers, who already have marginal operations, would be forced to suffer disrupted agricultural operations until their fields carried water as before. In addition to the meadows and fields, there are large numbers of 2 to 10-acre pastures and pens for livestock, which would need to be crossed by construction without allowing the animals to escape, etc.

The DOI land managing agencies prefer to avoid disruption of the lives and occupations of the rural population in Kamas Valley by using the West Kamas Valley Variation.

The Mill Creek Variation is preferred over the portion of the proposed action which it replaces. A site specific EA would be prepared by the FS on the four possible routes associated with this variation. One route would be selected by the FS after completion of the EA. Any of these routes would avoid the dissected Dairy Fork area.

The Daniels Canyon Variation II is preferred over that portion of the proposed action which would pass through the steep canyon bottom at Indian Springs and along Indian Creek. The variation could also follow the general route of the Strawberry Ridge road.

The Moapa Variation is preferred over the proposed action. The variation is similar to the proposed route, although 2 miles longer, but unlike the proposed action, it would follow the over 3,000-foot wide rights-of-way corridor included in Public Law 96-491 which expanded the Moapa Indian Reservation. It is BLM policy to

follow this corridor which currently is used for transmission lines. There is sufficient room for more utilities to use the corridor.

The East Las Vegas Subvariation a and the southern portion of the East Las Vegas Variation are preferred over the segment of the proposed action which they replace. The conflicts with the Colorado River Commission and thus the State of Nevada in the Eldorado Valley land transfer under public law would thus be avoided. proposed action which it replaces. The FERC discussion in this chapter basically states the reasons for this preference.

FS ENVIRONMENTALLY PREFERRED ALTERNATIVE

The FS, Department of Agriculture, finds that the Northern Systems Alternative (Alternative A) is environmentally preferable. However if the proposed corridor is selected in the decision process, the FS prefers that the following variations on National Forest land be included in the project.

-Mill Creek Variation (Variation 5). After preparation of a site-specific environmental assessment, the FS would select one of the four possible routes included in this variation, the original route or one of three shorter versions.

-Daniels Canyon Variation II (Variation 6-II).

-Other Variations. The FS concurs with the DOI land managing agencies preferences for the West Kamas Valley and Moapa Variations.

The first 13 pages of the FS comment letter state its rationale for preference. Please refer to it for further discussion.

CHAPTER 6

RESPONSE TO PUBLIC COMMENTS ON DEIS

Comments on the DEIS were received from the agencies, groups, and individuals listed below. The comments and responses from the EIS team appear on the following pages.

COMMENTS FROM BLM PUBLIC HEARINGS

Advisory Council On Historic Preservation

This response does not constitute Council comment pursuant to Section 106 of the National Historic Preservation Act, nor Section 2(b) of Executive Order 11593.

1522 K Street, NW
Washington, DC 20005

Reply to:
Lake Plaza South, Suite 616
44 Union Boulevard
Lakewood, CO 80228

August 13, 1981

Mr. Ed Hartey
Associate Director
Bureau of Land Management
Office of Special Projects
Third Floor East
555 Zang Street
Denver, Colorado 80228

Dear Mr. Hartey:

Thank you for your request of July 13, 1981, for comments on the environmental statement for the Rocky Mountain Pipeline Project with potential construction in Wyoming, Utah, Nevada, Arizona, California, Idaho, and Oregon. Pursuant to Section 102(2)(c) of the National Environmental Policy Act of 1969 and the Council's regulations, "Protection of Historic and Cultural Properties" (36 CFR Part 800), we have determined that your draft environmental statement does not demonstrate compliance with Section 106 of the National Historic Preservation Act of 1966 as implemented by the Council's regulations.

However, the Bureau of Land Management's Special Projects Office in Denver has provided us with a copy of the Technical Report for Cultural Resources prepared for the environmental statement and has been working with me and my staff to develop a Memorandum of Agreement in accordance with the Council's regulations which, when ratified, will stand as evidence of the Bureau's compliance with Section 106. This should be done prior to completing the final environmental statement (FES). A copy of the ratified Memorandum of Agreement detailing the steps that will be taken with respect to historic properties effected by construction of the proposed pipeline should be included in the FES.

Should you have any questions, please contact Brit Allan Storey of my staff at (303) 234-946, an FTS number.

Sincerely,

Louis S. Wall
Chief, Western Division
of Project Review

The BLM has submitted a Programmatic Memorandum of Agreement (PMOA) to the Advisory Council on Historic Preservation. The next step is for the Advisory Council to send the PMOA out to the involved Federal agencies and to the State Historic Preservation Officers of the involved states for review. If this document is received in time, it will be placed in the FEIS.

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
324 25th Street
Ogden, UT 84401

1950
2800
AUG 3 1 1981

Mr. Kenneth D. Frye
Project Manager
Office of Pipeline and Producer Regulation
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

Dear Mr. Frye:

Enclosed are our comments on the Draft EIS for the proposed Rocky Mountain Pipeline Project (FERC Docket No. CP 79-424).

Our comments are divided into three parts as follow:

A. General comments relating to and supporting our position on the (1) Preferred Route and (2), (3), and (4) Variations of the Proposed Action through National Forest lands.

B. General comments on the content in the Draft EIS.

C. Specific Comments on the Draft EIS are identified by page, column, paragraph, and sentence.

Part A-2 covering the Mill Creek Variation is referenced and described on the map (Enclosure 1).

Parts A-3, 4, and 5 are shown on the map (Enclosure 2) by milepost (MP) numbers.

National Forest personnel have spent a considerable amount of time reviewing the Proposed Action on the ground with the proponent. We believe that the proponent generally agrees with the corridor location shown on the maps enclosed with our comments.

6200-11 (1/69)

If you have any questions regarding our comments, please contact Jim Butler at FTS-586-3332 or Garth Heaton at FTS-801-584-8239.

Sincerely,

L. Kent Mays, Jr.

L. KENT MAYS, JR.
Deputy Regional Forester
Resources

Enclosure

cc:
Janis Bowles
Project Manager
Bureau of Land Management w/copy of enclosure

ROCKY MOUNTAIN PIPELINE PROJECT (RMPP)

Comments on Draft EIS

Submitted by
USDA FOREST SERVICE - INTERMOUNTAIN REGION

A. General Comments - Forest Service Position on the Selection and Presentation of Pipeline Corridors

1. Preferred Natural Gas Transmission System.

The USDA Forest Service, Intermountain Region, continues to support the Northern Systems Alternative as environmentally preferable to that of the Proposed Action and all other alternatives and alternative variations addressed in the RMPP Draft EIS. Our support is based on the Draft EIS analysis and the conclusions on the environmentally preferred alternative which are adequately addressed in the Summary, page xx; Chapter 2, Table 2-11; and Chapter 5, pages 5-1 to 5-3 of the Draft EIS.

No response required.

2. Mill Creek Variation

Based on several field investigations involving personnel from the Rocky Mountain Pipeline Company (RMPC) and Forest Service, the following comments are submitted for the Mill Creek Variation. Enclosure No. 1 is a map showing the Proposed Action.

Pipeline construction, operation, and maintenance within the Mill Creek Variation corridor would cause less natural resource damage than would the corresponding segment of the Proposed Action. The potential for induced slope failures and associated erosion is much greater along the Proposed Action segment. Visual resource impacts would also be greater along the Proposed Action. Long-term operation and maintenance of a pipeline route would be easier along the terrain crossed by the Mill Creek Variation, i.e., there would be less time and work involved in stabilizing and reclaiming disturbed soil resources and establishing native vegetative cover. Specific comments presented in item C address these statements in more detail.

For topography and geology, the assertions in this paragraph are true for the modified Mill Creek Variation analyzed in the FEIS; they are not true for the original variation analyzed in the DEIS.

The Draft EIS shows MP 0 - MP 7 of the Mill Creek Variation as an easterly deviation from the general southwest direction of the corresponding Proposed Action segment. (MP 0 - MP 7 exists as a corridor backtracked to the east to access Mill Creek Ridge.) The July 28-29, 1981, field investigation and office review (involving RMPC and Forest Service personnel) have shown that this easterly deviation can be eliminated or shortened by corridor location on one of three south-running ridge systems existing between the corresponding Proposed Action segment and the most easterly MP location of the Draft EIS Variation (MP 7). All three ridge systems connect into the Mill Creek Ridge system. Corridor location on either of these three ridge systems would shorten the Mill Creek Variation by 3 to 4 miles and avoid conflicts with existing uses in Spanish Fork Canyon.

The Forest Service (by overview field investigations) finds that pipeline construction, operation, and maintenance within the Draft EIS Variation corridor or within a corridor location on either of the three westerly located ridge systems would cause less resource damage than the corresponding Proposed Action segment. Further indepth field analyses would have to be done to determine which of the four corridor ties to Mill Creek Ridge would best meet RMPC and Forest Service objectives.

The Forest Service requests that the Final EIS address the three corridor potentials for a more direct tie to the Mill Creek Ridge system. It is the consensus of Forest Service and RMPC personnel that the EIS analysis would not provide sufficient detail for selection of the environmentally preferred Mill Creek Variation tie. The EIS schedule did not allow the time needed to gather the detailed information. The Forest Service requests that the Final EIS recognize the three corridor ties as mapped, stating that if the Mill Creek Variation were chosen as part of the preferred pipeline system, the environmentally preferred tie would be selected during the specific route identification phase as authorized by the Bureau of Land Management Right-of-Way Grant or the Forest Service Special-Use Permit.

Please see the added information and map in chapter 2 on this modification to the variation.

Natural resource descriptions, impacts, and analyses for either of the three ridge systems would be similar if not identical to those items addressed for MP 7 to MP 21.4 of the Draft EIS Variation. Land use conflict discussions would be different, i.e., less conflicts would be involved due to location outside of Spanish Fork Canyon.

Refer to the enclosed 7½' quadrangle maps for identification of the three ridge systems (Enclosure No. 1).

The Mill Creek Variation possible routes shown on the referenced 7-1/2 minute quadrangle maps are located on map 2-4.

3. Thistle Creek Variation

Based on the July 28, 1981, field investigation involving RMPC and Forest Service personnel, the following comments are submitted for the Thistle Creek Variation.

The FS position on the Thistle Creek Variation is acknowledged by the printing of this letter.

The existing land uses (D&RGW Railroad and U.S. Highway 6/50) and Soldier Creek would be heavily impacted by construction of the proposed natural gas pipeline in the Spanish Fork Canyon bottom if MP 0 to MP 8 were used. Construction of the pipeline on the slopes of the canyon (in an attempt to avoid canyon bottom conflicts) would cause many unacceptable environmental impacts. The engineering feasibility of construction on these slopes is questionable.

The Forest Service finds that when compared to the total length of the Mill Creek Variation, construction, operation, and maintenance of the pipeline within the first 8 miles of the Thistle Creek Variation would cause resource impacts that would be unacceptable

Please see the text changes on the FS section of the "Summary" and "Land Managing Agencies' Preferred Alternative."

to the general public and local, state, and Federal land management agencies. We request that the above Forest Service position (with rationale) on the Thistle Creek Variation be stated in the Final EIS.

4. Daniels Canyon Variation and Proposed Action--Crossing or Adjacent to the Uinta National Forest. (MP 0 to MP 51.8 of the Daniels Canyon Variation and MP 116 to MP 156 of the Proposed Action)

Recent field investigations and office reviews were made of the corridor lengths mentioned above. RMPC, Forest Service, and Bureau of Land Management personnel participated in these investigations and reviews. The following comments are based on input from both the company and Forest Service. The field work and followup analyses are considered to be comprehensive and eventually applicable to a site-specific centerline location. The Forest Service requests that the following positions, rationale, and significant factors be presented in the Final EIS. Based on these positions with supporting rationale and significant factors, the Forest Service requests that the appropriate changes be made in the Summary presentation of the Land Managing Agencies' Preferred Alternative and Chapter 5, Conclusions, Recommendations, and Preferred Alternative. Measures needed for mitigation of construction impacts must also be addressed in the Final EIS.

The following positions on the Proposed Action and Daniels Canyon Variation do not change the Forest Service position on the Northern Systems Alternative as the environmentally preferred pipeline system.

NOTE: The corridors for the Daniels Canyon Variation and Proposed Action either overlap, parallel, or are adjacent to each other along the above-stated mile--posts. The following comments are key to <u>Segment Numbers on the map</u> (Enclosure No. 2). A comment on any particular segment number will address the <u>Forest Service position</u> for the applicable overlapping, paralleling, or adjacent corridors. The Position Statements will be followed by the rationale and significant factors supporting the Forest Service position. (<u>Key rationale items are followed by an asterisk</u>.)

Enclosed maps are USGS 7½' quadrangles provided to the Forest Service by RMPC. Map symbols are:

-- Dashed blue line = centerline of mile-wide corridor for the Proposed Action, plotted by RMPC;

-- Solid green line = boundaries of the mile-wide corridor for the Proposed Action;

-- Solid black line = centerline of Daniels Canyon Variation as addressed by the Draft EIS;

The new Daniels Canyon Variation II reflects the FS position on each of the six segments of the original variation as stated on the next 10 pages of this letter. The original Daniels Canyon Variation has been deleted from the main body of the EIS; a brief explanation of this variation can be found in appendix F, "Alternatives Considered but Eliminated."

-- Solid yellow line = boundaries of mile-wide corridor for new proposed Variation (includes a portion of the Daniels Canyon Variation as addressed by the Draft EIS);

-- Solid blue line = location of the existing West Strawberry Reservoir Road;

-- Solid red line = flood pool elevation of the Strawberry Reservior, i.e., 7,620'. Will not be filled to this elevation prior to 1987;

-- Red and orange areas (shaded or diagonal line) = slumps and landslide prone areas.

SEGMENT I - Daniels Canyon Variation (MP 0 to MP 27) versus Proposed Action (MP 116 to MP 131)

Forest Service Position

The Proposed Action would be preferable. (Refer to enclosed map for the location of the mile-wide corridor.)

Rationale and Significant Factors Supporting Forest Service Position

Proposed Action (MP 116 to MP 120)

1. Terrain allows relatively easy construction and reshaping.*

2. Visual impact from construction would occur on the south side of Heber Mountain.

3. Shallow soils on the ridgetop would require careful topsoil conservation, but if accomplished, should allow for good revegetation opportunity.*

4. Ridgetop construction would result in minimal visual impacts.*

Proposed Action (MP 120 to MP 123)

1. Route encounters some paleoslides and wetlands.

2. Opportunity to avoid paleoslides and wetlands by routing on ridgetops, essentially along existing road routes.*

3. Cutting across head of basin would cause visual impacts which could be reduced by following the approximate existing road route.*

Proposed Action (MP 123 to MP 126- Mill B Creek)

1. Route encounters landslide-prone materials at various locations.

2. Several stream crossings would be required.

3. General evidence of subsurface water.

4. Specific pipeline location in this area would be critical because of mass stability problems, stream crossings, geology, and topography.

5. Some areas would require extensive construction which would be difficult to reshape to existing contour.

Proposed Action (MP 126 to MP 131)

1. Construction on route would be relatively easy, except from the mouth of Bjorkman Hollow to the mouth of Mill "B" Creek where impact could be substantially reduced by utilizing the ridgetop east of Strawberry River, but still within the corridor.*

2. Proposed route encounters potential landslide materials on steep slopes along canyon bottom between Bjorkman and Mill "B".

Daniels Canyon Variation (MP 0 to MP 27) - specifically addressing the Daniels Canyon area.

1. The route would be in a narrow canyon, cross the stream in many locations, and have the potential to cause increased stream encroachment.*

2. High potential for eroded material to enter Daniels Creek and cause damage to associated fisheries.*

3. Construction would result in major inconvenience to travel and public.*

4. Portions of U.S. Highway 40 would be closed during stages of construction.*

5. Inability to construct in roadway fills would leave inadequate canyon bottom width for required pipeline limits and would result in encroachment to oversteepened and sometimes unstable cut slopes.*

6. Rehabilitation of some cut slopes in the canyon would be impossible.*

7. Increased visual impact would result from heavy construction activity along a major travel route.*

SEGMENT II - Daniels Canyon Variation (MP 27 at Strawberry River crossing to MP 32) versus Proposed Action (MP 131 to MP 136)

Forest Service Position

The Proposed Action is preferable.

Rationale and Significant Factors Supporting Forest Service Position

Proposed Action (MP 131 to MP 136)

1. Easy terrain - construction impact will be minimal.*

2. Easy terrain will allow excellent topsoil conservation and utilization.*

3. Subsurface water in fairly extensive area adjacent to Strawberry River.

4. Fisheries impacts at Strawberry River Crossing.

Daniels Canyon Variation (MP 27 to MP 32)

1. Damage to State Highway surface would result.*

2. Removal and replacement of fence on one side of road would be required.

3. Isolated subsurface water in wetlands adjacent to existing highway.

4. Traffic delays and safety hazards would result from constructing the pipeline in the existing road right-of-way.*

5. Existing roadways's entire embackment would preclude placing pipeline in the existing road.*

6. Would reduce the width of the total pipeline right-of-way required.

SEGMENT III - 'Daniels Canyon Variation (MP 32 - at Highway 40 crossing to MP 36) versus Proposed Action (MP 136 - Clyde Creek to MP 147)

Forest Service Position

Both the Proposed Action and Daniels Canyon Variation are essentially in the same mile-wide corridor for corridor

Segment III. There are problems with dissected terrain along the Proposed Action (west side of corridor) and potential pipeline construction problems along Daniels Canyon Variation (new west-side Strawberry Reservoir Road). Impacts from construction within this corridor could be significantly reduced by using the east side of the Proposed Action corridor and generally utilizing the old west-side road alignment. This would avoid both the dissected terrain problem and problems associated with construction along the new west-side road. If the east side of the corridor were utilized as the route location, the potential exists for 1 to 2 miles of pipeline being submerged by the Strawberry Reservoir. (Refer to enclosed maps for location of the potential submergence.) Proposed flood pool elevation of the reservoir is 7,620 feet. According to the Bureau of Reclamation, the reservoir would not be filled to this elevation prior to 1987.

A mitigation measure could be written stating that the east side of the Proposed Action corridor from MP 136 to MP 140 could be used to avoid dissected terrain, potential soil erosion, and the need to remove considerable overstory vegetation.

Rationale and Significant Factors Supporting Forest Service Position

Proposed Action (MP 136 to MP 140--east side of corridor)

1. Little or no dissected terrain with most construction taking place on flat to greatly sloping terrain.*

2. Easy soil stabilization and good revegetation potential.*

3. Less visual impacts than with route on west side of corridor.*

4. No overstory vegetation clearing involved.*

5. Could use portions of an old road alignment, i.e., old west-side reservoir road.*

6. Possible that 1 to 2 miles of pipeline would be inundated by the enlarged Strawberry Reservoir.

Proposed Action (MP 136 to MP 140--west side of corridor)

1. Corridor crosses more dissected terrain which would require moderate to heavy construction with associated backslope stability failures.*

2. Portions of the corridor would be visible from Strawberry Reservoir due to maintained 25-foot clearing in the aspen type.*

3. Construction and visual impacts would be reduced if the pipeline were routed along the existing old west-side Strawberry road, portions of which would be inundated by the enlarged Strawberry Reservoir.*

4. Proposed route crosses important sagegrouse habitat.

5. Slump-prone Uinta Formation.*

Daniels Canyon Variation (MP 32 to MP 36)

1. Portions along new west Strawberry road to junction of old west-side Strawberry road would require very heavy additional construction in areas with various backslope stability problems.*

2. Would require replacement of the entire surfacing structure on the new west-side Strawberry road.*

3. Topsoil on existing cutslopes of previous road would be very difficult to recover.*

4. Would disturb recently stabilized cutslopes resulting in fresh cutslopes which would require revegetation along the new west-side road.*

5. Roadfill section would not be usable in pipeline construction which will require constructing a pipeline pad adjacent to these roads.*

6. Construction would result in closing the west-side Strawberry road to traffic for the duration of construction and road replacement.*

7. Would increase the visibility of the new west-side Strawberry road from Strawberry Reservoir.*

8. Existing fences would allow grazing control along pipeline.

9. Fisheries impact at Strawberry River crossing.

10. Slump-prone Uinta Formation.*

<u>SEGMENT IV</u> - Daniels Canyon Variation (MP 36 to MP 40) versus Proposed Action (MP 140 to MP 147)

<u>Forest Service Position</u>

The Proposed Action would be environmentally preferable.

Refer to discussion on Segment V for additional information on the Forest Service position on Daniels Canyon Variation (MP 36 to MP 40).

Rationale and Significant Factors Supporting Forest Service Position

Proposed Action (MP 140 to MP 147)

1. Relatively easy terrain--construction impacts minimal.*

2. Needs to cross Squaw Creek, Crooked Creek, and Horse Creek.

3. Moderate terrain would permit easy conservation of topsoil and high potential for vegetation success.*

4. During construction, potential exists for minor cut failures.

5. Corridor would be visible from Horse Creek to East Portal as viewed from Strawberry Reservoir area and west side of Strawberry road.

6. Corridor crosses important sagegrouse habitat.

7. Faultlines within the corridor would require special consideration.

8. Slump-prone Uinta Formation.

Daniels Canyon Variation (MP 36 to MP 40)

1. Moderate terrain would permit easy conservation of topsoil and high potential for vegetation success along Strawberry Ridge. Strawberry Ridge has more relief and impacts in some areas would be greater.

2. No creek crossing required.

3. Route from Strawberry Ridge to East Portal would be highly visible from Strawberry Reservoir recreation area.

4. Portions of Strawberry Ridge road and Diamond Fork road could be upgraded and placed within pipeline grading limits.

5. Slump-prone Uinta Formation.

SEGMENT V - Daniels Canyon Variation (MP 40 to MP 45) versus Proposed Action (MP 147 to MP 150)

Forest Service Position

Environmentally, MP 40 to MP 45 of this Daniels Canyon Variation portion is preferable. Some adjustments would be applied to reduce impacts, such as locating the route on a bench east of Strawberry Ridge from MP 43 to MP 45.

Instead of utilizing the Daniels Canyon Variation from MP 36 to MP 40 as portrayed by the Draft EIS, the Forest Service preference is to access the Strawberry Ridge route from the Proposed Action corridor on an east-west ridge line between Crooked Creek and Streeper Creek (leaving the Proposed Action at MP 146, heading west and tying back into the Daniels Canyon Variation at MP 40). Although this ridge line was not addressed in the Draft EIS, resource values are similar to those encountered from MP 36 to MP 45. Soil stabilization and revegetation would be easier and visual resources less impacted on this ridge line than along the Variation corridor from MP 36 to MP 40.

<u>Rationale and Significant Factors Supporting Forest Service Position</u>

Daniels Canyon Variation (MP 40 to MP 45 <u>and new connection</u> to Proposed Action Corridor)

1. Earthwork reduced due to ridgetop construction.*

2. If topsoil is conserved, revegetation potential should be relatively high.*

3. Potential to upgrade Strawberry Ridge road and eliminate portion in canyon bottom at Indian Springs.*

4. Existing Strawberry Ridge fence would reduce the cost of protecting one side of one right-of-way from grazing for the establishment of vegetation.

5. Avoids the encroachment on riparian area along Indian Creek.

6. Opportunity to reduce impact by routing right-of-way on bench east of Strawberry Ridge from milepost 43 to the head of Second Water.

7. Avoids fishery conflicts along Indian Creek.*

8. Avoids need for Streeper Creek crossing.

9. Avoids Green River shale.*

10. Out of direct view from Strawberry Reservoir recreation area.*

Proposed Action (MP 147 to MP 150)

1. Two miles of riparian zone would be impacted.*

2. Construction outside of riparian zone requires work on steep side hills with extensive construction.*

3. Above Indian Springs (Creek), the canyon bottom is n row which would result in heavy construction impact in canyon bottom.

4. Corridor included Indian Creek which is an important fishery.*

5. Requires Streeper Creek crossing.

6. Slump-prone Uinta Formation.*

<u>SEGMENT VI</u> - Daniels Canyon Variation (MP 45 to MP 51.8) versus Proposed Action (MP 150 to MP 156).

<u>Forest Service Position</u>

Proposed Action would be environmentally preferable with some adjustments necessary in the head of First Water Creek.

Difficult construction and stabilization problems would be encountered along the referenced portion of the Daniels Canyon Variation; therefore, the Forest Service does not advocate this location as preferable.

<u>Rationale and Significant Factors Supporting Forest Service Position</u>

Proposed Action (MP 150 to MP 156)

1. Potential road grade for future arterial road route.*

2. Construction requirements would be relatively light along the route with the expection of an area in First Water Creek.*

3. Revegetation would require topsoil conservation and protection from grazing.

4. Shallow soils are problems in localized areas.

5. Parts of the first 3 miles of the route would be visible from Highways 50 and 6.

6. Construction in Sec. 16 along First Water Creek would be extremely difficult, requiring extensive erosion control measures.

7. During construction, there would be a high probability of water pollution and sediment production in the head of First Water Creek.

8. Primary concerns would be revegetation and erosion control.

9. First half of route is an important deer winter range.

10. Within the corridor, major construction impacts and erosion potential could be reduced by using First Water ridge instead of crossing First Water Creek.*

11. In Secs. 16 and 21, the whole width of the corridor crosses difficult terrain and requires extensive construction.

12. Highly plastic and erodible subsoils in the Green River shale areas.

Daniels Canyon Variation (MP 45 to MP 51.8)

1. Crosses slump area in Sec. 30.*

2. Adjacent to Sheep Creek stream for first 4 1/2 miles, where there is heavy sedimentation from existing road which would increase as a result of pipeline construction.*

3. Very heavy construction required in sections along Sheep Creek.*

4. Revegetation potential almost nil.*

5. Erosion rate exceeds rate of soil formation over much of the route.*

6. Possible soil toxicity problems relating to revegetation potential.*

7. Lower two-thirds of this section is important deer range.

8. Highly plastic and erodible subsoils in the Green River shale areas.*

In determining the Forest Service position on the above six segments, the following considerations were assumed applicable to all segments.

1. All topsoil would be conserved and utilized for improved rehabilitation success.

2. Grazing would be controlled by management where possible and by fencing where needed until the disturbed areas were stabilized and revegetated.

3. Where a roadway is not left in the construction limits, positive erosion control and prevention of use by ORV's must be incorporated in the rehabilitation.

4. Where feasible and compatible with an approved Forest transportation plan and when agreed upon by the RMPC, a road grade with adequate drainage would be left within or directly adjacent to the pipeline construction limits. The subgrade would be compatible with projected transportation needs. If it is not agreeable to leave a subgrade as described, then the pipeline would have to be constructed to a depth that would not require relocation of the pipeline if in the future a road were constructed.

Considerations 1-3 are covered by current Draft EIS mitigating measures. Consideration 4 would be an agreement reached with RMPC during the development of construction and operation plans.

BLM agrees with this statement.

B. GENERAL COMMENTS ON GENERAL DRAFT EIS CONTENT

1. Cultural Resources

The following comments primarily apply to cultural resources within or adjacent to the six National Forests located in the State of Utah. Major portions of the RMPP Proposed Action and portions of several alternative and variations affect Forest Service lands in Utah.

The proviso (on page 3-25, right column, 4th paragraph) that a selected route be intensively surveyed and impacts mitigated adequately protects cultural resource values. However, certain assumptions and determinations should be clarified so that the magnitude of possible impacts and mitigation measures can be accurately assessed.

First, the significance of the Dominguez-Escalante Trail seems to be downplayed in both the cultural resources technical report (page 7-3, paragraph 3) and in the Draft EIS (page 3-26, left column, 1st paragraph) where it is not even specifically mentioned. The Proposed Action, Variation 1, and Variation 6 all cross the trail in the Strawberry Reservoir and Ridge areas. The Proposed Action parallels the route (periodically crossing it) from Nephi through Scipio Pass and down to just north of the Cedar City area. Alternatives B, D, E, and F would most likely cross the trail. Cultural materials related to the expedition are not likely to be located along the trail. However, the trail does mark a significant historic event for which good historic records are available, and it has been designated as a National Scenic Trail with an EIS published by the National Park Service this past year.

The Dominguez-Escalante Trail is discussed in the cultural resource technical report on pages 7-3 and 7-4. As stated in the DEIS (page 4-22), the impacts to the trail cannot be absolutely determined until an alignment is chosen and a centerline is staked and examined for cultural resources. This intensive field survey will be done as required to satisfy compliance with 36 CFR 800, Executive Order 11593, and other historic preservation legislation.

In accordance with 36 CFR 800.8 a PMOA is being developed with the Advisory Council on Historic Preservation, the State Historic Preservation Officers, and the Federal agencies with compliance responsibility. Site identification and plans for mitigation will be deferred until the intensive surveys are made. If it is found that the project would adversely affect the Dominguez-Escalante Trail, specific mitigation recommendations will be made following the procedures agreed upon in the PMOA.

Second, turning more specifically to cultural resources and work documented in the technical report (Chapter 8) and reflected in the Draft EIS (page 3-26, full page, and page 3-27, left column, 1st paragraph), three Proposed Action segments--mileages 200-250, 300-350, and 250-400--appear to have the density and/or significance underrated. The result is that the cultural sensitivities likely underestimate possible impacts and concomitant mitigation consideration.

The cultural sensitivity ratings are judgmental based on the information available. As field surveys and other additional information surface, the sensitivity ratings may be altered. Although listing on the National Register and proximity to water were included in the significance criteria, these were not the <u>only</u> factors considered.

Specifically, for surveys conducted on Forest Service lands adjacent to mileage segment 200-250, moderate site densities are recorded which would raise the cultural sensitivity level from low to moderate (compare to technical report page 8-6, table 18, and page 8-7, paragraph 5--although many of the sites recorded are either seasonal procurement stations or campsites, any impacts would be easily mitigated). For mileage segment 200-350, project surveys in the area indicate at least moderate, rather than low, prehistoric and historic cultural sensitivities (compare to technical report page 8-6, table 18; page 8-7, paragraph 3; page 8-27, paragraph 6; and page 8-28, table 25). For mileage segment 350-400, project surveys indicate high, rather than low, site significance (with numerous residential and seasonal campsites) and, thus, indicate a high prehistoric cultural sensitivity level (compare to technical report page 8-6, table 18, and page 8-8, paragraph 4).

Although not specifically cross-referenced by mileage segments in the Draft EIS (page 3-26, right column, paragraphs 7 and 8, and page 3-27, left column, paragraph 1), these segments should generally be considered more sensitive overall, with residential or significant sites not limited to those listed on the National Register nor confined to water sources.

The underestimation of cultural sensitivity generally reflects the nature of the Class I--published literature search. Site files and unpublished manuscripts (available from both land management agencies and the Utah State Historical Society) contain the bulk of known data for this region. Manuscripts on file with the Forest Service for surveys covering large acreage in or immediately adjacent to the Proposed Action of the RMPP include:

On the Fishlake National Forest:

Leonard, Robert W.
1980 An Archeological Survey and Site Evaluation in the Domeron Canyon-Corn Creek Area, Millard County, UT

1980 An Archeological Survey and Site Evaluation in the North Indian Front Chaining Area, Beaver County, UT

On the Dixie National Forest:

Craig, Chris
1977 An Archeological Survey of the Twin Springs Chaining

Domeier, Barbara
1975 An Archeological Survey of the Eight Mile Chaining

Dykman, James
1976 An Archeological Survey of the Lytes Land Exchange

Sender, Malcolm and James Dykman
1976 An Archeological Survey of the Spring Creek Chaining

Third, turning to the overall site predictability models and general research designs, some additional factors should be considered. Sites were predicted to be highly sensitive to permanent water resources (technical report, page 8-4, paragraphs 5 and 7; Draft EIS, page 3-26, entire prehistory section). However, recent studies on Utah indicate a high correlation of site occurrence with sand dunes totally independent of water resources (Richard N. Holmer, personal communication, MX survey). For a good discussion of site/sand dune associations, see Holmer, R.N.; 1979; Split Mountain Cultural Study Tract; Archeological Center, Department of Anthropology, University of Utah, Salt Lake City). High desert

Although these manuscripts were not provided by the FS to the cultural resource overview consultant, BLM has requested copies to ensure that the compliance archaeologist can effectively use these reports during the preconstruction survey of cultural resources and subsequent development of mitigation.

The information on the correlation of site occurrence with sand dunes will be considered in designing subsequent field studies.

Comment	Response
environments typically contain such habitats, and major portions of the RMPP Proposed Action traverses high desert environments. This is a predictability factor which should be considered when examining routes and estimating mitigation measures.	
In addition, serious consideration should be given to the significance of campsites and procurement stations--the types of sites most frequently found in this region. Although adverse impacts to these types of sites would generally be uncomplicated to mitigate, the sites could contain significant information related to settlement patterns and resource utilization. A research design incorporating these factors (see technical report, page 9-4, paragraph 3, items 1, 2, and 3; Draft EIS, page 3-26, prehistory section) seems critical to the assessment of cultural resources in this area.	This consideration will be given during the cultural resources survey which is conducted after the staking of the pipeline centerline.
Fourth, from a cultural resources standpoint, the northern systems alternative appears the most environmentally sound. Areas highly sensitive to cultural resources would be crossed by the Proposed Action and all major alternatives. The northern systems alternative is preferred simply because it impacts far fewer acres (Draft EIS, page 2-48, table 2-11, cultural resources).	This conclusion is stated in the cultural resources technical report.
2. Transportation Networks	
The information provided in the RMPP Technical Report for Transportation Networks does not appear to have been used in the analysis of project impacts. There are no presentations of transportation network impacts in Chapter 2, Comparative Analysis, and no crossing information on probable utilization of existing transportation routes in Chapters 3 and 4.	Because anticipated impacts to transportation networks due to pipeline construction would be minor, no comparison of impacts between alternatives and variations is necessary. Please see the discussion on pages 42 through 45 of the transportation networks technical report which addresses minor, short-term impacts; no long-term significant impacts were found in the analysis.
The Technical Report does address more than just insignificant impacts (page 42-45). Disruption to normal traffic flows and impacts to transportation facilities would involve public safety concerns and reparation needs. Quantifying such concerns and needs would serve as good information in a comparative analysis.	
It is recommended that the Final EIS address transportation networks by including a discussion on involved networks in the Comparative Analysis section and portraying numbers and types of crossing, etc., in Table 2-11.	
3. Water Resources	
The proposed route would cross through the prime water-producing areas of the State of Utah. Headwaters of the Weber, Provo, and Duchesne Rivers and Utah Lake tributaries would be intercepted by the proposed route. It holds the hazard of disrupting the principal water collection systems of 70 percent of the people of the State of Utah. Seeps, springs, and streams could be blocked and diverted with quality and quantity changes being the end result. An effect would be felt on principal water conservancy districts created by	The water resources technical report and the soils and agriculture technical report discuss the impacts associated with construction through these areas. We feel that this is an adequate and accurate assessment of the impacts that would take place.

Utah statutes. The proposal could place the water flows which the Forest Service is charged to protect in jeopardy. There is a possibility that the proponent may tamper with many existing water rights, which may have been established as early as 1860.

The discussions on water and lands of an agricultural nature fail to focus on the waters, soils, geology, landforms, and characteristics of the land. The Draft substitutes generalized descriptions for analysis. The Draft also neglects to consider factors of major importance to managing the lands, such as state laws, state support, and state intent to develop water facilities through conservancy districts and water resource development. The effects of the proposal on "closed out" or foregone water development opportunities and the critical issue of state and Federal water rights affected should be considered and discussed in the Final EIS.

The methodology of adequately addressing impacts to water development and water rights would entail an identification and discussion on key watersheds traversed by the pipeline, establishment of baseline data on water production and water rights for each watershed, and evaluating the effects of the proposed pipeline on the outputs of each key watershed. This methodology should be employed in the Final EIS for the Proposed Action and each alternative.

4. Comparative Analysis Presentation in the Draft EIS

As the comparative analysis is written, it is difficult to arrive at a conclusion as to which alternative(s) best meets project proposals as submitted by the RMPC and at the same time would be consistent with environmental constraints as established by land management agencies.

It is clear from the analysis that the Northern Systems Alternative at the 413,000-Mcfd level (76.8 miles of pipeline looping--best case or 225.1 miles of pipeline of both new pipeline and pipeline looping--worst case) would be the environmentally preferred alternative. It is also clear from this same analysis that RMPC is not convinced that this alternative would best meet the company's long-term development objectives.

It is our recommendation that the Final EIS display (in a priority format, i.e., best to worst) which alternatives best meet project proposals as submitted by the RMPC and, at the same time, are consistent with established environmental constraints.

On February 25, 1981, Jeff M. Sirmon, Regional Forester, Intermountain Region, sent a letter to the EIS Team Leader. This letter discussed methodology that could be used to meet the recommendation presented in the preceding paragraph. The evaluation criteria presented in Mr. Sirmon's letter was consistent with goals and objectives of all land management agencies. A matrix system, displaying how each criterion is met by each alternative (on a numerical or work-scale basis) would serve to complement and increase the value of the EIS Comparative Analysis section as an analysis tool.

The BLM and FERC as joint lead agencies established the format and general methodology that would be used in the EIS about 6 months before the FS identified its proposal. In February, the EIS team leaders analyzed the methodology proposed by the FS and rejected it because it was more suited to comparing the alternatives to agency goals and objectives. The FERC project manager was opposed to this methodology since a matrix system is subjective and such an approach has proven difficult to defend in hearings. The need in the EIS was to compare the alternatives on the basis of environmental impact. A number of methods were examined by BLM and FERC; the one in the EIS was selected because it displays the potential impact of all of the evaluated routes so that all may be compared to one another. It also compares each of the routes directly to the proposed action.

C. SPECIFIC COMMENTS ON DRAFT EIS CONTENT

1. Summary Section

Page	Column	Paragraph	Sentence
xv	left	5	1

The Forest Service is also concerned that impacts to soils in areas covered by Soil Group 2 would be more severe than calculated in the EIS.

Soil impact evaluations for all soil groups were based on information gained by applying the Universal Soil Loss Equation for areas disturbed by construction. Selected representative sites and conditions for each soil group were evaluated for effectiveness of applicable measures to ensure successful erosion control, revegetation, and restoration. It is our opinion that this analysis adequately recognizes soil impact evaluations for each soil group.

Page	Column	Paragraph	Sentence
xv	right	1 under Vegetation	3

Additional information should be presented here; suggested wording as follows:

Such guidelines could ensure successful revegetation on the Uinta and Manti-LaSal National Forests only after intensive monitoring and application of guideline measures. Existing soil and geologic conditions along the Proposed Action and Daniels Canyon Variation on the Uinta National Forest and along the Proposed Action on the Manti-LaSal National Forest would cause difficulties in adequate, prompt, and lasting erosion control and revegetation.

This condition should be stated in the Final EIS.

The general concern of this comment is identified in "Summary: Vegetation" by the statement: "A few small unquantifiable areas where adequate vegetation could not be established and maintained because of unstable soils would require continuing intensive erosion control measures."

Text is revised to specifically recognize the Uinta and Manti-LaSal National Forests and to include the language as requested.

Page	Column	Paragraph	Sentence
xv	right	1 under Vegetation	4&5

From mileposts 140-157 of the Proposed Action on the Uinta National Forest and mileposts 160-168 of the Proposed Action on the Manti-LaSal National Forest, the acres within the right-of-way (303 acres) as well as acres associated with unstable geologic fractures and soils adjacent to the right-of-way (unestimated acreage) would experience severe impacts to vegetation. Loss of vegetation, slow and inadequate revegetation efforts, and induced slides and slumping would be significant problems to Forest Service land managers and National Forest users and uses. The above information should be stated in this portion of the Summary.

The concerns about specific milepost locations and hazards encountered are identified in the impact discussion for the proposed action under Soil Group 1.

The "Summary: Vegetation" and "Summary: Soils" have been modified to clarify the need for intensive implementation and monitoring of localized areas where revegetation would be more difficult.

The statement "slow and inadequate revegetation efforts" is misleading; the RMPC will be required to perform these efforts adequately as a condition of the right-of-way grant. The EIS identifies very effective applicable measures and advocates and provides for Authorized Officer review of implementation plans and detailed onsite direction and compliance monitoring of all right-of-way activities to ensure soil protection and revegetation. However, the FS position on this was added to the "Summary."

The above comments also apply to the Daniels Canyon Variation from mileposts 47-50.

Page	Column	Paragraph	Sentence
xvii	left	1 under Wildlife	3&4

Refer to above comments on vegetation. The statement that ". . . revegetation would restore the habitat." is misleading when you read the following sentence which states, in part, ". . . insignificant habitat loss would occur." Wildlife impacts along the mileposts, as indicated, would not be temporary; the impacts would be long lasting due to revegetation difficulties. This type of statement should be included in this portion of the Summary.

Field trip analysis and discussion with FS personnel indicate that complete vegetative cover would be impossible; it would be possible to establish a ground cover to preexisting conditions using mitigation measures specified in appendix C.

Habitat losses caused by a linear project such as this pipeline average 12.12 acres per mile. Loss of a narrow strip such as this, compared to the total amount of habitat available, would be an

Page	Column	Paragraph	Sentence
xvii	Right	1 under Soils	Last

Discussion on vegetation also applies here. Soils may not stabilize on the Uinta and Manti-LaSal portions of the Proposed Action and Daniels Canyon Variation. Existing soils and geologic conditions are erosive and unstable, and past project revegetation efforts have had limited success over long periods of time (5 years plus). This type of statement should be included in this portion of the Summary.

xvii Right 1 under Agriculture, Grazing Forest Resources

No mention is made of potential, significant economic losses to ranchers due to loss of right-of-way use until revegetation is completed and stabilized. (Refer to Appendix J of the Draft EIS).

Economic losses to ranchers could be expected along the Proposed Action from mileposts 90-130. The degree of loss is discussed in the Forest Service document on grazing sent to the EIS Team on April 4, 1981.

NOTE: Appendix J does not present the potential revenue losses to ranchers as discussed by the Forest Service document of April 18, 1981. This information should be presented in the Summary as well as in other appropriate EIS sections.

xviii Right Geology and Topography

The Forest Service believes that the Proposed Action would adversly affect the geologic stability of the area from mileposts 160-168. (Refer to Forest Service report entitled "Reconnaissance Geologic Evaluation of a Proposed Utility Corridor in the Dairy Fork, Lake Fork, and Little Clear Creek Drainages, Manti-LaSal National Forest" which was sent to the EIS Team on April 15, 1981.) This geologic condition should be highlighted in the Summary section.

2. Chapter 2 - Proposed Action and Alternatives

2-7 Table 2-1 Land Requirements (borrow areas)

Borrow site requirements can cause serious impacts. A statement of how the figures were derived and where borrow sites would be located, i.e., mountainous terrain or flat-rolling terrain. A discussion should be provided (by alternative) on the types and duration of impacts that would be expected from borrow activities if they were carried out in steep-mountainous terrain versus gentle-sloping terrain.

insignificant impact. Revegetation of most species would be rapid. See response to your previous comment for further revegetation information.

See text changes in "Summary: Soils." The concerns raised in the comment are also addressed in chapter 4, "Proposed Action: Soils."

Provisions to implement and monitor applicable measures are also outlined in appendix C, "Erosion Control, Revegetation, and Restoration Guidelines for Use on Federal Lands."

Appendix J was incomplete in the DEIS due to printing error. Analysis prepared by the FS including the economic analysis of losses to ranchers should have been presented in its entirety. Appropriate revisions have been made to "Summary: Agriculture, Grazing, Forest Resources."

Information on this subject has been placed in the summary of the FEIS. the body of the FEIS, and in appendix M.

This information has not been provided by the applicant. RMPC has only indicated that about 60 acres of land would be disturbed if existing borrow sites cannot be used.

The applicant gave a rough estimate of gravel needs, from which the EIS team calculated acres of borrow sites, using the average depths of borrow sites. This was extrapolated for the alternatives. Borrow sites administered by

Page	Column	Paragraph	Sentence

The whole presentation on borrow areas is weak and should be expanded to include:

- locations,
- quantities (cu. yds),
- impacts, and
- special mitigation

the BLM would be in areas where impacts are minimal. It is assumed that the same would be true of FS and county sites. Gravel is needed for padding the pipe. Before centerline staking, it is impossible to tell how much and where the padding would be needed. Gravel sources should be within economic hauling distances of where they are needed. If the project gravel needs exceed the capacity of existing borrow sites, RMPC would apply to the FS or the BLM or the private landowners for new sites. The BLM and FS would process these with TUP's which have site-specific environmental assessments, complete with impacts and mitigation. Thus, the information requested is not possible to provide.

2-17	Table 2-8		

This table indicates that no communication sites outside of RMPP compressor and maintenance stations would be needed. Is this a realistic presentation? The paragraph preceding this table refers to the need for microwave radio links and a VHF-UHF radio system. RMPC should have some concept of where the systems would be located; not all needs can be located in compressor and maintenance stations. The statement that existing communication facilities would be used may or may not be true. Such facilities were not mapped in the Graphic Supplement, and there is no way to tell if existing communication facilities would be in the correct location for use by the RMPP. The complete communication system should be discussed and included for EIS analysis.

This information has not been provided by the RMPC. The applicant was asked for more information on this subject; RMPC replied that the information was not available.

2-17	Left	Last under Facilities Components	2 and 3

RMPC is still segregating electrical power needs from the pipeline project. Such needs are a part of the project, and the impacts of providing power for cathodic protection, microwave stations, and other needs by electrical distribution lines should be analyzed. To do this, an estimate of the miles of electrical distribution lines to be installed (by alternative) should be made. The number of miles of distribution lines would depend on the location of existing electrical power sources, such as high voltage lines, substations, and distribution lines. Estimates of these miles by alternative would provide another indication of project-related impacts and their degree.

Since the exact locations of the solitary maintenance bases, cathodic protection, microwave stations, block valves, and the pipeline itself have not been established, any such estimates would be sheer speculation. The FEIS recognizes this requirement.

2-17	Right	2 under Land Requirements	2

The July 28, 1981, field review of the Proposed Action and Variation on the Uinta and Manti-LaSal National Forests showed that <u>new access roads</u> would be needed for pipeline work. The Pacific Gas Transport Company representative, Nick Day, was present during this review. He agreed that some <u>new access roads</u> would be needed to deliver and string pipe along <u>the right-of-way</u>. A statement can be made in the Final EIS that an unestimated number of miles of new access roads would be needed on the Uinta and Manti-LaSal National Forests.

Comment reflected in chapter 2, "Proposed Action: Land Requirements."

Sentence unclear as written. Would RMPC be periodically removing large brush and trees over 2 inches in diameter from the total permanent right-of-way width or just from the area 10 feet on either side of the pipeline?

The Forest Service would allow (during construction) removal of groundcover, such as grasses, leaves, roots, brush, and trees only to the extent necessary and (during operation and maintenance) removal of vegetation over 2 inches only in the area 10 feet on either side of the pipeline. This should be so stated in Appendix C, under Right-of-Way and Site Clearing, page C-6, and Maintenance and Monitoring, page C-8.

The applicant would only allow grasses and forbs to grow on the 23-foot wide area above the pipeline and would limit tree growth over the remainder of the permanent right-of-way.

The type of vegetation maintained in the 20-foot wide area over the pipeline in forested areas should be identified as a stipulation in the detailed site-specific reclamation plan which is a part of the operation plan.

The removal of existing ground cover for construction activities is addressed in appendix C, "Erosion Control, Revegetation, and Restoration Guidelines for Use on Federal Lands," and "Mitigating Measures Resulting from Impact Assessment" under "General Measures" and "Visual Resources," appendix C.

Total clearing of right-of-way for construction is not advocated as a standard procedure, merely as an amount for analysis. Right-of-way clearing procedures would be conducted as directed by the Authorized Officer. Areas would be cleared only to the extent necessary. An additional measure in appendix D concerning vegetation clearing would be duplicative.

2-32	left	2nd under Land Requirements	1

Change first sentence to read "The permanent pipeline right-of-way across BLM and Forest Service lands could be up to 50 feet wide."

The Forest Service will request the BLM to prepare the right-of-way grant in such a manner as to allow specific permanent right-of-way widths to be established only after completion of pipeline construction and rehabilitation work; the permanent right-of-way widths should not automatically be 50 feet, but be set as conditions warrant. Different widths (by reasonable mileage lengths) could and should be established to reflect actual pipeline requirements.

Comment noted. However, the Northern Systems Alternative would cross no FS lands. BLM recognizes this position and may also use it as conditions warrant.

2-35	left	2nd Under West Salt Lake Alternative	Last

Geologic instability along the Proposed Action was also a reason for developing this alternative.

The West Salt Lake Alternative text in chapter 2 has been revised to reflect this comment.

2-37	left	Variation 5 Mill Creek	Last

This sentence also applies to the Thistle Creek Variation.

This sentence has been incorporated into chapter 2, "Variation 2--Thistle Creek Variation."

2-40 & 2-41 Table 2-10

Due to the delay in the RMPP construction schedule, there may be related projects with construction schedules overlapping that of the RMPP. Only those project construction schedules overlapping the RMPP schedule should be discussed.

Construction schedules often slip for a variety of reasons. Since other project schedules could also slip, the results cannot be accurately determined. The EIS attempts to forecast the scheduling conflicts with resultant impacts for the decision-maker. For this reason, no change in the EIS is necessary.

Also, under the Alternatives column, the letters RMPP should be changed to read Proposed Action since this is the designation given to the RMPC proposal throughout the Draft EIS.

RMPP is the acronym/name of the proposed action that has been used in this EIS. It encompasses all of the facilities that would be required to carry out the proposed project and not just those that have been filed for. No change is required. However, BLM has made the suggested change to table 2-10 in the FEIS.

Page	Column	Paragraph	Sentence
2-45		Table 2-11	Soils Group 1-8 for Mill Creek Variation and Thistle Canyon Variation

The figures shown for these two variations should be shown in a footnote reading "Although the figures shown are higher than the Proposed Action which they would replace, actual site conditions indicate that the Proposed Action portion would be more susceptible to slides, high erosion hazards, and other construction limitations.

Table 2-11 identifies total acreages and mileages of Soil Groups 1 through 8 which would be crossed by the proposed action, alternatives, and variations. Specific site conditions are not noted by footnotes in the table. More specific right-of-way siting conditions, using inclusions within the various soil groups (especially Soil Group 1) are discussed in the "Comparative Analysis" in chapter 2 and in the soil impact discussion for each variation in chapter 4.

2-45		Table 2-11	Visual Resources Class 2/Retention for Mill Creek Variation

The results of the July 28, 1981, field review by the Forest Service and proponent indicate this Variation would be less visible from existing travelways than the Proposed Action portion it replaces. The Proposed Action portion would be more visible from U.S. Highway 6/50 and Forest Service roads than the Mill Creek Variation. Acres of Class 2/Retention should be shown for the Proposed Action portion and would be more than those acres shown for the Variation. Acreage should be recalculated, utilizing information obtained from the July 28, 1981, field review. Contact the Forest Service Liaison Officer at Richfield, Utah, for this information.

A mile-wide corridor was used as a basis for determining potential significant visual resource impacts which could occur along the proposed route. The comment presents site-specific, highly analyzed data and judgment which perhaps would change the degree of impact for the portion of the route described. However, if the same degree of analysis were applied to the whole pipeline, the general sense of impact would remain approximately the same. Therefore, no changes have been made.

2-48		Table 2-11	Geology/Topograph - Faults Crossed for the Proposed Action

Replace "8" with "10" (crosses two additional faults at SW corner of Strawberry Reservoir - Indian Creek faults; Van Arsdale's "Geology of Strawberry Valley and Regional Implications," University of Utah, December 1979 (map 2 attached).

The FS is unable to show that these two faults meet criteria for inclusion in the EIS discussion. Moreover, the map provided by the FS shows that while the faults are within a 1-mile wide corridor centered on the pipeline, they are parallel to it, <u>not</u> crossed, and could be easily avoided. In addition, the faults are apparently less than 2 miles long, probably not capable of significant movement. However, if one assumed the faults meet the EIS activity criterion, one would be compelled to add two fault crossings to Daniel's Canyon Variation II, since the corridor associated with that variation would cross both faults at right angles. This modification would still not add any crossings to the RMPP, since it would parallel these faults.

2-49		Table 2-11	Geology/Topography - Miles of Side Slopes Greater than 30% for the Mill Creek Variation

The July 28, 1981, Forest Service field review provides information indicating the corresponding Proposed Action portion to the Mill Creek Variation would have more miles of side slopes greater than 30 percent. Miles should be recalculated using information from the July 28, 1981, field review. Contact the Forest Service Liaison Officer at Richfield, Utah, for this information.

Comment reflected in text.

2-52	Left	1 under Proposed Action	Last Two sentences

The Proposed Action would significantly alter the riparian habitat if located from MP 145 to MP 147 (Indian Creek Drainage). This portion of corridor is located completely within a canyon bottom and through a key riparian habitat on the Uinta National Forest. If the pipeline were constructed in this canyon, the riparian vegetation would not recover quickly; in fact, it is doubtful that it would ever recover completely since construction work would alter stream flow patterns and existing spring flows from the adjacent sidehill.

If the pipeline could not be placed upslope within the 1 mile wide corridor, the riparian habitat would be affected, as would the stream. The regrowth of the riparian vegetation would contain the same species and, eventually, density as originally, but it would not be in a pristine condition any longer. The Daniels Canyon Variation II bypasses this drainage and would avoid these impacts.

Page	Column	Paragraph	Sentence

All riparian vegetation on Utah National Forests is considered significant. This vegetation provides 30 to 40 percent of the wildlife habitat (fawning areas, cover, etc.). The whole treatise of riparian vegetation is weak throughout the Draft EIS. The EIS team did not adequately respond to Forest Service direction (given early in Preliminary Draft EIS reviews) to address Forest Service responsibilities for riparian management. (Refer to Forest Service comments on the RMPP Preliminary Draft EIS released for review on November 7, 1980--Forest Service comments were sent to the Team Leader November 18, 1980.) Riparian habitat zones are not adequately addressed in the Draft EIS. The Final EIS should reconcile this error by following the direction for proper analysis as provided by the Forest Service and Department of Agriculture Policy Statement No. 2019, dated July 8, 1980, on fish and wildlife, including riparian habitat protection and management.

Construction which could occur along any of the pipeline routes within the forests would be managed under the policy direction of the FS and Department of Agriculture Policy Statement No. 2019, dated July 8, 1980. This restriction has been added to appendix D, "BLM and FS General Measures."

2-52	left	3 under Proposed Action	3

The Forest Service does not agree that implementation of the Erosion Control, Restoration, and Revegetation Guidelines presented in Appendix C of the Draft EIS would stabilize and rehabilitate all National Forest areas affected within 3 years. Of particular concern would be those soils within the corridor from MP 140 to MP 168. It is the belief (evidenced by impacts from past and ongoing surface uses) that soil stability would not be achieved within 3 years. The guidelines as presented in Appendix C would be strictly enforced, and RMPC could expect costly and time-consuming rehabilitation work over a period greater than 3 years. This should be so stated in the Final EIS.

The response to the comment on vegetation impacts for the proposed action (page 30 of this letter) also addresses this concern.

2-52	left	4 Under Proposed Action	1

This discussion on visual resources has no meaning in regard to comparative analysis impacts. What should be said here is "Acres which would exceed acceptable levels of visual contrast based upon VRM classes and VQO." The figures here would be subject to change to reflect Forest Service comments on page 2-45, Table 2-11, Visual Resources.

Please refer to text changes in "Comparative Analysis: Visual Resources."

2-52	right	7 Under Proposed Action	4

Subject to change to reflect Forest Service comments on page 2-49, Table 2-11, Geology/Topography.

Comment reflected in Geology/Topography section of the EIS.

2-53	left	5 under Alternative A Northern Systems Alternative	

As presented, the reader cannot tell what unacceptable visual resource contrasts would be involved for this alternative and how they would compare to the Proposed Action. Please provide this comparison in the Final EIS.

Please refer to text changes in "Comparative Analysis: Visual Resources."

Page	Column	Paragraph	Sentence
2-57	left	2nd Full paragraph	1

Same as comment for page 2-53, paragraph 5.

Please refer to text changes in "Comparative Analysis: Visual Resources."

Page	Column	Paragraph	Sentence
2-58	left	2nd full paragraph under Alternative E West S.L. Alt.	1

There are no golden eagle nesting areas, desert tortoise habitat areas, or desert bighorn sheep habitat areas along the West Salt Lake Alternative. The Draft EIS statement is in error. It should be made clear that such areas and habitat exist on the Proposed Action portion of the Alternative.

Each alternative discussed in the "Comparative Analysis" includes the appropriate portions of the proposed route; therefore, species found along the alternative itself and on that portion of the proposed action above or below the alternative are included.

Page	Column	Paragraph	Sentence
2-58	right	1	1

The EIS should define what is meant by "susceptible" soils in regard to this Alternative. What would these soils be more susceptible to when compared to soils of the Proposed Action?

Refer to clarifying wording in the comparative analysis of Alternative E. "Susceptibility" of soils is defined in soils sections throughout the EIS.

Page	Column	Paragraph	Sentence
2-58	right	2	1

Same as comment for page 2-53, paragraph 5.

Please refer to text changes in "Comparative Analysis: Visual Resources."

Page	Column	Paragraph	Sentence
2-59		Alternative F Provo Can. Alt.	2

Same as comment for page 2-53, paragraph 5.

Please refer to text changes in "Comparative Analysis: Visual Resources."

Page	Column	Paragraph	Sentence
2-59		Alternative F Provo Canyon Alt.	

Add paragraph mentioning the possibility of inclusion of the pipeline within the construction limits of the proposed Provo Canyon highway reconstruction project.

Because the schedules of both the RMPP and the proposed Provo Canyon highway reconstruction project are subject to many variables, it would be misleading to assume that they could be constructed concurrently.

Page	Column	Paragraph	Sentence
2-59	right	2 under Variation 2 Thistle Creek Variation	1

Same as comment for page 2-53, paragraph 5.

Please refer to text changes in "Comparative Analysis: Visual Resources."

Page	Column	Paragraph	Sentence
2-60	right	2 under Variation 5 Mill Creek variation	1

Same as comment for page 2-53, paragraph 5.

Please refer to text changes in "Comparative Analysis: Visual Resources."

Page	Column	Paragraph	Sentence
2-60	right	3 under Variation 5 Mill Creek Variation	1

The Mill Creek Variation is located on the Manti-LaSal National Forest and, as such, does not fall under the proposed guidelines for utility corridors as included in the Uinta National Forest Draft Forest Land Management Plan. The proposed guidelines are applicable only to the Uinta National Forest.

All references to this have been deleted in the FEIS.

2-61 left 3

Refer to Forest Service comments for page 2-59, Variation 2, and page 2-53, Alternative A. These comments also apply to the Daniels Canyon Variation.

Please refer to text changes in "Comparative Analysis: Visual Resources."

2-61 right 1 1

The Daniels Canyon Variation would cause comparable (not significant) impacts when compared to the corresponding segment of the Proposed Action. The sentence as written is an indication that the EIS Team did not travel the complete length of the Variation and compare it to the corresponding segment of the Proposed Action.

Several of the BLM EIS specialists did travel the complete length of the variation and the corresponding segment of the proposed action.

3. Chapter 3 - Affected Environment

3-2 Figure 3-1

This figure should show a symbol for significant impacts. (This symbol might or might not occupy a block within a column presently occupied by an existing symbol.) As the figure appears in the Draft EIS, no significant impacts are expected from the RMPP. The Forest Service would expect significant impacts (based on the EIS Team's significant criteria on pages 4-1 through 4-4 of the Draft EIS) to soils, visual resources, recreation, transportation networks, livestock grazing, and geologic conditions along the Proposed Action and Variations on the Manti-LaSal and Uinta National Forests and along the West Salt Lake Alternative on the Caribou National Forest.

This figure should be printed in the Final EIS with symbols for significant impacts shown.

Figure 3-1 has been clarified. This figure was intended to guide the reader to an understanding of where resources were and were not discussed within the EIS for each of the routes. It was not intended to indicate where significant impacts would occur. However, the figure shows where discussion of impacts occurs within the EIS.

3-5 Table 3-2 Footnote 1

The footnote explains why no aquatic species are listed in the table. However, since the Draft EIS Technical Report on terrestrial and aquatic biology considers some impacts to riparian vegetation and stream crossings, we feel it would be beneficial to list key game and/or sensitive fish species in this table.

Impacts to riparian vegetation and to streams where pipeline crossings are planned are estimated to be insignificant; therefore, species in these areas are omitted from the tables in the EIS.

Species determined to receive insignificant impacts are not discussed in the EIS; however, they are discussed in the terrestrial and aquatic biology technical report.

Page	Column	Paragraph	Sentence
3-11	right	1 under Federal and State Listed Species	4

This sentence mentions the Proposed Action crossing 37 miles of bald eagle habitat. This is not reflected in the acre calculation for bald eagles, page 2-44, Table 2-11.

3-11		Proposed Action	
3-13		Soils	

The Uinta National Forest soil scientist provided the EIS Team with considerable information on the soil management concerns for the Proposed Action corridor from MP 150 to MP 158. This information should be referenced in Chapters 3 and 4 and placed in the EIS Appendix material. The Draft EIS makes no real mention of Forest Service soil data provided to the EIS Team. Forest Service references are included in the reference section of the RMPP Technical Report for Soil and Agriculture, but the information referenced was not included for review.

Please refer to our November 18, 1980, Preliminary Draft EIS comments. Our comments included a section on soil management concerns that should be placed in the EIS Appendix material and referenced in appropriate EIS chapters.

3-12	left	1 under Soil Group 1	1

Replace the number 28 with 48 (information from rain gage at Heber Mountain site shows average of 48.72" for approximately a 10-year period).

3-13		Table 3-9 Soils Group 1	

Replace 14-28 inches with 14-49 inches.

3-17		Land Uses: Recreation Resources	

No mention is made of the Dominguez-Escalante Trail location being paralleled and criss-crossed from MP 235 to MP 237 of the Proposed Action. This portion of the trail location is addressed by the National Park Service (NPS) as a scenic trail portion. (Refer to Draft EIS, Dominguez-Escalante National Historic Trail, dated November 1980.) Since the Proposed Action corridor occupies the trail location for several miles and since potential conflicts are addressed in the NPS Draft EIS, this resource should be discussed in Chapters 3 and 4 of the EIS with possible inclusion in the comparative analysis section.

The acreage calculations in table 2-11 have been corrected.

Soil limitations and soil management concerns identified by information received from the FS for the proposed action corridor from MP 150 to MP 158, MP 158 to MP 168, and MP 140 to MP 157 are identified in the soils discussion for Soil Group 1 in "Proposed Action: Soils," chapter 4. The area of concern is identified as being from MP 80 to MP 170.

The handwritten field notes and memoranda received from the FS were recognized in the DEIS as "a more detailed review or soil hazards." The text is revised to reflect that the information was provided by the FS. The excerpt from the November 18, 1980, comments has been placed in appendix M, "Forest Service Positions on Soils/ Geology Problems on National Forests," and it has been referenced in chapter 4, "Soils."

The dominant average annual precipitation of Soil Group 1 ranges from 14 to 28 inches. Included are small localized areas of high mountain soils with annual precipitation of 28 to 40 inches (Wilson 1975). The text is revised to reflect the comment and clarify that inclusions occur.

Table 3-9 has not been changed, since it is an abbreviated description and does not identify precipitation inclusions.

See response to first comment under "General Comments on General Draft EIS Content."

Page	Column	Paragraph	Sentence

It is recognized that pages 3 and 26 of the RMPP Technical Report for Recreation and Wilderness discuss trails of potential national significance and consider RMPP impacts to such trails as not significant. Due to the restricted pipeline route through Scipio Pass (MP 235 - MP 237 of the Proposed Action), definite conflicts would result with NPS interpretive objectives for the Dominquez-Escalante Trail. The NPS should be consulted as to whether such conflicts would be considered insignificant.

3-21 Agriculture

The Chapter 3 coverage of impacts to livestock grazing on National Forest lands is only mentioned and indicates to the reader that few if any problems would exist with grazing.

Such is not the case. The information provided in Appendix J on livestock grazing should be summarized, referenced, and placed in Chapters 3 and 4. The opening sentence of Appendix J clearly indicates the importance of this use and resource. The information in the Appendix warrants an appropriate EIS presentation and analysis, including complete information on grazing revenues as provided to the EIS Team by the Forest Service.

Livestock grazing, affected environment, and environmental consequences would be even more meaningful as analysis tools if the EIS Team had presented a complete picture of revenue losses as supplied to the EIS Team by the Forest Service on April 18, 1981. The potential large revenue loss to ranchers due to pipeline construction impacts on livestock grazing needs to be addressed in the Final EIS. Forest Service letters on this subject can be referenced as source data.

Chapters 3 and 4 adequately address livestock grazing with the addition of the note to refer to appendix J for complete analysis and data display. Although the information could be placed in either chapters 3 and 4 or the appendix, to streamline the FEIS, appendix J will continue to present this information. Information on possible loss of income provided by the FS was incomplete in the DEIS due to a printing error. It is presented in its entirety in the FEIS. The technical report was also incomplete due to a printing error; it has been corrected. Additional references to livestock impacts and appendix J have been placed in chapters 3 and 4.

3-21 Table 3-12

The miles and acres of cropland for the Proposed Action and Alternative A, Northern Systems, is exactly the same (88 miles and 1,065 acres). This is also true in the Soils and Agriculture portion of the Technical Report (Table 2, page 15). We do not see how these figures can be the same given the different right-of-way lengths of the two routes.

The miles and acreages of cropland for both the proposed action and Alternative A, Northern Systems (worst case), were determined to be the same. The figures are correct as stated.

3-28 left last last

We do not agree with the Draft EIS approach used to compare pipeline routes in regard to faults. It is not a valid method to merely add the major known fault lines and disregard the literally hundreds of minor faults which, in some cases, could cause major impacts to the pipeline.

The Final EIS should mention that numerous minor faults are being crossed from MP 158 to MP 200 of the Proposed Action and such faults would contribute to possible pipeline failure during extensive fault movement.

The statement that numerous minor faults would be crossed is true for all the alternative routes and variations studied in the EIS. The FS has not provided any information to support the existence, activity, size, potential displacement, and significance of these "minor faults." The FS statement that in some cases these minor faults could cause major impacts to the pipeline cannot be substantiated without such information. Moreover, FERC staff experience indicates that displacement on minor faults is rarely a problem for natural gas pipelines.

Page	Column	Paragraph	Sentence
3-30	left	2nd full paragraph	

The Manti-LaSal National Forest provided a report to the EIS Team entitled "Reconnaissance Geologic Evaluation of a Proposed Utility Corridor in the Dairy Fork, Lake Fork, and Little Clear Creek Drainages, Manti-LaSal National Forest," dated March 7, 1981. This report identified areas where slides could be induced by pipeline construction activities. This report should be referenced in the appropriate Final EIS chapters with a brief summary presentation of the report finding.

Comment reflected in the text. The report is included in the FEIS as appendix M.

The report, dated March 2, 1981, does identify portions of the drainages which are subject to surface instability. They are not the only areas, and there are no such reports on the alternatives and variations. The admittedly general conclusions reached in the DEIS and the description of methodology in chapter 3, "Proposed Action: Geology and Topography," are not affected by the information in this report.

3-43	left	1 under Wildlife-Birds	

The ring-necked pheasant would be encountered in all agricultural areas south of Gunnison, Utah, (MP 50 to MP 90) along the Sanpete Valley Alternative.

The section on birds has been revised to include the ring-necked pheasant.

3-47		Visual Resources Table 3-28	

The Central Nevada Alternative crosses a portion of Connors Pass and Canyon area (MP 172-MP 176). This area should qualify for inclusion in Table 3-28.

The alternative route would pass through the Connors Pass area, but because the pipeline could be shifted within the mile-wide corridor to avoid particular combinations of landform and vegetation types, the alignment generally would not create any significant visual resource impacts. Without additional data to show otherwise, the analysis remains accurate.

3-62	left	2 under Wildlife	1

Suitable cliff nesting habitat for raptors would only be found in the 9-mile Spanish Fork Canyon portion of the Thistle Creek Variation. This can be verified with Utah Division of Wildlife Resources.

The figure has been corrected to 9 miles rather than 19 miles.

3-62	left	1 under Soils	1

This sentence on soils for the Thistle Canyon Variation misleads one to think that 19 miles of the Variation is located within steep, mountainous terrain. Actual ground conditions for this Variation are as follows:

MP 0 - MP 9 - Narrow canyon bottom with steep side slope.

MP 10 - MP 15 - Rolling mountain terrain with broad ridges and gentle side slopes.

MP 16 - 27.1 Broad mountain valley.

Soil Group 1 encompasses 18.5 miles of the 27.1-mile long Thistle Creek Variation (MP 9 to MP 18.5). Soil Group 1 includes small areas of narrow valleys, floodplains, and smoother sideslopes that can be used in final pipeline alignment to avoid steep, highly erodible slopes and potential slide areas. (Refer to the description of Soil Group 1 in "Proposed Action: Soils" in chapters 3 and 4.) Portions of the Thistle Creek Variation are identified as having these inclusions.

Page	Column	Paragraph	Sentence

The poor soil stability and high erosion hazards generally assigned to Soil Group 1 by the EIS Team only apply to areas along the Variation from MP 0 - MP 9. Moderately good soil stability and moderate to low erosion hazards would apply to the remaining miles of the Variation.

3-62 Visual Resources
Table 3-36

This Variation (MP 10 to MP 23) is not located within a steep, restricted canyon as stated in Table 3-36. Actual terrain conditions are rolling mountain terrain with broad ridges and gentle side slopes from MP 10 to MP 15 and a broad mountain valley from MP 16 to MP 27.1.

The Thistle Creek Variation was reanalyzed using the new data supplied by the FS and other sources. Changes have been made to reflect significant visual contrasts between MP 0 and MP 19 because of long-term changes in landform and vegetation as viewed from U.S. Highways 6 and 89.

4. Chapter 4 - Environmental Consequences

4-4 left 1 under Insignificant Impacts 1

This sentence implies that impacts on Alternatives and Variations similar to those created by the Proposed Action would be considered as insignificant. This would not be the case. No matter what the similarity may be, significant impacts should be discussed for each Alternative and Variation and not just portrayed as similar to the Proposed Action. The Final EIS should correct this presentation error. If an impact for a particular Alternative or Variation is significant and is similar to that of the Proposed Action, it should be discussed.

The word "or" has been changed to "and" for clarity. Pursuant to CEQ regulations requiring deletion of duplication, no other change has been made. Significant impacts from alternatives and variations which differ from those of the RMPP are identified.

4-4 right 1 under Recreation Resources

Provo Canyon contains at least six highly developed recreation sites (all of which are private and operated by cities or the county). If the pipeline were constructed outside of the highway reconstruction limits, there would be significant impacts on developed recreation and dispersed recreation (fishing and hiking).

Under the assumption that the pipeline would not traverse the six recreation sites, impacts to recreation opportunities and experiences along Alternative F, Provo Canyon Alternative, would be minor and short-term, therefore insignificant. Pages 19 and 20 of the recreation and wilderness technical report inventory the various developed recreation sites within Provo Canyon. Page 36 of the technical report analyzes impacts for a mile-wide corridor. Since impacts were considered insignificant, no discussion is provided in this EIS.

4-5 left Transportation Networks

The July 28, 1981, Forest Service field review of Variations 2 and 6 provided additional insight into possible roadway deterioration from project activities.

It is the consensus of the Forest Service that significant road surface damage could be expected along U.S. Highway 6/50 in Spanish Fork Canyon and U.S. Highway 40 in Daniels Canyon if utilized as part of the pipeline right-of-way construction zone. The road along the west side of the Strawberry Reservoir would also be subjected to significant surface damage from pipeline construction work.

Significant road surface damage could be expected along U.S. Highway 6/50 in the Spanish Fork Canyon and the west shore road of the Strawberry Reservoir if the pipeline were placed within these rights-of-way. Should roadways be damaged, they would be restored to at least their original quality. Utah Department of Transportation officials have stated that, with an encroachment permit, the pipeline construction could proceed through canyon areas. Possible roadway closings would be allowed by the Utah Department of Transportation for no longer than 30 minutes, including during necessary blasting. Therefore, no significant adverse impacts would result to

Page	Column	Paragraph	Sentence
4-6 through 4-7		Vegetation All Paragraphs	

The Forest Service position has and will continue to be that total clearing of the construction right-of-way would not be a standard procedure on National Forest land. Clearing would only be that necessary to accomplish construction as identified in an approved operating plan.

An Appendix D, Forest Service General Measure, should be written and included to support the above Forest Service position on vegetative clearing.

4-7	left	Vegetation- Impacts of Proposed Action for Forest	2 & 3

Refer to Forest Service comment on Soils, page xvii of Summary.

The Forest Service position, as stated in three previous Preliminary Draft EIS reviews, is that implementation of the Erosion Control, Revegetation, and Restoration Guidelines, proposed by RMPC on the guidelines for Federal lands, will not assure stabilization of soils and revegetation within 5 years.

The Draft EIS presents soil stabilization and revegetation as an assurable end to RMPP activities. The Forest Service continues to stress that this would not be the case for the Proposed Action and Variations crossing the Uinta and Manti-LaSal National Forests. Pipeline construction within the corridors being analyzed on these two National Forests would contribute to and accelerate soil losses currently considered as excessive by Forest Service soil scientists.

The Proposed Action and Daniels Canyon Variation pass through the most fragile soil and geologic unstable terrain found on the Uinta National Forest (MP 150 - MP 157 of the Proposed Action and MP 45 - MP 52 of the Daniels Canyon Variation). The Proposed Action passes through an area known to be highly susceptible to induced slope failures on the Manti-LaSal National Forest (MP 159 - MP 168).

The Final EIS should discuss these concerns and include information provided by the Forest Service on the above described locations. (Refer to Forest Service letter and comments on RMPP Preliminary Draft EIS, dated November 18, 1980, and the report entitled Reconnaissance Geologic Evaluation of a Proposed Utility Corridor in the Dairy Fork, Lake Fork, and Little Clear Creek Drainages, Manti-LaSal National Forest, dated March 12, 1981.)

traffic flow. The Daniels Canyon Variation has been dropped from further analysis in the EIS. The Daniels Canyon Variation II, which would traverse the Strawberry Reservoir area, has been developed as a replacement; it is analyzed in chapters 2, 3, and 4.

Please refer to response to comment page 21, paragraph 2, of this comment letter.

Implementation, monitoring, maintenance, and adequate compliance of the Erosion Control, Revegetation, and Restoration Guidelines outlined in appendix C would ensure successful revegetation and soil stabilization for erosion control, commensurate with preconstruction conditions. A few small localized areas would require continuing intensive erosion control measures equal to the variables encountered. These areas would require continuous extensive erosion control measures to ensure soil protection provided under the monitoring and maintenance program.

The conclusions are based upon results from onsite investigations with the FS staff, evaluation of additional information concerning revegetation potential of the area, and observations and evidence of similar projects and conditions in the same geological area. Although BLM staff members thought that BLM/FS concensus had been reached in the last field review of July 28, 1981, separate FS positions have been placed as requested in a new appendix M.

Refer to the response to FS comment on "Proposed Action: Soils," pages 3-11 and 3-12 of the DEIS.

Chapter 3, "Proposed Action: Geology and Topography," identifies landslide-prone areas, including this segment. The landsliding conditions in the vicinity of the RMPP are discussed in the FS report, appendix M. However, it should be noted that the authors indicated that they were not aware of the specific location of the project and that they did not study the landsliding potential of the variations.

Page	Column	Paragraph	Sentence
4-8	left	2 under Wildlife-Mammals	2

Does the Utah Department of Wildlife Resources agree to this statement? The Forest Service considers reduction of winter forage from MP 170 - MP 175, MP 100 - MP 120, and MP 150 - MP 155 as significant.

The pipeline construction would temporarily remove about 364 acres of winter range in this area. The only comment received from the Utah Division of Widlife Resources concerning winter ranges suggested adjustment to construction schedules to avoid conflicts with big game migration and wintering activities (White 1981, Sweeney 1981, Nish 1981).

4-10 right 3 & 4 under Soils

Refer to Forest Service comment for page 4-7, Vegetation. Same comment applies here.

The response to the comment on vegetation impacts for the proposed action, page 30 of this letter, also addresses this comment.

4-14 Visual Resources Table 4-13

The July 28, 1981, Forest Service field review of the Proposed Action indicated that the pipeline route from MP 158 - MP 163 would be highly visible from U.S. Highway 6/50. The present VQO Class is R&PR for this part of the route. These milepost designations and the appropriate visual resource impact should be shown in Table 4-1. Contact the Forest Service Liaison Office at Richfield, Utah, for this information.

A mile-wide corridor was used as a basis for determining potential significant visual resource impacts which could occur along the proposed action. The comment presents site-specific, highly analyzed data and judgment which perhaps would change the degree of impact for the portion of the route described. However, if the same degree of analysis were applied to the whole pipeline, the general sense of impact would remain approximately the same. Therefore, no changes have been made.

4-15 left 1 under Recreation Resources Impacts of Proposed Action 2 & 4

The Proposed Action corridor, as mapped, would cross the major access roads to and around Strawberry Reservoir several times in the vicinity of MP 140. These crossings dispute the statement made that ". . . the construction area would be 1 to 1.5 miles west of the major access road."

Also, the Forest Service policy for recreation management in the Strawberry Reservoir area is that public sensitivity to disturbances is medium to high, not low to medium as indicated.

The DEIS analysis of impacts was based on a 1-mile wide corridor. In a field review conducted on November 25, 1980, FS officials pointed out the general alignment of the proposed pipeline. This was understood to be approximately 1 to 1.5 miles west of the Strawberry Reservoir west shore road, thus the general description in the EIS. The conclusions on public sensitivity to construction in this area were based upon this information and upon the present intrusions in the area, as explained in the recreation resources text of chapter 4.

4-16 Agriculture

Refer to Forest Service comments on Agriculture for page xvii of the Summary and page 3-21 of Chapter 3. The same comments apply here.

Refer to the following response and to responses to FS comment on "Summary," pages xvii and 3-21 of the DEIS.

Page	Column	Paragraph	Sentence
4-16		Agriculture	

Grazing impacts should be discussed here. The impacts discussed in Appendix J along with potential economic losses to ranchers can be brought forward and placed in the Environmental Consequences Chapter. The impacts to grazing are considered significant by the Forest Service.

Grazing impact analysis is discussed in appendix J, "Livestock Grazing." Sentence has been added to the FEIS referring the reader to this appendix. Original placement in the appendix was due to untimely submittal of data and not to lack of significance of impacts to grazing on forests. Time and manpower constraints unfortunately did not permit rearranging the document between draft and final.

Page	Column	Paragraph	Sentence
4-24		Water Resources-General Impacts	

Refer to General Comments on Water Resources for the Forest Service concerns about impacts to water production and water rights.

No mention is made of impacts associated with withdrawal and discharge of water for hydrostatic testing of the pipeline. This would result from the release of up to 279,210 gallons of water for testing various pipeline segments. Also, some impacts could result from diversion of water for testing purposes.

The whole subject of hydrostatic testing is lightly treated by the Draft EIS. The actual procedure is so briefly discussed in Chapter 2 that is difficult for a reader to determine just what would result from such testing procedures.

The Final EIS should include a discussion on potential impacts from water used in hydrostatic testing. Mitigating measures for water released should be developed.

Hydrostatic test water has been treated briefly because existing laws and permit processes adequately protect the environment from both withdrawals and discharges.

The applicant has two options for obtaining water or withdrawing it from a surface source: (1) purchase the water from a holder of existing rights or (2) apply for a permit to withdraw water for whatever use is intended, such as hydrostatic testing.

In the first case, no precautions would take place to ensure that there would not be any downstream impacts from the withdrawal. This is because the holder of the water rights holds an agreement with the State Engineer's Office stating the conditions under which water can be withdrawn. Therefore, even if a portion of the water rights were to change hands, the withdrawal conditions would have to be met.

In the second case, where a permit is required, the issuing state agency--in most cases, the State Engineer's Office--would set a withdrawal rate that would be compatible with downstream uses. The permit system has been designed to minimize impacts to the water bodies involved.

This information was obtained from Mr. Dick Lawrence, Director, Division of Water Resources, Division of Water Rights, Department of Natural Resources, Salt Lake City, Utah, September 2, 1981, phone: (801) 533-5401, and from Mr. Tom Snails, Hydrologist, Engineer, Nevada State Engineer's Office, Reno, Nevada, phone: (702) 470-5911 or (702) 885-4380.

Page	Column	Paragraph	Sentence
4-29	left	3	

This paragraph presents <u>incidents per year</u> as a basis for discussion on pipeline safety. It is not possible to determine from the Draft EIS if the incident rate used by RMPC is applicable to the type of terrain that would be crossed by the Proposed Action. The mountainous terrain in northern Utah exhibits geologic and soil problems that could cause more repair incidents and, therefore, a higher predicted mean accident rate than that presented in the Draft EIS.

The Final EIS should discuss a predicted mean accident rate that would be applicable to the terrain in the proposed corridor and the time it would take the company to close valves if a break occurred in a highly used recreation area, such as Strawberry Reservoir.

The number of service incidents per year is based upon average nationwide service incidents reported to DOT. Those records do not quantify the incidents by topographic characteristics. However, depending upon the actual right-of-way characteristics, a segment of pipeline may experience a net increase or decrease from the national service incident rate.

Page	Column	Paragraph	Sentence
4-38	right	Unavoidable Adverse Impacts	

Impacts to grazing should be included in this section as unavoidable.

"Unavoidable Adverse Impacts," "Irreversible/Irretrievable Commitment of Resources," and "Relationship Between Short-term Uses and Long-term Productivity" have been revised for the FEIS. This comment is addressed in the tabular format developed in conjunction with these sections.

Page	Column	Paragraph	Sentence
4-38	right	Irreversible/Irretrievable Commitment of Resources	

This section simply does not provide the reader with substantive information. As written, the section does not meet the intent of NEPA and CEQ regulations for environmental consequences.

There would be irreversible commitments of:

--soils
--vegetation
--cultural resources
--land uses

There would irretrievable commitments of:

--soils
--vegetation
--wildlife
--cultural resources
--visual resources
--land uses

The degree of commitment depends on the corridor and segment of corridor being addressed.

In order to avoid a detailed discussion of each of the above-mentioned resources, a recent EIS prepared by BLM could be used as an example to provide acceptable content for this section of Chapter 4.

Pages 140-159 of the Moon Lake Powerplant Project (MLPPP) Draft EIS, dated January 8, 1981, present irreversible and irretrievable commitments of resources for water pipelines and electrical transmission lines (Linear Projects) in Utah and Colorado. Certain segments of the transmission system corridor would be located within 1 to 5 miles of the RMPP Proposed Action (MP 150 - MP 168). Impacts and resource commitments resulting from electrical transmission line construction and the construction acivities as proposed by RMPC would be similar. The Forest Service position is that impacts from the RMPP would be more severe. The presentation in the MLPPP Draft EIS on resource commitments is acceptable to the Forest Service. The RMPP Final EIS should provide a similar presentation for all Alternatives and Variations.

These sections have been revised to incorporate these concerns. Format now contains table for clarity.

Page	Column	Paragraph	Sentence
4-38	right	Relationship Between Short-term Uses of Man's Environment and the Maintenance and Enhancement of Long-term Productivity	

The Forest Service comment for page 4-38, Irreversible/Irretreivable Commitment of Resources, also applies here.

Following an aproach similar to that used in the Moon Lake Powerplant Project Draft EIS would make this section of Chapter 4 worthwhile as an analysis tool. As written, this Chapter 4 section does not provide reviewers with a complete and accurate analysis of impact data.

Please see changes to "Relationship Between Short-term Uses of Man's Environment and the Maintenance and Enhancement of Long-term Productivity" in chapter 4.

5. Appendix Sections

Appendix C

Page	Column	Paragraph
C-6	right	Under Right-of-Way and Site Clearing

Change first sentence to read:

"Existing groundcover and overstory, such as grasses leaves, roots, brush, and trees, would be cleared only to the extent necessary for pipeline construction activities. The extent of such clearing will be approved by the authorized agency official."

This is the position the Forest Service has taken during Preliminary DEIS reviews and will be required during construction phases on National Forest land.

It is important that the cleared ground cover be stockpiled and conserved for use in the the restoration operations. The text is revised to reflect "as approved by authorized agency official."

Page	Column	Paragraph
C-6		Under Right-of-Way and Site Clearing

Add a new measure which states, "Site clearing of trees and tall shrubs will be undulated or feathered in areas where the route goes through timber (tree) or shrub stands to prevent the vertical wall effect on each side of clearing limits."

Suggested measure is adequately addressed in "Mitigating Measures Resulting from Impact Assessment: General" and "Mitigating Measures Resulting from Impact Assessment: Visual Resources."

Page	Column	Paragraph
C-6&7	right	Appendix C Trenching and Preservation of Topsoil

Add the following to the measure on topsoil:

"Backfilling operations will include replacing the original (or greater) depth of topsoil into the trench."

Topsoil preservation and backfilling is adequately addressed in "Trenching and Preservation of Topsoil," appendix C. Authorized Officer direction is also provided. Because of this, "(or greater)" depth should not be required; hence, no change has been made.

C-8 Revegetation (Reseeding and Planting)

Add new measure which states, "In order to reestablish vegetation, temporary and/or permanent structures will be installed at specified points along cleared right-of-way and other disturbed sites to prevent off-road vehicle access."

Text has been revised to reflect comment.

C-8 right Maintenance and Monitoring

Add the following to this section:

"The Forest will allow removal of vegetation over 2 inches in diameter only in the area 10 feet on either side of the pipeline during RMPC maintenance activities."

Refer to the response to the comment on page 21, paragraph 2, of this comment letter.

Appendix D

D-7 Left #26 BLM-FS General Measures

Add the following sentence to measure No. 26:

"Temporary and permanent structures to control off-road vehicle use will be installed and maintained to BLM and Forest Service specifications."

It is our opinion that measure 26, as stated, adequately addresses this concern. Addition of the sentence in the comment would be essentially a reiteration. The measure presently states that FS and BLM will direct the activity.

Appendix G

Table G-1

Miles of pipeline route in existing corridors for a particular alternative should include those miles along the Proposed Action north and/or south of where the alternative leaves and/or joins with the Proposed Action. Table G-1 does not appear to accurately display this fact.

ex. Alternative B. Sanpete Valley would have the same utility transportation corridor milepost information as would the Proposed Action from MP 0 to MP 176 (that point where Alternative B leaves the Proposed Action). From MP 0 of Alternative B (MP 176 of the Proposed Action) to MP 200 (MP 356 of the Proposed Action), this alternative would have different utility/transportation corridor milepost information. Alternative B would then have the same milepost information as would the Proposed Action from MP 356 to MP 591.

Table G-1 does not display Alternative B of the other applicable Alternatives in this manner.

The table did include the referenced information; however, there were some editorial inaccuracies which have been corrected.

Page Column Paragraph Sentence

The discrepancies of Table G-1 would, therefore, affect the figures shown in Table G-2. These tables should be corrected and reprinted in the Final EIS with appropriate corresponding changes.

The total miles of pipeline route in existing corridors (by alternative) should be displayed in Table 2-11 and discussed in the comparative analysis narrative sections (page 252 - page 261). Such information and data are essential to a comparative analysis, since portrayal of potential corridor sharing is mandated by law and regulations (FLPMA and National Forest Management Act - NFMA).

Project management decided against duplicating the material in these tables. This is in consonance with the CEQ regulations to reduce unnecessary duplication.

6. Technical Reports

Terrestrial and Aquatic Biology

Page 52: The project does cross and/or is adjacent to elk and moose winter ranges in Rich, Summit, Wasatch, and Utah counties in Utah. The third and fourth paragraphs on this page mention no elk or moose ranges on or near the pipeline.

Letters from the Utah Division of Wildlife Resources dated January 9, 1981, and February 10, 1981, did not identify any moose or elk winter ranges along the proposed action in these counties.

Page 84: Native willows, grasses, and other species should be given first priority for revegetation rather than introducing new species.

Refer to page 85 of the technical report, first sentence, which states that grasses and other species of plants adapted to the site would be planted. Also refer to the soils and agriculture technical report, appendix A, "Erosion Control, Revegetation, and Restoration Guidelines," which also states that only species adapted to local soil and climatic conditions would be used.

Page 96, Impacts to fish: Construction in or near stream crossings should be minimal in time span to assure limited and short-term impacts to fish species and aquatic habitats so that riparian area protection and maintenance comply with FSM 2526 (Riparian Management, copy provided EIS Team).

According to the Utah Division of Wildlife Resources, no impacts to aquatic resources are anticipated at any stream crossings as long as management practices defined in 33 CFR, part 323, are followed (Nish 1981). These "best practices" include minimal time spent in crossing streams; thus, compliance with FSM 2526 is anticipated.

Pages 166-168, Table A-4: Fish species list is inconsistent with fish species contained on pages 59-61 and 73-74 of the Draft EIS Technical Report for Threatened and Endangered Species. The Threatened and Endangered Species list on the above pages is not even included within Table A-4, yet Table A-4 is supposed to cover all classes of fish species. The classification rating for fish species in Table 4, as shown in the Remarks Column, is also inconsistent with Forest Service terminology. Class #3 should specify either a rare or threatened species, but not both. A threatened Class should be given separate status just like Class #4, endangered species. Several species in Table A-4 are sensitive species to BLM and Forest Service, yet no sensitive Class exists. A sensitive Class should be added to the list.

Appropriate changes have been made to table A-4 of the terrestrial and aquatic biology technical report to reflect this comment. It is now consistent with the EIS.

Appendix B Tables: The footnote explanation for the "Stream Evaluation Rating" column is not shown. It would help the reader understand the symbols for each stream. It would also be helpful if the key fish species were placed in parentheses behind the stream evaluation rating symbol to assist the reader in species - habitat relationship evaluation.

Appropriate changes have been made to table B-1 of the terrestrial and aquatic biology technical report to clarify the Stream Evaluation Rating. Adding the key fish species is not felt to be necessary.

THREATENED AND ENDANGERED SPECIES

Pages 59-61 and 73-74: Several threatened and endangered species listed in Table A-4 are not discussed on these pages of the Draft EIS Technical Report for Terrestrial and Aquatic Biology.

Page 1, paragraph 2: The ninth line is the only reference to sensitive species and only in relation to the states. It appears any discussion and listing of Federal agency sensitive species is not considered.

Pages 2-3: The definition of a "sensitive" species is not given. Also the term sensitive is not included in any discussions within the "Affected Environmental Consequences" narratives.

Table A-4 lists species that could occur on or near the pipeline routes based upon published distribution maps. The terrestrial and aquatic biology technical report discusses only those species that would occur on the route which are not listed as threatened or endangered. The threatened and endangered species technical report discusses the threatened and endangered species. Section 7 requirements are fulfilled by discussion in the threatened and endangered species technical report; therefore, no duplication is required in the terrestrial and aquatic biology technical report.

The FWS did not identify any federally sensitive species near any of the routes in its section 7 lists.

There is no Federal classification termed sensitive in the Endangered Species Act of 1973. Some states use the term "sensitive" to indicate the state wildlife agencies concerns about the future of a particular species; however, the designated species is not at a level requiring state listing as rare or endangered. No species designated as sensitive by a state would be found along the proposed action, alternatives, or variations.

United States Department of Agriculture | Rural Electrification Administration | Washington D.C. 20250

JUL 28 1981

OFFICIAL FILE COPY

SUBJECT: Docket No. CP79-424
Case No. U-45957

TO: The Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

CENTRAL FILES

RECEIVED BY
AUG 4 1981
ENVIRONMENTAL EVALUATION BRANCH

We have reviewed the Draft Environmental Impact Statement (DEIS) regarding Rocky Mountain Pipeline Company's proposed interstate natural gas transmission system and offer the following comments:

1. Page 3-22: The DEIS explains that prime agricultural land associated with the surface facility sites, except the compressor station near Sage, is not known because specific site locations are not available. However, page 3-31 states that, "all of the aboveground, permanent structures for the proposed action have been generally located..." Prime agricultural land, if any, associated with the general locations for these aboveground or surface facilities should be identified and quantified. A statement of whether there are any practical alternatives should be included for any prime agricultural land that is affected, and if there are no practical alternatives the reasons should be stated. In addition, identify the environmental impacts on any affected prime agricultural land. 1

2. If affected, prime agricultural land should be identified and quantified for the alternative routes and the variations, giving the same amount of detail as asked for in comment no. 1. 2

3. Page 3-31: The DEIS states that "the proposed pipeline system would cross a floodplain at each stream crossing. The floodplains would vary in width from a few feet on either side of the stream to several thousand feet." These floodplains should be identified and quantified for each crossing. State whether there are any practical alternatives to crossing these floodplains and if there are none, state the reasons. Identify any environmental impacts expected at these crossings. 3

4. Floodplains crossed by the alternative routes and the variations should be identified and quantified giving the same amount of detail as asked for in comment no. 3. 4

5. Page 2-40: The DEIS points out that the gradual expansion of existing systems could create greater construction requirements and impact more environmentally sensitive areas than those crossed by the proposed action. A statement should be included to support this reasoning and explain how or why this type of a situation could result. 5

1. All proposed surface facility sites were evaluated to determine whether prime agricultural land or other cropland would be removed from production for the life of the project. This would be a significant agricultural concern. Cropland and prime agricultural land were identified and quantified according to general locations of proposed surface facility sites. Specific locations and acreages of croplands which would be affected can be determined only after final route selection and the right-of-way alignment is staked.

2. The EIS recognizes avoidance of cropland and prime agricultural land for surface facility sites as a means to minimize impacts related to agriculture.

3. The floodplains are identified by named stream crossings in appendix A of the water resources technical report. The technical report lists the stream crossings in a downline order by milepost for all routes. This report further states the methodology used to determine and locate the floodplains, the affected environment, and the environmental consequences of their use. There are no practical alternatives to crossing the floodplains; a linear project more than 600 miles long must periodically cross streams.

The Executive Order that protects floodplains states that the 100-year floodplain will be studied to determine the effects of its use. In the project area, there have not been sufficient hydrological studies to identify the 100-year floodplains. Therefore, the EIS contains the general statement that each stream crossing would have a floodplain associated with it.

The Secretary

6. The Northern Systems Alternative appears to be more environmentally sound than the proposed action and if this alternative is not chosen an explanation of the trade-offs involved in not selecting the environmentally preferrable route should be included. 6

Thank you for the opportunity to comment.

Charles T. Crowley

CHARLES T. CROWLEY
Chief, Environmental Services Branch
Environmental and Energy
Requirements Division

3. Given the applicant's construction technique and the revegetation plan, no significant impacts would result from trenching through the floodplains. Because of this, the floodplains were not identified or quantified for any of the crossings; rather, an idea of the number of floodplains that would be crossed can be reached by reading the water resources discussion for each alternative, which lists the number of stream crossings.

4. Please see the response immediately above.

5. The statement on page 2-40 refers to the potential situation, whereby individual pipeline projects, none "major Federal actions," could be constructed without the extensive review incorporated into EIS preparation. These individual projects, constructed at different times, could create combined impacts greater than those of the proposed project.

6. As indicated in the last paragraph of chapter 1, an EIS is only one of a number of factors that will be used by the FERC to determine if the proposed project should be authorized or denied. The FEIS will be circulated before the administrative record has been fully developed.

The DOI Land Managing Agencies' preferred alternative is based on economic, social, environmental, and other factors. It may not be environmentally superior.

After the EIS is completed, BLM will prepare a decision document for the Secretary of the Interior and his line management and the FS management involved in making the decision on the proposed right-of-way. This document will identify all possible alternatives and the various factors which should be considered, including the advantages and disadvantages of choosing each route. The decisionmakers will make their decision on whether to allow a right-of-way and which route it will follow. The alternative preferred by the land managing agencies in the FEIS may or may not coincide with this decision.

United States Department of Agriculture
Soil Conservation Service
2828 Chiles Road
Davis, CA 95616
(916) 758-2200

August 13, 1981

Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

Dear Mr. Secretary:

We acknowledge receipt of the draft environmental impact statement for the Rocky Mountain Pipeline Project, Docket No. CP79-424, Case No. U-45957, that was mailed to Francis Lum on July 10, 1981 for review and comment.

We have reviewed the above draft and have the following comments:

1. On table 2-1, page 2-7, titled Facilities and Components, under Land Requirements, the Construction ROW does not have units listed. We note on page 2-17 that these indeed are acres and suggest you add units to the table.

2. On page 2-21, we note that SCS would be consulted on specific seed mixtures to use in the revegetation program. Along with seed mixtures, certain SCS standards and specifications for vegetation could be included as well. These would contain fertilizer, mulch, and seed recommendations.

3. The document indicates that impacts to cropland would be short term or for the growing season only, except for the five acres permanently lost to the project. Where possible, rights-of-way should be coordinated so as to disrupt only the edge field boundaries in order to minimize impacts.

We appreciate the opportunity to review and comment on this proposed project.

Sincerely,

Francis C. H. Lum

FRANCIS C. H. LUM
State Conservationist

cc: Norm Berg, Chief, SCS, Washington, D.C.

Table 2-1 has been revised to include units of measurement. These were inadvertently omitted during the printing process.

The text has been modified to reflect this comment.

Coordination with field boundaries is recognized, where significant, to minimize impacts to resources such as those to orchard areas. Since this is an underground facility, impacts related to field boundary coordination are not as critical as they are for projects with surface structures along the right-of-way.

Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

In reply refer to: SJ

August 31, 1981

OFFICIAL FILE COPY
CENTRAL FILES

Your Reference:
Docket No. CP 79-424
RMPP DEIS

Mr. Kenneth Plumb, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, NE.
Washington, D.C. 20426

Dear Mr. Plumb:

We have reviewed the Draft Environmental Impact Statement (EIS) on the Rocky Mountain Pipeline Project, and we have one comment:

A statement is made on page 2-17 that each of 15 cathodic protection stations will "need a source of electricity; thus they would require unknown lengths of electric powerline to be installed." The EIS should make clear who will supply this power, since if a customer of Bonneville Power Administration (BPA) is involved, an additional load may be placed on BPA and may even, depending on the size, qualify as a New Large Single Load.

If you would like further information, please contact this office.

Sincerely,

Anthony R. Morrell

Anthony R. Morrell
Acting Environmental Manager

Utah Power and Light Company is the only potential source of power supply identified by RMPC. The specific power needs and sources for the RMPP, alternatives, and variations have not been identified or studied.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, D.C. 20410

OFFICE OF THE SECRETARY

JUL 27 5 29 PM '81

JUL 23 1981

FEDERAL ENERGY REGULATORY COMMISSION

RECEIVED BY
AUG 4 1981
ENVIRONMENTAL EVALUATION BRANCH

OFFICE OF THE ASSISTANT SECRETARY
FOR COMMUNITY PLANNING AND DEVELOPMENT

IN REPLY REFER TO:

OFFICIAL FILE COPY

TO	INIT.	DATE
DOCKET		

CENTRAL FILES

CP79-424

Honorable Kenneth Plumb
Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

Dear Mr. Secretary:

Subject: Draft Environmental Impact Statement
Rocky Mountain Pipeline Project

Thank you for providing us the opportunity to review the above draft Environmental Impact Statement (EIS). In accordance with 24 CFR Part 50 Protection and Enhancement of Environmental Quality, Department of Housing and Urban Development procedures, particularly Section 50.61 of our Regulations, we are forwarding the EIS to the responsible HUD Regional Environmental Officer. He will review and comment as appropriate, directly to you by your due date.

If non-HUD EIS's are sent directly to the Office with review responsibility, it would assure more prompt and thorough review. You should send copies of all future EIS's as follows:

1. All EIS's on legislative proposals, regulations, or policy documents of national or multi-state programmatic significance are reviewed by HUD Headquarters and should be sent to Mr. Richard H. Broun, Director, Office of Environmental Quality, HUD, Washington, D. C. 20410; and

2. All other site specific activities or project EIS's should be forwarded to the appropriate HUD Regional Office for comment. We have enclosed a list of our Regional Environmental Officers and their addresses.

If you have any questions in this regard, please feel free to contact me at (202) 755-6300.

Sincerely,

Richard H. Broun
Director
Office of Environmental Quality

Enclosure

No response required.

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Philadelphia, Pa. 19106

States: Pa., Delaware, Maryland, Va., West Virginia, D.C.

Region IV
Ivar Iverson
Environmental Officer
Department of Housing
& Urban Development
Richard B. Russell Fed. Bldg.
75 Spring Street, S.W.
Atlanta, Georgia 30303

States: Florida, Ga., Ala., Miss., Tenn., Ky., N.C., S.C.

Region V
Harry Blus
Environmental Officer
Department of Housing
& Urban Development
300 South Wacker Drive
Chicago, Illinois 60606

States: Ill., Ind., Mich., Minn., Ohio. Wisconsin

Region VI
Otis Trimble
Environmental Officer
Department of Housing
& Urban Development
221 W. Lancaster Avenue
P.O. Box 2905
Fort Worth, Texas 76113

States: Texas, New Mexico, Oklahoma Arkansas, Louisiana

Region VII
Gary Ultican
Environmental Officer
Department of Housing
& Urban Development
Federal Office Building
911 Walnut St., Room 300
Kansas City, Kansas 64106

States: Missouri, Kansas, Iowa, Nebraska

Region VIII
Walter Kelm
Environmental Officer
Department of Housing
& Urban Development
Executive Tower Building
1405 Curtis Street
Denver, Colorado 80202

States: Montana, Wyoming, Colorado, N. Dakota, S. Dakota, Utah

Region IX
Dale James
Environmental Officer
Department of Housing
& Urban Development
450 Golden Gate Avenue
Box 36003
San Francisco, Ca. 94102

States: Calif., Arizona, Nevada, Hawaii, Guam, American Samoa, Trust Territories

Region X
Ry Tanino
Environmental Officer
Department of Housing
& Urban Development
3003 Arcade Plaza Bldg.
1321 Second Avenue
Seattle, Washington 98101

States: Wash., Oregon, Idaho, Alaska

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
REGIONAL/AREA OFFICE
EXECUTIVE TOWER - 1405 CURTIS STREET
DENVER, COLORADO 80202

REGION VIII

August 5, 1981

IN REPLY REFER TO:

8SOQ

U.S. Department of the Interior
Bureau of Land Management
Office of Special Projects
555 Zang Street
Denver, Colorado 80228

Gentlemen:

Thank you for the opportunity to review and comment on the draft Environmental Impact Statement (EIS) for the Rocky Mountain Pipeline Project.

Your draft has been reviewed with specific consideration for the areas of responsibility assigned to the Department of Housing and Urban Development (HUD). The review considered the proposal's compatibility with local and regional urbanized areas. Within these parameters we find this statement adequate for our purposes.

Our review only considered the consequences of your proposal within Region VIII. Any impacts on states other than Wyoming and Utah were not addressed.

We have contacted our San Francisco counterpart and he will make any necessary comments pertinent to HUD Region IX.

If you have any questions regarding these comments, please contact Mr. Carroll F. Goodwin, Area Environmental Officer at 837-3102 in Denver.

Sincerely,

Raymond D. McKinney

Raymond D. McKinney
Director
Program Planning and Evaluation

AREA OFFICE
DENVER, COLORADO

No response required.

DEPARTMENT OF THE AIR FORCE
Headquarters 554th Operations Support Wing (TAC)
Nellis Air Force Base, NV 89191

SPECIAL PROJECTS STAFF
AUG 1 0 1981
RECEIVED

DEIR (Ms. Hein, 2924) 4 August 1981

Proposed Rocky Mountain Pipeline Project

Bureau of Land Management
Office of Special Projects
555 Zang Street, 3rd Floor East
Denver, Colorado 80228

1. Reference OPPR/DPC-EEB, Rocky Mountain Pipeline Company, Docket No. CP79-424, and the Draft Environmental Impact Statement (DEIS), dated July 1981.

2. In the event the pipeline follows Variation 3 — East Las Vegas Variation, described on page 3-63 of the DEIS, and comes on to Air Force controlled lands, the Company will have to get a permit from Nellis Air Force Base.

3. Request the Company be advised a lead time of several months is needed to get Base/Headquarters Tactical Air Command approval; and execution of a permit by the Corps of Engineers, the Air Force real estate agent.

4. The Company request should be addressed to the Commander, Attention: 554 OSW/DEIR, Nellis Air Force Base, Nevada 89191.

ADENOIS A. LUJAN
Asst Deputy Commander for
Civil Engineering

Copy to: Ms. M. A. Ryan, PE
Pacific Gas Transmission Co.
245 Market Street
San Francisco, CA 94105

Thank you for the information. The applicant would obtain this permit prior to any activities. It has been notified of this requirement. The permit has not been added to the list in the EIS, since it is only for the proposed action. It is assumed that similar permits would be necessary for each alternative, thus they were not listed for each route analyzed.

DEPARTMENT OF THE ARMY
SOUTH PACIFIC DIVISION CORPS OF ENGINEERS
630 SANSOME STREET, ROOM 1216
SAN FRANCISCO, CALIFORNIA 94111

SPDPD-R

OFFICIAL FILE COPY

TO	INIT.	DATE
DOCKET		

CENTRAL FILES

21 AUG 1981

Kenneth F. Plumb, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, NE
Washington, DC 20426

Dear Mr. Plumb:

The Rocky Mountain Pipeline Project (Docket No. CP79-424, Case No. U-45957) FERC, BLM, Sage, Wyoming to Searchlight, Nevada Draft Environmental Impact Statement was referred by the Office of the Chief of Engineers to this office for preparation of comments and direct reply to you. We have reviewed the project and found that implementation of the program would not conflict with any projects or programs within our jurisdiction.

In regard to flood control, it appears that consideration has been given to the impacts of locating above-ground facilities within 100-year flood plain areas. However, the statement does not appear to provide assurances that stream crossings would be constructed to avoid restrictions to flow or to prevent flood damages to the pipeline or appurtenances. The proposed pipeline plan should not significantly change hydrologic conditions or floodflows as they relate to urban areas.

In flowing streams, the water flow would be maintained during construction and the streambeds would be returned to their original contours. The applicant has also indicated that the pipeline would be buried a minimum of 5 feet below streambeds. This measure should protect the pipeline except in cases of severe stream bed erosion. If the pipeline were exposed, the applicant would have to either rebury and protect it or establish a new crossing.

Construction of pipeline crossings of waterways of the United States will require Department of the Army permits under Section 404 of the Clean Water Act (33 USC 1344). The report recognizes nationwide and specific permits will be obtained, as appropriate. With regard to streams in the jurisdiction of our Sacramento District, a letter from that District dated 10 November 1980 to BLM (Inclosure 1) furnished data regarding streams which would require permits. In addition construction work involving streams (in Washington County, Utah, Lincoln and Clark Counties in Nevada, and San Bernardino County in California) that drain into the Virgin River or the Colorado River below Lees Ferry are under the jurisdiction of our Los Angeles District and would require Section 404 permits. If Alternative Pipeline Route C is utilized, Section 404 permits would need to be obtained for work in White Pine, Nye, and Esmeralda Counties in Nevada, and Mono, Inyo, Kern, and San Bernardino Counties in California.

Thank you for the additional information. "Authorizing Actions" listed in chapter 2 and in the accompanying narrative in appendix D focus on various Federal, state, county, and local actions required to implement the proposed action. Since the same general types of authorizations would be required for the various alternatives and variations, they are not presented in the EIS. Individual Section 404 permits needed along the proposed action have been added to the discussion.

Thank you for the opportunity to review the proposed project.

Sincerely,

NEIL E. SALING
Colonel, CE
Deputy Commander

1 Incl
as

SPKCO-O (NWUC-96) 10 November 1980

Mr. Gary R. Konwinski
U.S. Department of the Interior
Bureau of Land Management
Special Projects Staff
3rd Floor, East
555 Zang Street
Denver, Colorado 80228

Dear Mr. Konwinski:

This is in response to your letter of 8 October 1980 inclosing maps and other data showing various stream crossings of the proposed Rocky Mountain Pipeline Project.

Our review of your project has determined that the following streams will be crossed at locations below the headwaters, which is defined as the point on a stream where the average annual flow is less than 5 cubic feet per second.

Big Creek	Weber River	Provo River
Woodruff Creek	East Canyon Creek	Strawberry River
Saleratus Creek	South Fork Creek	Soldier Creek
Lost Creek	Beaver Creek	Salt Creek

The Department of the Army has issued a Nationwide Permit that allows for the placement of dredged or fill material in association with utility crossings in "waters of the United States". Construction of the pipeline across the above listed streams can be accomplished under this authority provided the work meets the conditions on the attached information sheet. This authorization does not allow for construction of cofferdams. Should the contractor choose to construct a cofferdam at any of the crossings, an individual permit application will be required for the fill material placed in the streambed.

All other stream crossings shown on the maps (within the Sacramento District boundaries) have been determined to be above the stream headwaters and are subject to the conditions of the attached information sheet for work above headwaters. No individual permit is required for cofferdam construction above the headwaters.

Certification that the proposed work will not violate applicable state water quality standards may be required from the state prior to the commencement of any of the stream crossings.

Inclosure 1

No response required as this letter is not a comment on the DEIS, but an attachment to the previous letter from the Army Corps of Engineers.

Thank you for your cooperation, and if you have any questions, please contact Mr. Skerdal in our Salt Lake City Regulatory Office, telephone 588-5015 FTS.

Sincerely,

G. W. PROBASCO
Chief, Construction-Operations
Division

2 Incl
As stated

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

AUG 27 1981

Mr. Kenneth Plumb
Secretary, Federal Energy
Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

Dear Mr. Plumb:

We have reviewed the draft environmental impact statement for the Rocky Mountain Pipeline issued jointly by the Federal Energy Regulatory Commission and our Bureau of Land Management on July 10, 1981.

Our comments are presented according to the format of the statement or by subject.

General Comments

The general consensus throughout the Department is that the statement is well prepared. For example, significant terrestrial and aquatic wildlife impacts seem to have been addressed to the extent feasible at this stage of project planning. Some potential site specific plant and wildlife problems only become apparent, or are dealt with effectively, when exact right-of-way alignments are determined. Therefore, we emphasize the importance of maintaining close coordination with the appropriate state fish and wildlife conservation agencies and the Fish and Wildlife Service, as detailed planning progresses.

In addition, we note that alternatives to the proposed action many times do not follow established utility corridors. Alternative B is of special concern because of important scenic values and the scientific uniqueness of geologic formations contained in the narrows of Marysvale Canyon.

It is suggested that prior to actual construction, meetings be scheduled with the Moapa Tribal Council, the Bureau of Indian Affairs and the Bureau of Land Management to keep the land management agencies advised of the progress of the pipeline.

This coordination would be carried out before construction.

Wildlife

Reference is made to Chapter 3, pages 3-11, Table 3-7 and 3-8. It is stated that there are 51 miles of raptor habitat along the 583 miles of pipeline and right-of-way. Utah has a large number of birds of prey. For example, in Rich County, Utah, 50-60 active raptor nests have been sited. In addition, the data concerning golden eagle population appears very conservative. Utah has a healthy golden eagle population with 60-75 known active eagle nests in Tooele County, alone.

Visual Resources

Your attention is directed to two areas of sensitive visual concern: Scipio Pass and the area between Cove Creek and White Sage Flats, where the narrow right-of-way, steep topography and vegetation types would be particularly conducive to highly visible scarring.

Pipeline construction would cross Highway 40 and parallel the Strawberry Westside Road which is the major recreation access road. Scenic overlooks and the Strawberry Administration Site would also be affected since their main access is by way of the Strawberry Westside Road.

Land Uses

Recreation - Recreationists at Strawberry Reservoir and Deer Creek Reservoir are accustomed to seeing heavy traffic in these areas; however, any traffic delays should be on weekdays only (no weekends or holidays) and limited to 30 minutes at a time. Delays of a longer nature would create such congestion that it would take hours to unravel.

Cultural Resources

No mention is made of the Oregon National Historic Trail in the environmental statement, graphic supplement, or Technical Report for Cultural Resources. In comparing the location of the Oregon Trail with the route of the Northern System Alternative shown on Map S-13, it appears that the pipeline would be adjacent to the trail in the vicinity of Montpelier and Soda Springs, Idaho.

The present proposal through Echo Canyon, Utah crosses the eastern end of the canyon where a pipeline valve is located at about MP (mile post) 50. Interstate 80 at this location is the driving route for the Mormon Pioneer National Historic Trail. We would urge that the valve station be situated and/or landscaped in such a manner as to avoid being a distraction for travelers along the trail in this area. Reference is made to Map S-2 which shows the proposed pipeline passing east of the Ball and Moore reservoir. That point is the approximate location of Cache Cave in the S 1/2, Section 23, T. 13 N., R. 7 E. We also note that map S-2 approximates the pipeline route as being variable in location within a 1-mile corridor. We urge that the pipeline be located at least 1 mile east from Cache Cave. Even there, it will cross the route of the original trail in either Section 13 or Section 24.

It is agreed that Utah has a large number of birds of prey. Because raptors are sensitive to disturbance at a distance of about 1 mile, only those nests within a mile or so were inventoried as potentially impacted. Raptors out of the range of impacts were not discussed or further analyzed.

The Scipio Pass area through which the proposed action would pass was analyzed for significant visual impacts. Changes in landform and vegetation would create a high, long-term impact which would be viewed from Interstate 15, for 4 miles, as summarized in table 4-1 for MP 232 to MP 235.

The proposed route between White Sage Flats and Cove Creek would create short- to long-term visual impacts because of the vegetative clearing. Analysis showed that the change for significant contrast would be low because alignment and clearing considerations during route design would lessen the impact to an acceptable level under the VRM Class 3 objective.

All points were considered when determining the significance of visual resource impacts for the Strawberry Reservoir Area.

The Oregon Trail is discussed in the technical reports for recreation and wilderness and for visual resources. Specific sites and trail locations that could be adversely affected by the project will be identified during field inventories before construction. Oregon Trail has been added to appendix L.

Mitigation measures have been added to appendix C to either move the valve or screen-landscape it. Another measure would cause the route to avoid Cache Creek.

Cache Cave is a very important point along the Mormon Pioneer National Historic Trail. The original route of the trail approaches Cache Cave from the east. The area near the cave was the first major campsite for emigrants entering Utah.

We recommend that the Oregon and Mormon Pioneer National Historic Trails be specifically described as examples of the "westward American expansion" mentioned in the treatment of history on page 3-26. Also, although the entire national historic trails are not on the National Register of Historic Places, since the Congress considered them important enough for national designation, we suggest that these two national historic trails should be listed as significant cultural resources in Appendix L.

Further, the draft EIS does not adequately identify and discuss impacts to other cultural resources, including Native American Sacred sites. In addition to identified impacts resulting from ground disturbing activities and increased numbers of people in the project area, the associated facilities would have a visual impact on any nearby above ground resources. Table L-1 in Appendix L does not indicate the distance from the MP to the resource, thus not clearly identifying possible impacts. The final EIS should include a more specific discussion of impacts and a copy of the Memorandum of Agreement to be developed with the Advisory Council on Historic Preservation, the State Historic Preservation Officers, and the Federal agencies.

The proposed Frenchman Mountain-Rainbow Gardens national natural landmark site would be bisected by the proposed alignment. This landmark area presents the complete stratigraphic relationship of the Precambrian, Paleozoic, and Mesozoic eras with numerous faults in classic textbook fashion. Destruction of these stratigraphic formations would be essentially permanent, and would reduce the nationally significant values of the site. Since there is little soil or vegetative cover on the site and recovery rates are very slow, even surface disturbance along the 100-foot wide construction corridor would have long-term impacts.

Since the pipeline would impact the visual, scientific, and geological resources of Frenchman Mountain-Rainbow Gardens, we do not concur with the statement on page xvii that no recreation resources of "high significance" would be affected. The impacts would be longer-term or permanent in nature, therefore we feel that the impacts on passive recreation opportunities would be significant as defined under the significance criteria contained in the document. We do not agree that impacts to the proposed landmark site would be confined to the four to six week construction period as indicated on page 4-15.

The East Las Vegas Variation (Alternative V-3) would avoid this landmark, however, it would impact the Las Vegas Sand Dunes Recreation Area, the most intensively used ORV area in southern Nevada. Therefore, we suggest consideration of another alternative which would pass south of the Las Vegas Sand Dunes Recreation Area and around the perimeter of the Frenchman Mountain-Rainbow Gardens landmark, thereby missing both areas.

The Oregon and Mormon Historic Trails are discussed in the recreation and wilderness technical report. The trails are not anticipated to sustain significant impacts from any of the project routes. However, actual centerline staking would provide a better chance to determine the possibility of impacts. Specific sites and trail locations that might be adversely affected by the project would be identified during field inventories before construction. They have been added to appendix L with a footnote that they are on the National Historic Trail Register.

Native American sacred sites are addressed in chapter 3, "Fort Mojave Variation," and in the cultural resource technical report.

Actual distances to specific sites would be determined during field inventories before construction and after detailed project design such as centerline staking. Because a mile-wide corridor is the study area, specific measurements are difficult to determine. The PMOA will be included in the FEIS if it is received in time from the Advisory Council on Historic Preservation.

This information is in the DEIS and in the FEIS. The 1-mile corridor does miss the stratigraphic formations.

Page 4-16 of the DEIS recognizes the potential for long-term significant visual intrusion upon the recreation experience of uses of the proposed National Natural Landmark with the following statement: "Additionally, there could be a long-term reduction in scenic quality enjoyed by recreationists in the area." "Summary: Recreation Resources" has been rewritten.

The Las Vegas Sand Dunes Recreation Lands is the "most intensely used ORV area in southern Nevada," as chapter 3, "Recreation Resources," states. However, the East Las Vegas Variation would bypass the proposed Frenchman Mountain-Rainbow Gardens National Natural Landmark. Safety hazards to ORV recreationists in the Las Vegas Sand Dunes Recreation Lands would be significant, particularly if any of the 30 annual ORV events are scheduled during pipeline construction. Additions have been made to chapter 4 and to appendix C, "Mitigating Measures Resulting from Impact Assessment."

Page L-2--The Nunn Powerplant in Utah County was placed on the National Register of Historic Places on December 13, 1979.

Appropriate changes have been made.

Geology and Topography

The draft does not discuss mineral resources or producing facilities beyond noting on page 3-14 that ". . . utilities, mining activity, and highways are scattered throughout the area" and stating on page 4-5, "Although various kinds of minerals may be present under some affected lands, implementation . . . would not preclude further development of these resources. Therefore, no geological or mineral withdrawal impacts are discussed."

Known mineral resources of the proposed corridor and environs include:

alunite	iron	salines
arsenic	lead	sand and gravel
barite	limestone	selenium
beryllium	manganese	silver
clay	molybdenum	tellurium
coal	oil shale	thorium
copper	perlite	tungsten
fluorite	phosphate rock	uranium
gold	pumice	vanadium
gypsum	rare earths	zinc

This issue should be reappraised in the final statement.

Thank you for the information on minerals. It is believed, after analysis, that neither the proposed action nor any of the alternatives would preclude mining activities. Therefore, no mineral withdrawal impacts are discussed in the FEIS.

Water Resources

The Salt Lake Aqueduct running from Deer Creek Reservoir to the mouth of Provo Canyon would be disturbed by any major blasting or crossing of heavy construction equipment.

The applicant would probably place the pipeline in the area which would cause them the least administrative and physical effort within the 1-mile wide study corridor. In any case, if a crossing of any aqueduct were necessary, the applicant would bore and case beneath the aqueduct. In addition, the operators of the Salt Lake Aqueduct could specify points of ingress and egress, plus general construction site cleanup, when RMPC negotiates a right-of-way with them. Appendix C states that ". . . restoration or mitigation are to be performed by the RMPP to satisfy the requirements of the landowner."

The Water and Power Resources Service has been renamed the Bureau of Reclamation. This change should be included in the final environmental impact statement.

Appropriate changes have been made throughout the EIS.

We hope these comments will be helpful in the preparation of a final statement.

Sincerely,

Richard White

Deputy Assistant SECRETARY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII

1860 LINCOLN STREET

DENVER, COLORADO 80295

AUG 2 4 1981

Ref: 8W-EE

Ms. Janis L. Bowles, Project Manager
Bureau of Land Management
555 Zang Street
Denver, Colorado 80228

Dear Ms. Bowles:

We have reviewed the draft environmental impact statement for the proposed Rocky Mountain Pipeline Project, and we have come to the same conclusion as the Forest Service and the environmental staff of the Federal Energy Regulatory Commission. From an environmental perspective, the Northern Systems Alternative appears to be significantly superior to the proposed alternative because it makes extensive use of existing pipeline and corridors. Because of the availability of an environmentally preferable alternative, we have reservations with the pipeline alignment of the proposed action.

The Region IX office of EPA has identified some information gaps in the EIS which are discussed in the detailed comments attached. If you have any questions concerning the detailed comments, please contact Susan Sakaki directly at FTS 556-7858.

Thank you for providing us the opportunity to review and comment on this impact statement. In line with our policy to categorize the nature of our comments, we have no objections to the Northern Systems Alternative (LO), we have environmental reservations with the proposed action (ER), and we believe additional information in some areas could be helpful (2).

Sincerely yours,

Steven J. Durham
Regional Administrator

EPA's Detailed Comments on the Draft EIS
for the
Rocky Mountain Pipeline Project

I. Water Quality Comments

A. Pipeline Safety

1. Hydrostatic testing of the pipeline for safety would require 170 million gallons of water; this amount would supply the domestic needs of 4600 people for one year. This represents a significant water resource impact. The FEIS needs to address the availability of water for this test. The Northern Systems Alternative would significantly reduce the demand for water in areas which have limited supplies.

2. Page 2-25 describes a program of aerial and ground inspection of the pipeline for leaks in the line, using the criteria of erosion and dead vegetation to serve as indicators. The FEIS needs to elaborate on the procedures for the Leak Detection Program. This description should provide details of the automatic control features of the pipeline (telemetry system). Additionally, details should be provided on the procedures contained in the Emergency Plan for detecting and mitigating impacts at stream crossings and areas of high static water levels (water table) with small zones of aeration.

B. Soils

1. The summary on p. xvii states:

"All pipeline routes would cross acres of soils which are highly susceptible to slides, high erosion hazards, and other limitations associated with project construction and restoration. Acreages would vary from 279 acres along the best-case Northern Systems Alternative to 6,157 acres along the Central Nevada Alternative. The proposed action would cross 3,056 acres of such soils."

The DEIS categorically describes by generalized groupings soils which are considered to be most susceptible to environmental impacts. Data giving total area extent by grouping are presented but discussion of occurrence and extent are found in the Soils and Agriculture Technical Report. EPA Region IX did not receive a copy of this document to evaluate the data base from which these generalizations were derived and therefore cannot attest to the accuracy of Table 3-9 which presents the extent of various soil impacts. At a minimum, the FEIS should add to the graphic supplement a mapping of the locations of generalized soil groupings along the alternative routes.

Chapter 2, "Proposed Action: Construction, Operation, and Maintenance," states:

> The pipeline, tested in lengths dictated by elevation differentials, would require about 279,210 gallons of water per test segment mile. Test water would be pumped to succeeding segments to be reused as many times as practical before discharge. The water would be withdrawn and discharged in accordance with all applicable state and Federal regulations.

The comment that the pipeline would require 170 million gallons of water for testing is in error.

The availability of the water for the test is, similarly, not an issue. The applicant has two options for obtaining water or withdrawing it from a surface source: 1) purchase the water from a holder of existing rights or 2) apply for a permit to withdraw water for whatever use is intended, such as hydrostatic testing.

In the first case, there would be no precautions to ensure avoidance of downstream impacts from the withdrawal. This is because the holder of the water rights holds an agreement with the State Engineer's Office stating the conditions under which water can be withdrawn. Therefore, even if a portion of the water rights were to change hands, the withdrawal conditions would have to be met.

In the second case, where a permit is required, the issuing state agency--in most cases, the State Engineer's Office--would set a withdrawal rate compatible with downstream uses. The permit system has been designed to minimize impacts to the water bodies involved.

The applicant has not described a detailed leak detection program for the proposed pipeline system. However, if a pressure differential (leak) were detected at the control center in Salt Lake City or at the downstream metering station, the right-of-way would be thoroughly inspected. Since leaking natural gas flows to the area of least resistance, it would most likely percolate to the soil surface, killing vegetation or, at stream crossings, bubble to the water's surface. If a large pressure differential were detected, the pipeline system would be shut down. Detailed information on the automatic control (telemetry system) is not available. RMPC will have to comply with CFR Title 49, Part 192, Subpart M, "Maintenance."

Table B-1 in appendix B of the soils and agriculture technical report identifies the approximate occurrence and extent of general soil associations, by milepost, for the proposed action, alternatives, and variations. It is not necessary to include this information in the EIS. The technical report has been provided after receipt of the comment letter.

2. a. The summary, on p. xvii, concludes that "with implementation of the Erosion Control, Revegetation and Restoration Guidelines, all but a few localized areas affected by any of the routes should be successfully stabilized within 1 to 5 years." The FEIS should specify how and when mitigation measures would be instituted, indicating the entities and staff responsible for the work to be performed, enforcement and monitoring activities, should this project proceed. 1.

b. Revegetation of natural flora by seeding or other means should be considered mandatory. Because construction spreads will only last 6-8 weeks, follow-up is necessary by designated personnel. Seeding closer to optimal germination conditions should be preferable during the proposed May to October construction period. 2.

c. Erosion control measures should be considered mandatory in the fragile and arid desert environment. Double-ditch trenching to preserve the soil strata may prove to be more effective than mulching in windy areas with dry soil conditions. 3.

C. Water Resources

1. a. The summary, on p. xviii, states, "The only water resources which would be affected by any of the pipeline routes would be streams which would be crossed." The data presented in the DEIS is inadequate to fully assess this conclusion. The Water Resources Technical Report was not provided, therefore adequate analysis of data cannot be made. 4.

b. The DEIS discusses the total number of intermittent vs. perennial streams which would be impacted by each alternative. The proposed action crosses 61 streams while the Northern Systems Alternative crosses between 10 and 36 streams, depending on final routing. It would appear that the Northern Systems Alternative would minimize impacts. 5.

However, it is difficult to determine which routes would yield the least impact in that the reader must accept that "the flow characteristics and the bed composition of the streams which would be crossed by the alternatives and variations are similar to those of the proposed action; therefore the impacts from construction of crossings would be the same" (p. 4-24). Without maps or stream listings in the DEIS, such a conclusion cannot be verified.

2. No mention is made in the DEIS of the appropriate standards for the various stream reaches which could be affected. The FEIS should identify sensitive stream reaches and their existing ambient Water Quality Standards. 6.

1. Site-specific plans for how and when mitigation measures would be instituted on private lands are not available and must be developed between RMPC and the private landowner. As stated in appendix C, the rights and obligations of the RMPC in its use of private lands will be defined in the terms of the right-of-way agreement between RMPC and the landowner. The agreement could require that the restoration and mitigation measures satisfy the requirements of the landowner.

For mitigation which will be stipulated in the Federal right-of-way grant, refer to appendix C, "Erosion Control, Revegetation, and Restoration Guidelines Proposed by the RMPC" and "Erosion Control, Revegetation, and Restoration Guidelines for Use on Federal Lands." These guidelines identify: (1) the development of a detailed site-specific reclamation plan; (2) applicable erosion control and revegetation measures; (3) implementation and compliance; (4) applicant's responsibilities relating to appropriate liaison with Federal agency officials, local governments, and private landowners; and (5) monitoring and maintenance activities. This treatment gives sufficient detail for the FEIS and will be included as a general stipulation in the right-of-way grant. Then, when the actual pipeline route is staked within the approved 1-mile wide corridor, specific measures (based on the guidelines) will be developed to ensure that unnecessary resource impacts do not occur.

2. Refer to appendix C, "Erosion Control, Revegetation, and Restoration Guidelines Proposed by RMPC" and "Erosion Control, Revegetation, and Restoration Guidelines for Use on Federal Lands." Applicable erosion control and revegetation measures, their implementation, specifications, and compliance commensurate for conditions encountered, are recognized and identified. Followup and monitoring is part of the guidelines. (See "Maintenance and Monitoring.")

3. Erosion control measures will be mandatory everywhere along the route. Double-ditch trenching would be used to preserve topsoil where applicable. Suitable mulches are highly recognized and effective practices to protect unvegetated soil under most conditions. Seeding would be used where seasonal or weather conditions are most favorable for successful revegetation. Determinations of which specific practices should be used in a specific area would be made on the ground by the Authorized Office. No changes have been made to the EIS, because the Erosion Control, Revegetation and Restoration Guidelines will be a stipulation in the right-of-way grant and will protect the environment.

4. The discussion in the DEIS is not data but conclusions reached from data used in the water resources technical report. This report documents research on impacts; if significant impacts were identified, they were noted in the EIS.

   All technical reports were provided to your office in November 1981.

5. The total number of streams crossed is but one measure of the impacts to streams. Other parameters considered are the FWS's stream classification ratings, the wild and scenic qualities of the stream, and, in general, the water course type (is it a minor stream or is it a major river?). Due to these ratings and the fact that the southwestern portion of the project area is very arid, total stream crossings are not the best measure of the impacts for the various route alternatives; however, they are the only ones that could be used without conducting on-the-ground research, which was not possible as part of the EIS preparation.

   Available data, both published and unpublished, were compiled for the project area. This literature search determined that the streams fell into two groups according to their transport characteristics. (This method is described in the water resources technical report. We believe these groups accurately represent the streams. All named streams for the proposed action, each variation, and all the alternatives were compiled from USGS 1:250,000-scale maps. A 20-percent reduction of these maps accompanied the DEIS in the Graphic Supplement.

6. The technical review for the water resources in the area and the project components showed that the threat to water quality was so remote that a discussion of existing water quality standards was not warranted.

3. The FEIS should also identify the locations of any shallow aquifers which could be affected by the proposed project or alternatives.

The effect of the project on shallow aquifers did not warrant inclusion in either the DEIS or the FEIS.

D. Secondary Impacts

1. Construction and access roads will increase the potential for "off-road" vehicle traffic. The FEIS should discuss how the impacts of this activity on generalized soil groupings can be minimized. Also, abandonment of roadways after construction should be conducted to ensure no future use.

Abandonment of temporary roads after construction is addressed in item 7 under "Right-of-Way and Site Clearing," appendix C, "Erosion Control, Revegetation, and Restoration Guidelines for Use on Federal Lands," and in appendix C, "Mitigating Measures Resulting from Impact Assessment: Wildlife."

Impacts relating to ORV traffic would be minimized by the right-of-way maintenance and monitoring program identified in "Maintenance and Monitoring," appendix C.

2. The proposed project is designed to tranport natural gas to California and other Western markets, specifically New Mexico and Arizona. However, the proposal describes transport to and termination in California exclusively. The FEIS should address distribution of gas to New Mexico and Arizona, as well as the associated Environmental Assessment.

Information indicating how gas would be distributed in New Mexico and Arizona is not available. However, because of El Paso's existing transmission facilities in these areas, any sales of gas could probably be arranged by exchange. Southwest has also indicated that El Paso has agreed to file for two new delivery taps in the Las Vegas, Nevada, area if the RMPP is approved.

II. 404 Comments

A. Appendix D of the DEIS should be corrected to state that conditions of the Nationwide Permit are found at 33 CFR 323.4-3(b).

Suggested addition of CFR citation has been incorporated into the FEIS.

B. The FEIS should indicate whether any component of the National Wild and Scenic River System or any component of a State wild and scenic river system is to be crossed by the pipeline. The FEIS should also indicate whether a stream crossing may jeopardize the habitat of an endangered species.

The Nationwide Rivers Inventory System was studied during preparation of the technical report. This review determined that one stream, the Provo River, met the criteria needed for the Wild and Scenic Stream Classification; however, the NPS noted that it had been dropped from further study.

No habitat of an endangered species would be jeopardized.

C. Non-compliance with the conditions noted above or other conditions listed under 33 CFR 323.4-3(b) would necessitate an individual review of dredged or fill material placement for pipeline bedding or backfill in streams.

See response to the previous comment.

III. Energy Conservation Comments

The Energy Conservation Alternative (p. 2-37) was not adequately analyzed in the DEIS. The FEIS should present a thorough analysis of conservation potential and necessary measures to be taken toward that end. EPA recommends that the DOI/BLM Energy Conservation Analysis contained in the Allen-Warner Valley Energy System EIS could serve as a basis for further analysis of such an alternative.

The FERC EIS team disagrees. The Allen-Warner Valley Energy System: FEIS, which was reviewed in preparing the Energy Conservation Alternative discussion for the DEIS, reaches no conclusions about whether conservation could replace the Allen-Warner Valley Energy System.

California is actively promoting conservation measures. Meanwhile, the CPUC indicates that the demand for natural gas has been growing at a rate three times that of conservation's gains. This information and the measures that California has implemented are provided in the EIS. Therefore, presentation of more information on the Energy Conservation Alternative is not warranted. Energy conservation is just one of the measures that is being used to help meet the nation's energy needs.

State of California

GOVERNOR'S OFFICE

OFFICE OF PLANNING AND RESEARCH

1400 TENTH STREET

SACRAMENTO 95814

EDMUND G. BROWN JR.
GOVERNOR

August 26, 1981

Mr. Kenneth Plumb, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

RE: SCH #81071701
OPPR/DPC-EEB, Rocky Mountain Pipeline Project, Docket No. CP79-424

Dear Mr. Plumb:

State agency review of your draft environmental impact statement is complete and the comments of individual agencies are attached. If you have any questions about the comments or recommendations of these agencies, please contact the appropriate staffs. Highlights of the state agency comments follow.

DEPARTMENT OF FOOD AND AGRICULTURE

In general, the Department supports the proposed pipeline project. If the segment of pipeline in California is in an agricultural area, the Department agrees that double-ditching should be employed to conserve topsoil. In addition, any compacted cultivated land should be restored to its preconstruction condition.

DEPARTMENT OF TRANSPORTATION-DISTRICT 8

The proposed alignment and Alternative C would involve crossing state highways, thereby requiring an encroachment permit from CalTrans. Mitigation measures may be required as conditions for issuance of the permit, therefore, early and continuous liaison with CalTrans is urged on proposed construction plans affecting state highways. In addition, specific design features are suggested for pipelines crossing or adjacent to highways.

PUBLIC UTILITIES COMMISSION

The PUC staff finds that there is insufficient data in the DEIS to make a judgement that the Northern Systems Alternative is "significantly superior" to the proposed Rocky Mountain Pipeline Route. Until such time as environmental impact reports are prepared under CEQA for construction within California, the PUC staff cannot judge the superiority of any of the pipeline route alternatives. During the course of the certificate proceeding, economic, gas supply, and financial considerations will be fully evaluated.

See the following responses to the comments from each of the state agencies.

Thank you for the opportunity to comment on your draft document. If you would care for assistance, the Office of Planning and Research is available to help identify responsible agencies, organize coordination meetings, mediate disputes, and hold consolidated hearings.

Please contact Terry Roberts at the State Clearinghouse, (916) 445-0613, if you have any questions.

Sincerely,

Terry Roberts
for Stephen Williamson
State Clearinghouse

State of California

Memorandum

To : State Clearinghouse

Date : August 13, 1981

Place : Sacramento

From : Department of Food and Agriculture

Subject: Rocky Mountain Pipeline Project
SCH #81071701

California Department of Food and Agriculture (CDFA) does not oppose the proposed construction of the 583-mile pipeline for transporting natural gas. We note the only segment in California is a 27-mile pipeline which is a supplemental proposal by PG&E. Regarding this construction, the EIR does not state the land use of this area of eastern San Bernardino County.

The land in California is desert land in a natural condition.

If the 27-mile segment in California is in an agricultural area, then CDFA agrees that double-ditching should be employed to conserve topsoil, if requested by the landowner. Also, any cultivated land compacted during construction should be loosened and restored to its preconstruction condition. Of course, landowners would have to be compensated from the applicant for any loss of crops or other damages.

No response required.

Generally, we support the proposed pipeline from Lincoln County, Wyoming to the California-Nevada border, and the 27-mile segment in California.

Harry J. Krade

Harry J. Krade
Assistant Director
Special Assignments
(916) 445-0682

SURNAME
80-106

State of California | Business and Transportation Agency

Memorandum

To: Ms. Ann Barkley, DOTP

Attention Mr. D. Husum
A-95 Coordinator

Date: July 31, 1981

File: 08-SBd-40,95 & 395-Var
SCH #81071701

From: DEPARTMENT OF TRANSPORTATION
District 08

Subject: Rocky Mountain Pipeline Project (610 Miles Long Extending from Lincoln County, Wyoming into San Bernardino County, California)

We have reviewed the above-referenced document and request consideration of the following:

Two of the possible pipeline alignments would pass into Caltrans District 08. The Proposed Alignment would cross Interstate 40 and State Route 95. Alternative C would cross State Route 395. An encroachment permit will be needed and as a responsible agency, Caltrans may require that certain mitigation measures be provided as condition for issuance of a permit. We urge early and continuous liaison with Caltrans on proposed construction plans that could affect state highways. Encroachment permits can be obtained from:

California Department of Transportation
District 8
247 West Third Street
P. O. Box 231
San Bernardino, CA 92403

Forfacilities proposed within state highway rights of way, we suggest the following:

1. Lines parallel to the highway should be placed outside of the state highway rights of way, particularly controlled access facilities (I-40). Longitudinal installations within freeway/expressway rights of way require special approval and are allowed only if no other feasible alternative exists.

2. Transverse lines should cross the highway at right angles.

3. Lines may be required to be encased within the highway rights of way.

We would like a copy of the final document as soon as it is available. If you have any questions, please contact Steve Keel at (714) 383-4550.

R. G. POTE
Chief, Transportation Planning
cc: JVanBerkel
KOlson

REC'D AUG 4 1981

See the responses to the letter sent by The Resources Agency of California dated August 20, 1981 (page 3).

State of California

Memorandum

Date : August 14, 1981

To James A. Burns
Assistant Secretary
Resources Agency

From Public Utilities Commission — San Francisco -- Randolph W. Deutsch RWD
Principal Counsel
California Public Utilities Comm.

File No.:

Subject: Environmental Comments, Federal Energy Regulatory Commission's Draft Environmental Impact Statement, Rocky Mountain Pipeline Project. State Clearinghouse identification number 81071701

The California Public Utilities Commission (CPUC) staff has evaluated the Draft Environmental Impact Statement prepared by the U.S. Department of Interior, Bureau of Land Management, and the Federal Energy Regulatory Commission (FERC), Office of Pipeline and Producer Regulation, for the proposed Rocky Mountain Pipeline Project.

It is our understanding that both agencies have found that the environmental impacts associated with the construction and operation of the Rocky Mountain Pipeline Project would have a limited, adverse environmental impact and that the proposed project is environmentally acceptable, assuming the FERC finds a need for it (DEIS, p. 5-1). From a land managing agency's point of view, both the proposed route and the Northern Systems Alternative have been found acceptable and reasonable with certain variations. The U.S. Forest Service and the Department of Agriculture have found the Northern Systems Alternative environmentally preferable. The FERC environmental staff has found that the Northern Systems Alternative is "significantly superior" to the proposed route for the transportation of initial volumes of 413,000 Mcf per day. The FERC environmental staff concludes, however, that if throughput volumes for the project were to reach a higher level, such as 800,000 Mcf per day, factors such as economic and fuel use questions could override the alleged environmental advantages of the Northern Systems Alternative (DEIS, p. 5-2).

The CPUC staff has serious reservations as to whether there is adequate information in the DEIS to make a judgment between the alternate routes discussed. There is clealy insufficient data to find that the Northern Systems Alternative is "significantly superior" to the proposed Rocky Mountain Pipeline Route. Each of the routing proposals for the Rocky Mountain Pipeline Project involves construction within California. The original proposal would involve construction of 27 miles of pipeline by Pacific Gas and Electric Company in California. Alternatives to the Rocky

The FERC's environmental staff disagrees. "Economics, gas supply, financial considerations, etc." are not issues that should be addressed in an environmental impact statement. The statement that the Northern Systems Alternative is significantly superior to the proposed action is based solely on environmental considerations, and this position is clearly indicated within the text of the document. A conclusion based solely on environmental issues is not always in the best public interest if other factors favor a different choice.

Mountain Pipeline route involves as much as 235 miles of construction within California. The Northern Systems Alternative involves the construction of 148.3 miles of pipeline south of Brentwood in addition to the construction needed for the Western leg of the Alaska Natural Gas Transportation System. Any of these proposals will require the preparation of an environmental impact report under the California Environmental Quality Act. At this time the CPUC staff cannot ascertain to what degree the Federal Environmental Impact Statement can be incorporated into the state's environmental impact report. Because this agency will be placed in a position of issuing a decision on the routing within California and because the time period allowed for comments to the DEIS is insufficient to perform the detailed review contemplated under the California Environmental Quality Act, the CPUC staff cannot judge the superiority of any of the pipeline route alternatives at this time. It appears that all of the alternatives are viable but it is our view that the Northern Systems Alternatives should not be found to be environmentally preferable until the State of California has reviewed this route.

It clearly cannot be said, based on the current level of non-environmental information, that the Northern Systems Alternative is superior. In this case, even more than in other project applications, factors fully developed in the certificate proceeding such as economics, gas supply and financial considerations will be very significant in the pipeline routing decision.

Based on our knowledge of the project, it is our understanding that the Rocky Mountain Pipeline Project was designed for an optimum volume of 800 MMcf per day and that the 413 MMcf per day level was simply an initial transport volume for the pipeline. In analyzing the proposed pipeline, it is our belief that the Department of Interior and FERC staffs would be well advised to take into account the ultimate design of the proposed facility. We do not believe that the project can be appropriately evaluated unless its full potential transportation capacity is recognized. Indeed, it may be shortsighted to consider expanding existing systems to transport the initial volumes, such as is contemplated by the Northern Systems Alternative, when eventually additional volumes of gas are expected to be available for transport.

The CPUC staff also observes that the Northern Systems Alternative is premised on the completion of the western leg of the Alaska Natural Gas Transportation System. While significant progress has been made to finance the Alaska Natural Gas Transportation System, it is our understanding that financing of the vast new project is still not complete. It may be premature for the FERC staff to assume that the western leg will be available in the time frames require to transport gas from the Rocky Mountain area.

The applicant has stated that

> The certificate of public convenience applied for by RMP is for facilities and authorization to transport 413 MMcf/d. The proposed design of the project allows for expansion to an ultimate optimum capacity of 800 MMcf/d by adding, subject to regulatory approval, additional compressors.
>
> As set forth in Exhibit N of the amendment to application, Schedule 3 provides an illustrative showing assuming an ultimate volume throughput of 800 MMcf/d. Authority is not requested at this time for the facilities necessary to accommodate such increased volumes, nor has a specific source or field been identified as the source or field from which the gas will be produced.

The body of the document states, "The assumptions that the Western Leg will be completed south of Stanfield, Oregon, and that it can be prebuilt are essential to the feasibility of the Northern Systems Alternative." The RMPC has also indicated that its proposed schedule for construction is also subject to delay pending its acquisition of sufficient gas supply for the RMPP.

Our review of this DEIS shows that even at the initial volumes of 413 MMcf per day, significant volumes of additional fuel may be required to transport the gas through the Northern Systems Alternative. The proposed Rocky Mountain Pipeline Project was designed to be a very fuel efficient system using only approximately 2.91 MMcf per day of fuel to deliver the initial volumes. The proposed Northern Systems Alternative will use almost ten times as much fuel per day or 27.78 MMcf per day, to deliver the same volumes. The DEIS does not offer an economic analysis as to the impacts or effects of those increased fuel uses. Without such analysis, we believe that it would be difficult to conclude that the Northern Systems Alternative is superior to the proposed route. Fuel usage is a critical component in this economic analysis. Much of the Rocky Mountain gas will be deregulated and the quantity of gas consumed in transportation is critical. With increasing prices of natural gas, those receiving service by the proposed Rocky Mountain Pipeline Project may be more economically served by having entirely new facilities installed rather than increasing the fuel usage on existing systems. It also should be noted that, with deregulation, a purchaser that can economically transport the gas to market will have a distinct advantage in obtaining new supplies over a purchaser that must rely on a system with a higher transportation costs.

While the CPUC staff believes that the economics of the proposed Northern Systems Alternative require further study for the initial startup volumes we note that the problem is especially severe in the evaluation of the proposed Rocky Mountain Pipeline Project and the Northern Systems Alternative for deliveries at the 800 MMcf per day level. At this level the fuel usage on the Northern Systems Alternative (63.56 MMcf/d) greatly exceeds the fuel consumed by the proposed Rocky Mountain Pipeline Project (11.56 MMcf/d).

The fuel use of the Northern Systems Alternative depends on a number of factors identified in the text of the EIS. Apparently, the applicant is experiencing some difficulty in obtaining gas supply for this project, since no gas supply has been filed with the FERC to date and the RMPC has delayed its schedule for placing the RMPP in operation. Questions of economics and gas supply lie beyond the scope of the FEIS.

Besides economic considerations which require further evaluation, the CPUC staff believes that there may be other advantages to the Rocky Mountain Pipeline Project not adequately evaluated. Many of the new supply projects being planned for California ratepayers will come from the north. The Rocky Mountain Pipeline Project, on the other hand, will deliver supplies to the southern portion of the state. The location of these deliveries is especially critical now that Southern California Gas Company will receive gas from the project. PGandE also has a significant number of customers in the southern portion of California. In addition, El Paso's east-of California customers would be more easily served by the Rocky Mountain Pipeline Project.

The FERC staff disagrees. This information appears in the document, and the planned LNG facility at Point Conception, California, is practically in the backyard of the Los Angeles metropolitan region. The FERC staff also notes that no information has been filed with the FERC indicating exactly who would receive the gas that this system proposes to transport.

The proposed Rocky Mountain Pipeline Project also has other advantages. While the proposed project will initially transport gas from the Rocky Mountain area, the pipeline also traverses the Hingeline area. While little exploration has been done to date in this area, it is recognized that Hingeline has excellent potential for hydrocarbons. A pipeline, such as the Rocky Mountain pipeline, would provide greater incentive to the development of oil and gas in this area.

Gas supply is an issue that lies beyond the scope of the EIS.

In conclusion, we believe that the FERC Environmental Staff's recommendation that the Northern Systems Alternative is "significantly superior" is not based on a full assessment of the facts. During the course of the certificate proceeding economic and supply issues will be fully evaluated. Such evaluation may confirm that the applicants' proposed routing is vastly superior from an economic and supply standpoint. If such is the case, it would be the CPUC staff's view that the Final Environmental Impact Statement should conclude that the proposed Rocky Mountain Pipeline Project is environmentally acceptable.

RWD:avm

cc: tate Clearinghouse

The EIS discusses all of the general points identified in this paragraph. The first paragraph of chapter 5 reaches the conclusion identified by the CPUC's staff.

State of California

Memorandum

To : Jim Burns, Project Coordinator
Resources Agency

Date : August 28, 1981

Subject : Comments on the Draft Environmental Impact Statement for the Rocky Mountain Pipeline Project, SCH #81071701

From : Air Resources Board

We have been requested by the State Clearinghouse to comment on the Draft Environmental Impact Statement (hereinafter referred to as Draft) for the Rocky Mountain Pipeline Project (SCH#81071701). Our comments are restricted to the air quality aspects of the project.

Introduction

The Rocky Mountain Pipeline Project is a proposed 610-mile long natural gas pipeline transmission system. This project will consist of 583 miles of 36-inch diameter interstate pipeline from Lincoln County, Wyoming to the Nevada-California border in Clark County, Nevada, and 27 miles of 36-inch diameter intrastate pipeline within California. The intrastate pipeline would connect to the existing transmission systems of Pacific Gas and Electric (PG&E), Pacific Lighting Service Company (PLSC), and Southern California Gas Company (SCG), which is a subsidiary of PLSC.

The Rocky Mountain Pipeline Company (RMPC), which is a partnership of Pacific Gas Transmission Company (a subsidiary of PG&E), El Paso Natural Gas Company, Pacific Interstate Transmission Company (a subsidiary of PLSC), and Northwest Pipeline Corporation will construct the interstate pipeline and PG&E and PLSC will construct the intrastate pipeline.

The pipeline will be designed to transport 413 million cubic feet per day of natural gas. Although no gas is presently under formal contract, the gas will come from the Overthrust Belt and other producing areas in the Rocky Mountains, the Hingeline area in Utah, and other sources which may be developed, such as those in Canada. The capacity of the pipeline can be expanded to handle 800 million cubic feet per day. The cost of out-of-state facilities is $515 million, while the cost of in-state facilities is $25.6 million. It is expected that the minimum lifetime for the proposed pipeline will be 20 years.

For the 413 million cubic feet case, a single compressor station would be needed. This station, located in Wyoming, would have 21,200 hp of gas turbines. For the 800 million cubic feet case, three additional compressor stations, all located in Utah, would be required. These additional stations would have 10,600 hp of gas turbines each, while the Wyoming station would be expanded to 53,000 hp of gas turbines.

Besides the proposed route from Wyoming to California, there are numerous alternate routes which are discussed in the Draft. Most of these alternatives are minor deviations from the proposed route, and would have no effect on the California portion of the pipeline. One option, however, passes through central Nevada and the Owens Valley area in California. For this alternative, no compressor stations would be located in California.

Another alternative, the Northern Systems Alternative, consists primarily of modifying existing pipelines, and transporting the gas to the Northwest. The gas would then pass into the existing Pacific Gas Transmission pipeline, which is currently used to transport Canadian gas into California for PG&E. Additional pipeline construction between Northern and Southern California may be required to transport part of the Rocky Mountain gas into Southern California. For the 413 million cubic feet case, the Northern Systems Alternative would require an additional 8,750 hp of compression at the Delevan station in Colusa County. For the 800 million cubic feet case, additional compression would be required at the Tionesta, Modoc County station (5,250 hp), at the Burney, Shasta County station (7,250 hp), at the Gerber, Tehama County station (9,450 hp), and at the Delevan, Colusa County station (18,980 hp).

The primary sources of emissions for the pipeline would be from construction activities and the compressor stations.

General Comments

The Draft discusses the direct emissions from the pipeline project, but does not address any indirect effects on air quality. The Draft should have discussed and quantified the effect of adding 413 to 800 million cubic feet per day of natural gas to existing California supplies. For instance, if some of this additional natural gas is used in power plants to displace fuel oil, overall emissions from power plant would decrease. On the other hand, if this increased availability of natural gas promotes the growth of gas-consuming industry within California, emissions could increase.

The Draft fails to discuss or quantify the effects of NOx emissions from compressor stations on ambient oxidant (ozone) concentrations. Additionally, the draft fails to quantify construction emissions, but only discusses them in a vague and qualitative fashion.

The Draft should have quantified or discussed the emissions associated with the transport of the addition of volume gas within California. These emission increases are ignored for all alternatives except for the Northern Systems Alternative, and even in this latter alternative not all potential emission increases are discussed.

It has not been determined whether the RMPP or suitable alternative would bring additional volumes of gas into California or prevent future curtailment on the SoCal, PLS, and PG&E pipeline systems. The RMPC application to the FERC for a certificate of public convenience and necessity alleges that it must transport 410,000 Mcfd into California to reduce/prevent future curtailment. However, this volume of natural gas is currently not available.

Insufficient information is available for the staff to calculate the amount of fuel oil that could be displaced by natural gas within California. However, assuming that 410,000 Mcfd of natural gas would be used to fuel industrial gas turbines for electrical power generation and that the natural gas would displace No. 2 fuel oil on a Btu equivalent basis, a conservative statewide yearly air emission estimate was calculated. According to these assumptions, natural gas would generate 31,130 tons per year of NO_x, 3,020 tons per year of HC's, 8,668 tons per year of CO, 1,055 tons per year of particulate matter, and 709 tons per year of SO_2. No. 2 fuel oil would generate 36,764 tons per year of NO_x, 8,351 tons per year of CO, 2,711 tons per year of particulate matter and 759 tons per year of SO_2.

Regulations under the Federal Clean Air Act require control of major sources of ozone precursors, HC's/photochemical oxidants, and NO_x. The source of greatest air emissions, the Burley and Mt. Home Compressor Stations, would emit about 34 tons per year of HC's at the 800,000-Mcfd level. These new emissions would be minor, not requiring review under either the EPA's PSD program or any state regulations.

The applicant has not specified where and how much horsepower would be required at existing compressor stations within California. However, where additional horsepower would be needed, the compressor station(s) would be required to conform to EPA's PSD regulations and all applicable state regulations.

Specific Comments

1. The annual curtailment percentages for PG&E, SCG, and El Paso Natural Gas Company are presented on page 1-2. The values for SCG in 1979 do not agree with data found in the 1980 California Gas Report. Rather than an annual curtailment of 66 percent indicated on page 1-2, the Gas Report lists a figure of 31 percent. This discrepancy should be resolved in the Final EIS. 1

2. Based on the data found on page 2-17, the horsepower "requirements" evidently are not the same as the actual horsepower needed to transport 2 the gas. For example, if it is assumed that the Sage compressor station gas turbine engines are operated at "requirements" capacity, then the listed fuel consumption implies that the turbines will have a 42 percent conversion efficiency rating. If these engines are assumed to have a more resonable efficiency rating of 25 percent, then the engines would continuously operate at only about 60 percent of their maximum power rating. This confusion should be resolved in the Final EIS by discussing the average load factor for the turbines.

3. On page 2-30, the Sage compressor station power requirements are listed as 21,200 hp. However, Table 2-7 on pages 2-13 and 2-14 lists power 3 requirements for this station as 20,550 hp. The Final EIS should indicate the correct figure.

4. The Draft should have discussed and quantified the effect of NOx emissions from compressor stations on ambient oxidant (ozone) concentrations, since 4 NOx is a precursor to oxidant (ozone).

5. On page 2-55, the Draft indicates that additional gas consumption within California for the Northern Systems Alternative has not been determined. 5 This oversight should be corrected in the Final EIS, and the associated emissions and their effect on ambient air quality should be quantified. Moreover, fuel consumption within California from the proposed project and all other alternatives is not discussed. This oversight should also be corrected in the Final EIS.

6. On page 3-32 and 3-51, the affected region for California is incorrectly listed as the South Coast Air Basin and the appropriate air quality 6 control agency is also incorrectly listed as the South Coast AQMD. The Draft should have stated that the pipeline facilities would be constructed in the Southeast Desert Air Basin portion of San Bernardino County, and that the appropriate district is the San Bernardino County APCD.

7. On page 3-33 and 3-51, the Draft states that San Bernardino County is nonattainment for TSP, CO, NOx, and photochemical oxidants. This 7 statement should be corrected to indicate that the Southeast Desert portion of San Bernardino County is nonattainment for only ozone (photochemical oxidants) and TSP.

1 No change required. The information presented in table 1-1 is consistent with SoCal's stated need for gas. In either case, 66 or 31 percent, SoCal apparently failed to fully serve the requirements of its customers.

1 The applicant proposes to install three nominally rated 10,600-hp. compressor units at the Sage Compressor Station. One of these units would be a spare. The site horsepower rating of these units is 7,227.

2 Comment noted. This table has been revised.

3 It is not necessary to analyze the potential ground-level concentration of HC's because none of the new or modified compressor stations would be a major source of air emissions for ozone.

4 Fuel use for the Northern Systems Alternative in California north of Antioch was provided in the DEIS; this information is not available for gas transportation south of Antioch. The applicant has not indicated who would receive what volumes of gas, making it impossible to predict fuel requirements.

The applicant was asked to describe the facilities that would be required on the PLS, SoCal, and PG&E existing transmission systems in California to deliver the additional 413 million and 800 million cfd from the Rocky Mountain area. Its response to this request was as follows:

> Whether, and the extent to which, facilities are required downstream of the proposed Rocky Mountain pipeline within California for PGandE, SoCal, and PLS to receive Rocky Mountain gas is a function of the supplies available to the integrated PGandE, SoCal, and PLS systems. If El Paso Natural Gas Company (EPNG) and Transwestern Pipeline Company supply forecasts, as set forth in Exhibit I of the amended application, are realized, then the integrated PGandE, SoCal, and PLS systems will have sufficient capacity to transport the Rocky Mountain gas. If, on the other hand, EPNG supply to PGandE, and SoCal, and the Transwestern supply to PLS is significantly better than forecasted, then some modifications to the integrated PGandE, SoCal, and PLS systems may be needed for a short period of time.

Consequently, the applicant has not identified the fuel the RMPP would use in California.

8. There are a number of errors in the California air quality standards listed in several places in Section 3 of the Draft. The state 24-hour and 1-hour standards for SO_2 are listed in the annual average column. The state CO standard for 1-hour is 46 mg/cubic meter, not 40. The state hydrogen sulfide standard has a 1-hour averaging time, not three hours. In addition, California has a 12-hour CO standard, which is not listed in the Draft. A copy of the state and federal ambient air quality standard is attached.

9. On page 3-41 and in Table 3-26, the Draft states that Colusa, Shasta, and Tehama Counties violate the federal secondary TSP standard and that Colusa, Modoc, Shasta, and Tehama Counties violate the federal oxidant standard. These statements are incorrect. The Draft should have stated that all of these counties are classified as either attainment or unclassified for all federal standards, although recent monitoring has shown frequent violations of the state oxidant standard in Shasta County, along with violations of the state TSP standard in all four counties. Moreover, the federal oxidant standard has been replaced by an ozone standard.

10. Again on page 3-41, the Draft states that no ambient air quality data are available at the compressor station sites. Although this statement may be true in reference to the immediate area surrounding the compressor stations, data are available from a monitoring station near the Burney compressor station. Data from this station and other monitoring stations nearest the other compressor stations should have been listed and discussed in the Draft.

11. On page 4-4, the emission levels which the Draft designates as significant are the same as the EPA review levels. The EPA levels, however, were established for administrative purposes only, and are not designed to reflect significant impacts. For instance, modifications which increase particulate matter emissions by more than 25 tons per year are reviewed, but the corresponding review level for new sources is 250 tons per year. Clearly, an increase of 25 tons from a modified source will not be equal in significance to an increase of 250 tons from a new source.

A better measure of significance would incorporate the actual tons per year emitted, the increase in ground level concentrations, and the existing air quality of the surrounding area. Any increase in emissions within a nonattainment area should be considered significant.

12. The Draft also indicates that construction emissions will cause a temporary and minimal deterioration of air quality, but does not provide any data to support this statement. The claim of minimal deterioration, in fact, is refuted by the Draft since it is also claimed that construction emissions may cause violations of ambient air quality standards. The Draft should have estimated particulate emissions from fugitive dust and combustion emissions from diesel engines to support the claim that emissions from construction activities would have minimal effects on air quality.

8

6. Comments incorporated. **Corrections** have been made to the text of the FEIS.

7. The EPA's Maps Depicting Nonattainment Areas Pursuant to Section 107 of the Clean Air Act (with 1981 updates) lists the entire San Bernardino County as exceeding the primary standard for TSP, CO, NO_x, and ozone.

8. Comments noted; correction made.

Maps Depicting Nonattainment Areas Pursuant to Section 107 of the Clean Air Act classifies a portion of Shasta and all of Tehama Counties California, as exceeding the secondary standards for TSP. In addition, Colusa, Tehama, and a portion of Shasta Counties, California, exceed the primary and secondary standard for ozone.

Since no ambient air quality data is available for the proposed and existing compressor station sites, EPA's PSD guidelines were followed to estimate the potential background concentrations of NO_x. These procedures can be found in <u>Ambient Monitoring Guidelines for the Prevention of Significant Deterioration.</u> These values can be used for all averaging times, since the air quality in remote areas (without significant sources) should be uniform throughout the year. Minor fluctuations would be caused by meteorology and naturally occurring emissions.

If a PSD review were necessary, the proposed or modified source might emit criteria pollutants exceeding the NAAQS. In a non-attainment area, emissions in excess of 100 tons per year were considered a significant impact, since they would require a review under nonattainment procedures.

Since the exact number and types of equipment are not known, the amount of exhaust emissions cannot be determined. Emissions during construction might cause a temporary deterioration of the ambient air quality. However, the EPA considers these emissions temporary. The amount of fugitive dust generated by construction is impossible to predict because of the tremendous number of variables--e.g., terrain, soil, moisture content, vegetation, precipitation, wind, etc.

13. The Draft on page 4-26 concludes that particulate emissions from gas turbines are negligible. However, the reference used by the Draft to support this conclusion states that tests to determine emissions of particulate matter were not conducted. Particulate emissions for gas turbines are typically greater than SO_2 emissions, yet the Draft does not claim that SO_2 emissions are negligible.

Emission factors from EPA's AP42 Manual for Heavy-Duty Natural Gas-Fired Pipeline Compressor Engines were used to calculate the potential emissions generated by each of the compressor units. Particulate emissions were not calculated because the emission factor data are not available. However, the actual yearly emissions of particulates from natural gas compressors would be minor.

14. The Draft claims in several locations that 8750 hp of additional compression will be required at the Delevan station for the Northern Systems Alternative. However, on page 4-42, the required power and emissions for this alternative are based on 8450, not 8750 hp.

Text corrected.

15. In the modeling for NO_2 on page 4-42, the Draft indicates that the impact on Class I areas cannot be determined because the Class I areas are more than 50 kilometers away and the model used is not valid at these distances. Although the modeled results may not be valid for distances longer than 50 kilometers, the modeling should have been performed to obtain an indication of the magnitude of the impact on Class I areas.

It is not practical to model the ground-level concentrations of NO_x that would occur at a Class I area 50 miles away unless the NAAQS has been violated at the new or modified source.

16. The Draft indicates that the PTMAX model is used to assess short-term impacts. This model, however, is not designed to provide a worst-case estimate of maximum ground level concentrations. A model such as PTDIS, incorporating the effects of a capping inversion, would predict concentrations substantially greater than those from the PTMAX model.

The PTMAX model is used as a screening tool only. If violations of the NAAQS are recorded, another EPA air quality model should be used. The computer program recommended for modeling natural gas compressor stations is the Industrial Source Complex model. This model is not presently available to the EIS team; therefore, a refined analysis could not be conducted for this EIS.

17. The Draft provides insufficient information on the modeling to determine whether the results listed are reasonable. For instance, the description of the model used for annual averages (UNIMET) is insufficient to identify which model is used, as there are numerous UNIMET models. In addition, no information was provided on the meteorological and stack parameters used in the models.

The results of modeling using the PTMAX program are a conservative estimate of the actual air emissions generated by natural gas compressor stations. A more refined model normally indicates lower ground-level concentrations at the source. The PTMAX program does not require meteorological data. Stack parameters supplied by the applicant were used in the PTMAX program.

If you have any questions, or if we can be of further assistance, please do not hesitate to contact George Lew or Don Koeberlein of my staff at (916) 322-2886 and (916) 322-9335.

Ronald A. Friesen

Ronald A. Friesen, Chief
Industrial Project Support Branch

Attachment

cc: Wilbur Disney, Jr., Colusa Co. APCD
Ken Wright, Modoc Co. APCD
Walter Mook, San Bernardino Co. APCD
Dale Watson, Shasta Co. APCD
Dave Sale, Tehama Co. APCD
State Clearinghouse

AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards[1]		National Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Oxidant[10]	1 hour	0.10 ppm (200 ug/m³)	Ultraviolet Photometry	—	—	—
Ozone	1 hour	—	—	240 ug/m³ (0.12 ppm)	Same as Primary Standard	Chemiluminescent Method
Carbon Monoxide	12 hour	10 ppm (11 mg/m³)	Non-Dispersive Infrared Spectroscopy	—	Same as Primary Standards	Non-Dispersive Infrared Spectroscopy
	8 hour	—		10 mg/m³ (9 ppm)		
	1 hour	40 ppm (46 mg/m³)		40 mg/m³ (35 ppm)		
Nitrogen Dioxide	Annual Average	—	Saltzman Method	100 ug/m³ (0.05 ppm)	Same as Primary Standards	Gas Phase Chemiluminescence
	1 hour	0.25 ppm (470 ug/m³)		—		
Sulfur Dioxide	Annual Average	—	Conductimetric Method	80 ug/m³ (0.03 ppm)	—	Paraosanilline Method
	24 hour	0.05 ppm (131 ug/m³)[9]		365 ug/m³ (0.14 ppm)	—	
	3 hour	—		—	1300 ug/m³ (0.5 ppm)	
	1 hour	0.5 ppm (1310 ug/m³)		—	—	
Suspended Particulate Matter	Annual Geometric Mean	60 ug/m³	High Volume Sampling	75 ug/m³	60 ug/m³	High Volume Sampling
	24 hour	100 ug/m³		260 ug/m³	150 ug/m³	
Sulfates	24 hour	25 ug/m³	AIHL Method No. 61	—	—	—
Lead	30 day Average	1.5 ug/m³	AIHL Method No. 54	—	—	—
	Calendar Quarter	—	—	1.5 ug/m³	1.5 ug/m³	Atomic Absorption
Hydrogen Sulfide	1 hour	0.03 ppm (42 ug/m³)	Cadmium Hydroxide Stractan Method	—	—	—
Hydrocarbons (Corrected for Methane)	3 hour (6-9 a.m.)	—	—	160 ug/m³ (0.24 ppm)	Same as Primary Standards	Flame Ionization Detection Using Gas Chromatography
Vinyl Chloride (Chloroethene)	24 hour	0.010 ppm (26 ug/m³)	Gas Chromatography (ARB staff report 78-8-3)			
Ethylene	8 hour	0.1 ppm	—	—	—	—
	1 hour	0.5 ppm				
Visibility Reducing Particles	1 observation	In sufficient amount to reduce the prevailing visibility to less than 10 miles when the relative humidity is less than 70% (8)		—	—	—
APPLICABLE ONLY IN THE LAKE TAHOE AIR BASIN:						
Carbon Monoxide	8 hour	6 ppm (7 mg/m³)	NDIR	—	—	—
Visibility Reducing Particles	1 observation	In sufficient amount to reduce the prevailing visibility to less than 30 miles when the relative humidity is less than 70% (8)		—	—	—

(FOOTNOTES ON REVERSE SIDE)

NOTE:

1. California standards are values that are not to be equaled or exceeded.

2. National standards, other than those based on annual averages or annual geometric means, are not to be exceeded more than once per year.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 mm of mercury. All measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 mm of Hg (1,013.2 millibar); ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent procedure which can be shown to the satisfaction of the Air Resources Board to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by the Environmental Protection Agency (EPA).

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after implementation plan is approved by the EPA.

7. Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.

8. Prevailing visibility is defined as the greatest visibility which is attained or surpassed around at least half of the horizon circle, but not necessarily in continuous sectors.

9. At locations where the state standards for oxidant and/or suspended particulate matter are violated. National standards apply elsewhere.

10. Measured as ozone.

Resources Building
1416 Ninth Street
95814

(916) 445-5656

Department of Conservation
Department of Fish and Game
Department of Forestry
Department of Boating and Waterways
Department of Parks and Recreation
Department of Water Resources

EDMUND G. BROWN JR.
GOVERNOR OF
CALIFORNIA

THE RESOURCES AGENCY OF CALIFORNIA
SACRAMENTO, CALIFORNIA

Air Resources Board
California Coastal Commission
California Conservation Corps
Colorado River Board
Energy Resources Conservation and Development Commission
Regional Water Quality Control Boards
San Francisco Bay Conservation and Development Commission
Solid Waste Management Board
State Coastal Conservancy
State Lands Commission
State Reclamation Board
State Water Resources Control Board

Mr. Kenneth F. Plumb, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

August 20, 1981

Re: Docket No. CP79-[illegible]
Case No. U-[illegible]

Dear Mr. Plumb:

The State has reviewed the draft environmental impact statement, Rocky Mountain Pipeline Project, submitted through the Office of Planning and Research. This review, in accordance with the National Environmental Policy Act of 1969 and OMB Circular A-95, was coordinated with the Energy, Public Utilities, and State Lands Commissions; the Air Resources and Water Resources Control Boards; and the Departments of Conservation, Fish and Game, Forestry, Parks and Recreation, Water Resources, Food and Agriculture, Health, and Transportation.

We have received the following comments from the Public Utilities Commission and the Departments of Conservation and Transportation.

Public Utilities Commission

The PUC staff does not think that the DEIS has sufficient information to allow an evaluation of the alternative routes discussed, or to find that the Northern Systems Alternative is "significantly superior" to the proposed Rocky Mountain Pipeline Route. Because each of the routing proposals involves construction within California, any of these proposals will require the preparation of an environmental impact report under the California Environmental Quality Act (CEQA). PUC staff cannot tell to what degree the EIS can be incorporated into the EIR. Because this agency will issue a decision on the routing within California, and the comment period for the DEIS is too short to perform the detailed review required under CEQA, PUC staff cannot judge the superiority of any of the alternatives at this time. All alternatives appear viable, but the Northern Systems Alternative should not be found "environmentally superior" until the State has reviewed this route. Factors fully developed in the certificate proceeding (economics, gas supply, financial considerations, etc.) will be significant in the pipeline-routing decision.

PUC staff understands that the Rocky Mountain Pipeline Project was designed for an optimum volume of 800 MMcf/per day and that the 413 MMcf/d level was merely an initial transport volume. The project cannot be appropriately evaluated unless its full potential

See the responses to the Public Utilities Commission's memorandum attached to the California Governor's Office letter of comment dated August 26, 1981.

transportation capacity is recognized. Indeed, it may be inappropriate to consider expanding existing systems to transport the initial volumes, such as is contemplated via the Northern Systems Alternative, when additional volumes of gas are expected to be available for transport.

PUC staff also observes that the Northern Systems Alternative is based upon the completion of the western leg of the Alaska Natural Gas Transportation System. Although significant progress has been made to finance this system, financing of the vast new project is not complete. It may be premature for the FERC staff to assume that the western leg will be available in the time frames required to transport gas from the Rocky Mountain area.

Review of the DEIS shows that even at the initial volumes of 413 MMcf/d, significant volumes of additional fuel may be required to transport the gas through the Northern Systems Alternative. The proposed Rocky Mountain Pipeline Project was designed to be a very fuel efficient system, using only 2.91 MMcf/d of fuel to deliver the initial volumes. The proposed Northern Systems Alternative would use 27.78 MMcf/d to deliver the same volumes. Since the DEIS does not analyze the economic impacts of the increased fuel uses, it is difficult to conclude that the Northern Systems Alternative is superior.

Fuel use is a critical component in this economic analysis. Much of the Rocky Mountain gas will be deregulated, and the quantity of gas consumed in transportation is critical. With the increasing prices of natural gas, those receiving service by the proposed Rocky Mountain Pipeline Project may be more economically served by having entirely new facilities installed, rather than increasing the fuel use on existing systems. Also, with deregulation, a purchaser who can economically transport the gas to market will have a distinct advantage in obtaining new supplies over one who must rely on a system with higher transportation costs.

Although the economics of the proposed Northern Systems Alternative requires further study for the initial startup volumes, PUC staff notes that the problem is especially severe in the evaluation of deliveries at the 800 MMcf/d level. At this level, fuel use would be 63.56 MMcf/d for the Northern Systems Alternative, and only 11.56 MMcf/d for the Rocky Mountain Pipeline Project.

PUC staff comments further that the DEIS does not adequately evaluate other advantages of the Rocky Mountain Pipeline Project. While many of the new supply projects being planned for California ratepayers will come from the north, the Rocky Mountain Pipeline Project will deliver supplies to the southern part of the State. The location of these deliveries is especially critical now that Southern California Gas Company will receive gas from the project. PG&E also has a significant number of customers in the southern part of California, and

El Paso's east-of-California customers would be more easily served by the Rocky Mountain Pipeline Project.

Another advantage of the Rocky Mountain Pipeline Project would be that while the proposed project would initially transport gas from the Rocky Mountain area, it would also transverse the Hingeline area. Because Hingeline has excellent potential for hydrocarbons, a pipeline here would provide greater incentive to the development of oil and gas in this area.

Department of Conservation

The report identifies landslides, fault surface rupture, liquefaction, and volcanic eruption as geologic hazards to the operational integrity of the pipeline. The discuss of these hazards is very general in nature in the DEIS, perhaps because of the size of the areas involved. Although specific hazardous locations are not identified, it would be appropriate to expand the proposed mitigation section to identify the general types of mitigation proposed for each category of geologic hazard.

The general type of mitigation measures which could be used have been listed. It would be inappropriate for the EIS to identify particular mitigation measures to be used unless the applicant has stated its intention to employ those measures or another government agency has indicated it intends to require them.

The Department has the following comments concerning specific hazards:

1. Landslides - Potentially active landslides large enough to disrupt the pipeline should be avoided by rerouting the pipeline; mitigated by excavation, slope stabilization, or flow diversion barriers; or by providing the pipeline with automatic shutoff systems adjacent to such landslides.

The proposed route and most of the alternatives and variations have been tentatively placed to avoid most landslide areas. The final alignment would also attempt to avoid such areas. Where avoidance was not practical, appropriate mitigation would be applied. The EIS task force does not consider shutoff systems to be a mitigation measure; the applicant may or may not use them. With the exception of the crossing of the Wasatch fault, no population concentrations coincide with landslides or faults along the proposed route; therefore, it is not necessary to require shutoff capability above that required under current DOT regulation.

2. Fault surface rupture - For faults with significant Holocene displacement, the Department recommends either avoidance or equipping the pipeline with automatic shutoff valves. Significant Holocene displacement should be defined as displacement capable of rupturing the proposed pipeline.

The RMPP would avoid all the faults possible. See previous response concerning automatic shutoff systems.

3. Liquefaction - In areas where this hazard is identified (in further site-specific studies), it should be avoided or mitigated as described on page 3-28 of the DEIS. It is not enough to say that the hazard "could" be mitigated; it must be.

See response to the introductory paragraph of the Department of Conservation's comments.

4. Volcanic eruption - This hazard is significantly higher along alternative route C in the region including, and south of, Benton Hot Springs. Recently published data (Kilbourne, and others 1980) suggest that the Mono-Inyo chain of volcanoes have erupted at least 20 times in the last 2,000 years. If alternative C is chosen, specific mitigation of this hazard should be included in the design.

This hazard is recognized in the text; it is unlikely that this alternative will be chosen. If it is selected, the Department of Conservation will be able to suggest mitigation measures to the CPUC.

Department of Transportation

Two of the possible pipeline alignments would pass into Caltrans District 08. The Proposed Alignment would cross Interstate 40 and State Route 95, while Alternative C would cross State Route 395. An encroachment permit will be needed and, as a responsible agency, Caltrans

Suggested revisions have been made to "Authorizing Actions" and appendix C to include encroachment permits issued by Caltrans for the may require that certain mitigation measures be provided as condition for issue of a permit. Caltrans urges early and continuous liaison on proposed construction plans that could affect State highways. Encroachment permits are obtained from:

California Department of Transportation
District 8
247 West Third Street
P.O. Box 231
San Bernardino, CA 92403

For facilities proposed within State highway rights-of-way, the Department suggests the following:

1. Lines parallel to the highway should be placed outside of the State highway rights-of-way, particularly controlled access facilities (e.g., I-40). Longitudinal installations within freeway/expressway rights-of-way require special approval and are allowed only if no other feasible alternative exists.

2. Transverse lines should cross the highway at right angles.

3. Lines may be required to be encased within the highway rights-of-way.

We greatly appreciate having been given an opportunity to review and comment upon this report.

Sincerely,

James W Burns

JAMES W. BURNS
Assistant Secretary for Resources

cc: Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814
(SCH 81071701)

proposed action. "Authorizing Actions" focuses on various Federal, state, county, and local actions required for the proposed action. Since the same general types of authorizations would be required for Alternative C, they are not presented separately in the EIS.

John V. Evans, *Governor*
Daniel T. Emborg, *Administrator*

State Capitol Building
Boise, Idaho 83720

DIVISION OF ECONOMIC AND COMMUNITY AFFAIRS

August 18, 1981

Kenneth Plumb
Federal Energy Regulatory Commission
North Capitol Street N. E.
Washington, D.C. 20426

Refer to: OPPR/DPC-EEB
Rocky Mountain Pipeline Company
Docket No. CP79-424

Dear Mr. Plumb:

The Idaho State Clearinghouse has completed its review on the DRAFT ENVIRONMENTAL IMPACT STATEMENT ROCKY MOUNTIAN PIPELINE PROJECT - SAI #00716009. The following agencies were contacted for their review and comment:

Southeast Idaho Council of Governments
Department of Parks and Recreation
Department of Fish and Game
Department of Lands
Department of Health and Welfare/Division of Environment

The the time of sign-off comments have not been received from the reviewing agencies. All late comments will be forwarded to your agency.

Thank you for letting us assist you with the review of this project. If you have any questions, do not hesitate to contact myself or Lois Wade at 208-334-4718.

Sincerely,

Gloria Mabbutt

Gloria Mabbutt, Coordinator
Idaho State Clearinghouse

GM:lw

IDAHO
A Land For All Seasons

No response required.

STATE OF NEVADA
GOVERNOR'S OFFICE OF PLANNING COORDINATION
CAPITOL COMPLEX
CARSON CITY, NEVADA 89710
(702) 885-4865

OFFICIAL FILE COPY
TO | DOCKET | INIT. | DATE
CENTRAL FILE

August 17, 1981

Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

RE: SAI NV# 82300003 Project: Rocky Mountain Pipeline Project - Draft EIS

Dear Secretary:

Attached are the comments from the following affected State Agencies: Departments of Energy, Transportation and Human Resources concerning the above referenced project.

These comments constitute the State Clearinghouse review of this proposal. Please address these comments in the final or summary report.

Sincerely,

John Wm. Sparbel
State Planning Coordinator

JWS/sl
Enclosure

No response required.

NEVADA STATE CLEARINGHOUSE REVIEW FORM

State Planning
Water Planning
Environ. Prot.
Mineral Resources

PLANNING COORDINATOR
GOVERNOR'S OFFICE
CAPITOL COMPLEX
CARSON CITY, NEVADA
885-4865

7-27-81
Date

TO:

- [x] Transportation
- [x] Conservation & Natural Resources
- [x] ~~Human Resources~~
- [x] Wildlife
- [ ] Budget
- [x] Historic Preservation & Archeology
- [x] Agriculture
- [x] Community Services Agency
- [x] Commerce
- [x] Public Service Commission
- [x] Employment Security Department
- [x] Energy
- [ ] Law Enforcement Assistance
- [x] Taxation
- [ ] Equal Rights Commission
- [x] Economic Development
- [ ] G.O.P.C. -
- [ ]
- [ ]
- [ ]

RECEIVED
JUL 2 1981
DIRECTOR'S OFFICE
DHR

FROM: Bob Hill, State Planning Coordinator

SAI NV # 82300003

PROJECT: Rocky Mountain Pipeline Project - Draft EIS

Attached for review and comment is a copy of the aforementioned project. *PLEASE* evaluate it with respect to:

1) the program's effect on your plans and programs
2) the importance of its contribution to State and/or Areawide goals and objectives
3) its accord with any applicable law, order or regulation with which you are familiar
4) additional considerations.

JUL 1981

PLEASE submit your comments to this office NO LATER THAN 8-10-81 by checking the appropriate box below and returning the form to this office. *Please do so even if you have no comment* on this particular project so that we may complete our processing.

THIS SECTION TO BE COMPLETED BY REVIEWING AGENCY (__________)

- [ ] No comment on this project
- [x] Proposal supported as written (see below)
- [ ] Additional information (see below)
- [ ] Conference desired (see below)
- [ ] Conditional support (outlined below)
- [ ] Disapproval/denial of funding (must specify reason below)

Comments: *(use additional sheets if necessary)*

It does not appear that there will be a significant impact on the services offered by the Dept of Human Resources. We will be interested in the number of persons added to the state and the number of persons hired from within the state.

[illegible] — Chief of Planning — 885-4930 — 7-31-81

Reviewer's Signature | Title | Phone | Date

No response required.

NEVADA STATE CLEARINGHOUSE REVIEW FORM

PLANNING COORDINATOR
GOVERNOR'S OFFICE
CAPITOL COMPLEX
CARSON CITY, NEVADA
885-4865

7-27-81
Date

TO:

- ☑ [redacted]
- ☑ Conservation & Natural Resources
- ☑ Human Resources
- ☑ Wildlife
- ☐ Budget
- ☑ Historic Preservation & Archeology
- ☑ Agriculture
- ☑ Community Services Agency
- ☑ Commerce
- ☑ Public Service Commission
- ☑ Employment Security Department
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- ☐ Law Enforcement Assistance
- ☑ Taxation
- ☐ Equal Rights Commission
- ☑ Economic Development
- ☐ G.O.P.C. -
- ☐ ________
- ☐ ________
- ☐ ________

FROM: Bob Hill, State Planning Coordinator

SAI NV # 82300003 PROJECT: Rocky Mountain Pipeline Project - Draft EIS

Attached for review and comment is a copy of the aforementioned project. *PLEASE* evaluate it with respect to:

1) the program's effect on your plans and programs
2) the importance of its contribution to State and/or Areawide goals and objectives
3) its accord with any applicable law, order or regulation with which you are familiar
4) additional considerations.

PLEASE submit your comments to this office NO LATER THAN 8-10-81 by checking the appropriate box below and returning the form to this office. *Please do so even if you have no comment* on this particular project so that we may complete our processing.

THIS SECTION TO BE COMPLETED BY REVIEWING AGENCY (Department of Transportation)

- ☐ No comment on this project
- ☒ Proposal supported as written (see below)
- ☐ Additional information (see below)
- ☐ Conference desired (see below)
- ☐ Conditional support (outlined below)
- ☐ Disapproval/denial of funding (must specify reason below)

Comments: *(use additional sheets if necessary)*

The applicants attention is directed to NRS 408.955 which requires plans review and approval for any work proposed within the Highway right-of-way. Occupancy permits will also be required where prior rights have not been established. Contact the District engineer in the respective Districts for permits. Crossings will be jacked or bored on the State Highway system.

AUG 1981

A.M. Woodgate P.E. — Reviewer's Signature
Proj. Mgr. — Title
885-5400 — Phone
AUG 11 1981 — Date

The occupancy permits have been added to the list of permits for Nevada, as suggested.

NEVADA STATE CLEARINGHOUSE REVIEW FORM

PLANNING COORDINATOR
GOVERNOR'S OFFICE
CAPITOL COMPLEX
CARSON CITY, NEVADA
885-4865

7-27-81
Date

TO:

- [x] Transportation
- [x] Conservation & Natural Resources
- [x] Human Resources
- [x] Wildlife
- [ ] Budget
- [x] Historic Preservation & Archeology
- [x] Agriculture
- [x] Community Services Agency
- [x] Commerce
- [x] Public Service Commission
- [x] Employment Security Department
- [x] Energy
- [x] Law Enforcement Assistance
- [x] Taxation
- [x] Equal Rights Commission
- [x] Economic Development
- [ ] G.O.P.C. -
- [ ] ______
- [ ] ______
- [ ] ______

FROM: Bob Hill, State Planning Coordinator

SAI NV # 82300003

PROJECT: Rocky Mountain Pipeline Project - Draft EIS

Attached for review and comment is a copy of the aforementioned project. *PLEASE* evaluate it with respect to:

1) the program's effect on your plans and programs
2) the importance of its contribution to State and/or Areawide goals and objectives
3) its accord with any applicable law, order or regulation with which you are familiar
4) additional considerations.

PLEASE submit your comments to this office NO LATER THAN 8-10-81 by checking the appropriate box below and returning the form to this office. *Please do so even if you have no comment* on this particular project so that we may complete our processing.

THIS SECTION TO BE COMPLETED BY REVIEWING AGENCY (______)

- [ ] No comment on this project
- [x] Proposal supported as written (see below)
- [ ] Additional information (see below)
- [ ] Conference desired (see below)
- [ ] Conditional support (outlined below)
- [ ] Disapproval/denial of funding (must specify reason below)

Comments: *(use additional sheets if necessary)*

Concur with FERC Environmental Staff conclusions supporting Northern System Alternative, all impacts & costs significantly reduced.

JUL 1981

Robert [signature] — Reviewer's Signature | Admin. - R+D — Title | 885-5157 — Phone | 7-29-81 — Date

No response required.

COLORADO RIVER COMMISSION

OF NEVADA

Telephone (702) 733-7755

MAILING ADDRESS
P. O. Box 19090
Las Vegas, Nevada 89132

August 3, 1981

OFFICE ADDRESS
4220 Maryland Parkway
Building B, Suite 402
Las Vegas, Nevada 89109

Ms. Janis L. Bowles
Office of Special Projects
Third Floor East
555 Zang Street
Denver, CO 80228

RE: Rocky Mountain Pipeline Project

Dear Ms. Bowles:

In the Bureau of Land Management (BLM) publication "Public Identification of Issues for the Environmental Impact Statement: Rocky Mountain Pipeline Project" which was published January 2, 1981, the BLM recognized the issues which were of concern to the Colorado River Commission of Nevada (Commission). These issues were the 4th and 5th listed on page 24 of the aforementioned correspondence. Specifically,

1. Demonstrated cost-benefit of the Proposed Action (across Eldorado Valley, Nevada) versus other alternatives.

2. Study of aligning the Proposed Action immediately adjacent to Southwest Gas Company's existing line through Eldorado Valley to minimize expansion of the utility corridor.

These issues have not been discussed in any subsequent publications of which the Commission has been apprised.

The Eldorado Valley is already heavily impacted by gas and electrical transmission corridors and the Commission is extremely concerned about impacting additional areas with corridors. It was for this reason the Commission indicated it would be more appropriate to route the proposed pipeline parallel and contiguous to the existing Southwest Gas pipelines through the Eldorado Valley. The Commission still believes this is the most appropriate routing and is not inclined to consider any other at this time.

Except for the option of the Northern Systems Alternative, avoiding the Las Vegas area would require a substantially longer pipeline. Rugged terrain to the east and the large area occupied by the USAF to the west makes it necessary to select a route close to Las Vegas. The Central Nevada Alternative, 252 miles longer than the proposed route, demonstrates the additional length necessary to avoid Las Vegas and the Eldorado Valley. Since the proposed route parallels existing pipeline and/or highway rights-of-way through Eldorado Valley, the creation of a new utility corridor with extreme route modifications, such as the Central Nevada Alternative, do not appear necessary.

In Eldorado Valley, the proposed action would parallel one of Southwest's pipelines, which is adjacent to to Highway 95. Variation 3, the East Las Vegas Variation, would also closely parallel Southwest's dual pipeline west of the proposed action.

It would be appropriate to route the proposed pipeline parallel to existing pipelines; both the proposed action and the East Las Vegas Variation are so routed in the vicinity of Eldorado Valley. A subvariation has been added to the FEIS, East Las Vegas Subvariation A, which ties the proposed action to the southern half of the East Las Vegas Variation just north of Eldorado Valley. Thus, the pipeline could, if necessary, be routed to parallel Southwest's dual pipeline instead of its single pipeline adjacent to Highway 95.

The Draft EIS is deficient in that there were two specific authorizations omitted from Appendix D - Summary of Required Authorizing Actions on page D-4.

The first omission involves the crossing of the Southern Nevada Water System pipelines which will require a permit for joint occupancy within the pipeline right-of-way. The permit application must be made through the Las Vegas Valley Water District, operating agent for the Colordo River Commission. The permit application will be subject to the review and approval of the U. S. Bureau of Relcamation.

The second omission concerns the right-of-way through portions of the Eldorado Valley. Public Law 85-339, 85th Congress, March 6, 1958 authorized and directed the Secretary of Energy to segregate from all forms of entry under the public land laws of the United States certain lands in the Eldorado Valley. On March 1, 1968, the Colorado River Commission of Nevada made application to the Secretary of Interior for the acquisition of those lands and as a result of the pending application the segregation is still in effect. Therefore, any construction of a pipeline through those segregated lands cannot occur without the consent of the Commission.

Sincerely,

Jack L. Stonehocker

Jack L. Stonehocker
Deputy Director

The following two authorizations have been added to the FEIS:

Las Vegas Valley Water District joint occupancy permit;

Colorado River Commission consent through segregated areas in Nevada.

Nevada Department Of Wildlife

JOSEPH C. GREENLEY
DIRECTOR

ROBERT LIST
GOVERNOR

1100 VALLEY ROAD P.O. BOX 10678 RENO. NEVADA 89520 TELEPHONE (702) 784-6214

August 21, 1981

Secretary
Federal Energy Regulatory Commission
825 North Capitol Street
N.E., Washington, D.C. 20426

Re: ~~CP79-424~~
~~U-45957~~
RMPP - DEIS

Dear Sir:

The Nevada Department of Wildlife has reviewed the DEIS for the Rocky Mountain Pipeline Project and offers the following comments for consideration in preparation of the final EIS. Our comments are limited to those sections of RMPP which traverse Nevada, for both the Proposed Action and the Central Nevada Alternative, and to fish and wildlife resources and habitats.

The general format and organization of the document is logical and easily followed. The Graphic Supplement is well done and considerably enhances the value of the document as an impact analysis tool.

We find the wildlife sections for the Proposed Action and the Alternatives to present a fairly accurate depiction of the location and amount of significant wildlife species habitats which will be impacted by the project. The wildlife impact analysis, however, is inadequate in that it neglects to address, in any detail, the type of expected impacts, and provide any quantification as to the percentage of a population or its habitat that will be impacted. Direct impacts are addressed as to the extent of the habitats that will be disturbed (acres or miles), and this is good, but there is no analysis of potential secondary impacts that would result from human disturbance, poaching, and increased access. This area should be addressed in some detail in the final EIS.

Although the numbers of stream crossings are provided, virtually nothing is presented relative to the fishery values of said streams. No attention is given to fish species in the Muddy River or potential hazards to these populations from leaks or breaks in the pipeline. The federally listed (Theatened and Endangered) Moapa dace (Moapa coriacea) would possibly not be effected by the downstream crossing at Glendale, but game fish species and the roundtail chub (Gila robusta sp.), a state classified sensitive species, could be adversely impacted.

Detailed examination of the types of impacts expected from construction, operation, and maintenance of the pipeline appear in chapter 4, "Proposed Action: Wildlife." These explanations are shown only for the proposed action and are not repeated for each alternative or variation. They are also examined in the terrestrial and aquatic biology technical report. Impacts examined include harassment, short- and long-term destruction of vegetation used for food and cover, temporary blocking of migration routes, and increases in illegal and random killing. Quantification of percentage of a species' habitat was not provided because the impacts were short term and not of high significance. There were not species of limited distribution or low numbers which would be significantly impacted. Had this been the case, the requested quantification would have been necessary.

Table 3-17 indicates the FWS stream classification of fisheries values. Breaks or leaks in the pipeline within streambeds are unlikely, because heavier pipe is used in those locations and the pipe is buried below the scour level. Natural gas is lighter than air and would rapidly bubble through the water and dissipate into the air with no known adverse effects to aquatic species.

If "best practices," identified in 33 CFR, part 323, are followed, it is not anticipated that any adverse impacts to aquatic species would occur. The roundtail chub has been added to the technical report.

Elk and sage grouse are not listed in Table 3-2 as species of environmental concern for Nevada, and both species should be so identified. Also, in Nevada, elk characteristically winter at lower elevations than do mule deer, in contrast to the statement on page 3-7.

The table has been revised to reflect this comment.

The statement on page 3-7 of the DEIS refers to elk winter ranges along the proposed route. There are no elk winter ranges on the portion of the proposed action in Nevada.

The statement concerning desert tortoise on page 3-11, second paragraph, under Federal and State Listed Species is in error. The statement appropriately indicates tortoise distribution between MP 441 and MP 580, but then attributes this distribution to Utah, Nevada and California, The maps indicate that the proposed pipeline between MP 441 and MP 580 is completely within Nevada.

The paragraph has been changed to state that the area between MP 441 and MP 580 is within Nevada.

The proposed mitigation by avoidance of construction during wildlife seasonal use periods is highly desirable, however, because very general terms are used to define wildlife distribution and types of habitat disturbed, such mitigation would be strongly enhanced through consultation with the Department of Wildlife as indicated on page C-2.

No response required.

We fear that revegetation in the arid desert regions of southern Nevada would be very difficult, and success doubtful.

The DEIS states that much time would be required to completely revegetate certain arid vegetation types. See chapter 4, "Proposed Action: Vegetation," and the terrestrial and aquatic biology technical report, pages 81 through 84, for a more detailed description of revegetation problems in areas with 8 inches or less annual precipitation.

Based on our overall evaluation of the potential impacts of the project to Nevada's fish and wildlife resources, we would favor the following routes in priority order as listed:

1. Alternative A - Northern Systems Alternative. This alternative would preclude any impact to wildlife in Nevada.

2. Proposed Action with East Las Vegas Variation - Impacts to fish and wildlife would be minimal and less than for Central Nevada Alternative.

3. Proposed Action - Might have slightly greater impacts than with V-3 variation.

4. Alternative C - Central Nevada Alternative. This route would have the greatest impact on Nevada's fish and wildlife resources.

No response required.

We would appreciate consideration of the above comments in preparation of the final EIS and in making a route selection decision. We hope that you will find them of value in your deliberations for the RMPP project.

Sincerely,

Joseph C. Greenley
Director

WM:pw

cc: State Clearinghouse (SAI NV #82300003)
Regions II and III

VICTOR ATIYEH
GOVERNOR

Executive Department

155 COTTAGE STREET N.E., SALEM, OREGON 97310

OFFICIAL FILE COPY

TO	INIT.	DATE
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CENTRAL FILES

August 18, 1981

Secretary
Federal Energy Regulatory
  Commission
825 North Capitol Street N.E.
Washington, D.C.   20426

RE: Docket No. CP79-424
Case No. U-45957
RMPP DEIS

Thank you for submitting your draft Environmental Impact Statement for State of Oregon review and comment.

Your draft was referred to the appropriate state agencies. The Departments of Historic Preservation, Fish and Wildlife and Environmental Quality offered the enclosed comments which should be addressed in preparation of your final Environmental Impact Statement.

We will expect to receive copies of the final statements as required by Council of Environmental Quality Guidelines.

Sincerely,

INTERGOVERNMENTAL RELATIONS DIVISION

Kay Wilcox cB

Attachment sent to OFPK

Kay Wilcox
A-95 Coordinator

KW:cb
Enclosures

No response required.

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
155 Cottage St NE , Salem, Oregon 97310
Phone Number: 378-3732

JUL 28 1981

PNRS STATE REVIEW

Project #: 8107 4 450 Return Date: AUG 14 1981

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

If you cannot respond by the above return date, please call to arrange an extension at least one week prior to the review date.

ENVIRONMENTAL IMPACT REVIEW
DRAFT STATEMENT

( ) This project has no significant environmental impact.

( ) The environmental impact is adequately described.

(x) We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement.

( ) No comment.

Remarks

The Oregon Department of Fish and Wildlife has reviewed the Rocky Mountain Pipeline Project Draft Environmental Impact Statement.

The proposed action would have no direct impact on Oregon's fish and wildlife resources. The Northern Systems Alternative would result in minimal impact to fish and wildlife since construction would be adjacent to the existing pipeline. However, close coordination with our department will be necessary to minimize fish and wildlife impacts and provide possible mitigation measures.

We appreciate the opportunity to review this EIS. Please keep us informed on any new developments.

Agency Fish & Wildlife By [signature]
7/23/81 Environmental Management Section

Coordination with state wildlife officials is included in mitigation measures detailed in appendix C, "Mitigation Measures."

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
155 Cottage St NE , Salem, Oregon 97310
Phone Number: 378-3732

Management Services Div.
Dept. of Environmental Quality
RECEIVED
JUL 10 1981

PNRS STATE REVIEW

Project #: 8107 4 450 Return Date: AUG 14 1981

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

If you cannot respond by the above return date, please call to arrange an extension at least one week prior to the review date.

ENVIRONMENTAL IMPACT REVIEW
DRAFT STATEMENT

( ) This project has no significant environmental impact.

( ) The environmental impact is adequately described.

( ) We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement.

(X) No comment.

No response required.

Remarks

Does not appear that any part of the proposed project segment will be in the State of Oregon.

Agency DEQ By Glen Carter 7/24/81

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
155 Cottage St NE , Salem, Oregon, 97310
Phone Number: 378-3732

INTERGOVERNMENTAL RELATIONS DIVISION
JUL 17 1981

PNRS STATE REVIEW

Project #: 8107 4 450 Return Date: AUG 14 1981

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

If you cannot respond by the above return date, please call to arrange an extension at least one week prior to the review date.

ENVIRONMENTAL IMPACT REVIEW
DRAFT STATEMENT

( ) This project has no significant environmental impact.

( ) The environmental impact is adequately described.

(X) We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement.

( ) No comment.

Remarks

Rocky Mtn Pipeline Project Draft EIS

ALTERNATIVE A SEEMS TO BE THE PREFERRED ALTERNATIVE (5.1) BUT THE CULTURAL STUDIES DONE TO DATE emphasize all areas other than A.

All possible routes for the pipeline project were equally analyzed in a 10-mile wide overview study. As page 8-40 of the cultural resources technical report indicates, Alternative A would cause the fewest impacts to cultural resources.

HISTORIC PRESERVATION OFFICE
STATE PARKS & RECREATION
525 TRADE STREET SE
SALEM, OREGON 97310

Agency SHPO By NOTED L. GILSEN

STATE OF UTAH
OFFICE OF THE GOVERNOR
SALT LAKE CITY
84114

SCOTT M. MATHESON
GOVERNOR

August 21, 1981

Janis L. Bowles, Project Manager
Bureau of Land Management
555 Zang Street
Third Floor East
Denver, Colorado 80228

Dear Ms. Bowles:

I appreciate the opportunity to provide you with the comments of the State of Utah on the Draft Environmental Impact Statement for the Rocky Mountain Pipeline Project.

The attached comments, together with those provided by state representatives at the Provo public hearing of August 5, 1981, outline our technical concerns with the alternatives and variations presented in the DEIS. Our primary concerns surround the Daniels Canyon variation and Provo Canyon alternative. The severe physical constraints within these canyons preclude serious consideration of these routes. The applicant's proposed route provides a significantly superior alternative to these variations.

No response required.

The issue of impacts to agricultural activities and related land values, raised at the Coalville public hearing of August 6, 1981 is one that should be resolved through careful routing and mitigation of impacts in the Heber Valley area. The project sponsors have indicated a willingness to work closely with that community in resolving these problems and I am confident that an acceptable resolution can be achieved.

During the course of the public review of the DEIS in Utah, the project sponsors' proposed route received considerable support by those communities through which the pipeline would pass. The pipeline presents the opportunity for future gas supply to an area of the state where such opportunities are currently limited. The future availability of gas, and its attendant economic gains are important considerations to the State of Utah.

The Rocky Mountain Pipeline Project presents the State of Utah with the opportunity to expand the availability and use of

Janis L. Bowles
August 21, 1981
Page Two

its resources with a minimum of environmental impact. I urge you to consider the possible benefits to the State in making your final recommendation of a preferred alternative.

Sincerely,

Governor

Attachment
SMM:jc

state of utah

DIVISION OF WILDLIFE RESOURCES

1596 West North Temple/Salt Lake City, Utah 84116/801-533-9333

DOUGLAS F. DAY
Director

August 10, 1981

Ms. Juline Christofferson
State Planning Coordinators Office
124 State Capitol
Salt Lake City, Utah 84114

Dear Juline:

We have reviewed the Rocky Mountain Pipeline Project Draft Environmental Impact Statement (Reference 801215080), the Graphic Supplement and the Technical Reports for Terrestrial and Aquatic Biology and Threatened and Endangered Species. It is our opinion that most, if not all, impacts to wildlife and wildlife habitat have been adequately addressed in one or more of the above documents and reasonable measures have been suggested to minimize or mitigate wildlife impacts.

Our Division has provided a vast amount of data, information, suggestions and comments on wildlife affected by this program for a considerable amount of time during the preplanning phases of this project. Almost all the material offered has been incorporated in these documents.

No response required.

From the standpoint of wildlife in Utah, Alternative A, Northern Systems, would be preferable as it would not enter Utah. Of those alternatives crossing Utah, Alternative C, Central Nevada, would cause the least detrimental impacts on wildlife in Utah. We do not oppose the proposed action but would be opposed to any other alternative in Utah.

Even though we concur with the wildlife portions of the ES, we feel that adequate assessment of site-specific sensitive areas will require further consultation before the actual right-of-way is flagged. These consultations might even extend to "on-the-ground" assessments.

The Authorized Officer will work with Federal agency specialists in determining where the most appropriate centerline staking would be. The Federal specialists will consult with the State Division of Wildlife Resources prior to the actual determination of the centerline.

We appreciate the opportunity to review and comment on this project and offer any further assistance as appropriate.

Sincerely,

Douglas F. Day
Director

Acting Director

STATE OF UTAH

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF WATER RIGHTS

DEE C. HANSEN
STATE ENGINEER

EARL M. STAKER
DEPUTY

200 EMPIRE BUILDING
231 EAST 400 SOUTH
SALT LAKE CITY, UTAH 84111
(801) 533-6071

DIRECTING ENGINEERS
HAROLD D. DONALDSON
DONALD C. NORSETH
STANLEY GREEN
ROBERT L. MORGAN

MEMORANDUM

DATE: July 31, 1981

TO: Juline Christofferson, State Planning Coordinator's Office

FROM: Dee C. Hansen, State Engineer

SUBJECT: Rocky Mountain Pipeline Project

The Division of Water Rights has reviewed the Technical Report for Water Resources, a part of the Environmental Impact Statement for the Rocky Mountain Pipeline Project.

No response required.

The only comment we have is regarding the filing of necessary applications with this office for alteration of a natural stream.

Written approval of the State Engineer must be given before any stream alteration can take place.

Comment has been noted; appropriate changes have been made to chapter 2 and appendix D of the FEIS.

SCOTT M. MATHESON
GOVERNOR

STATE OF UTAH
DEPARTMENT OF COMMUNITY AND ECONOMIC DEVELOPMENT

Division of State History
(UTAH STATE HISTORICAL SOCIETY)

MELVIN T. SMITH, DIRECTOR
300 RIO GRANDE
SALT LAKE CITY, UTAH 84101
TELEPHONE 801/533-5755

August 81, 1981

Juliene Christopherson
Resource Development
Coordinating Committee
State Planning Office
118 State Capitol
Salt Lake City, Utah 84114

RE: Rocky Mountain Pipeline Project, Technical Report for Cultural Resources

Dear Ms. Christopherson:

The Preservation staff has reviewed the technical report for cultural resources concerning the Rocky Mountain Pipeline. The following comments are of a technical nature only, and should not be considered as consultation as outlined by 36 CFR 800.4. Thus the comments should not be seen as regulatory.

Our office would like to request that we be given the contact persons for the BLM and the applicant so that we can inform them of our consultation role as outlined by 36 CFR 800. If you have any questions, please contact me at 533-7039.

No response required.

Technical Report

1. The previous research chapter covering the eastern Great Basin focuses on breaking the past work down into periods of time. Generally it is accurate but probably the 1980 MX work should have been mentioned. There have been numerous large-scale surveys from 1978 through 1980 by the University of Utah and the Antiquities Section that are not mentioned in this report, for example, the excavations taking place in the Deep Creek Mountains near the Goshute Reservation.

2. The Virgin and Colorado River area overviews beginning on page 411 are somewhat erratic in the depth of detail of certain areas. For example, some time is taken on page 415 to detail Western Archeological Center research on very minor surveys, whereas major surveys carried out by International Research and Learning, Inc. in this area are only mentioned once, and the surveys involved with the completion of the Interstate System through the Virgin River Narrows are not mentioned. Part of this research was undertaken by the Museum of Northern Arizona. The section, however, is adequate but uneven in the amount of detail given, specifically for Utah, where much of Thompson's work and Gardner Dalley's work has been overlooked.

3. The chapter presented on the state of Utah in the Archaic is well written, and presents some of the problems that are currently being debated in the eastern Great Basin. The material used reflects the growing amount of information available concerning the Archaic in the Great Basin, and it may be pointed out that some of Madsen's work after 1975 may have been used to explain some of the furthering criticisms of his model as well as Aiken's criticism of that model.

4. The formative stage discussed in the paper, and broken down into Fremont origins and the Fremont traditions, is adequate in its discussion of the problems and site types that may be encountered in the surveys for the pipeline and various research questions that the pipeline survey may answer.

5. In summary of the review of the prehistoric portion of the document, it is generally felt that, although our offices have not had time to do an in-depth review of each of the sections, the prehistoric document does make an attempt to relate a question of environment and the adaptation of man to that environment. Also, there are several major research issues that have been brought forth in the document, and these research issues will be of value to the class II and class III surveys. Any general problems we have had are simply editorial comments, and we feel that the document is adequate as a class I document.

6. Historical study of the survey area. In general, the historical staff of the Utah State Historic Preservation Officer has felt that there are no substantial criticisms to offer of the document, and it adequately reflects the history of the area involved. For a document of this type it probably covers the major issues that class II and class III surveys would be concerned with.

8. Concerning chapter 8 in the route analysis, the Preservation Office feels an adequate attempt was made to deal with a very difficult problem of delineating sensitive areas from a class I survey. We feel that the combination of cultural and site density sensitivity is an adequate attempt to convey the potentiality or predictability of sites in the proposed corridors and their alternates. The only caution that we may offer in this is that the use of maximum significance, high significance, moderate significance, and minor significance not be confused when final determination of eligibilities are made with the criteria that must be followed in 36 CFR. However, it appears that they are aware of that and are using the rating system simply to make predictive models available for class II and class III surveys.

Sincerely,

Wilson G. Martin

Wilson G. Martin
Preservation Development Coordinator

JLD:jr

STATEMENT
ON THE
DRAFT

ENVIRONMENTAL IMPACT STATEMENT

ROCKY MOUNTAIN PIPELINE PROJECT

by

L. R. Jester

For

Utah Department of Transportation

August 5, 1981

We appreciate the opportunity to comment on the Proposed Rocky Mountain Pipeline Project.

First off, let me say that the UDOT is in agreement with the proposed route as shown in purple on the maps.

There is one alternative and one variation discussed which we are opposed to: 1) Alternative F - Provo Canyon Alternative. 2) Variation 6 - Daniels Canyon Variation. I will comment on each one separately.

Provo Canyon Alternate (F):

It is true that the Department of Transportation does allow installation of utility lines within the highway right-of-way under a license agreement and an encroachment permit. However, a pipeline of this size (36 inch) transporting a hazardous material (natural gas) under high pressure does present some very unusual circumstances.

We are very much aware of the environmental concerns in Provo Canyon, having just completed an Environmental Impact Statement (EIS) relative to highway construction after many years working on it. In addition to being environmentally sensitive, it is heavily used by utilities as well as transportation facilities as recognized by your Draft EIS. There are three major aqueducts, a recreation-oriented railroad, and a proposed sewer line in Provo Canyon, plus several developed parks along the Provo River. Some sections of the Salt Lake Aqueduct and the Provo City Water Line are in solid rock tunnels and could be seriously disturbed by any major blasting operations in the Canyon.

No response required. Comments noted.

There are a number of geologic problems in this rather narrow Canyon. There are fault lines, solid rock excavations, and rather steep sidehill slopes. Highway cuts and fills have proven to be somewhat unstable in certain areas of the Canyon. The involvement with Provo River and its riparian vegetation will also be very sensitive.

One of our major U.S. Highways 189 is routed through Provo Canyon. We plan to improve this highway starting in 1982. However, due to costs and funds available, it will be several years before the entire length of highway through the Canyon will be completed.

Since the highway serves small communities in the Canyon, numerous recreational activities in the Canyon, commuters to and from Heber Valley, commercial trucks, and interstate travelers, it could not be closed during construction of the pipeline. Traffic could not be blocked from using the Canyon except for short durations while blasting or other hazardous operations are occuring.

Therefore, the Utah Department of Transportation is opposed to Alternative F for the above mentioned reasons.

<u>Daniels Canyon Variation (6):</u>

Many of the factors mentioned in Provo Canyon also apply to Daniels Canyon; i.e., it is a rather narrow canyon, a stream (Daniels Creek) runs down the Canyon, there are several fault lines, solid rock excavation, sidehill construction, unstable side slopes, and many of the same environmental concerns.

No response required. Comments noted.

Since U.S. Highway 40 (S.R. 40) is the only major link from the Wasatch Front to the Uintah Basin, it handles not only large volumes of heavy truck (commercial) traffic to and from the oil fields in the Basin, but also large volumes of recreation-oriented traffic.

One only has to fly over the Uintah Basin to realize the tremendous amount of oil exploration being done in addition to the Tar Sands and Oil Shale development. The urbanized areas of the Wasatch Front are major supply and service centers for much of this activity.

Most of the recreation-oriented traffic in Daniels Canyon originates along the Wasatch Front and is destined for Strawberry Reservoir, Starvation Reservoir, Dinosaur National Monument, Flaming Gorge Recreational Area or any of the numerous other recreational facilities located east of the Wasatch Front.

The following is quoted from the "Corridor Analysis Report - US-40 - Silver Creek Junction to Colorado State Line" published by the Utah Department of Transportation in September 1977:

Page ii: "That portion of road which is now in the most critical condition is from Silver Creek Junction to the Strawberry Reservoir Road Shed (some 43 miles). Transportation demands for this section, projected for the next twenty years, calls for a four-lane facility."

Page 12: "SR-40 has been classified as a Principal Arterial route. The first section, from Silver Creek Junction to the Strawberry Reservoir road, is 41.80 miles (67.26 Km) in length and has been subclassified in the expressway catagory. As a further indication of its importance, in 1974 it was placed on the Priority Primary System, meaning that ultimately, four lanes will be required throughout."

No response required. Comments noted.

Page 56: "In Summit and Wasatch Counties, those sections of road from the I-80 Interchange at Silver Creek Junction to McGuire Canyon (not considered for nor warranting realignment) do warrant reconstruction to a four-lane design. Existing level of service is intolerable as are many physical features; such as, roadway width and pavement condition.

"Traffic generators in the vicinity will attract recreationists from the populous Wasatch Front, even with the spectre of energy shortages looming in the background. The new projects from McGuire Canyon to the Strawberry Reservoir road will be marginal from a 1995 capacity analysis, and environmental impacts will have to be weighed against benefits derived from increased mobility with a four-lane road."

I could go on, but in the interest of time just let me conclude by saying that we in the Department of Transportation feel that there are sufficient reasons to ask that the Daniels Canyon Variation 6 not be considered as a viable option for this proposed pipeline project.

WYOMING
EXECUTIVE DEPARTMENT
CHEYENNE

ED HERSCHLER
GOVERNOR

August 24, 1981

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CENTRAL FILES

Mr. Kenneth F. Plumb, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, NE
Washington, D.C. 20426

RE: Rocky Mountain Pipeline DEIS
Docket No. CP 79-424
Case No. U-45957

Dear Mr. Plumb:

The draft environmental impact statement for the Rocky Mountain Pipeline Project has been circulated for review by our state agencies. Copies of their comments are enclosed for your consideration and use. I draw your attention to comments provided by our Department of Environmental Quality, Recreation Commission, and State Engineer's Office which discuss potential circumstances whereby state permitting actions or clearances will be required. I suggest that the project applicants contact these agencies directly to discuss these situations and requirements. Likewise, I suggest that the applicants work closely with the local governments in Kemmerer and Evanston, Wyoming in order to minimize socio-economic impacts and housing problems associated with construction of the Sage compressor plant.

Thank you for the opportunity to review and comment on this document. Please keep me informed of any further progress in this effort.

Yours sincerely,

EH:pcd
enclosures

No response required.

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

AUG 5 1981

State Engineer's Office

BARRETT BUILDING CHEYENNE, WYOMING 82002

August 5, 1981

M E M O R A N D U M

TO: Dick Hartman, State Planning Coordinator

FROM: Louis E. Allen, Water Resources Engineer LEA

SUBJECT: State Identifier Number 81-125, Draft EIS on the Rocky Mountain Pipeline Project.

The subject Draft Environmental Impact Statement was reviewed primarily for possible effects on Wyoming water resources and water administration.

Apparently the proposed action would involve only a compressor station about 6 miles northwest of Sage and a very short length of pipeline in Wyoming, all in Lincoln County. The "preferred alternative" would utilize an existing compressor station at Kemmerer and an existing pipeline in Wyoming. The other alternatives, so far as they involve Wyoming, would include one or the other of these situations.

Water resources in Wyoming would apparently be only minimally affected. This would be through stream crossings, and the DEIS indicates adequate protection at these places. The DEIS indicates air cooling for the compressors.

State Engineer temporary permits would be required for any construction water and hydrostatic test water diverted or pumped in Wyoming. Any Wyoming water used in support of the compressor station operation would also require a State Engineer permit. These necessary permits are omitted from Appendix D, page D-4, State and Local Authorizations and Permits. Perhaps the plans do not call for the use of Wyoming water for either purpose, although it seems domestic use water should be available at the compressor station.

These permits have been added to chapter 2 and appendix D.

Thank you for the opportunity to review this DEIS. Your referral memorandum is being returned as requested.

LEA/ht

cc: George L. Christopulos
State Engineer

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

Department of Environmental Quality

AIR QUALITY DIVISION

EQUALITY STATE BANK BLDG.
401 W. 19TH STREET

CHEYENNE, WYOMING 82002

TELEPHONE 777-7391

MEMORANDUM

TO: Robert E. Sundin, Director
Department of Environmental Quality

FROM: Randolph Wood, Administrator
Air Quality Division

SUBJECT: Rocky Mountain Pipeline Project Draft EIS

DATE: July 21, 1981

I have reviewed the subject report with respect to Air Quality matter. A discussion of the impacts due to the operation indicates that no violation of standards would be anticipated. A permit will be required for construction of the compressor station and a final determination with respect to compliance will be made at that time.

No response required.

Please see response to comment in paragraph 3, page 5, of RMPC's General Comments, dated August 21, 1981

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

Department of Environmental Quality

SOLID WASTE MANAGEMENT

401 WEST 19TH STREET
EQUALITY STATE BANK BUILDING

CHEYENNE, WYOMING 82002

TELEPHONE 307-777-7752

MEMORANDUM

TO: Robert E. Sundin, Director

FROM: Lon Revall, Solid Waste Management Analyst LR

RE: Rocky Mountain Pipeline Project, DEIS

DATE: July 27, 1981

After briefly reviewing the Rocky Mountain Pipeline Project, DEIS, it appears that the impact from the construction work force in Wyoming will be minimal on the existing permitted solid waste disposal system in South Lincoln County. However, a permit from the Solid Waste Management Program will be required if disposal of solid waste generated from actual construction activities or from the work force is planned in other than a State approved and permitted landfill.

Appendix D, Summary of Required Authorizing Actions, Page D-4, of the Rocky Mountain Pipeline Project, DEIS, addresses state and local authorizations and permits which may be required.

The landfill permit for solid waste disposal has been added to "Authorizing Actions."

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

Wyoming Recreation Commission

604 EAST 25TH STREET CHEYENNE, WYOMING 82002

JAN L. WILSON
Director
777-7695

July 23, 1981

Mr. Dick Hartman
State Planning Coordinator
2320 Capitol Avenue
Cheyenne, Wyoming 82002

Dear Mr. Hartman:

The draft environmental impact statement concerning the Rocky Mountain Pipeline Project, A-95 #81-25, was received in this office on July 17, 1981. Thank you for giving us the opportunity to review the report.

Enclosed is a memorandum from our staff archeologist who reviewed the materials. He indicates that further work must be done before cultural clearance for the project can be recommended by the Wyoming State Historic Preservation Officer (SHPO) for the purposes of applicable state and federal laws.

If you have any questions concerning this recommendation please contact the appropriate member of our staff.

Sincerely,

Mark Junge

Mark Junge, Chief
Resources Division and
Deputy SHPO

FOR:

Jan L. Wilson, Director and
State Historic Preservation Officer

MGJ:kim
Encls.

See the response to the memorandum from the staff archaeologist.

WYOMING RECREATION COMMISSION

STATE HISTORIC PRESERVATION OFFICE

REVIEW AND COMPLIANCE

Interdisciplinary Staff Comments

Archeology • *History* • *Historical Architecture* • *Recreation Planning*

TO: Mark Junge, Chief

FROM: Richard Bryant, Archeological Compliance Officer RB

DATE: July 23, 1981 (district #3)

RE: Rocky Mountain Pipeline Project--Draft Environmental Impact Statement (A95, #81-25)

The DEIS analyzes six alternative pipeline locations. All six alternatives include a 6 to 8 mile R/W from Sage, Wyoming to the western Wyoming border. The DEIS states that a class III cultural resource survey will be conducted after a final route has been approved. (p 3-25) At this early level of planning sufficient provisions for cultural resources have been made. Detailed review of potentially impacted cultural resources and recommendations for mitigation plans must await our relvew of the class III cultural resource report.

Thank you for your review of the DEIS and concurrence that sufficient provisions for cultural resources have been made at this stage of the project. As you are aware, a PMOA is being developed with the Advisory Council on Historic Preservation Officers (SHPO). Provisions are made in the PMOA for the inventory, evaluation, and mitigation of significant cultural resources prior to surface disturbance. Provisions for SHPO review and recommendations are also included in the PMOA.

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

Game and Fish Department

CHEYENNE, WYOMING 82002

EARL M. THOMAS
DIRECTOR

August 17, 1981

EIS 634/L3 SIN 81-125
Rocky Mountain Pipeline
Oppr/DPC-EEB Docket # CP 79-424
Lincoln County.

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TO	INIT.	DATE
DOCKET		

CENTRAL FILES

Mr. Kenneth F. Plumb, Secretary
Federal Energy Regulatory Comm.
825 North Capitol Street, N.E.
Washington, D. C. 20426

Dear Mr. Plumb:

Please consider the following information and comments in approving this project and in planning the permitting and controls.

Our concerns about this pipeline center mainly around reclamation. Seasonal construction stipulations will prevent human impacts to sage grouse and big game, but there is a need for BLM to check revegetated areas to be certain that revegetation has really occurred. No exotic plant species should be used, only native plants. These should preferably be species present on or near the pipeline route prior to distrubance.

The following specific comments relate to the DES.

According to this DES (P. C-3), exact alignment of the pipeline has yet to be determined. Site-specific plans for erosion control, revegetation and restoration are to be developed after the exact alignment is determined. The general proposed route passes from Kemmerer west, passing just north of Sage, Wyoming. Twin Creek, a Class 4 stream, may be affected. Species present include a variety of dace, suckers, chubs and cutthroat trout. To insure that potential aquatic impacts are minimized, we suggest that the applicant:

a. Avoid, if possible, exact alignments which cross streams in Wyoming.

b. Contact the Wyoming Game and Fish Department regarding precautions on the exact pipeline alignment.

c. Cross streams by boring and casing.

Boring and casing are listed on Page C-2 as mitigative measures to be employed for crossing concrete-lined canals, irrigation ditches, etc. Streams warrant the same consideration.

Refer to appendix C, "Erosion Control, Revegetation, and Restoration Guidelines Proposed by the RMPC," and "Erosion Control, Revegetation, and Restoration Guidelines for Use on Federal Lands." Concerns about reclamation, plant species compliance, monitoring, and maintenance are discussed in these two sections.

For discussion of plant species, refer specifically to "Revegetation (Reseeding and Planting," item 3, in both sets of guidelines.

In selecting alternatives, every effort was made by the applicant as well as the authorizing Federal agencies to avoid adverse impacts. This included crossing as few streams as possible. The Wyoming Fish and Game Department will have several opportunities to review the crossings. The "Additional RMPC Mitigation Measures" identified in appendix C state that "during construction of biologically sensitive areas, a qualified biologist will be present" and that "the applicant would avoid construction during peak wildlife breeding periods or other critical times." A COE permit would be required for water crossings. When application is made for this permit, a 30-day comment period is required. If comments are received, the District Engineer will offer the applicant an opportunity to resolve any adverse impact. Also, please see "COE Prescribed Management Practices" in appendix D of the FEIS. These measures which are part of the permit would minimize impacts.

Boring and casing is used where other construction techniques are not feasible. They will not be used at stream crossings because of the impacts associated with dewatering and collapse of noncohesive soils.

Page 4.24, Water Resources, displays some misleading information. Tables show the distance that various sediments would be deposited down stream from construction. Then the conclusion is drawn that "The majority of the construction-induced sediment would be transported such a short distance that the effects would be insignificant." We take exception to this conclusion for three reasons.

First, location and timing play important roles in significance of impacts. If each crossing was made just above spawning gravels during spawning season, impacts could be quite significant.

Second, deposition of silts over nearly 0.4 mile and clays over nearly 38 miles downstream could be quite significant to the stream affected.

Third, the total amount of construction-induced sediment ends up somewhere. These potential impacts warrant assessment beyond that given in the DES.

Please contact this office if we may be of further help on this project.

Sincerely,

W. Donald Dexter

W. DONALD DEXTER,
ASSISTANT DIRECTOR, OPERATIONS
WYOMING GAME AND FISH DEPARTMENT

HBM/mlr

cc: State Planning Coordinator

cc: Game Division

cc: Fish Division

cc: Mr. Robert Burford, Director
U.S. Dept. Interior
Bureau of Land Management
Office of Special Projects
3rd. Floor, East
555 Zang Street
Denver, Colorado 80228

As appendix C indicates, the applicant would, where appropriate, cross concrete-lined canals, irrigation ditches, and drainage channels by boring and casing. The only stream the applicant may cross by boring (because of potentially severe erosion) is the Las Vegas Wash.

We believe the information is correct. This point is illustrated by the following example. Consider crossing a stream that is 10 feet wide with a 5- by 5-foot trench; then assume that all of the materials that are excavated fall into the stream. This would produce a total of 250 cubic feet of "sediment." Depending upon the type of stream, 50 percent of the sediment would be deposited within a few feet (5 feet or 25 feet based upon information in the water resource technical report). An additional 80 to 90 percent of the remaining 50 percent would be deposited within 2,000 feet. Considering that this would be 100 to 113 cubic feet with 20,000 square feet of stream bottom, 2,000 feet would result in a layer of sediment 0.005 foot thick or 0.06 inch thick. This is considered to be insignificant.

However, this example exaggerates impacts for two reasons: all the sediment will not be lost into the stream during excavation; also the sediment would not be deposited in a uniform layer. The point that should be stressed is how little sediment will actually be produced (estimates range from 5 to 25 percent of the excavated materials which would be lost during water construction), rather than how far it will be transported. An estimated 15-percent loss of excavated materials would produce 38 cubic feet of sediment or about 8 wheelbarrow loads, which is considerably less than the 100 to 113 cubic feet of sediment calculated above; thus, impacts would be even less.

The Cedar City
Chamber of Commerce
P.O. Box 220 286 North Main Street
Cedar City, Utah 84720
Phone (801) 586-4484

August 4, 1981

RECEIVED BY

AUG 1 3 1981

ENVIRONMENTAL EVALUATION BRANCH

OPPR/DPC-EEB
Rocky Mountain Pipeline Company
Docket No. CP79-424

At the Chamber Of Commerce Board Of Directors Meeting, held July 27, 1981; a resolution of support was adopted for the proposed Rocky Mountain Pipeline Project (RMPP); supporting the propsed action as indicated in the draft environmental impact statement (DEIS).

The Board Of Directors, after discussion of the (DEIS) felt that there had been adequate concern given to both the natural environment and natural habitat.

We feel that with Natural Gas being introduced through our area the potential of a Natural Gas Distribution Systems in the region is a definite plus. Also Iron County would benifit from the Tax-Base.

We urge quick and appropriate action to be taken by the Federal Regulatory Agencies who deal with this project allowing an early completion date.

Steven Thomas, President
S. Garth Jones, Executive Secretary

Cedar City Chamber Of Commerce

"Color Country's Heartland"

No response required.

Cedar City Corporation

P. O. Box 249, Cedar City, Utah 84720

August 10, 1981

United States Department of Interior
Bureau of Land Management
Office of Special Projects-3rd Floor East
555 Zing Street
Denver, Colorado 80228

Re: OPP/DPZ-EEB
Rocky Mountain Pipeline Company
Cocket #CP79-424

Gentlemen:

The draft environmental statement for the Rocky Mountain Pipeline Company is in our opinion a very needed project. We would like to recommend construction of the pipeline along the proposed action route.

For the past several years Cedar City has had limited industrial growth. One of the reasons for not being able to attract growth is the lack of availability of natural gas as a utility. We, as a community, are not interested in rapid large scale growth. However, we also feel a need for sufficent growth to reverse the trend of exporting college education. The construction of the Rock Mountain Pipeline project, we feel, would assist Cedar City in being able to attract the type of industries which would not hinder our rural environment, but would allow sufficent growth to reduce the exportation of our young people.

No response required.

This proposed alternative would also transverse the overthrust belt which is currently receiving a large amount of exploratory drilling. Geologists feel that there is no question as to natural gas and oil being found, but the question lies in the location and magnatude of supply. We feel that the alternative not transversing southwestern Utah would in the long run create the situation of requiring additional pipelines being constructed at a later date.

An analysis of gas supplies, reserves, and potential for the Overthrust Belt is beyond the scope of the EIS. Certainly the construction of any pipeline(s) in the area should be based on the need for the facilities.

We, of the community, also feel that utility cooridors should be established for more than one use. The alternatives proposed by the

No response required.

project company would follow the alignment as near as we can tell, of the major cooridors for the Intermountain Power Project.

We feel that these duo uses should be used wherever possible. With the construction of a project such as the natural gas pipeline, there is definitely some disturbance of the environment. However, with current construction capabilities, even though it is an arrid area, we feel that the environmental impacts are minimal, the permanent impact almost non existent. Since it is a very narrow strip of land disturbed and within two to three years most people crossing the construction area would be unaware of its existence.

Cedar City would like to go on record again supporting construction of the project as proposed by Rocky Mountain Pipeline Company. We feel that the adverse affects are far outweighed by the benefits of such a utility service being available to our area.

We appreciate this opportunity to express our feelings on the draft environmental impact statement and look forward to coordinating further activity with the sponsoring company and governmental agency.

Very truly yours,

S. Jack Sawyers
Mayor

SJS/mb

No response required.

Clark County

Department of Comprehensive Planning

DONALD L. "PAT" SHALMY
DIRECTOR

RICHARD B. HOLMES
ASSISTANT DIRECTOR

300 SOUTH FOURTH STREET
VALLEY BANK PLAZA, SUITE 506
LAS VEGAS, NEVADA 89101
(702) 386-4181

August 27, 1981

Secretary
Federal Energy Regulatory Commission
825 North Capital Street NE
Washington, D. C. 20426

OPPR/DPC-EEB
Rocky Mountain Pipeline Company
Docket No. CP 79-424
Case No. U-45957

ROCKY MOUNTAIN PIPELINE PROJECT
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Clark County Department of Comprehensive Planning has reviewed the Rocky Mountain Pipeline Project Draft Environmental Impact Statement. We concur with the FERC environmental staff conclusions and recommendations presented in Chapter 5 of the DEIS. Should the pipeline traverse Clark County, we agree that Variation 3, East Las Vegas would be preferred over the "Proposed Action" for part of the pipeline route.

By utilizing the East Las Vegas variation, the pipeline would cross the Las Vegas Wash area at a location which would avoid the proposed site of the Clark County Wetlands Park and the Rainbow Gardens National Heritage site. The East Las Vegas Variation also avoids crossing the portion of the Las Vegas Wash most susceptible to severe erosion.

No response required.

In order to mitigate environmental degradation during and after pipeline construction and to minimize conflicts with other planned or proposed projects in the vicinity of the Rocky Mountain Pipeline Project, Clark County Department of Comprehensive Planning recommends that the pipeline proponents comply with the following conditions:

- o that the selected pipeline route utilize existing utility and transportation corridors where possible;
- o that unnecessary soil and vegetation disturbance be prevented;
- o that a thorough analysis be conducted upon completion of the Clark County Wetlands Park Master Plan to determine the impacts of the pipeline on the park and to recommend appropriate mitigative measures;

- o that all pipeline routing, design, right-of-way acquisition, and construction activity required for Variation 3, East Las Vegas along the proposed Clark County Advanced Wastewater Treatment export pipeline route and through Clark County Sanitation District property be coordinated with the Clark County Sanitation District;

Comment reflected in chapter 5, "Conclusions, Recommendations: Preferred Alternative."

- o that the location of the preferred pipeline route and construction activities be coordinated with all local land use and development plans;

- o that the Muddy River crossing near Glendale be designed for maximum protection of endangered species habitat (Moapa Dace); and;

The biological opinion from the FWS, issued in compliance with section 7 of the Threatened and Endangered Species Act, contains mitigating measures to protect this habitat if any problems are perceived.

- o that the pipeline proponents comply with the Bureau of Land Management's Standard Operating Procedures and Mitigating Measures.

RMPC would comply with BLM's Standard Operating Procedures and Mitigating Measures (i.e., stipulations of the right-of-way agreement) when the pipeline crossed federally owned land. However, when the pipeline crossed non-Federal land, the compensation, mitigating measures, etc., to be employed would be negotiated with the individual landowner as part of the right-of-way agreement.

Clark County Department of Comprehensive Planning's review of the RMPPDEIS indicated that the following revisions should be made to ensure the factual accuracy of the document:

Page 3-20 Map 3-3 Clark County Recreation Lands

The patterns shown on the legend to indicate the Las Vegas Wash Wetlands Park (Proposed) and the Frenchman Mountain/Rainbow Gardens National Landmark (Potential) should be reversed.

Appropriate changes have been made to this EIS and to the recreation and wilderness technical report.

Page 3-21, paragraph 2, sentence 4

The sentence should be revised to read "Typical recreation activities enjoyed in the proposed wetlands park area include sightseeing, nature study, hiking and hunting."

Suggested revision has been made to chapter 3, "Recreation Resources."

We appreciate the opportunity to review the Draft EIS. We would like to receive a copy of the Final EIS, and we would welcome the opportunity to review any additional planning documents related to the pipeline project.

Sincerely,

DEPARTMENT OF COMPREHENSIVE PLANNING

Richard B. Holmes

Richard B. Holmes
Assistant Director

RBH:bm

Clark County
Sanitation District
E. JAMES GANS
DIRECTOR
5857 E. FLAMINGO ROAD
LAS VEGAS, NEVADA 89122
(702) 458-1180

OFFICIAL FILE COPY
August 21, 1981
DOCKET | INIT. | DATE
CENTRAL FILES

Mr. Kenneth Plumb
Secretary
Federal Energy Regulating Commission
825 North Capitol Street, N.E.
Washington, D.C.

Dear Mr. Plumb:

Re: Rocky Mountain Pipeline Company
Docket No. CP79-424
Case No. U-45957
RMPP DEIS
OPPR/DPC-EEG

The Clark County Sanitation District has reviewed the Draft Enrironmental Statement for the Rocky Mountain Pipeline Project, and wish to compliment you on the excellent job that was done.

There are, however, some areas which will impact on the District, and therefore on your project, should Variation 3, East Las Vegas Variation, be selected. We have listed and briefly discussed several areas of concern in the attachment which we would like you to consider in your final environmental assessment. We feel that with proper planning, these concerns will not be obstacles to the pipeline location.

Please keep us informed on meetings scheduled and progress made on this project.

If you have any questions, do not hesitate to contact me at Area Code 702, 458-1180.

Yours very truly,

Ron Billi

Ron Billi
Division Manager

RB:EM:ab

ROCKY MOUNTAIN PIPELINE COMPANY
DRAFT ENVIRONMENTAL IMPACT STATEMENT
Docket No. CP79-424
Case No. U-45957
RMPP DEIS
OPPR/DPC-EEG

1. Pipeline Location

We are submitting a topographic map (Attachment 1) for your review. You should note the locations of existing treatment and ancillary facilities as these represent constraints if Variation 3, referenced in the DEIS, is selected. Additionally, we are submitting an alignment plan (Attachment 2) for proposed Treatment Facilities Study Projects (A thru D) that are due to commence about November, 1981. Schedules for completing each phase (A thru D) vary from 12 months to 18 months.

As conflictions with existing facilities, and conflictions with proposed facilities (plus possible overlapping construction schedules) are imminent if the alignment of Variation 3 is followed, we are submitting a modified Variation 3 for your review. This modification to Variation 3 is represented as a red dashed line on Attachment 1. Advantages of following the proposed modification are:

a) Eliminate conflictions with existing facilities.
b) Eliminate conflictions with proposed facilities.
c) Eliminate effects of overlapping construction schedules.
d) Reduce your expenses related to severe ground water conditions known to exist in the area between the CCSD Plant and the AWT Plant. Specifics regarding this are given in Item 4.
e) Land adjacent to modified Variation 3 would allow for utility corridors expansion.
f) Environmental concerns of avoiding the Rainbow Gardens and Las Vegas Wash areas would be met.

Information on conflicts has been added to chapter 2, table 2-10, and chapters 3 and 4, "East Las Vegas Variation."

As the comments have stated, there are conflicts between the Clark County Sanitation District activities in the mile-wide corridor of the East Las Vegas Variation and the construction of a natural gas pipeline. However, it appears that the pipeline could be built, although under difficult conditions, in the eastern half of the corridor through the land treatment beds and beneath the buried sewage line (Billi 1981).

The proposed modification, however, would pass through the proposed Clark County Wetlands Park and through a wetlands/riparian zone. In addition to that, if the preferred alternative cited in the environmental assessment on the proposed park is implemented as planned, the route modification would also pass through a "wetlands interpretative area." The construction difficulties would be similar to those found in the eastern half of the variation corridor, but the impacts to sociological values (park, natural habitat, ecological studies) would be much more severe. Consequently, the FEIS does not include the proposed modification to the East Las Vegas Variation.

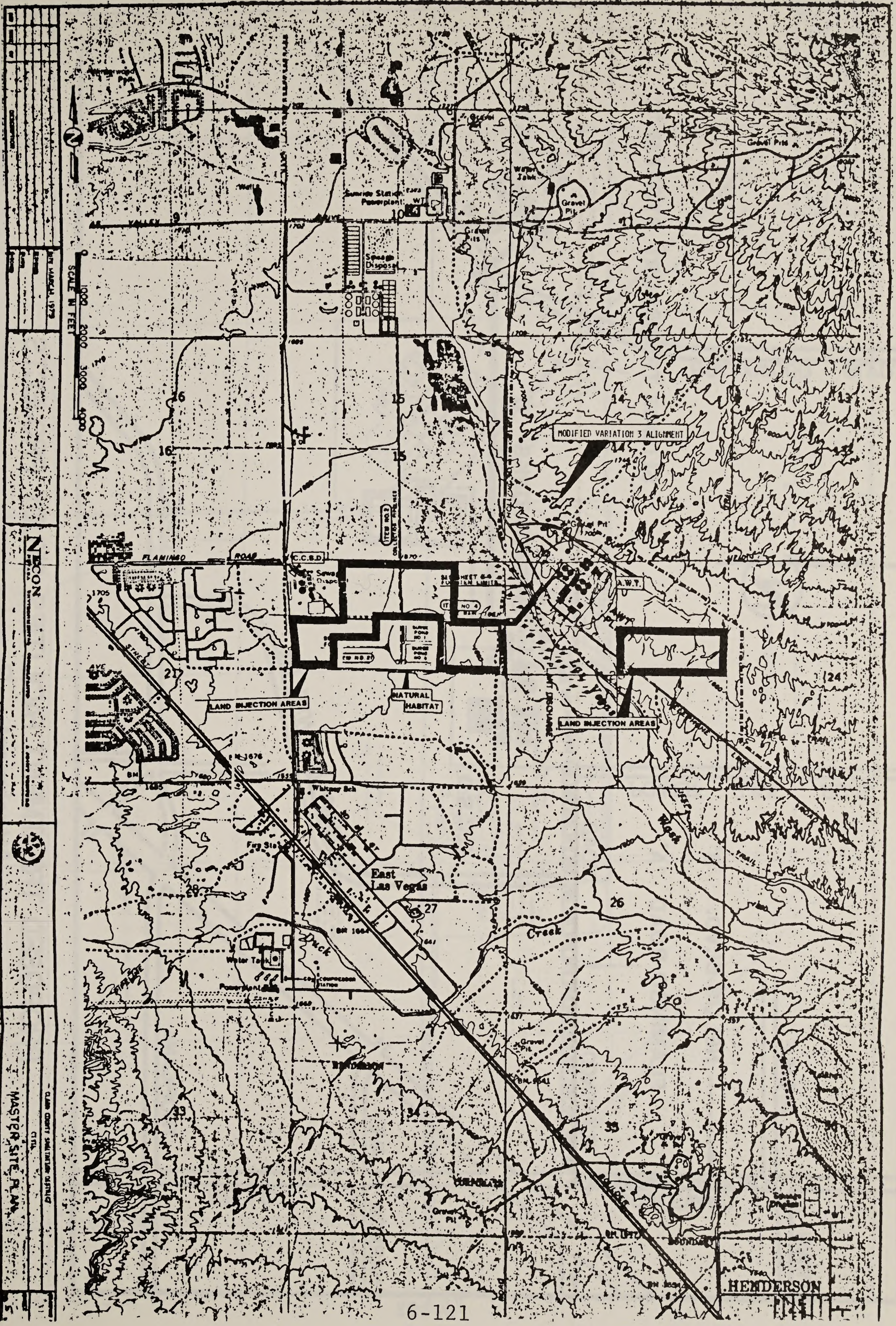
2. Right-of-Way

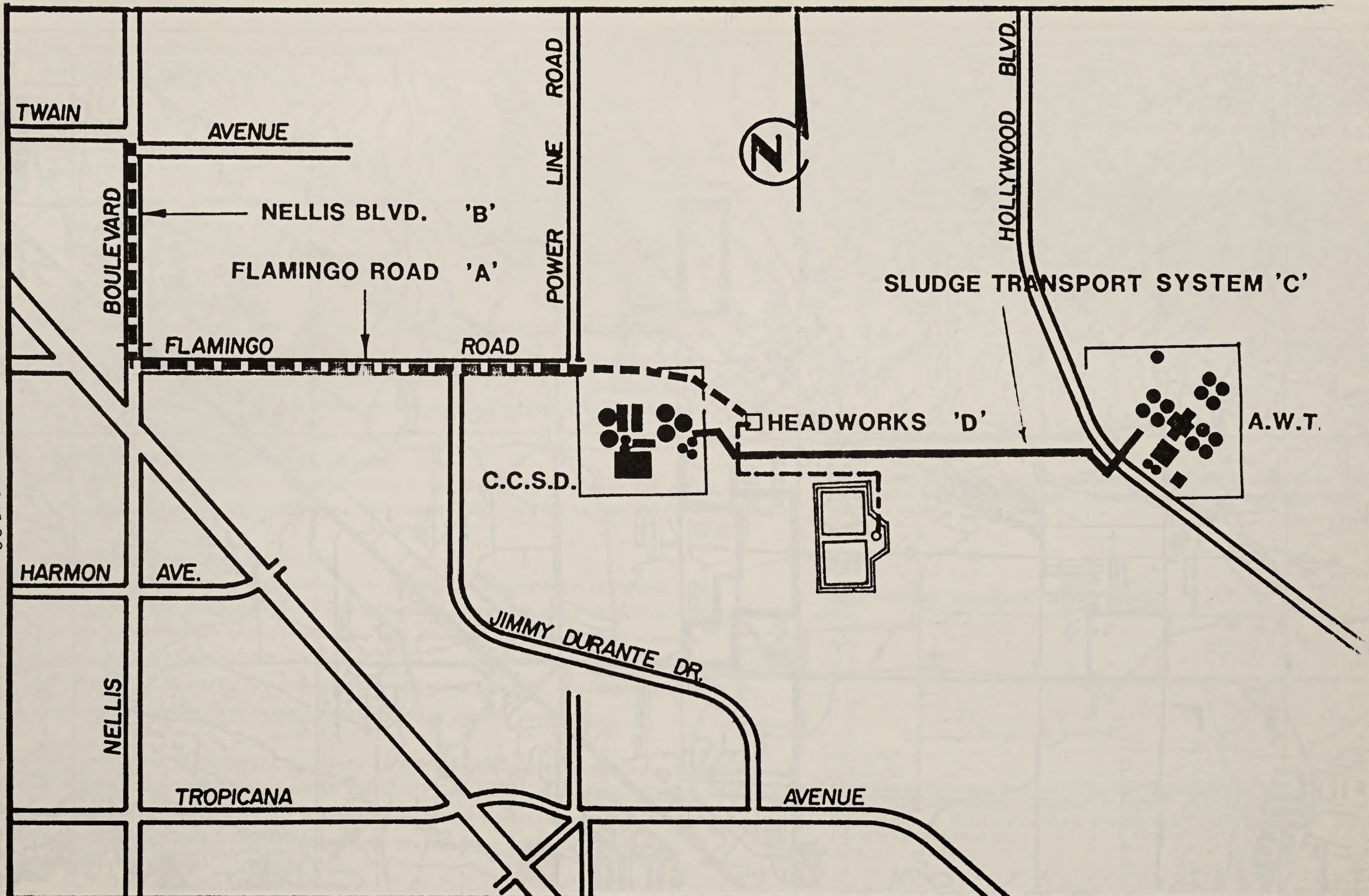
Variation 3 as proposed would be located between two of our treatment plants and therefore would affect existing land treatment processes and severely affect construction and operation of short and long term proposed treatment facilities. In addition, since some of the land is owned by Clark County Sanitation District, and some by Clark County, separate right-of-way approvals may need to be obtained from both when the pipeline location is finalized (Attachment 3).

See response to similar comments in the letter from the San Joaquin County Council of Governments dated July 23, 1981.

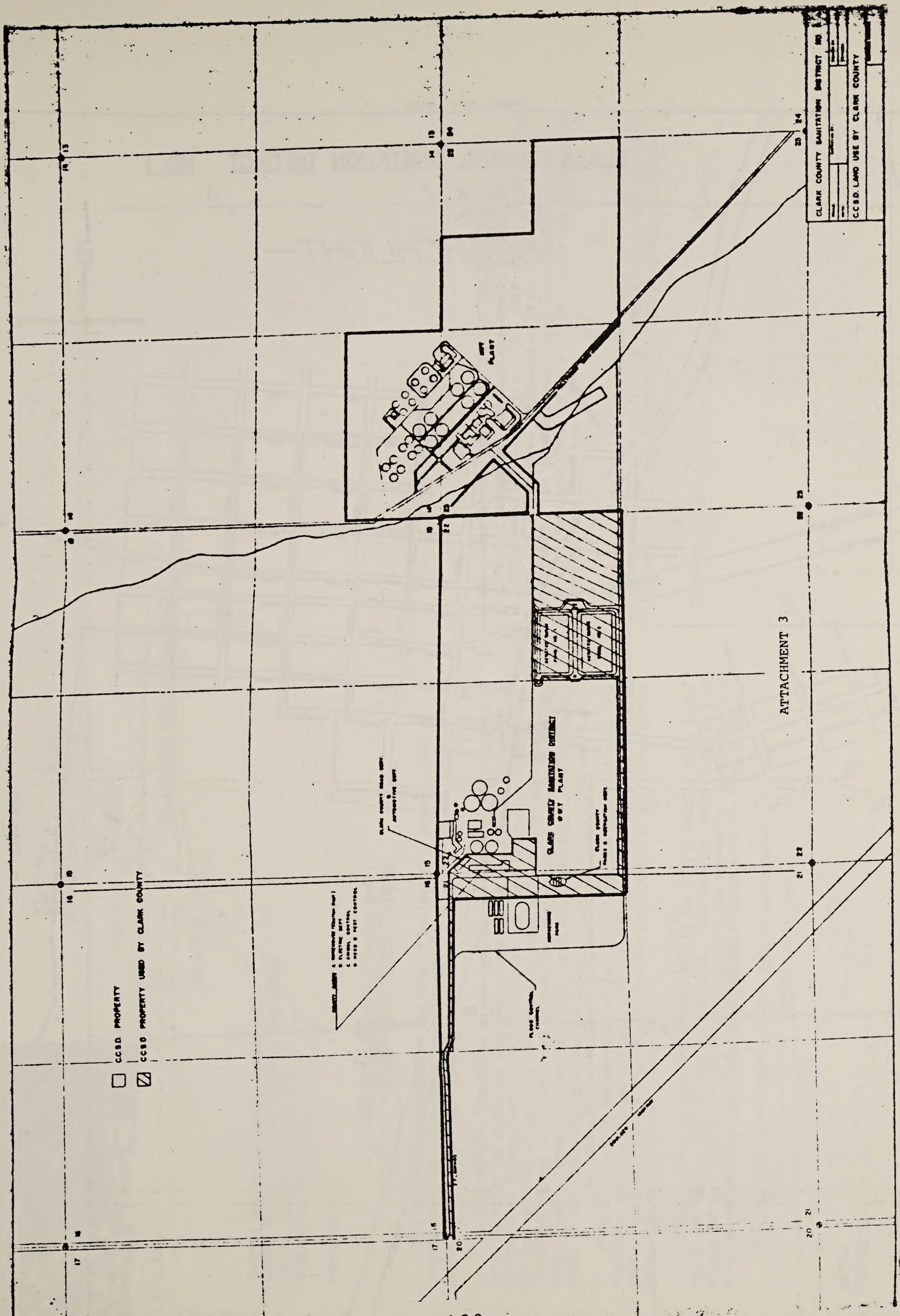
Comment	Response
3. Pipe Alignment Plan District approval of the finalized pipe alignment plan will be required prior to commencement of construction to insure that there is not a negative impact on District operations.	The authorizing actions listed in chapter 2 and the accompanying narrative description in appendix D focus on major Federal, state, county, and local actions required to implement the proposed action. Since the same general types of authorizations would be required for the various alternatives and variations, they are not presented in the EIS. Also, for purposes of this EIS, district approvals are not considered major authorizing actions.
4. Water Table Another condition that exists in the area of your proposed site is that the water table is near the surface at various depths. This condition will slow down the pipeline project during construction, possibly will require a change in the type of piping, will necessitate a dewatering plan and may result in additional maintenance and higher costs.	Comment noted. Although a specific dewatering plan for areas with high ground water has not been proposed at this time, the general procedure is described in chapter 2, "Proposed Action: Construction, Operation, and Maintenance."
5. Effects on Land Injection The District currently uses land injection as part of their treatment process. The land most readily used for this process is located in the direct path of your proposed alignment. In addition, the majority of the other land injection areas are located between our secondary and tertiary plants (See Attachment 1).	As the comment has stated, there could be a conflict in this area.
6. Access/Egress Roads Within CCSD Confines The draft EIS references that access/egress roads will be available for public use. Within CCSD confines however, this access will need to be limited to maintenance of the line.	This restriction could be included in the easement contract between the sanitation district and the RMPC.
7. Searchlight Wastewater Facilities The District maintains approximately 16,700 L.F. of wastewater collector lines and a treatment facility in the area primarily east of Highway 95 at Searchlight, Nevada, as indicated on Attachment 4. Our concern addresses DEIS statements regarding the proposed RMPP alignment in the proximity of Searchlight. Approval of mitigating measures for protection of existing District facilities will be required to insure that District right-of-ways are not encroached.	No response required.
In addition, since the District currently is charged with the responsibility for wastewater discharge for the unincorporated areas of Clark County, we will be quite interested in being notified of any wastewater discharge permit requested from the Nevada Division of Environmental Protection and any pretreatment programs planned or implemented.	The Clark County Sanitation District could probably make arrangements to have the Nevada Division of Environmental Protection notify it of any permits.

Comments submitted by: Clark County Sanitation District No. 1
5857 E. Flamingo Road
Las Vegas, NV 89122
(702) 458-1180

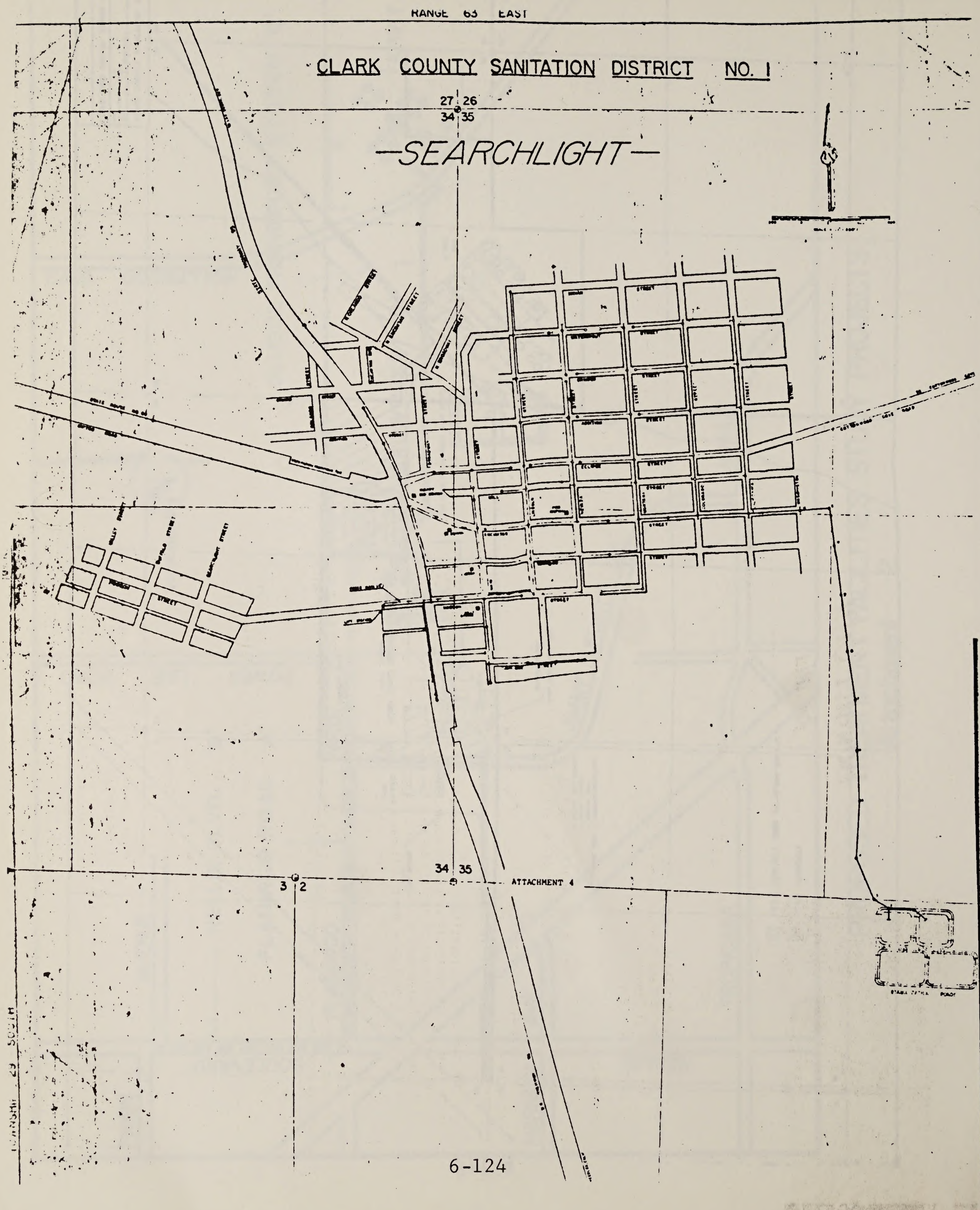

MASTER SITE PLAN
CLARK COUNTY SANITATION DISTRICT
CIVIL
NECON
SCALE IN FEET
1000 2000 3000 4000
MARCH 1979
MODIFIED VARIATION 3 ALIGNMENT
LAND INJECTION AREAS
NATURAL HABITAT
LAND INJECTION AREAS
A.W.T.
C.C.S.D.
FLAMINGO ROAD
VALLEY
Sunrise Station Powerplant
Sewage Disposal
Gravel Pit
East Las Vegas
Whitney Sch
Water Tank
Powerplant
Creek
HENDERSON



PROPOSED TREATMENT FACILITIES STUDY PROJECTS
Attachment 2



ATTACHMENT 3


RANGE 63 EAST
CLARK COUNTY SANITATION DISTRICT NO. 1
27 26
34 35
—SEARCHLIGHT—
34 35
3 2
ATTACHMENT 4
TOWNSHIP 29 SOUTH

CITY OF

Boulder City

Nevada

P. O. BOX 367

900 ARIZONA STREET 89005

August 17, 1981

Federal Energy Regulatory Commission
Office of Pipeline and Producer Regulation
825 No. Capitol Street, N.E.
Washington, DC 20426

Gentlemen:

RE: <u>Rocky Mountain Pipeline Draft Environmental Impact Statement</u>

The Engineering Division of the City of Boulder City hereby offers comment relating to the Draft Environmental Impact Statement (DEIS) for the Rocky Mountain Pipeline Proposal.

The map exhibits identified in the Appendix as S-10 and S-11 do not properly identify the municipal corporate boundaries of the City of Boulder City. We feel this is important to rectify because the one mile corrider represented by the preferred alternative involves land situated within the municipality. Therefore, we are enclosing a map delineating the municipal boundary of Boulder City. Noted, however, is the fact that Variation 3, the East Las Vegas Variation, is not situated within Boulder City.

The 1-mile wide corridor of the proposed action directly overlays the western municipal corporate boundary of Boulder City. If this route is selected and the RMPC comes to Boulder City to negotiate an easement, the correct municipal boundaries would be used. However, the FEIS will not show the corrected boundaries on a new map.

Also of import is the omission of the City of Boulder City from among the regulatory agencies listed on Page 2-27 of the DEIS. Since the preferred alternative would pass through the City of Boulder City, the City would have zoning regulatory authority.

Please see the addition of the City of Boulder City zoning regulatory authority (conditional use permit) to chapter 2 and appendix D, "Authorizing Actions."

Uniquely, the City owns all of the land in fee simple that is not a highway in the western half of the map enclosed. Consequently, acquisition of right-of-way for any pipeline alignment passing within the boundaries of Boulder City would be subject to right-of-way negotiations directly with the City as owner.

Comment noted.

This opportunity to comment on your DEIS is appreciated.

Very truly yours,

Kurt Weinrich

Kurt Weinrich, P.E.
City Engineer

KW/jam
Enclosure

RECEIVED AUG 21 10 11

cc: Bureau of Land Management (w/enclosure)
555 Zang Street
Third Floor East
Denver, CO 80228

Leigh S. Cassidy (w/enclosure)
Attorney at Law
Pacific Gas Transmission Company
Pacific Transmission Supply Company
Rocky Mountain Gas Transmission Company
245 Market Street
San Francisco, CA 94105

T. Zerkle (w/o enclosure)
L. West " "
D. Chapman " "

CITY OF

Boulder City

Nevada

P. O. BOX 367 — 900 ARIZONA STREET 89005

August 20, 1981

RECEIVED
AUG 25 9 27 AM

Federal Energy Regulatory Commission
Office of Pipeline and Producer Regulation
825 No. Capitol Street, N.E.
Washington, D.C. 20426

Gentlemen:

RE: Rocky Mountain Pipeline Draft Environmental Impact Statement

The Community Development Department of the City of Boulder City has had an opportunity to review the Draft Environmental Impact Statement (DEIS) for the Rocky Mountain Pipeline Proposal and are in concurrence with the review previously submitted by the Engineering Division of the City of Boulder City.

The proposed action identified paralleling the western boundary of Boulder City is presently zoned "S" Interim Study Zone. This study zone was established to permit control in those areas which are at present premature for urban development. Uses within this zone are limited to temporary, open air type uses which require no permanent structures or buildings. Any uses established within this district is subject to approval of the Planning Commission and subject to such conditions stipulated by the Planning Commission. This proposed action would require conditional approval by the Boulder City Planning Commission.

The "Authorizing Actions" and "Summary" have been revised to reflect this comment.

Page XX "Land Managing Agencies Preferred Alternative" - should reference Boulder City in addition to the City of Henderson and Clark County.

Appropriate changes have been made to the FEIS. Refer to the "Summary," chapter 5, "Land Managing Agencies' Preferred Alternative," and chapter 2, "Authorizing Actions," for text changes.

Page 2-17, Chapter 2 "Proposed Action" - identifies that a base will be located in Las Vegas, Nevada. Since these are five acre sites, has a parcel been identified, or is this in the general vicinity of Las Vegas?

The precise location for all of the maintenance bases has not been determined by RMPC. The Sage Compressor Station and maintenance base is the only maintenance base that has been identified by milepost.

Page 2-17 "Communication Requirements" - will a transmission site be required from Boulder City?

This information has not been provided by the applicant. Existing communication facilities would be used where possible.

Federal Energy Regulatory Commission August 20, 1981

Page 4-16 "Conflicts with Land Use Plans, Policies, and Controls" - Report does not identify any municipal reference to land use plans.

The comment is correct. Municipal land use plan conflicts were omitted from the DEIS in the expectation that the municipalities which received the DEIS would identify any conflicts.

Is the valve location proposed along U.S. 95, south of U.S. 93, proposed within Boulder City corporate limits? Where is the fill material or select materials for silting being acquired in the Boulder City area?

The general locations of the block valves are shown on the maps in the FEIS. Specific sites for the block valves and the source(s) for fill materials have not been identified by RMPC.

Another area of importance to Boulder City is the alighment south of the Boulder City corporate limits. Boulder City has expressed interest and willingness in acquiring a portion of the Eldorado Valley to relocate the existing municipal airport. The land is currently optioned to the State of Nevada from the Department of the Interior. A Master Plan for the airport and associated relocation has been adopted by the City of Boulder City. I will forward to you a map delineating the optioned land to the State of Nevada and airport relocation site.

No response required.

Page 2-21, 4-17 through 4-21--Proposed action identifies Boulder City as a double-jointing yard and, I assume, a railhead for the project. Has a double-jointing yard been selected? Is the Union Pacific spur in Boulder City to be utilized as the railhead for this portion of the pipeline? What impact will the double-jointing yard have on the transportation network: traffic circulation; traffic disruption; and roads and pavement?

The applicant has not finalized the locations of double-jointing yards; therefore, they are subject to change. However, should the applicant elect to use Boulder City, there would be additional truck traffic on the major north and south routes from the yard site to deliver pipeline to the right-of-way. These vehicles would not exceed the load and weight standards in existence.

It is estimated in the report that double-jointing yards will be maintained approximately five months. According to the report, approximately 230-277 workers would be working on each section of the pipeline and 21% of the peak work force would be located at the double-jointing yard. What impact will there be on housing, tourism, police and fire protection within Boulder City?

Because Boulder City has a large socioeconomic base relative to the size of the workforce, significant impact to housing, tourism, police, and fire protection should not occur. (See chapter 4, "Proposed Action: Socioeconomics.")

It appears that an environmental assessment would be appropriate if the staging area is within Boulder City.

If a double jointing yard were located in Boulder City, only 67 people would work at the site for 5 months. Because Boulder City would not sustain significant socioeconomic impact, an environmental assessment should not be necessary.

Very truly yours,

Lee R. West

Lee R. West, Director of
Community Development

LRW:ls

cc: Terry L. Zerkle, City Manager
Kurt Weinrich, City Engineer

CITY OF HENDERSON

CITY HALL 243 WATER STREET 702/565-8921
HENDERSON, NEVADA 89015

Gateway to Lake Mead Resorts

Community Development Department Kenneth A. Knight, AICP, Director

August 17, 1981

Janis L. Bowles, Project Manager
Bureau of Land Management
555 Zang Street
Third Floor East
Denver, Colorado 80228

Kenneth D. Frye, Project Manager
Federal Energy Regulatory Commission
825 North Capitol Street NE
Washington, D.C. 20426

Gentlemen:

Re: Rocky Mountain Pipeline Project
FERC Docket No. CP79-424
BLM Case No. U-45957

The following comments and questions concern the Draft Environmental Impact Statement for which the public hearing was held August 3rd in Las Vegas. We would prefer that this line follow an alternate route that does not go through Henderson. If a route through Henderson is selected however, our major concern is for the safety of our residents. 1

Pipeline Safety

1. Henderson has housing in Sections 4 and 27 adjacent to the preferred route. Future housing is planned for areas adjacent to the alternate route. In the event of a break in the line, would there be a health/safety hazard? The Las Vegas Valley is subject to inversion layers that could trap a cloud of natural gas and hold it. What measures will be taken to recognize this and deal with it? What measures will be needed to protect our residents? How far from the line will the protective measures be taken? How fast will danger occur, if any? What type of danger (asphyxiation, explosion)? How extensive? How long until repairs can be made? 2

2. Is any of this line to be exposed? What safety measures are proposed for any exposed portions of this line? For example, can a bullet penetrate line? What can be done to camouflage valve sections? 3

Air Quality - Construction in Las Vegas Valley must meet the required watering of sites; this pipeline would be no different. The APCD, a division of the Clark County Health District, should be listed as a regulatory agency. 4

The primary and ELV alternate are designed to coincide with future streets, specifically Foothills. Measures should be taken to design these sections so that road construction in the future will not rupture or disturb this line. Will they build Foothills for Henderson as a maintenance road? What grades and routes design can be used for dual purpose? 5

1. Pipeline safety has been addressed in chapter 4 of the EIS.

2. If a pipeline ruptures, the greatest health/safety hazard would be an explosion and resulting fire. Explosions occur when natural gas or any other flammable substance is ignited in an enclosed space. Since natural gas is buoyant (less dense than air), it is impossible for the atmosphere to confine it to the Las Vegas Valley. Gas from a ruptured pipeline would simply act as a rising column of gas or as a flare until the pipe segment was isolated and the gas flow stopped. Therefore, the atmospheric inversion "problem" has not been discussed in the EIS.

   If an explosion occurred following a pipeline rupture, individuals in the vicinity of the rupture could be injured. It is impossible to determine the extent of damage resulting from a pipeline rupture. However, DOT Class standards are designed to mitigate any catastrophic pipeline safety hazard. Pipeline repairs would normally begin as soon as the ruptured segment of pipeline had been isolated by block valves and depressurized.

3. None of the 36-inch diameter pipeline would be aboveground. As shown in figure 2-6, the block valves would not be camouflaged, but they would be surrounded by a guard fence.

4. Comment has been noted and revisions made to chapter 2 and appendix D.

5. RMPC has not specifically stated that it would build a maintenance road in the area described. Any road RMPC would construct would conform to the minimum Nevada requirements for light-duty roads, including grades. To enhance cooperation, RMPC would probably be willing to make slight variations in its road network to satisfy the dual purpose. This would be resolved between RMPC and the local authorizing agencies.

The ELV alternate passes the National Guards' armory. Sixty ton tanks are used at this facility; some type of structure will be needed to protect the line from the military crossing if this route is selected.

Flood control could be a problem where these lines cross dry washes. Sudden flood water could disrupt the trenching and expose sections of the line.

COH crossings for water, sewer and roads - will we have to pay for this right? Or, will the City be allowed prescriptive right of transgress?

Revegetation of line near populated areas to reduce visual intrusion and dust - will they do it?

What is the timing on this? Will it start in Wyoming and wind its way south or in parts from each direction? What affect will this have on local employment of skilled labor?

The following refer to pages in the DEIS:

<u>Page 2-1</u> - The note that the system is designed to be doubled. Does this mean that the construction crews will be right back through with another pipe? Or, how is the doubling to occur? Will additional right-of-way be needed? How close to this line will the second line be placed? Answers to this came at the Public Hearing, i.e., the pressure will be increased in the same line. Will this doubling be handled by the pipe? How will the doubling of pressure and gas volume be addressed in terms of our question No. 1?

<u>Page 2-17</u> -How will the Boulder Highway be crossed? Will traffic be interrupted during this crossing? How will Lake Mead Drive be crossed? Will traffic be interrupted during this crossing?

The environment is documented for vegetation and soils, etc. but says nothing about people.

<u>Page 4-5</u> - Traffic disruptions in the Las Vegas Valley could be very significant. Some mention of how these are to be mitigated must be made.

We appreciate the opportunity to comment on this and to ask the above questions.

Yours truly,

Richard C. Heckendorf
Planning Chief

RCH:tbb

Should this variation be chosen, the applicant would coordinate and obtain applicable permits from local authorities. Southwest has two 16-inch diameter pipelines that pass just east of the National Guard armory, and the East Las Vegas Variation could follow these pipelines.

Although the possibility is remote, sections of pipeline could be exposed. The applicant would bury the pipeline a minimum of 5 feet under streambeds and anchor it with concrete coating, weights, or mechanical means to reduce the risk of exposure. Sudden floodwater could disrupt operations: however. the environmental impacts of such an event cannot be determined with any degree of reliability.

These questions lie beyond the scope of this EIS. It is reasonable to expect that the laws of the State of Nevada, local ordinances, and the negotiated right-of-way agreements would provide the answers to these questions.

RMPC will revegetate the right-of-way if the right-of-way agreement specifies this requirement. As chapter 2 states, revegetation along the right-of-way would be accomplished using appropriate materials and methods for each particular area, in accordance with the right-of-way agreements.

Figure 2-2 shows the proposed project construction schedule. Chapter 2, "Proposed Action: Construction, Operation, and Maintenance" provides additional information. Most of the local employment opportunities would be for unskilled labor.

The answers to these questions can be found in chapter 2, "Proposed Action: Future Plans and Abandonment."

Although secondary farm and county roads would be crossed using the open-cut method of construction, highways would be bored or cut as required by <u>permitting authorities</u>. Thus, the construction <u>method to be used when</u> crossing Boulder Highway and Lake Mead Drive would depend on the permits issued.

The socioeconomic sections address "people-oriented" issues.

Due to pipeline construction methods of boring beneath roadways, traffic disruptions in the Las Vegas Valley should be minor rather than significant. Slow-moving equipment along Las Vegas Valley roadways could create some minor traffic disruptions and delays; however, this would be temporary (2 weeks) and insignificant.

Department of Water and Power the City of Los Angeles

August 21, 1981

Mr. Kenneth Plumb, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

Dear Mr. Plumb:

Draft Environmental Impact Statement
Rocky Mountain Pipeline Project

This is in response to your letter of July 10, 1981. Please refer to OPPR/DPC-EEB, Rocky Mountain Pipeline Company, Docket No. CP79-424, Case No. U-45957, and the Rocky Mountain Pipeline Project (RMPP) Draft Environmental Impact Statement (DEIS). Comments addressing the concerns that the Los Angeles Department of Water and Power (LADWP) has with the DEIS are submitted below.

The LADWP is a participant in the existing Pacific Intertie, approved Intermountain Power Project (IPP), and the proposed White Pine Power Project (WPPP). To show the location of the RMPP relative to these projects we have enclosed a marked-up version of the RMPP Map S-20 showing these project facilities. Included on the map are routes traversed by the approved IPP Transmission Line right-of-ways, the WPPP Transmission Line alternatives, and the existing Pacific Intertie Transmission Line.

We feel that the coordination requirements and conflicts inherent between RMPP, Pacific Intertie, IPP, and WPPP should be addressed in the DEIS. The only section that mentioned the subject of project interrelationships occurred on page 2-40 and in Table 2-10 on pages 2-40 and 2-41. In this section, projects now in the planning stages and within or adjacent to the RMPP, or its alternatives, were addressed. It appears that Table 2-10 was intended to show only those planned projects which had construction schedules overlapping the construction schedule of the RMPP or its alternatives. Because of the immensity of the RMPP and the potential long-term impacts on existing and planned projects, Table 2-10 should be retitled to read "Rocky Mountain Pipeline Project Interrelationship with Other Projects." This change would then give a full picture of the RMPP and its conflicts with other projects.

The discussion of pipeline safety in chapter 4 focuses on some of the potential hazards from joint use of rights-of-way, whereas table 2-10 notes overlapping construction and employment schedules. It is assumed that any place a pipeline and a transmission line share the same corridor, a conflict could occur. Because of this, table 2-10 does not list the potential safety hazards as conflicts. Please see the additions to table 2-10.

111 North Hope Street, Los Angeles, California [ ] Mailing address: Box 111, Los Angeles 90051
Telephone: (213) 481-4211 Cable address: DEWAPOLA

Once the title has been changed, the format of the original table could remain the same. The necessary information regarding the LADWP interests could then be appropriately added to Table 2-10 and would appear as shown on the enclosed chart.

Although a revised Table 2-10 would address the potential problems with the RMPP, the responsibility of identifying potential conflicts and mitigating these conflicts with existing facilities and approved projects would belong to the RMPP.

If there should be any questions on our comments or the enclosures, or if you should make any changes in the DEIS in response to our comments, please contact Mr. Tom Halford of our staff at (213) 481-5333.

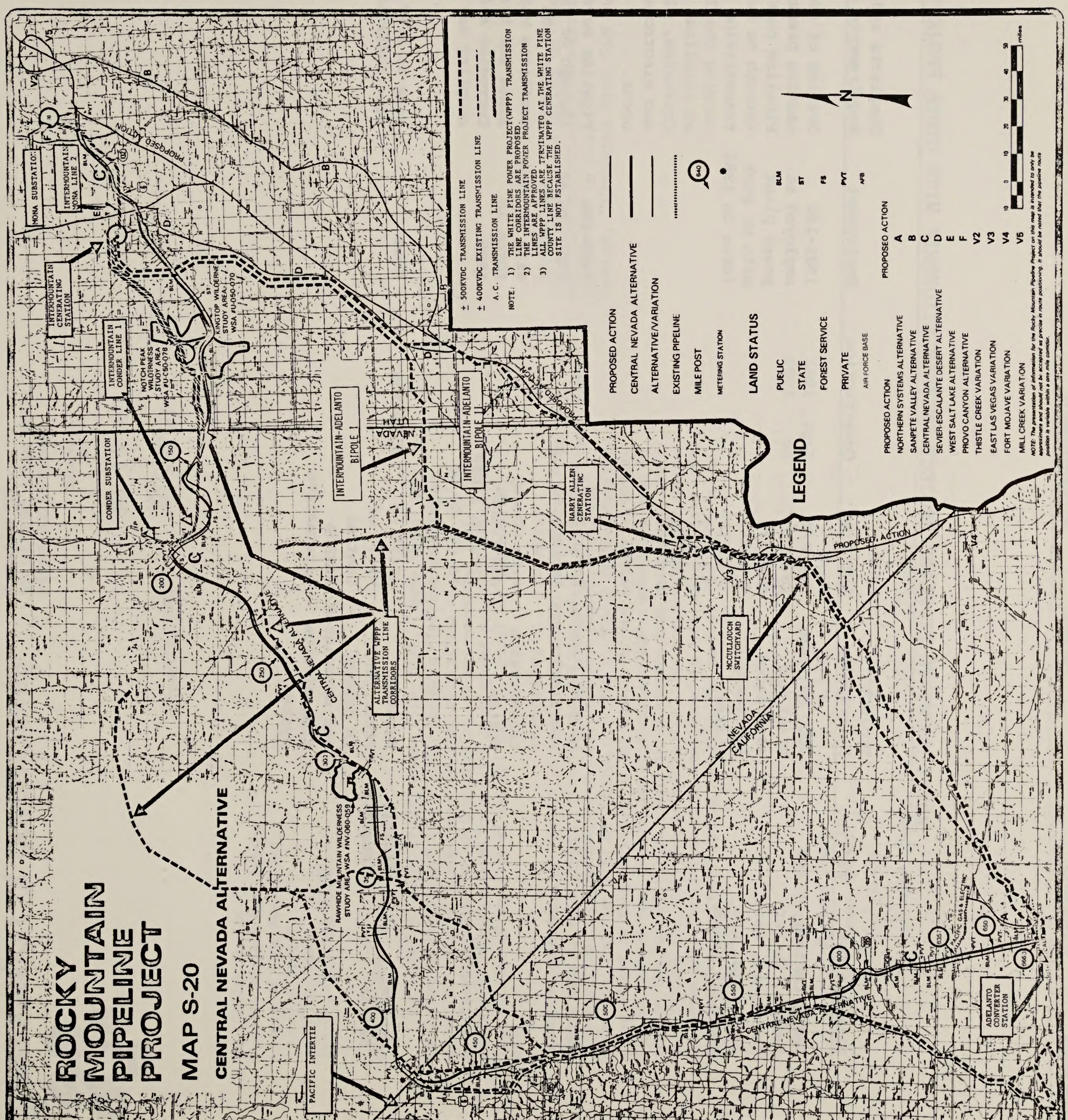
Very truly yours,

Melvin Frankel

MELVIN FRANKEL
Engineer of
Environmental Coordination

Enclosures

cc: Mr. Tom Halford


ROCKY MOUNTAIN PIPELINE PROJECT
MAP S-20
CENTRAL NEVADA ALTERNATIVE
LEGEND
PROPOSED ACTION
CENTRAL NEVADA ALTERNATIVE
ALTERNATIVE/VARIATION
EXISTING PIPELINE
MILE POST
METERING STATION
LAND STATUS
PUBLIC
STATE
FOREST SERVICE
PRIVATE
AIR FORCE BASE
BLM
ST
FS
PVT
AFB
± 500KVDC TRANSMISSION LINE
± 400KVDC EXISTING TRANSMISSION LINE
A.C. TRANSMISSION LINE
NOTE: 1) THE WHITE PINE POWER PROJECT(WPPP) TRANSMISSION LINE CORRIDORS ARE PROPOSED.
2) THE INTERMOUNTAIN POWER PROJECT TRANSMISSION LINES ARE APPROVED.
3) ALL WPPP LINES ARE TERMINATED AT THE WHITE PINE COUNTY LINE BECAUSE THE WPPP GENERATING STATION SITE IS NOT ESTABLISHED.
PROPOSED ACTION
NORTHERN SYSTEMS ALTERNATIVE A
SANPETE VALLEY ALTERNATIVE B
CENTRAL NEVADA ALTERNATIVE C
SEVIER-ESCALANTE DESERT ALTERNATIVE D
WEST SALT LAKE ALTERNATIVE E
PROVO CANYON ALTERNATIVE F
THISTLE CREEK VARIATION V2
EAST LAS VEGAS VARIATION V3
FORT MOJAVE VARIATION V4
MILL CREEK VARIATION V5
miles
MONA SUBSTATION
INTERMOUNTAIN MONA LINE 2
INTERMOUNTAIN GENERATING STATION
INTERMOUNTAIN CONDER LINE 1
CONDER SUBSTATION
INTERMOUNTAIN-ADELANTO BIPOLE I
INTERMOUNTAIN-ADELANTO BIPOLE II
HARRY ALLEN GENERATING STATION
MCCULLOUGH SWITCHYARD
ALTERNATIVE WPPP TRANSMISSION LINE CORRIDORS
PACIFIC INTERTIE
ADELANTO CONVERTER STATION
UTAH
NEVADA
CALIFORNIA
PROPOSED ACTION
CENTRAL NEVADA ALTERNATIVE

ROCKY MOUNTAIN PIPELINE PROJECT INTERRELATIONSHIP WITH OTHER PROJECTS

Alternatives	Project	Project Description	Location	Construction	Employment	Conflicts and Coordination Requirements with RMPP
RMPP, Central Nevada, Sevier-Escalante, West Salt Lake, and East Las Vegas	IPP	3000 MW Power Plant and associated transmission system.	See R/W Grants U-42516 U-42517 U-42518 U-42519 U-45882 U-45883	Sept. 1981 to 1989	1981-160 employed at power plant site to peak force in 1985	Overlap of construction schedules causing pressure to local services. Pipeline corridors would cross through or run adjacent to approved transmission right-of-ways thus causing conflicts with locations of pipelines and transmission lines. Corrosion, electrostatic coupling, and electromagnetic coupling may occur.
RMPP and Central Nevada	WPPP	1500 MW Power-plant and associated transmission system.	Powerplant is located in White Pine County and trans-mission lines as yet to be established	Jan. 1985 to 1991	1985-160 employed at powerplant site to peak force in 1989	Pipeline corridors would cross through or run adjacent to trans-mission line corridors thus causing conflicts with locations of pipe lines and transmission lines. Corrosion and electromagnetic coupling may occur.
Central Nevada	Pacific Intertie	Existing Powerplant in Oregon and associated transmission system.	MP425 to MP575 of Central Nevada Alternative	Existing	None	Same as WPPP except add potential electrostatic coupling problems.

five county association of governments

P. O. BOX "O"
ST. GEORGE, UTAH 84770
PHONE (801) 673-3548

SPECIAL PROJECTS STAF

AUG 1 0 1981

RECEIVED

August 6, 1981

Ms. Janice Bowles
Special Project Team Leader
Bureau of Land Management
5 Zane Street
3rd Floor East
Denver, Colorado 80228

Dear Ms. Bowles:

On August 4, 1981, at SUSC Cedar City, Utah, I made formal presentation on the support of the Rocky Mountain Pipeline applicants preferred route with some environmental alterations on behalf of the Five County Association of Governments. It was requested that I furnish additional information on Industrial Development potential and economic loss because of the lack of natural gas in central and southwestern Utah.

The communities of central and southwestern Utah presently do not have access to natural gas. With the construction of the Rocky Mountain Pipeline, the communities in Juab, Millard, Beaver, Iron, and Washington counties will be located near the alignment of the pipeline. In an effort to take advantage of the commercial and industrial potential of natural gas, central and southwestern Utah communities need to examine the feasibility of establishing service from natural gas available through the Rocky Mountain Pipeline. The preliminary 1980 census has shown that the five counties considered in this proposal have undergone substantial growth during the 1970-1980 period. The table below reveals the growth.

	1970	1980
Juab County	4,574	5,544
Millard County	6,988	8,915
Beaver County	3,800	4,455
Iron County	12,177	17,450
Washington County	13,669	26,002
	41,208	62,366

Additional information on the ability of local communities to obtain gas service from the RMPP is presented in response to a comment from Mr. John D. Keeler, "Comments From BLM Public Hearings."

Ms. Janice Bowles
Page 2

The regional growth trends are expected to increase even more dramatically during the 1980-1990 time frame. Development of central and southern Utah natural resources plus the deployment of the MX Missle System, will place energy demands on local communities that will be difficult to satisfy from existing energy sources. Additionally, central and southwestern Utah are beginning to emerge as regional industrial centers. Superior transportation access, favorable business environment, and rural setting make the area attractive for future industrial expansion. With this impending growth, the potential for natural gas service from the Rocky Mountain Pipeline System must be endorsed.

The Five County Association of Governments and the Six County Commissioners organization were designated as Economic Development Districts with growth centers by the U.S. Department of Commerce for the purpose of fostering and promoting economic growth. As part of our economic activities in promoting industrial growth we are the lead agencies and work in conjunction with the Utah State Division of Industrial Development in locating private industry into our designated growth centers.

The following is a summary of industrial firms that have shown intent to establish facilities in the Six County and Five County area. These firms declined to commit to the area because of the unavailability of natural gas service. Had natural gas service been available, 1,152 additional direct jobs would have been created.

Type Firm	Product/Service	Location	Jobs
Battery Mfg Co. (A)	Multi-Purpose Batteries (Reg. 900,000 cf/day)	Nephi	300
Nutritional Laboratory (B)	Infant/Adult Nutritional Products	Cedar City	250
Electronics Co. (C)	Electronic Components	6/Co/5 Co	72
Industrial Ceramics Co. (D)	Heat Processing for High Tension Conductors/ Houseware Conduits	6 Co.	30
Electronics Co. (E)	Electronic Components	6 Co/5 Co	25
Small Arms Co. (F)	Ammunition Assembly	5 Co	150
Aircraft Mfg. (G)	Aircraft Interior and Accessory Installation	Cedar City	200
Computer Mfg. (H)	Computer Assembly	6 Co/5 Co	125
			1,152

Assuming an indirect to direct job ratio of 1.672 (average from available service job ratios), 1,926 additional jobs were lost due to nonavailability of natural gas. Assuming baseline growth and equivalent opportunities available

See previous response.

to the area in the future, approximately 3,078 jobs would be created between 1982 and 1985.

This information should be pointed out as additional positive socio-economic impacts to central and southwestern Utah if the proposed actions occur.

The formal position of the Five County Association of Governments will be mailed separately. The intent of this information was to provide information as you requested.

Sincerely,

John S. Williams
Executive Director

JSW:bi

Because of the uncertainty that local communities could obtain gas service, these "positive socio-economic impacts" have not been discussed in the EIS.

five county association of governments

P. O. BOX "O"
ST. GEORGE, UTAH 84770
PHONE (801) 673-3548

August 6, 1981

Ms. Janice Bowles
Special Project Team Leader
Bureau of Land management
555 Zane Street
3rd Floor East
Denver, Colorado 80228

Dear Ms. Bowles:

The Five County Association of Governments representing the Southwestern Utah Regional Planning District as designated by the governor of the State of Utah wishes to submit this formal letter of support to Pacific Gas and Transmission Company's preferred route through Beaver, Iron and Washington Counties with some minor environmental adjustments to be mitigated between Pacific Gas and Transmission and the federal local managers for the Rocky Mountain pipeline proposal.

The elected officials of Southwestern Utah who have the responsibility for the health and welfare of the citizens, they were elected to represent, feel energy development which would support the national goal of energy independence to be of the highest priority today and for generations to come. We encourage energy development projects within our regional boundaries and transmission lines which would encourage economic and industrial growth to our economically depressed area. As the United States Department of Commerce designated Economic Development District and in conjunction with the Six County Economic Development District, we can summarize eight industrial firms that had shown intent to establish facilities in the Six County and Five County areas who declined to commit to our area because of the unavailability of natural gas service. These direct job potential list with indirect job ratio's approximately 3,078 jobs would have been created between 1982 and 1985 if natural gas had been available to our regions.

The applicants preferred route for the Rocky Mountain Pipeline will enhance development and with the new discoveries in Utah within the overthrust belt and natural gas findings would require transmission capabilities which we feel can be met by PG&T's proposal. This would meet our goal in overall planning and implementation for energy resource development. The draft EIS for the Rocky Mountain Pipeline adequately analysis the minimal environmental impacts to the applicants proposal,

No response required.

BEAVER GARFIELD KANE WASHINGTON

Ms. Janice Bowles
Page 2

however, we wish to express there would be substantially more economic benefits in our region than was outlined in the EIS draft.

We very much appreciate the opportunity of supporting this proposed project into our region on behalf of the citizens we as elected officials represent.

Sincerely,

Howard J. Pryor, Chairman
Steering Committee

HJP:bi

FORESTRY AND FIRE WARDEN
3800 Sierra Way · San Bernardino, CA 92405 · (714) 882-1227

DON C. BANGHART
Director

COUNTY OF SAN BERNARDINO
ENVIRONMENTAL
PUBLIC WORKS AGENCY

JOHN M. BERNARD
Agency Administrator

OFFICIAL FILE

August 10, 1981

RECEIVED BY
AUG 25 1981
ENVIRONMENTAL EVALUATION
BRANCH

Federal Energy Commission
825 N. Capitol Street
Washington, D.C. 20426

Attn: Kenneth Plumb

Re: CA State Clearinghouse No. 81071701

Dear Mr. Plumb:

We have reviewed the EIS for the proposed Rocky Mountain Pipeline Project as it relates to the portion which would traverse San Bernardino County in California. The proposed alignments do not go through any areas with significant fire potentials due to vegetation. The only impacts we can foresee would be the short term related construction activities, which, due to accidents or equipment fires, could create emergency responses from our department. We would not consider these impacts to be significant.

In the long term, when the pipeline is in service, contacts should be made and procedures drafted to minimize any impacts caused by pipe ruptures or other accidents.

If you have any questions or comments, please direct them to the undersigned at any time.

DON C. BANGHART,
County Fire Warden

BY: BRIAN L. RICHTMYER,
Fire Protection Planning Officer

cb

cc: State Clearinghouse

No response required.

EPWA

Life, Property and Resource Fire Prevention and Control,
Insect Control, Training Aid Library, Fire and Emergency Coordination,
Serving Unincorporated Areas and the Cities of Grand Terrace and Needles.

LAS VEGAS WASH DEVELOPMENT COMMITTEE

5800 EAST FLAMINGO ROAD

LAS VEGAS, NEVADA 89122

* * * * * * * * * *

ADVISORY TO THE BOARD OF COUNTY COMMISSIONERS
CLARK COUNTY

August 21, 1981

Mr. Kenneth Plumb
Secretary, FERC
825 N. Capitol Street, N.E.
Washington, D. C. 20426

Reference: Docket No. CP79-424
Case No. U-45957
RMPP DEIS

Dear Mr. Plumb:

The Las Vegas Wash Development Committee (WDC) is advisory to the Board of County Commissioners of Clark County, Nevada on the proposed Desert Wetlands Park. The County has purchased acreage as park nucleus, and a master plan will be published next month.

A subcommittee of the WDC has reviewed the RMPP DEIS and commends the FERC, BLM and FS for their comprehensive statement. The Graphic Supplement is a pleasure to use.

The WDC concurs with Chapter 5, Conclusion, Recommendations and Preferred Alternative of the DEIS.

The following are specific comments the WDC suggests to you regarding the DEIS:

1) Map 3-3, Clark County Recreation Lands, Page 3-20. The legend is in error. "Las Vegas Wash Wetlands Park (Proposed)" and "Frenchman Mtn./Rainbow Gardens National Natural Landmark, (Potential)" should be exchanged in their designation on the map.

2) Page 3-21, second full paragraph in the discussion, "typical recreation activities enjoyed in the proposed wetlands park area include .... four-wheel driving." Four-wheel driving is <u>not</u> one of the recreation activities for the proposed Desert Wetlands Park.

The legend for the Clark County Recreation Lands map has been revised in both the FEIS and the recreation and wilderness technical report to reflect this comment.

Please refer to the response to paragraph 9 of the comment letter from the Clark County Department of Comprehensive Planning, dated August 27, 1981.

Kenneth Plumb
Ref: Docket No. CP79-424
Case No. U-45957
RMPP DEIS

3) Page 4-11, paragraph 1, we suggest "Final pipeline alignment would tend to avoid, where possible, highly erodible slopes and potential slide areas such as in the Las Vegas Wash." Soils in the present area of the headcut erosion are very unstable. They are fine and powdery and slough off into the water. More assessment of severe headcut erosion is warranted, in our opinion. Soils, through which the Southern Nevada Water Project (SNWP) line passes are presently eroding. The RMPP proposal would be in this vicinity. The SNWP line was buried deeper where it crosses the Wash due to erosion potential, but it may well be exposed in the near future by continuing erosion. Boring or tunneling the RMPP may not be enough to protect the gas line from erosion in severe run off. Therefore, if the proposed line crosses Las Vegas Wash, protective construction may be necessary. At the same time, such construction should result in mitigation to marsh wildlife habitat and impacts on the proposed Desert Wetlands Park.

The WDC has been pleased to tour the Wash with compilers of the DEIS and we appreciate their efforts. We look forward to continued communication on the RMPP. Enclosed please find a very recently published brochure on the Desert Wetlands Park. A static picture exhibit and audio-visual presentation is also newly available. We invite FERC, BLM and FS to view these education efforts whenever your personnel has the opportunity to be in our area again.

Sincerely,

Glade Koch

Glade Koch
Chairman

GK/mw
Enclosure

The headcut in the Las Vegas Wash area is identified and recognized as a "critical area" requiring intensive implementation of applicable measures to control further headcut erosion and additional adverse effects caused by pipeline construction. Applicable measures are identified in appendix C, "Erosion Control, Revegetation, and Restoration Guidelines." Headcut erosion occurs in many soils and is not created by soil conditions alone; it is caused mainly by surface and topographic conditions creating runoff concentration.

Adequate implementation, compliance, and monitoring of the mitigation measures should be identified during easement negotiations with the company. Implementation of applicable measures by RMPC and adequate compliance monitoring by agencies on the pipeline would not adversely affect wildlife habitat.

Mountainland Association of Governments

August 6, 1981

Federal Energy Regulatory
Commission
Office of Pipeline and
Producer Regulation
Washington, D.C. 20426

Bureau of Land Management
Office of Special Projects
Denver, Colorado 80228

Dear Sirs:

Please be advised that this letter is being submitted on behalf of the Utah County Commission located in Provo, Utah and also the Mountainland Association of Governments which is a regional planning agency that represents Utah, Wasatch and Summit counties and all of the cities located within said counties. It is the desire of these bodies to go on record supporting the Rocky Mountain Pipeline Program and proposed route as it was submitted by the applicant with the following observations and recommendations:

1. The suggested Provo Canyon variation is totally unacceptable inasmuch as it would be extremely destructive to a highly used and very narrow canyon as well as to several of the major cities located in Utah county.

2. The Utah County Commission favors deviation from the proposed route by recommending adoption of variation 2 known as the Thistle variation. The County Commission is of the belief that this variation would have significant beneficial impact in the future development of Utah county and that it would also be commercially beneficial to the applicant, Inasmuch as it appears that construction of the line following the route of the variation would be less costly and difficult than the proposed route.

3. It is the understanding of the Utah County Commission and the Mountainland Association of Governments that Wasatch county has determined that variation number 6 known as the Daniel's Canyon variation is not an acceptable route through that county and that they do endorse the proposed route. If that is the official position of Wasatch county, Utah county and the Mountainland Association of Governments endorse that position.

160 E. Center / Provo, Utah 84601 / (801) 377-2262

No response required.

It is the desire of the Utah County Commission and the Mountainland Association of Governments that this statement be inserted into the official record of the hearings being held concerning the proposed Rocky Mountain Pipeline. Further, with the suggested changes these two governmental agencies strongly support the construction of the pipeline within their jurisdictional boundaries.

Sincerely,

Homer C. Chandler

Homer C. Chandler
Executive Director

jr

NYE
COUNTY

DEPARTMENT OF PLANNING

THOMAS H. TROTTER
Director

ROBERT L. HANKS
Assistant Planner

August 7, 1981

Mr. Kenneth F. Plumb, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

SUBJECT: Docket NO. CP 79-424, Case No. V-45957
RMPP DEIS (Central Nevada Alternative)

Dear Mr. Plumb:

We have been requested to respond to the Rocky Mountain Pipeline project D.E.I.S.; specifically, the Central Nevada alternative, which would affect Nye County, Nevada.

We have been empowered by the Nye County Board of Commissioners to review and comment on proposed or existing land use in this County, and we welcome this opportunity to comment.

VEGETATION: Nye County is the third largest County in area in the United States, surpassed only by Coconino County (Arizona) and San Bernardino County (California). It is also one of the most sparsely populated. Small communities, none greatly exceeding 100 people, line the route of the proposed pipeline project, along Highway 6. Among these are: Currant, Warm Springs, Tonopah Test Range, and Tonopah Airport. Ranching and agriculture are the primary occupations for the majority of residents in the proposed corridor. Therefore, it is of concern to this County that the alternative, if selected, would not disturb existing livestock grazing patterns. There is sufficient concern already that the proposed MX Missle Project, to be largely based in the valleys of Northern Nye County, will have a potentially disastrous effect on livestock grazing. It is strongly suggested that a separate analysis be conducted of the effects of the RMPP on livestock grazing, specifically in Nye County, as so many individuals depend on this activity for

Except for possible trailing areas and near water sources, livestock grazing patterns would not be adversely affected. Any disturbance would be short term due to the pipeline construction timetable. Also, the proposed pipeline would be located adjacent to powerlines and roadways, which would lessen impacts. Problems would be resolved between the applicant and right-of-way grantor during easement negotiations.

Please refer to appendix J for a detailed analysis of potential impacts to livestock grazing. The analysis in appendix J considers worst-case situations to allow for potential management actions temporarily removing livestock from Federal allotments which might be particularly difficult to revegetate under livestock pressure. This could occur on lands administered by the FS in Utah.

liveihood, in the proposed corridor.

WILDLIFE: Regarding the area west of Currant Summit, what are the specific habitat impacts, if any, of crossing "a large deer Winter Range?" This is not elicudated in the DEIS.

Regarding the Desert Bighorn Sheep located west of Tonopah. What effects, if any, will the RMPP have on habitat? If none, why are they mentioned?

Three brood areas of the Sage Grouse are to be directly impacted by the RMPP. What mitigation measures are proposed?

Please identify those areas of potentially arable land within Nye County along the proposed pipeline route, rather than including only a discussion of suitable soil types for construction of the project. This was done for Delta, Utah (P. 38, "agricultural")

Land use data identifying existing cropland was recorded and displayed on USGS 1:250,000-scale topographic maps. Cropland for the entire alternative was identified in the DEIS by mileage and acreage and not by county. (Maps which identify cropland are available for inspection at the BLM Environmental Impact Statement Office in Denver).

SOCIOECONOMICS: (Specifically, Table 3-29)

More current information available from the Bureau of Census and Nye County itself prior to RMPP DEIS Publication date of July 1981. Please update.

It is true that these values are lower than the values found in the 1980 census. However, this new information would not change the conclusion that self-contained work camps would be required in this region of Nevada.

WATER SOURCES: What is the impact of the alternative's crossing of "44 Intermittent streams and 44 Perennial streams?" Please expand.

Figure 3-1 shows that the water resource impacts for all of the variations and alternatives will involve "different affected environments, same impacts." The impacts are listed in chapter 4, "Proposed Action: Water Resources." Basically, it is an unquantifiable increase in sediment that would be transported a certain distance. This would take place in the number of streams listed for each alternative or variation. Therefore, on this alternative, the impact can be expected on the numbers of intermittent and perennial streams listed.

HOUSING/CONSTRUCTION WORK CAMPS: At present there is no available housing along the proposed corridor for RMPP workers. Construction camps would be an infeasible and costly alternative for a number of reasons:

- No proven sustained source of water exists along the proposed corridor.
- No community sewerage system exists; full reliance would be placed on septic systems.
- Energy would be difficult and expensive to supply to the camps.
- No service centers exist that could supply even the most rudimentary goods and services.

The EIS team agrees that constructing work camps would be costly and difficult.

WORKFORCE: No specifics are indicated on worker impacts, for either construction and/or secondary supply sectors.

We would welcome your response to the concerns as expressed herein.

Sincerely,

Thomas H. Trotter, Director
Department of Planning
Nye County, Nevada

cc: Nye County Commissioners (3)
Peter L. Knight, District Attorney
U.S. Forest Service, District Office
State Office of Planning Coordination
Les Monroe, BLM, Tonopah Area Manager
File

Potential worker impact is qualified in chapter 4, "Central Nevada Alternative: Socioeconomics." Since self-contained work camps would be constructed, they would limit the impact on local services.

SAN JOAQUIN COUNTY COUNCIL OF GOVERNMENTS
1860 EAST HAZELTON AVENUE
STOCKTON, CALIFORNIA 95205
TELEPHONE (209) 944-2233

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FEDERAL ENERGY REGULATORY COMMISSION

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ENVIRONMENTAL EVALUATION BRANCH

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July 23, 1981

Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

Ref: Docket No. CP79-424, Case No: U-45957, RMPP DEIS

Dear Sir/Ms:

Thank you for the opportunity to comment on the draft EIS for the Rocky Mountain Pipeline Project.

Our comments concern the Northern Systems Alternative, the only part of the proposal which might directly impact San Joaquin County. The Brentwood-Panoche Junction pipeline which would probably be a part of this alternative would cross the southwestern part of the County.

Our comments are as follows:

(1) The San Joaquin County Ordinance Code requires transmission line route review by the County Board of Zoning Adjustments.

(2) A new community of about 30,000 population has been proposed for a 5,000 acre site immediately southeast of the junction of Interstate 580 and Corral Hollow Road in San Joaquin County. It appears that the Brentwood-Panoche Junction pipeline would traverse this site. If both the pipeline and the community are constructed, measures will have to be taken to avoid conflicts.

(3) The Brentwood-Panoche Junction pipeline would cross both the California Aqueduct and the Delta-Mendota Canal in San Joaquin County. The City of Tracy obtains part of its water supply from the Delta-Mendota Canal, and farming operations in the County obtain irrigation water from both the canal and the aqueduct. Measures would have to

"Authorizing Actions" in chapter 2 and the accompanying narrative in appendix D focuses on various Federal, state, county, and local actions required for the proposed action. Since the same general type authorizations would be required for the various alternatives and variations, these are not presented in the EIS. Also, for purposes of this EIS, review functions are not considered as authorizing actions unless they include veto authority.

The EIS team agrees. Measures would have to be developed. If the decisionmakers choose this route, those measures will be coordinated with the county.

The California Aqueduct and the Delta-Mendota Canal, if crossed, would be treated as any other stream crossing. Pages 2-21 and 2-22 of the DEIS describe the applicant's proposed method for such crossings. In areas where either of the canals are concrete-lined, the applicant would treat them as a road or rail crossing and bore under, as stated on page C-2 of the DEIS. In either type of crossing, there would be no interruption of water supplies. The Rocky Mountain Pipeline Project Technical Report for Water Resources discusses the likely contaminants that could be introduced into the water at any stream crossing, of which the main one would be sediment. Other contaminants are likely to be of such a small quantity that they would be undetectable.

be taken to insure against contamination or interruption of water supplies during or after pipeline construction.

If you have any questions concerning our comments, please do not hesitate to contact me.

Very truly yours,

Gordon E. Moore
GORDON E. MOORE
Planner

GEM/gs
cc: San Joaquin County Planning Department
Tracy Community Development Department

ST. GEORGE AREA CHAMBER OF COMMERCE

97 East St. George Blvd.   St. George, Utah - 84770   (801) 628-1658

TO: FEDERAL ENERGY REGULATORY COMMISSION

SUBJECT: <u>DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE ROCKY MOUNTAIN PIPELINE PROJECT.</u>

In reference to Chapter 5, of the Draft Environmental Impact Statement entitled, " Conclusions, Recommendations, and Preferred Alternatives," we will respond individually to some of the statements brought forward in this chapter.

Comment	Response
1. The construction and operation of the RMPP would have a limited adverse environmental impact and that the proposed project is environmentally acceptable. (RESPONSE) Construction of the (RMPP) utilising contemporary pipeline construction methods would minimally effect the proposed (RMPP) route. This statement is made and corroborated by personal observation and experience over a period of years, by many Chamber Members and Directors.	No response required.
2. The construction of 76.8 miles of pipeline and at most 225.1 miles is clearly superior to the minimum facility requirement-- 610 miles of pipeline-- for the proposed project. (RESPONSE) Without commenting on the economic and environmental affects on the Northern Systems Alternative; it seems idiomatic to construct as little as 225 miles and as much as 890 miles of pipeline for a pipeline total of over 1200 miles to transfer Natural Gas only 610 miles.	The FERC's environmental staff disagrees. Some of the natural gas that is currently delivered or will be delivered to California is effectively transported over an even longer distance. For example, 240,000 Mcfd of Pan Alberta gas is being transported through Northwest's and El Paso's transmission systems to California (1,563 miles) instead of moving it due south to California markets (750 miles). The Northern Systems Alternative and many other nationwide gas transportation agreements take advantage of exchange/direct transportation arrangements to deliver gas without actually hauling it through all of the pipeline systems between where the gas is produced and consumed. Even the RMPP proposes to transport gas (90,000 Mcfd) delivered from Canada at Summas, Washington, and to transport it effectively from Washington to Wyoming and then to California. Natural gas companies make what they believe to be the best arrangements possible to deliver gas; an environmental impact statement does not consider all of the factors that are used to determine the best system for implementing a proposed action.
3. The FERC enivironmental staff finds that the Northern Systems Alternative is a significantly superior alternative to the proposed project. The FERC environmental staff believes that unless it can be demonstrated that the alternative is economically or otherwise inferior, the proposed project should not receive FERC approval since it is not environmentally equivalent to or better than the Northern Systems Alternative. (RESPONSE) "Northern Systems Alternative is significantly superior," that we ask the FERC to consider the following statements:	The text of the FEIS reveals these impacts/possibilities. Therefore, these environmental impacts have been considered.
a. The RMPP will formulate and established right-of-way, which mitigate future localize increases in Natural Gas demand.	The FERC staff recognizes the potential market for natural gas in Utah and the local benefits of increased county tax revenues from the pipeline.
b. Washington County with a population of approximately 30,000 will receive immediate and noticeable beneficial economic impacts from property taxes derived from the (RMPP). Moreover the tax dollar revenue to county resident racial is much greater here than most communities, thus,	

making the financial benefits per person greater and more effective.

c. Natural Gas available in large amounts to industrial users made prompt, the type of clean industrial growth Southern Utah desires. Here-to-fore, Industrial Natural Gas consumers have been forced to locate in other areas or at best reduce operating capacity to met gas availability.

The proposal route submitted within the (DEIS) for the (RMPP) is exceptable and desired, therefore, we respectfully recommend to the Federal Energy Regulatory Commission, The Bureau Of Land Management, U.S. Dept. Of The Interior, and the U.S. Dept. Of Agriculture, to acknowledge that (RMPP) will serve the public interest.

Sincerely,

M. Royce Jones, Executive Vice President
St. George Area Chamber Of Commerce

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JUL 30 1981

ENVIRONMENTAL EVALUATION BRANCH

SAAG Stanislaus Area Association of Governments

814-14th Street
Modesto, California 95354
(209) 526-6200
atss 482-6200

July 16, 1981

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Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, DC 20426

RE: Clearinghouse Review - "Rocky Mountain Pipeline Project - Draft Environmental Impact Statement" - #0704
OPPR/DPC-EEB, Rocky Mountain Pipeline Company
Docket No. CP79-424, Case No. U-45957

The Stanislaus Area Association of Governments has received the "Rocky Mountain Pipeline Project - Draft Environmental Impact Statement". Review of the Environmental Impact Statement is being conducted in accordance with SAAG's responsibilities as the Metropolitan Clearinghouse for the Stanislaus Area.

You may receive comments or responses to your subject project no later than August 24, 1981.

You will be notified if there is any need for further Clearinghouse action involved with the review of your project.

Thank you for your cooperation.

Roger K. Smith

Roger K. Smith
Clearinghouse Officer

RKS/pt

CH-4

No response required.

SAAG — Stanislaus Area Association of Governments

814-14th Street
Modesto, California 95354
(209) 526-6200
ofs 482-6200

SECRETARY

Aug 27 10 40 AM '81

FEDERAL ENERGY REGULATORY COMMISSION

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CENTRAL FILES

August 25, 1981

Secretary
Federal Energy Regulatory Commission
825 N. Capitol Street, N.W.
Washington, D.C. 20426

RE: Clearinghouse Review - "Rocky Mountain Pipeline Project - Draft Environmental Impact Statement" - #0704.
OPPR/DPC-EEB, Rocky Mountain Pipeline Company, Docket No. CP79-424, Case No. U-45957

The Stanislaus Area Association of Governments (SAAG) has completed its review of your Draft Environmental Impact Statement. The review was conducted in accordance with SAAG's responsibilities as the Metropolitan Clearinghouse for the Stanislaus Area.

No comments were received regarding the subject project and this notification documents completion of the review.

Completion of this review does not relieve you from any responsibility for notification to the State Clearinghouse or other appropriate Metropolitan Clearinghouses, whose procedures you must also comply with.

Thank you for your cooperation.

Heidi McNally-Dial

Heidi McNally-Dial
Clearinghouse Officer

HMD/pt
Attachment(s)

cc: State Clearinghouse

CH-5

No response required.

JURISDICTIONS: Stanislaus County • Cities of Ceres, Hughson, Modesto, Newman, Oakdale, Patterson, Riverbank, Turlock, Waterford

Utah County PLANNING COMMISSION

August 5, 1981

Kenneth D. Frye, Project Manager
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, DC 20426

Dear Mr. Frye:

The following are our comments and concerns pertaining to the Draft Environmental Statement of the Rocky Mountain Pipeline Project:

1. Page viii, Summary, Geology and Topography. The DEIS does not mention the Provo Canyon Variation's crossing of the Wasatch Fault at the mouth of Provo Canyon near the homes of 218,000 people. Some mention of the fault is given on page 3-61, but much more detail is needed considering the large population of Utah County and the potential hazard of a gas transmission line crossing an active fault this near to a population of this size.

   The text has been modified to indicate that the alternative would cross the fault. Note that the RMPP would cross this same fault near Nephi, Utah. In either case, some of the risk to the large number of people near the fault crossing could be reduced by designing for the fault. However, some risk would always be present.

2. Page D-4, State and Local Authorizations and Permits. Utah County requires a conditional use permit for large scale utility line construction and should be included on this page. This was also omitted on page 2-27. A copy of this ordinance is enclosed.

   The conditional use permit from Utah County has been added to chapter 2 and appendix D.

3. Page 2-36, Variation 2, Thistle Creek Variation. The description of the route should read "highway 89" instead of "highway 91".

   Appropriate change has been made to the text.

4. The crossing of the Mountain Fuel Supply transmission line near Indianola near MP 170 of the proposed action is not mentioned anywhere in the DEIS.

   The proposed crossing of the Mountain Fuel transmission pipeline near Indianola (MP 170 of the proposed action) was not discussed in the DEIS because no significant adverse or positive impacts would be anticipated at this crossing point. Page 4-5 of the DEIS, "Transportation Networks," states: "Disruption to railroads, other pipeline systems, and electrical power transmission systems would not occur as a result of the proposed action, alternatives, or variations."

5. Table 2-11, Waterfowl Nesting Areas. Thistle Creek may provide some nesting habitat. This should be checked out.

   No waterfowl nesting habitat was identified in this area by the Utah Division of Wildlife Resources.

6. Table 2-11, Faults Crossed (page 2-48). This table indicates that the Provo Canyon Alternative would cross one fault, Thistle Creek Variation would cross none, and Mill Creek Variation would cross one. The <u>Geologic Map of Utah</u>, by Hintze, Stokes, Madsen, 1961-1962, indicates that, for Utah County only, the proposed action will cross six faults and parallel another for about nine miles; the

   Only active or potentially active geologic faults are of concern. See "Quaternary Fault Map of Utah" by Larry W. Anderson and Darryl G. Miller, Fugro, Inc., Long Beach, California 1979 (available through Utah Geological and Mineral Survey).

Provo Canyon Alternative will cross fourteen faults, parallel the Wasatch Fault for six miles, and cross three or four additional faults west of Utah Lake and Lake Mountain; the Thistle Variation will cross six faults; and the Mill Fork Variation will cross four faults. Enclosed is a geologic map of Utah County, taken from the above cited Geologic Map of Utah, which shows these faults.

7. Table 3-5, Page 3-9, Sage Grouse Habitat. This table does not list two known sage grouse areas. These are along Thistle Creek near the Utah-Sanpete County boundary, and also at the head of Kimball Creek at the Utah-Juab County boundary along the Provo Canyon Alternative. Enclosed is a map of grouse habitat in Utah County. Data on this map were obtained from the Utah Division of Wildlife Resources. Also, the DEIS makes no mention of Blue Grouse, Ruffed Grouse, or Band-tailed Pigeon habitat. Please refer to the same map and also the map of Upland Game Birds in Utah County. 1

1. The table and appropriate text have been changed to reflect the new information on sage grouse locations. Blue grouse, ruffed grouse, and band-tailed pigeons are not mentioned in the DEIS because of where their habitats lie in relation to the proposed pipeline route. The impact to these three species would be non-existent or insignificant.

8. Table 3-10, Page 3-14 makes reference to Rockford Lake. The correct name is Rockport Lake. 2

2. Appropriate correction has been made to table 3-10.

9. Table 3-10, Page 3-15 makes reference to Highway 6-50 between MP 153 and MP 158. The correct designation is now Highway 6. Highway 50 is now used on a highway farther south. 3

3. Information has been incorporated into the table.

10. Page 3-22, Agriculture Affected by the Proposed Action. The exact acreages of prime agricultural land, as well as its location, should be given. 4

4. Approximate mileages and acreages of cropland were identified for the pipeline right-of-way. Specific acreages and locations of cropland and orchards which would be affected cannot be determined because evaluations were based on a mile-wide corridor. Only if a route is selected and the alignment staked can specific acreages and locations be determined.

Proposed surface facility sites were evaluated to determine whether prime agricultural land or other cropland would be removed from production for the life of the project. This, along with right-of-way construction through orchards, would be considered a significant agricultural concern.

11. Page 3-31, Water Resources. 1:250,000 scale maps are inadequate to determine the correct number of perennial or intermittent streams. These stream symbols are often placed on the map purely at the discretion of the cartographer. A scale of 1:24,000, at least, should have been used. 5

12. Page 3-60, Agriculture. Utah County is the number one agricultural producing county in the State of Utah, mostly because of its fruit crop. More specific data should be given as to the amount of agricultural land, specifically prime agricultural land, that will be removed from production, even temporarily, by the construction. The locations of this land should be precisely given. Also, the amount and location of orchard land to be displaced should be given. 6

Refer to chapter 4, "Proposed Action: Agriculture." Successful restoration of all cropland, especially prime agricultural land (except orchards) would be expected within 1 to 2 years with implementation of the Erosion Control, Revegetation, and Restoration Guidelines (appendix C). The viability of these lands would not be significantly diminished.

Kenneth D. Frye
August 5, 1981
Page 3

13. Page 3-60, Conflicts with Land Use Plans, Policies, and Controls. The official land use plan for Provo Canyon, the Provo Canyon Plan, was adopted as an element of the Utah County Master Plan June 24, 1975. The goals and policies section of the plan places circulation third in the list of priorities for the canyon behind watershed and recreation (page 73). The specific goals for circulation, including utility lines, is given on page 76. Recommendations pertaining to utility lines are given on page 111. A copy of this plan is enclosed. 7

14. Page 3-60, Socioeconomics. This section states that most of the Provo Canyon Alternative is rural, with 1.6 to 7.2 persons per square mile. The DEIS completely fails to mention the fact that Utah County is Utah's second largest metropolitan area with over 218,000 people, with a county-wide density of over 100 people per square mile. When the Provo Canyon Alternative leaves Provo Canyon it crosses the northern part of Utah Valley. Ninety Nine percent of the population of the county live in this valley. The pipeline would pass near the homes of approximately 87,000 people who live in an area of only 100 square miles. This puts the line in the middle of an area with a density of 870 persons per square mile. The line will pass through or near the boundaries of nine incorporated municipalities: Provo, Orem, Lindon, Pleasant Grove, Cedar Hills, Highland, Alpine, American Fork, and Lehi. None of this was mentioned in the DEIS, nor was the impact the gas line on local utility lines, such as water, telephone, electric, and sewer lines serving these cities. -8

15. Page 3-61, top of page. Utah County's zoning ordinance <u>will</u> permit the line at Springdell, which is not an incorporated municipality as was implied. The problem with zoning will be at the small Trades and Services zone located at Vivian Park. This zone will permit only local gas distribution lines. The transmission line will have to circumvent this zone. All other zones through which the proposed action and all variations and alternatives must pass in Utah County do permit high-pressure gas transmission lines. A conditional use permit must first be obtained, however. Copies of the zone maps and all pertinent sections of the zoning ordinance are enclosed.*

16. Page 3-61, Geology and Topography. The Denver & Rio Grande Railroad abandoned the Provo Canyon route in the 1960's. Part of the route is used for an excursion train, and the track has been removed from the remaining sections.

*Please see also Item 33.

5. The use of 1:250,000-scale maps was an administrative decision. It was considered to be consistent with the overall depth of the study and the anticipated potential for impacts to streams. Furthermore, 1:24,000-scale maps were considered and abandoned because they show literally thousands of intermittent streams, washes, and unnamed tributaries.

The impact analysis showed that streams crossed by a pipeline, using the applicant's proposed construction methods, would not sustain significant impacts. Only the major streams have been identified for each alternative to indicate the relative number of streams which would be crossed by each route. Those streams not specifically identified in the EIS would still be given the same protective treatments.

6. Please see the response to your comment on page 3-22 of the DEIS regarding prime agricultural land.

7. After careful review, the EIS team has determined that there apparently would be no conflicts with the Provo Canyon Plan if a pipeline were to be placed through this canyon.

8. The alternative does not pass through the heart of these population centers and, as a 1-mile wide corridor, it tends to avoid the developed areas.

These types of utilities have existing rights-of-way; therefore, the RMPC would have to contact these right-of-way owners and obtain their agreement/approval before constructing across their facilities. This coordinated planning and Federal, state, and local regulations governing these activities should make any impacts insignificant.

Comment incorporated.

The text has been modified to reflect this comment.

17. Page 3-61, Geology and Topography. Provo Canyon is the main source of culinary water for Provo City and Orem City, and is a major source for the Salt Lake Valley. Provo City has wells, springs, and lines throughout the canyon. Only passing mention was given these. More detail as to their protection is needed. 1

18. Page 3-61, Geology and Topography. No mention is made of the Wicks landslide area, the Bridal Veil Falls slide area, or any of the other slide areas in Provo Canyon. Please see page 9 of the Provo Canyon Plan. These slides could pose a major threat to the line. 2

19. Page 4-2, Agriculture. Although orchard land, as other farm land, may be returned to production following construction, trees lost could not be replaced and productivity resume for many years. Thus, the pipeline should avoid <u>all</u> orchard areas. This is mentioned on page 4-16, but very weakly. More detail is needed. 3

20. Page 4-8, Mammals. The impact of construction during big game hunting seasons was not discussed. The safety of construction workers could be jeopardized if construction were not temporarily halted during these seasons. 4

21. Page 4-16, Conflicts with Land Use Plans, Policies, and Controls. Again, the Utah County Master Plan, Provo Canyon Plan, and Utah County Zoning Ordinance should be mentioned and any conflicts between these documents and the proposed action should be resolved. Copies are enclosed. 5

22. Page L-2, Table L-1, Significant Cultural Resources. The Nunns Power Plant, located in Provo Canyon about three miles northeast of the Olmstead Plant, should be listed. Both are on the National Register of Historic Places. 6

23. Page 4-22, Cultural Resources. Several historic sites have been identified along the pipeline that are not on the National Register of Historic Places but which might be considered for inclusion on the register. These include the old railroad towns of Thistle, Mill Fork, and Tucker. 7

24. Page 4-58, Visual Resources. Cross-reference this paragraph with page 111 of the Provo Canyon Plan: 8

> <u>Utility Lines</u>. The lack of coordination in the placement of utility lines has been an important cause of scenic disfigurement in the canyon. It is also true that the timing of utility work

1. Should the Provo Canyon Alternative be selected, the applicant would be required to obtain permits to cross and use all existing utility line rights-of-way. In this canyon, permits would be needed almost all of the way. It is usual in these cases for the holders of the rights-of-way to require sound engineering construction. In addition to this, when water crossings are necessary, the applicant would have to construct in accordance with COE permit requirements. Considering these permits and the protection that they would give to the canyon, it is felt that there is adequate discussion in the EIS.

2. Although the major slides are not mentioned by name, they are encompassed by the milepost interval noted in "Geology and Topography," namely MP 27 to MP 30. Additional slides exist.

3. Please see text changes made in chapter 4, "Agriculture: Significance Criteria " and "Agriculture: General Impacts." Avoidance by onsite alignment within the 1-mile wide corridor is a basic assumption throughout the document. This would minimize impacts. It is felt that the detail of the modified discussion on orchards is appropriate.

4. Construction impacts on big game hunting were not discussed in chapter 4, "Recreation Resources," because no significant impacts are anticipated. Construction-related activity (i.e., noise, dust accumulations) may have some impact upon big game movements; however, it is felt that this would not significantly diminish the hunting experience or significantly reduce the probability of a "take." To ensure construction workers' safety during hunting season within known areas popular to hunters, appendix C contains a mitigation measure requiring construction to halt during deer season. Another measure added to the FEIS would require workers to wear fluorescent or orange vests during hunting season in those areas where hunting is a marginal activity and/or the construction has not been required to halt.

5. There appear to be no conflicts between the Provo Canyon Plan, specified in the Utah County Master Plan, and the proposed action or Alternative F, Provo Canyon Alternative.

work has not been well coordinated among the various agencies operating in the canyon. It is recommended that the Planning Commission require the clustering of new utility lines next to existing lines so that the canyon floor does not become a maze of pipes, wires, and easements.

25. Page 4-59, Agriculture. The fruit orchards in the Provo area are called "small", yet they are the major crop in Utah County in terms of dollar value. Their restoration would take years, and would be totally precluded within 25 feet of the pipeline. Specific details must be given on how this resource will be protected.

26. Page 4-60, Socioeconomics. Only Vivian Park would be affected by county zoning, and there only on the Trades and Services zone. Springdell and Wildwood would not, as their zones will allow the pipeline, provided the necessary conditional use permit is obtained.*

27. Pages 4-58 to 4-60, Provo Canyon Alternative. No mention of the landslide or Wasatch Fault hazards in Provo Canyon is made.

28. Pages 4-61 and 4-63, Soils. Excavation into the toes of slopes will trigger earth mass movements and landslides, especially in areas of clay-rich mountain soils and areas with a history of slides. This impact was not discussed.

29. Tables C-1 to C-8, Appendix C. Also avoid construction in any big game habitat during their hunting seasons.

30. Page C-2. Final right-of-way selection should also avoid all orchard areas because of possible irretrievable commitment of resources.

31. Page F-6, Spanish Fork Canyon Alternative. It is interesting 1 that this alternative was eliminated "due to the anticipated congestion of the existing facilities in Spanish Fork Canyon." This is the very reason that Provo Canyon should have been eliminated from consideration, as congestion is already much more severe than it will ever be in Spanish Fork Canyon. Also, Provo Canyon contains a class one fishery. Spanish Fork River is a class three at best and in places a class six fishery. It would be a superior alternative to Provo Canyon. Also, same paragraph, East Bennett is incorrect. It should read East Bench.

*Please see also Item 33.

6. The Nunns Power Plant has been added to table L-1.

7. Thank you for the information on the railroad towns of Thistle, Mill Fork, and Tucker.

8. The recommendation to cluster utilities is worthwhile, in that the visual resource of the area would benefit and land use would be more orderly. However, the land within the corridor is generally privately held, and the Federal Government can only reinforce recommendations to the local planning commission by concurring with the value of such a siting arrangement.

Technically, the most suitable locations for new facilities may not be within the corridor, since existing utility alignments may have left no room for new ones.

As indicated by the statement in the same paragraph, onsite adjustment during right-of-way alignment would minimize impacts to fruit orchards. Restoration concerns and impacts concerning fruit orchards are discussed in chapter 4, "Proposed Action: Land Use." Please also see response to your comment 19.

Comment reflected in text.

Discussion of geological hazards appears in chapter 3. See the "Provo Canyon Alternative: Geology and Topography."

As noted above, landsliding is identified as a hazard in chapter 3. Excavation may or may not trigger landslides; proper engineering precautions could avoid major problems.

Please refer to the discussion of "Impacts of the Proposed Action" for Soil Group 1 (chapter 4). Impact discussion concerning mass movement and slides applicable to the Thistle Creek and Mill Creek Variations are presented in this section. Reference to the proposed action discussion is indicated.

Please see appendix C, "Recreation Resources," for this mitigation measure. Also, see response to your comment.

The criteria presented for selecting the final right-of-way represent only those which the applicant has identified. Since the applicant did not specifically state that orchards would be avoided, the statement cannot be included.

The applicant indicates the final right-of-way selection would incorporate deviations prompted by easement acquisition and land use patterns. Avoidance of orchard areas in final right-of-way selection to minimize impacts is discussed in "General Impacts" for agriculture in chapter 4.

32. All wildlife sections of the DEIS. Large carnivores, black-bear, mountain lion, bobcat, coyote, kit fox, and red fox, were not mentioned, nor were impacts on their habitat. The populations of all but the coyote are very limited. Impacts on specific fish species and habitats, such as the Provo River and Thistle Creek German Brown Trout populations, were not mentioned. 2

33. Two other areas that will involve possible problems with the T&S zone are in Spanish Fork Canyon. They are Thistle and Sheep Creek. Zone maps of these areas are enclosed. 3

34. General comment on the DEIS. The descriptions of the proposed action itself and its environmental consequences are not specific enough to describe problems along any given portion of the route. Specific impacts were described in very general terms as to their locations. More specific geographical descriptions are needed. 4

We trust that these ideas and the enclosed documents will assist in the final drafting of the DEIS and in formulating a decision as to the construction of the proposed action.

Sincerely,

Paul R. Larson

Paul R. Larson
Planner

PRL:mb

Enclosures

BLM cannot propose mitigation for private lands.

1. The Provo Canyon Alternative was proposed by the FS as an alternate route to the proposed action across the forest lands and resources.

The Stream Evaluation Map--1978 State of Utah, published by FWS, Office of Biological Sciences, Denver, Colorado, shows that Provo Canyon contains a fishery that is equally divided between class 1 and class 2. This same map shows the Spanish Fork River to be a class 3 or class 4 fishery; no class 6 fisheries are listed in the criteria on the map.

2. Unless there are significant impacts to animal species, they are not mentioned in the body of the EIS. No significant long-term impacts to these species were mentioned by the Utah Division of Wildlife Resources, nor did the analysis show that there would be any.

3. The T and S zone designates scattered 5-acre tracts in this area. It only allows natural gas pipelines 16 inches or less in diameter and a maximum pressure of 600 pounds per square inch to cross these tracts.

Since the RMPP would be 36 inches in diameter and would operate at 1,235 pounds per square inch, both the proposed action and the Thistle Creek Variation would conflict with the T and S zone in the Thistle and Sheep Creek areas. However, the alignment could probably be moved to avoid the T and S zones.

The summary, comparative analysis, and chapters 3 and 4 of the FEIS identify this conflict.

4. The pipeline routes for the RMPP, alternatives, and variations are defined in this document as a 1-mile wide corridor. The applicant has not identified a staked route for the RMPP. Since a pipeline alignment is adjusted during planning, surveying, and right-of-way acquisition, it is possible to avoid many problem areas within a corridor. However, because of the length of the pipeline it is virtually impossible to provide specific geographical locations of such areas before the alignment is staked. However, the RMPP and its environmental consequences have been adequately delineated within these constraints to allow the decisionmakers to reach a knowledgeable conclusion. (Also, more detailed information is available in the technical reports.)

WASHINGTON COUNTY
197 East Tabernacle • St. George, Utah • 84770

August 3, 1981

Ms. Janis Bowles
Special Project Team Leader
Bureau of Land Management
555 Zane Street
3rd Floor East
Denver, Colorado

Dear Ms. Bowles:

Having received notice of the public hearing relative to the approval of a request from the Pacific Gas & Transmission Co. to locate a pipe line through Washington County, Utah, for the purpose of transporting natural gas gas from its source to population centers in southern California, The Commission of Washington County would like to be placed on record as favorably supporting this request.

There are presently existing utility corridors through Washington County and the addition of an underground pipeline along any of these routes would not, in our opinion, adversely affect the environment of the County. As a commission we are in favor of clean air industry in our County and this proposal, while contributing significantly to the tax base of the county, would not conflict with our goal of developing clean air industry.

No response required.

It is our understanding that this proposal makes provision for possible future expansion of supply and distribution as additional natural resources are developed and this would be in keeping with the national goal of developing energy independence. We support this goal and favor this route as being the most direct route between s upply and market.

No response required.

Your favorable consideration and approval of this request is appreciated.

Sincerely,

Jerry B. Lewis

Washington County Commission
Jerry B. Lewis, Chairman

JBL:jw

Bldg 5220, Rm 2113
Dugway, Utah 84022
19 August 1981

Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

Dear Sir:

I have reviewed the Rocky Mountain Pipeline Project draft EIS (July, 1981) and offer the following comments:

1. The "Proposed Action" appears to be reasonable for the segment extending south from Cedar City. The segment north of Cedar City traverses numerous mountain ranges, streams, agricultural lands, and is close to major population centers. Construction along this route would be unnecessarily costly and disruptive. Alternatives D and E, taking the pipeline through the Sevier-Escalante Desert and north to the west side of Salt Lake would have less impact on population, agricultural lands, and recreation areas. Also, with the modification proposed in paragraph 2, land acquisition and construction costs could be greatly reduced.

2. Alternative E could be modified to include a link to the Pocatello-Boise section of existing pipeline right of way via the Raft River Valley or one of the other north-south valleys along the Utah-Idaho border. This modification could reduce construction costs and disturbance to the land without the circuitous routing required with the northern system alternative.

3. The Provo Canyon alternative (F) and Daniels Canyon variation (6) are unacceptable. Routing through the Cache Valley should be avoided, if possible.

4. It is assumed that pipeline construction would be accomplished with a minimum of disruption and that efforts would be made to restore the environment as closely as possible to its original condition following construction. Unfortunately, this "clean-up" phase of construction is often ignored, leaving scarred, eroded ditches as permanent blights on the countryside. I would therefore suggest that Rocky Mountain Pipeline Company be required to put up a bond to provide protection against this type of negligence.

Sincerely,

Christopher A. Bilhoft

Although the construction of the pipeline through the area north of Cedar City would be initially disruptive, reclamation procedures would adequately protect the environment. Alternatives D and E also have merit, although they are longer.

Although the suggested modification to alternative E could be added, the EIS team feels that it would not have sufficient environmental advantage to add at this point in the analysis. It would, however, avoid the routing of the Northern Systems Alternative.

Comment noted.

All right-of-way grants include stipulations to restore the environment. The Code of Federal Regulations section dealing with right-of-way administration allows BLM to require bonds from the applicants (CFR 2803.1-3). Invariably, on large projects such as this, bonds are required.

Searchlight, Nevada
August 26, 1981

Bureau of Land Management
Ed Ciliberti
P.O. Box 5400
Las Vegas, Nevada 89102

Dear Sir

I am writing to you as I see in the Sun Newspaper you are the spokesman for BLM on this project to comment on the proposed route of the Rocky Mountain Gas pipeline. I understand one of the proposed routes is to run parallel to the Southwest Gasline. I own 16½ acres near Searchlight. Pt. Mineral Survey 3510 - Sec 23 T 28 - R.63. I have been contacted by a representative of Rocky Mountain asking permission to go on property to survey. The Southwest Gas Company already crosses this property, also their maintenance road. If another pipe line is permitted it would certainly reduce the value of this property by a large amount, as one is not allowed to build and other restrictions on their right of way.

I also own Pt. Gov. Lot 24 - Pt Mar 4 - Sec. 4 - T. 22 - R.63 - - 1.32 A on the proposed route. This would also

No specific route has been selected for the pipeline; therefore, it is difficult to determine exactly where the construction of the rights-of-way would occur. Both the BLM and the FERC have analyzed the proposed action, six alternatives, and eight variations. Final selection of these routes will not be made until at least 1982. In addition, the analysis deals with a 1-mile wide corridor, allowing some latitude for minor route adjustments around specific problem areas or areas of special local concern. If, however, RMPC decides to locate the pipeline through private property, the landowner must negotiate specific conditions as part of the easement.

decrease the value of this property greatly as the acreage is small.

The most of the pipeline would lie on B L M. land and I would prefer they go around my two property on government land as it is on both sides of Searchlight acreage and close to the other.

Thank you.

Sincerely,

Elliott H. Davis

Box 185
Searchlight Nev.
89046

4008 Meadow Valley
Las Vegas, Nevada 89107
August 1, 1981

Federal Energy Regulatory Commission,

I am very upset about hearing of the natural gas pipeline plan of running it through the Las Vegas area.

Since this source is of no value to Las Vegas it should not be run near our community because of potential dangers of explosion or fumes.

This supply line should be built in California or remote areas of Nevada or Utah where dangers of an accident are much less likely to cause injury.

Yours truly,

C. Ronald Eggert

Nevada would receive two major benefits from the proposed RMPP pipeline: increased revenue and the possibility of pipeline taps in the counties that would be traversed by the pipeline. Additional gas supplies could spur additional industrial or residential development within the Las Vegas, Nevada, region.

Although pipeline incidents do occur, the overall safety record of the natural gas industry as a whole is very good. This information is detailed in chapter 4, "Proposed Action: Pipeline Safety." Although a pipeline rupture may occur in any segment of the proposed alternative pipeline systems, the applicant would devise procedures to mitigate impact resulting from a pipeline rupture.

~~9~~653 Trigo Road A
Goleta, CA 93117
3 August 1981

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CENTRAL FILES

AUG 7 11 50 PM '81

Secretary
Federal Energy Regulatory Commission
825 North Capital Street, N.E.
Washington, D.C. 20426

Dear Secretary:

I've had the opportunity to review the Draft Environmental Impact Statement for the Rocky Mountain Pipeline Project, and would like to offer my comments. First, I appreciated the maps and the completeness with which all alternatives and variations were considered.

Based on information in the DEIS, I favor Alternative A (the Northern Systems Alternative), and would be hard-pressed to find reason to support any of the other projects above it. First and foremost, it takes advantage of already existing facilities, rights-of-way, and maintenance bases. It seems to make inherent common-sense, as well as good business sense, to utilize the easiest, most efficient method of building a project.

More specifically, I favor Alternative A over the proposed plan and all presented alternatives for the following reasons:

Since a good proportion of the pipeline is already in existence, material and other construction costs should be well below that of the proposed action and all other alternatives. Consider:

- The proposed action's total length is over 610 miles. The worst case for Alternative A shows a pipeline only 225.1 miles in length, the best case only 76.8 miles -87 % less than the proposed action.

- The proposed action requires five maintenance bases be constructed. All alternatives require at least that number, some more. Alternative A requires that no maintenance bases be built.

- Construction rights-of-way (ROW) for the proposed action is almost 7,400 acres. Alternative A ROW is 2,728 acres for the worst case, only 931 acres for the best case - a substantial difference, well below all other alternatives.

- The same considerable difference exists in permanent ROW. Alternative A is, again, well below all alternatives and the proposed action.

On these facts alone rests a strong case for Alternative A. It simply utilizes existing facilities better than any of the other projects. I see no

No response required.

logic in building five maintenance bases when one need not build any, no logic in building a pipeline already built. Why permanently disturb more land when not at all necessary? There is no sense in spending time and money in such duplicated effort. Speaking in terms of facilities, Alternative A, even in its worst case, is far superior to any of the other projects.

Regarding environmental effects, Alternative A seems to create fewer negative impacts than either the proposed action or any of the alternatives. Consider:

- The proposed action will temporarily disturb 6,330 acres of native vegetation. Alternative A's worst case will disturb 1,662 acres, its best case only 931 acres. Quite a difference.

No response required.

- The proposed action potentially effects eight threatened or endangered plant species. The best case of Alternative A effects none, while its worst case potentially effects two. Other alternatives threaten up to twelve such species.

- Considering soils, the proposed action and all alternatives come out significantly worse than Alternative A. The proposed action crosses 3,056 acres of poor soils (i.e., susceptible to erosion, slides, etc.). Alternative A's best case crosses only 270 such acres.

- The proposed action crosses 61 streams. The best case of Alternative A crosses 10.

- Perhaps most environmentally significant of all, Alternative A generates far less NOx air pollution than either the proposed action or any of the alternatives. The proposed action will produce 404 tons of NOx. The best case of Alternative A, only five. The best case analysis for Alternative A shows pollution levels below the proposed action for all pollutants listed. Only in the worst case do its levels for two pollutants rise above the other projects' levels.

Air emissions for the RMPP and some of the alternatives have been revised in the FEIS. It is correct to assume that only 5 tons of NO_x would be generated if the Northern Systems Alternative were implemented before gas from Alaska is transported. However, once Alaskan gas flows through the pipeline, a net increment of 268 tons per year of NO_x would be generated by four expanded compressor stations along the PGT and PG&E pipeline systems. Therefore, the resulting air emissions would include 273 tons per year of NO_x. As shown in the FEIS, the proposed action would generate either 184 or 275 tons per year of NO_x, which does not represent a significant difference from the Northern Systems Alternative.

Considering environmental factors, Alternative A seems the best project by far. This, combined with its excellent safety rating (its worst case safety rate is more than twice as good as the best of any other project), and its facilities advantages must make it the superior pipeline project. The FERC Staff has called both the proposed action and Alternative A "environmentally acceptable," but Alternative A is "Significantly Superior." The U.S. Forest Service, Department of Agriculture, also finds Alternative A to be environmentally preferable. And Department of Interior land managing agencies find it acceptable and reasonable.

If the pipeline is needed, and unless there are some major factors I'm unaware of, I too feel the best choice is the Northern Systems Alternative (Alternative A). Judging by the information presented in the DEIS, I can't see how anyone could come to a different conclusion. If, for some reason, Alternative A is not built, Alternative C seems to warrant last consideration. It is the longest, uses the most ROW (both temporary and permanent), disturbs the most native vegetation, potentially threatens federal endangered or threatened species, crosses more dangerous soils, and passes by or through three wilderness study areas. In no way should this alternative be considered.

No response required.

Again, based on the information presented in the DEIS, I consider the Northern Systems Alternative as far-and-away the best project to build. If the pipeline is constructed, I would hope that this alternative is the plan chosen.

Sincerely,

Fred S. Etheridge

The Secretary
Federal Energy Regulatory Commission
825 No. Capitol Street
N.E., Washington D.C. 20426
Ref. Docket No. EP79-424, Case No. U-4597
RMPP DEIS.

Dear Sir.

I am representing the Kamas Soil Conservation District in Summit County Utah. I am the chairman of that organization and we have been asked by the majority of private landowners in this area to lead the efforts of the group in dealing with the RMPP project and the DEIS.

We would like to first state that we are in full support of the Northern Systems alternative and would prefer to see that route used by PGT.

Secondly we feel that the DEIS has not addressed the concerns of the private landowner adequately. This pipeline will pass through mostly private land if R.M.P.P. proposed route is taken. Quoting the Farm Bureau:

"As landowners of Summit County, we endorse the following principles with regard to the building of the proposed Rocky Mountain Pipeline.

Concerns regarding private landowners were considered to be related mainly to agricultural lands. The DEIS identifies the impact to agricultural lands in chapter 4, "Proposed Action: Agriculture." Also, the applicant has recognized mitigation measures necessary on private land; they are identified in appendix C.

Seven scoping meetings were held to determine the issues that the public believed should be addressed in the EIS. The West Kamas Valley Variation has been analyzed in the EIS as a direct result of the concerns raised by the Kamas Valley Soil and Water Conservation District. Consequently, the FEIS addresses the environmental issues raised by the public.

1. We feel that public utilities should be required to provide economic impact studies when crossing private lands which are comparable to those required for crossing public land.

Public utilities are required to comply with local zoning ordinances, but no law requires economic impact studies which deal with impacts to individual livelihoods.

2. We feel these public utility companies should be required to comply with local land planning and zoning ordinances.

3. In cases where eminent domain proceedings are used to obtain easements, this compensation should be subject to periodic review and further compensation granted for loss

Compensation for the right-of-way and any damages, long-term or otherwise, is negotiated between the pipeline company and the landowner. The legal issues raised are beyond the scope of this EIS.

of income-producing opportunities.

4. Routes of the line should be such as to cause the least possible damage to private and public ground. Landowners should be involved in each stage of such planning considerations.

The only private citizens group that the DEIS lists in Appendix A as having been consulted is the League of Women Voters.

The R.M.P.P. proposed route will be crossing some of the best cropland that we have in Summit County. We have already submitted an alternate route

The staffs of the BLM and FERC agree. Numerous attempts were made to involve the public in the EIS process, as identified in the beginning of chapter 2, "Proposed Action and Alternatives: Background."

Appendix A contained some printing errors; the statement explaining how detailed lists of individuals receiving DEIS's could be obtained was inadvertently deleted. However, appendix A is only a general indication of who received DEIS's. This list has been updated to indicate a more accurate mailing list.

A complete list of persons receiving copies of the EIS does not appear in appendix A, since over 900 copies of the document were mailed. A copy of the mailing list is available upon request.

Please refer to the description and analysis of the West Kamas Valley Variation in chapters 2, 3, and 4.

map in the west Hills to the BLM for consideration. We do not have a large amount of irrigated land. Only 2% of the acreage in the county is arable. This proposed route crosses through the major portion of irrigated land here. This type of impact to our best cropland should be avoided.

This line also passes within a few hundred feet of several spring areas that are used for culinary water for people in the town of Levan. This was not addressed in the DEIS.

According to the Attorney General's Office of the State of Utah, the only law that applies to this situation is section 10-8-15. This law states that livestock may not graze within 1,000 feet of a culinary water supply. No laws pertain to construction within a minimum distance to water supplies; however, if such a law exists, the applicant must comply with it and therefore would have to reroute the pipeline. Because the DEIS analyzed a 1-mile wide corridor, the same analysis is applicable.

The DEIS has not adequately reviewed the type of impact this pipeline will have on our irrigation systems, and our soil. Most of our cropland is flood irrigated, we also have alot of sub irrigated pastures. Construction of the pipeline through these areas could drastically upset these systems despite the construction methods described in the DEIS. Our soils generally have a thin layer of topsoil over a gravelly sub soil. It will be very difficult to replace this soil so that it will not affect our irrigation

Impacts to agricultural lands are discussed in chapter 4, "Proposed Action: Agriculture." Intensive implementation, compliance, and monitoring of applicable measures would be required to ensure successful restoration, but this could be done without diminishing the viability of the agricultural lands involved.

These concerns will be considered in the decisionmaking process.

methods. We feel that the pipeline will disrupt the underground flow of water. The land on one side of the pipe will be wet and that on the other side will burn up.

From past experience we have learned that it takes quite awhile for a company to respond to maintenance problems. If one of our cannals has trouble where the RMPP has gone through we would probably miss two or three days of water and many people their entire turn before it could be repaired.

Maintenance of irrigation systems and related structures is recognized in "Erosion Control, Revegetation, and Restoration Guidelines Proposed by the RMPC: Backfilling and Grading."

Provisions for necessary maintenance activities would be made during easement negotiations between the applicant, landowners, irrigation company, and/or district official. Timeliness of response could be made part of the easement. (The introduction to "Erosion Control, Revegetation, and Restoration Guidelines Proposed by the RMPC" discusses the terms of easement.)

These valleys and meadows are also the last area in Summit County that the Sandhill Crane has to live in. They are a high interest bird and used to be common in the Snyderville and Park City Area but these areas are being sub divided and the wild life driven out.

The EIS needs to look at the impacts on wild life in our area closily.

We feel that if PGT will consider our alternate route in the west hills they will see that it is longer and more rugged country But in the long

See response to comment on page 8, paragraph 5, of the RMPC's General Comments, dated August 21, 1981.

ron would cost them less to go that way then through all the different land owners, cannals, fences, roads, cropland, etc. They would avoid alot of trouble with livestock, water systems, people, and disrupting our farming.

Thank you for the chance to comment on the DEIS and the proposed RMPP.

We would also like to thank Dell Waddoup an Al Amen for their help and attention to our problems.

Robert E Lee

Chairman Kanab Valley Soil Cons. Dist.

8-1-81

Mario J. Pawlik
4340 So. Escondido 158
Las Vegas, Nev. 89109

Dear Secretary:

We in Las Vegas do not want a gas pipe line thru our community - recreational land., especially one which does not benifit us. So do use your alternate route thru central Nevada. If you must destroy our state slowly & surely, do it where I will not have to see it for the present.

Hopefully your project will go the same way as we pray my goes - to some other state.

Sincerely,
Mario J. Pawlik

The RMPP may provide the Las Vegas area with additional gas supply. Mr. R. L. Muirhead of Southwest Gas Corporation indicated at BLM's August 3, 1981, public hearing in Las Vegas, Nevada, that

> El Paso has agreed that if this project is approved, authorization for at least two new delivery points to serve the southern Nevada customers of Southwest Gas will be requested from government authorities. This source of gas, virtually at our doorstep, should eliminate some planned costly future pipeline additions. The Rocky Mountain project is an economical and reliable means of providing increased gas service to this area.

No applications have been filed with the FERC for new delivery points. The pipeline would also generate additional tax revenues and employment for seven individuals.

PACIFIC GAS AND ELECTRIC COMPANY

PG&E

P. O. BOX 7442 • 77 BEALE STREET, 31ST FLOOR, SAN FRANCISCO, CALIFORNIA 94106
TELEPHONE (415) 781-4211 TELECOPIER (415) 543-7813

September 3, 1981

Honorable Kenneth F. Plumb, Secretary
Federal Energy Regulatory Commission
825 N. Capitol Street, N.E.
Washington, D.C. 20426

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CENTRAL FILES

Re: OPRP/DPC - EEB
Rocky Mountain Pipeline Project (RMPP)
Docket No. CP79-424
Case No. U-45957
RMPP DEIS

Dear Mr. Plumb:

The following comments are submitted on behalf of Pacific Gas and Electric Company and Pacific Lighting Gas Supply Company, the entities which will own and operate the California Segment of the Rocky Mountain Pipeline.

We have reviewed the Rocky Mountain Pipeline Project Draft Environmental Impact Statement. We support the comments submitted on behalf of the Rocky Mountain Pipeline Company which accompanied its cover letter to you of August 21, 1981.

Very truly yours,

S F Greenwald

STEVEN F. GREENWALD

SFG:mqs
cc: J. Bates
Janis L. Bowles
A. H. Caremeros
A. Formanek
T. Fowler
Kenneth Frye
Michael D. Gayda
H. G. Gillit
W. E. Hensala
L. LoBaugh
Don T. Nebeker
C. A. Novak
G. J. Odegard
C. S. Snyder
Gary J. Wicks

No response required.

PACIFIC GAS TRANSMISSION COMPANY

245 MARKET STREET
SAN FRANCISCO, CALIFORNIA 94105
(415) 781-0474

PETER W. HANSCHEN
GENERAL COUNSEL

LEIGH S. CASSIDY
ROBERT B. McLENNAN
ATTORNEYS

August 21, 1981

The Hon. Kenneth F. Plumb, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

Re: OPPR/DPC - EEB
Rocky Mountain Pipeline Project (RMPP)
Docket No. CP79-424
Case No. U-45957
RMPP DEIS

Dear Mr. Plumb:

Pursuant to your letter of July 10, 1981, there are transmitted herewith for filing with the Commission, on behalf of the project sponsors, fifteen copies of Rocky Mountain Pipeline Company's comments on the Draft Environmental Impact Statement (DEIS).

Two sets of comments have been prepared. One set, entitled "Rocky Mountain Pipeline Company's General Comments to the DEIS", contains general comments on the adequacy of the DEIS and the merits of the alternatives discussed within the document. The other, entitled "Rocky Mountain Pipeline Company's Technical Comments to the DEIS", contains specific, detailed technical comments to the text and technical reports.

Please find enclosed an original and fourteen copies of the general and technical comments. By copy of this letter we are also providing two copies to the Department of the Interior, Bureau of Land Management, and to the Forest Service. In addition, I am serving copies of our comments upon all persons reflected in the Secretary's official service list.

Please direct any inquiries concerning the comments to the undersigned.

Very truly yours,

Leigh Cassidy
LEIGH S. CASSIDY

LSC:at.
Enclosures

cc: Janis L. Bowles (2)
Rocky Mountain Pipeline Project Leader
Denver, Colorado

Mr. Kenneth Frye (2)
Federal Energy Regulatory Commission

Mr. Gary J. Wicks (2)
State Director
Utah Bureau of Land Management

Mr. Don T. Nebeker (2)
Forest Supervisor
U.S. Department of Agriculture

CERTIFICATE OF SERVICE

I hereby certify that I have this day caused a copy of the foregoing Technical Comments to the Draft Environmental Impact Statement, and General Comments to the Draft Environmental Impact Statement to be served upon each person designated in the official service list compiled by the Secretary in Docket No. CP79-424, in accordance with the requirements of Section 1.17 of the Commission's Rules of Practice and Procedure.

Dated at San Francisco, California, as of the 24th day of August, 1981.

PETER W. HANSCHEN

ROCKY MOUNTAIN PIPELINE COMPANY'S[1] GENERAL COMMENTS TO THE DRAFT ENVIRONMENTAL IMPACT STATEMENT[2]

A. FERC Environmental Staff Conclusions

I. Northern Systems Alternative

RMPC concurs with and endorses the conclusion of the DEIS that the RMPP is an environmentally acceptable project. RMPC does not agree, however, with the position taken by the FERC environmental staff that the Northern Systems Alternative (NSA) is "significantly superior." This finding is based on an incomplete, very limited analysis, focusing primarily on the number of miles of new pipeline which would be required for each system.

In evaluating the RMPP, the DEIS does not fully consider all factors necessary for an informed evaluation of this project vis a vis the NSA proposed by the FERC environmental staff. We would agree, however, that insufficient information exists at this time to perform such an evaluation, and that it should properly be conducted at a later date, in the course of the FERC certification proceedings.

We believe, however that it is important at this time to offer several observations on the limited analysis contained in the DEIS. First, it should be kept in mind that the RMPP is intended to have an ultimate design capacity of 800 MMcf per day and that 413 MMcf per day is only intended for the initial stages of the project. It would appear ill-advised to base such a recommendation on the transportation of initial volumes without considering the ultimate capacity of the pipeline.

Also, critical to any economic analysis which will be undertaken is the difference in fuel efficiencies of the two systems. As recognized in the DEIS, the RMPP is a far more fuel efficient system than the Northern Systems Alternative. For instance, to deliver 413 MMcf per day the RMPP will use only 2.91 MMcf per day whereas the Northern Systems Alternative will use almost ten times that amount of fuel, or 27.78 MMcf, to deliver the same volume. At 800 MMcf, which will be the ultimate capacity of the project, the difference in fuel efficiency is extremely significant with RMPP using only 11.56 MMcf/day, as opposed to 63.56 MMcf/day for the Northern Systems Alternative. Deferral of the economic analysis, however, does not warrant minimizing these economic issues.

In addition to the issue of economics, certain other advantages of the RMPP are not considered. For instance, the pipeline will traverse the Hingeline Area which is believed to have high potential gas reserves. The pipeline area

[1]Rocky Mountain Pipeline Company is a general partnership to be formed by subsidiaries of Pacific Gas Transmission Company, El Paso Natural Gas Company, Pacific Interstate Transmission Company, and Northwest Pipeline Corporation.

[2]RMPC has also prepared specific, detailed comments to the DEIS entitled "Rocky Mountain Pipeline Company's Technical Comments to the Draft Environmental Impact Statement", dated August 21, 1981. Also, please note that once a comment or correction is made, it will not be repeated.

This finding is based solely on environmental considerations, as required by the National Environmental Policy Act. Table 2-11 compares more than the number of miles of new pipeline, and it overwhelmingly shows that the Northern Systems Alternative would have less environmental impact than the RMPP.

The FERC environmental staff agrees that an EIS is not the forum for considering all of the factors that are required to make a final decision. The DEIS analyzes environmental impact as required by the National Environmental Policy Act.

The application that has been filed with the FERC is for 413,000 Mcfd, not 800,000 Mcfd. In its November 12, 1980, data response, RMPC states:

> The certificate of public convenience applied for by RMP is for facilities and authorization to transport 413 MMcf/d. The proposed design of the project allows for expansion to an ultimate optimum capacity of 800 MMcf/d by adding, subject to regulatory approval, additional compressors.
>
> As set forth in Exhibit N of the amendment to application, Schedule 3 provides an illustrative showing assuming an ultimate volume throughput of 800 MMcf/d. Authority is not requested at this time for the facilities necessary to accommodate such increased volumes, nor has a specific source or field been identified as the source or field from which the gas will be produced.

An economic analysis is not an environmental concern and is beyond the scope of the FEIS.

Chapter 1 identifies this "potential" advantage. Issues such as gas supply, potential, and availability are beyond the scope of the FEIS.

will provide significant incentive for development of gas reserves in this area, where to date there has been little exploration.

The Rocky Mountain Pipeline Project offers further benefits by delivering supplies to southern California, whereas other planned energy projects generally come from the north. The RMPP offers the best means of direct delivery of gas supplies to Southern California Gas Company as well as to PGandE's customers in southern California, and will better serve El Paso's east-of-California customers. The pipeline could also be utilized to provide natural gas service to communities in western Utah and Nevada.

The planned LNG receiving terminal at Point Conception, (900,000 Mcfd) is only about 120 miles northwest of Los Angeles. Its planned 112-mile long connecting pipeline would cross at least five pipelines owned by SoCal, PG&E, and PLS in southern California.

Any conclusion concerning the RMPP and NSA would be premature at this time. The applicants fully expect, however, that at such time as the RMPP and the NSA are completely evaluated, the RMPP will be found to be significantly superior.

The final decision of the Commission will not be based solely on environmental issues. With the assumptions identified in the EIS, the Northern Systems Alternative is significantly superior to the environmental impact of the proposed project.

II. East Las Vegas (Variation 3)

The FERC Environmental Staff's recommendation of the East Las Vegas Variation (ELVV) is unwarranted. While detailed issues have been identified for the RMPP route, there are similar issues and additional difficulties that have not yet been identified for the East Las Vegas Variation. This variation will impact the Las Vegas Dunes Recreational Area, off road vehicle (ORV) activities, the Nellis Air Force Base, east Las Vegas residential areas such as Sunrise Manor, facilities proposed by the Clark County Flood Control District, commercial and industrial development areas of Henderson, and the Clark County National Guard facility.

The FERC environmental staff no longer recommends this variation. The text of the FEIS has been modified to reflect these concerns. Additional information has been received from the Clark County Sanitation District identifying its problems with the variation.

If the ELVV were adopted, the route would be moved from the existing transmission corridor to parallel segments of "proposed routes". These proposed routes are within a planning corridor delineated by Sloan Channel on the west and the Lincoln Co. Power line on the east. The area between these facilities is private property and is being developed for residential use rather than preserved and dedicated for use as a "transmission line" corridor.

Comment reflected in text.

The DEIS fails to recognize that RMPP's proposed route parallels existing corridors except where it deviates from the transmission corridor at Gypsum Wash to avoid the proposed Rainbow Gardens Area. It joins existing roads as it emerges south of Frenchman Mountain, crosses the Las Vegas Wash about 1000' east of the Las Vegas Lateral and follows the lateral and county roads until it joins the proposed-alignment of Foothills Blvd. near the transmission corridor. The out-of-corridor length is about eight miles, approximately the same length as the ELVV crossing of the Las Vegas Dunes Recreational Area.

Appendix G of the EIS identifies the location of the proposed route and alternatives relative to existing utilities, subject to the constraints shown in the appendix heading.

The following disadvantages of the ELVV should be considered:

a. Route length is increased;

The variation is about 3 miles or 5 percent longer than that portion of the RMPP it would replace.

b. The length of impact on intense ORV use is increased;

The length of time the area would be affected is essentially the same, regardless of the route chosen.

c. Because of site characteristics, low bluffs and dunes, necessary right-of-way regrading would cause greater long term impacts on the Las Vegas Dunes Recreation Area;

The type and extent of regrading within the Las Vegas Dunes Recreation Area, if necessary, would fall beneath the topography significance criteria used for the analysis of the RMPP and all alternatives and variations. Note that the RMPP would cross about 2 miles of this area.

d. Construction time and costs would be increased due to urban traffic congestion and constricted working space. Also material costs would be somewhat greater as thicker wall pipe would be required for the more densely populated area;

Comment noted.

e. Maintenance hazards and exposure to third party damage would be increased as services for new developments are extended across the pipeline from existing facilities (power, water, gas, sewer, etc.); and

f. Restrictions would be imposed on major construction currently proposed by others immediately adjacent to the pipeline. Restrictions would also be imposed on the movement of heavy equipment across or over the pipeline.

Comment noted.

These types of restrictions would be imposed wherever the pipeline was located.

In conclusion the RMPC concurs with the recommendation of the land management agencies that the RMPC's proposed route be utilized.

B. Land Managing Agencies' Conclusions

1. Daniels Canyon (Variation 6)/Provo Canyon (Alternative F)

The RMPC believes that the Daniels Canyon Variation (DCV) is an unacceptable route. As noted in the DEIS (p. 2-61) "there is also serious doubt of the technical feasibility of this variation".

No response required.

Benefits from following existing roads and corridors need to be fully assessed against the impacts caused by such routing. The DEIS identifies the steep, confined walls of the canyon, and recognizes that construction would be required along at least 7 miles of U.S. Highway 40. However, the DEIS does not fully address the problems associated with construction in such locations. Constricted construction operations would require that road use be limited to one lane with alternating one-way traffic and occasional closing of the road. This situation might last as long as 4 to 8 months, and would have a severe impact on traffic and the local community. Access to the pipeline for operations and maintenance would also disrupt traffic. In addition, the canyon shows signs of possible faulting as well as road and slope instability.

The Daniels Canyon Variation has been dropped from further analysis. The Daniels Canyon Variation II which would go through the Strawberry Reservoir area, has been developed as a replacement and is analyzed in chapters 3 and 4. Information about the original Daniels Canyon Variation can be found in appendix F.

Both variations run through Heber Valley and adjacent to Heber City. This agricultural community is becoming more oriented to residential and recreational use, and would be affected by both the Provo Canyon Alternative (PCA) and the DCV. Both alternatives would cut across residential and farm lands and affect more property owners than the proposed route.

No response required.

The RMPC has concluded that due to the greater length of the DCV and the PCA and the severe impacts that would occur during construction of the pipeline, these variations are significantly inferior to RMPP's proposed route from both environmental and economic perspectives.

No response required.

Comment	Response
II. Thistle Creek (Variation 2) or Mill Creek (Variation 5)	
After considering the Thistle Creek and Mill Creek variation, RMPC has concluded that both are significantly inferior to the proposed route as discussed below.	No response required.
These variations, and the southerly portion of the Daniels Canyon Variation, are located between Strawberry Ridge and Indianola (approximately between MP 150 and 175). All four routes through this area -the proposed route, DCV, Thistle Creek Variation (TCV) and the Mill Creek Variation (MCV) cross through slaked shale of the Green River formation north and/or south of US 50/6. This formation presents certain construction problems; the proposed route was carefully selected to avoid these problems to the extent possible.	No response required.
TCV passes through Red Narrows, a constricted portion of Spanish Fork Canyon, which is only 200 to 800 feet wide. Existing physical constraints in the canyon, including two railroad tracks, US 50/6 and Soldier Creek, make it impossible to construct a pipeline along the canyon floor without severe impacts on traffic and existing facilities. Operation and maintenance would have similar impacts.	No response required.
South of Thistle Junction from Wildcat Canyon to Blind Canyon, the available corridor is again defined by canyon walls. While this part of the TCV is not as constrained as the Red Narrows, safe efficient routing adjacent to the highway would be difficult to establish.	
MCV follows US 50/6 for about five miles through erosion prone Green River shale. The average elevation of the variation is a thousand feet higher than the proposed route. Weather impacts would place further limitations on construction periods and accessibility for operations and maintenance.	No response required.
The proposed route from Strawberry Ridge to Indianola would have essentially the same environmental impacts as the TCV and MCV. These impacts can be suitably mitigated. The proposed route is also superior in that it is substantially shorter than the variations.	No response required.
C. Other Comments	
I. Kamas Valley, Utah	
The DEIS discusses concerns voiced by the Kamas Valley Soil Conservation District, and others, regarding the crossing of agricultural lands in Kamas Valley (page XV, and 2-37). We do not believe that the comments or concerns expressed about Kamas Valley are unusual or unique. We are confident that preventative and mitigative actions can be taken at the design, construction and immediate post-construction stages to solve or correct all impacts that are anticipated by individual landowners.	The agriculture and soil concerns of the Kamas Valley landowners were identified and evaluated in the DEIS. The Erosion Control, Revegetation, and Restoration Guidelines adequately cover the concerns of cropland restoration and disruption to irrigation systems, and indicate preventive and mitigation actions which would minimize all impacts that individual landowners anticipated. However, it is the sentiment of the landowners and the Kamas Valley Soil Conservation District that a route avoiding the cropland and pasture areas, which consist of many small ownerships, would be to the advantage of both the landowners and PGT. Thus, chapters 2, 3, and 4 analyze another variation (West Kamas Valley Variation) which would avoid the Kamas Valley.

All of the RMPC partnership sponsors have had extensive pipeline design, construction, maintenance and operating experience with large diameter pipeline facilities built through agricultural lands. Such lands include irrigated fields, irrigation ditches and canals, and a diverse variety of crops. The Rocky Mountain Pipeline Company will not be an absentee owner (or construction contractor), but will continue to work with individual landowners and tenants to correct any problems during the entire operating life of the pipeline.

Comment reflected in appendix C.

The proposed pipeline was selected upon the criteria that maximum use be made of existing utility or transportation corridors. Where joint-corridor use was not possible, an attempt was made to parallel these existing corridors.

No response required.

We note the final EIS will include a description and analysis of a variation that would pass around the west edge of Kamas Valley (Variation 8, page 2-37). RMPC has already reviewed such a variation and has found that such a route would result in a longer pipeline, and that the entire route variation would also be on private lands. It can be expected that such a change would substitute new objections and concerns for those already voiced about the proposed route.

The RMPC suggests, if any further variations are to be considered for the FEIS, that such analysis be limited to proposals that offer substantial improvement to the pipeline project, and that effort not be expended in further studies that may have substitute value but would also incur new and different impacts that outweigh any perceived benefits.

No response required.

II. Other Alternates and Variations

The RMPC generally agrees with the DEIS evaluation of the alternates and variations, other than as previously discussed. Therefore RMPC does not believe it necessary to comment upon the various aspects of these other alternates and variations, none of which have been found to be preferable to the proposed route.

No response required.

III. Schedule

The RMPC originally estimated that the RMPP could be in operation by late 1982. Ho\.ever, gas supply sufficient to allow the RMPP to go forward by that date has not been acquired. The RMPC is continuing to diligently pursue the acquisition of a sufficient gas supply for the RMPP and is confident that with continued exploration and development in the Overthrust Belt and other producing basins in the Rocky Mountain area, an adequate gas supply will be acquired.

Comment noted.

IV. Mitigative Measures

While the RMPC recognizes the obligation of the land managing agencies to require reasonable mitigation, the RMPC believes that a decision of whether to require the site specific measures listed in "Mitigative Measures", Appendix C, and the "BLM and FS General Measures", Appendix D, pp. D-5 thru D-7, should be made on a case by case basis by the office issuing the right-of-way grant or the special use permit. This would allow for site specific consideration of situations requiring special mitigative measures while limiting general stipulations to those applicable to the total project. This would also provide the applicant the opportunity to utilize its expertise to insure adequate, cost effective techniques.

The RMPC requests that the Authorized Officer (A.O.) consult with the RMPC before issuing any order that would impact project design, schedule, or cost.

V. Visual Resources

RMPC believes that visual impacts may be overstated in the DEIS. Visual impacts are closely related to site specific location and surroundings within a corridor, and appropriate selection of alignment can substantially reduce perceived impacts. Also, any visual impact can be expected to be modified and lessened with time, assuming reasonable mitigative measures.

VI. Socioeconomic Impact:

The potential impacts of the East Las Vegas Variation, Daniels Canyon Variation, and the Provo Canyon Alternative appear understated in view of the population density and potential development immediately adjacent to these variations.

VIII. Soils

The DEIS states in the "Summary" that one of the issues to be resolved is the severity of potential impacts to the mountainous soils in Utah (page XIX). This appears to conflict with the statement on page XVII, that, with implementation of mitigation measures for soils, all but a few localized areas should be successfully stabilized within one to five years. The RMPC has submitted its "Erosion Control, Revegetation, and Restoration Guidelines" as its commitment to soil conservation and reclamation. These guidelines will be applied to all lands as a work specification in the construction contracts.

The RMPC believes that final route location and alignment will greatly minimize soils impacts. Given the scale at which soils were mapped and their extreme variability over small areas, it is possible that the evaluation made in the DEIS for a corridor strip overstates the severity of potential impacts.

The site-specific measures listed in "Mitigative Measures," appendix C, and the "BLM and FS General Measures," appendix D were developed in close coordination with the Utah State Office and the various FS offices which will later administer the right-of-way grant. The "BLM and FS General Measures" are a combination of general guidelines to help the Utah State Office in developing the right-of-way grant and more specific items submitted by the FS. Both sections have been extensively reviewed by the offices which would administer the right-of-way grant. More site-specific consideration of sensitive resources will be reflected in the operating plans which the applicant will prepare in consultation with the agencies. During preparation of any right-of-way grant, the issuing office coordinates with the applicant.

Two nationally recognized visual analysis systems were used to assess the visual impacts which would occur if the project were constructed. The analysis was based upon what would appear to be the most likely pipeline alignment and facility locations for the proposed action, alternatives, and variations, using the available project data and design features. Further, prudent and creative alignment and siting techniques could preclude much visual contrast; the resource assessment allowed for this. The element of time was a factor in determining the degree of significance of visual resource impacts, as described in the criteria for analysis in chapter 4, "Proposed Action: Visual Resources."

The Clark County Department of Comprehensive Planning has reviewed the DEIS and indicated a preference for the East Las Vegas Variation. However, the Clark County Sanitation District and further analysis of this variation have identified conflicts with the route. The original Daniels Canyon Variation has been dropped from consideration. Conflicts with the Provo Canyon Alternative have not been understated.

The statement in the "Summary"--"One of the resource issues to be resolved involves continuing study to determine how severe potential impacts would be to mountainous soils in Utah" has been deleted to resolve the apparant conflict of statements. The study has been completed; no changes to impact conclusions occurred as a result.

Final route location and alignment will minimize soil impacts. This is recognized in the last paragraph of the general impact discussion in chapter 4, "Proposed Action: Soils."

IX. Air Quality

Potential emissions at the Sage Compressor Station are overstated in the DEIS. Emissions should be based on site rather than ISO (sea level) horsepower and should include two turbines only. The third unit will simply be on standby. In order to provide accurate emissions data, emissions should be calculated from AP-42, Compilation of Emission Factors, on the basis of fuel requirements of 2.91 MMcfd. On this basis, PSD (Prevention of Significant Deterioration) review would not be required.

A PSD applicability determination will be required from the Wyoming Department of Environmental Quality for the Sage Compressor Station. The applicant could have obtained a formal applicability determination from the state; this could have been included in the FEIS.

In the FEIS, the staff has analyzed the operation of two and three compressor site-rated units at the Sage Compressor Station. The resulting emissions are shown in table 4-7 of the FEIS.

Fuel consumption figures were not used to calculate the maximum potential to emit because these fuel values are estimated averages of the actual fuel consumption.

ROCKY MOUNTAIN PIPELINE COMPANY'S[1] TECHNICAL COMMENTS TO THE DRAFT ENVIRONMENTAL IMPACT STATEMENT[2]

Chapter	Page	Comment	
Summary	xv	Under "Subjects of Controversy" there is noted public concern in the Las Vegas area that the line would adversely impact the area without any local benefit. There should be included a reference to Southwest Gas Company's proposal to utilize the line to increase their service for the area rather than undertaking extensive expansion themselves.	Paragraph has been revised to reflect Southwest's intention.
Summary	xv	Under "Major Impacts", the DEIS assumes that all vegetation will be removed within the "100-foot wide construction width" along the pipeline routes; however, on page 4-6, under "Proposed Action", the DEIS states that "on slopes of about 10 percent and less, some vegetation would probably not be removed". Therefore, the maximum amount of vegetation removal has been calculated for impact assessment.	Impact assessments are based upon a worst-case scenario wherever exact figures are not available. Therefore, the analysis assumed a 100-foot wide strip would be cleared of vegetation.
Summary	xvii	Under "Wildlife", insert "winter" between "bald eagle" and "habitat". Also make this change elsewhere in the DEIS where reference is made to bald eagle habitat in order to make clear that no breeding habitat could be affected.	Appropriate changes have been made in the "Summary" and in chapter 3, " Federal and State Listed Species."
Summary	xvii	Under "Visual Resources", to say that the proposed action would cause significant visual contrasts is misleading, especially when mitigative measures such as landscape screening, revegetation and environmentally-coordinated paints are available to reduce such contrasts. Also, how was the figure "1,209 acres" derived?	The summary statement was based upon the acres of significant visual resource impacts which would occur along the proposed route as determined by the significance criteria. The results indicated that approximately 1,196 acres would receive significant adverse visual impacts, even with implementation of mitigative measures. The 1,209 acres is more correctly 1,196 acres (1,179 acres of pipeline construction right-of-way plus 20 acres for one compressor station complex and a maintenance base. (See table 4-2.) The number in the summary has been corrected.
Summary	xvii	Under "Recreation Resource", the DEIS states that "The proposed action would conflict with four managed areas". Actually, two of these are proposed — Clark County Wetlands Park and Rainbow Gardens National Natural Landmark. Only Sunrise Mountain Natural Area and Las Vegas Dunes Recreational Area are managed.	"Summary: Recreation Resources" has been revised.

[1] Rocky Mountain Pipeline Company is a general partnership to be formed by subsidiaries of Pacific Gas Transmission Company, El Paso Natural Gas Company, Pacific Interstate Transmission Company, and Northwest Pipeline Corporation.

[2] RMPC has also prepared general comments entitled "Rocky Mountain Pipeline Company's General Comments to the Draft Environmental Impact Statement", dated August 21, 1981. Also, please note that once a comment or correction is made, it will not be repeated.

Chapter	Page	Comment	Response
Summary	xviii	Under "Conflicts with Land Use Plan, Controls, and Constraints", the statement is made that "The proposed action would conflict with the Utility Corridor Rule of the proposed Forest Land Management Plan for the Uinta National Forest". No such plan has been made available to RMPP. However, this EIS process provides a means to integrate the proposed route into the Forest Plan as it is developed and finalized. As the DEIS states on page 2-52, paragraph seven under "Proposed Action", "the values which determined the placement of utility corridors would not be significantly affected by the proposed action".	Comment noted; perhaps the FS will integrate the pipeline corridor with its plan. The Uinta National Forest Plan: Draft Environmental Impact Statement can be obtained from Mr. Don T. Nebeker, Forest Supervisor, (801) 377-5780.
Summary	xviii	Under "Conflicts with Land Use Plan, Controls, and Constraints", second complete sentence and throughout the DEIS -any inference that the proposed action will be a significant issue or conflict within the Moapa Indian Reservation should be omitted. Based upon PGT's meeting with the Moapa Tribe last May, no insurmountable problems are anticipated even though the pipeline will not be within the utility corridor which now crosses the Reservation.	There is no conflict between the proposed action and the Moapa Indian Reservation itself. The legislation which expanded the Moapa Indian Reservation provided for a 3,010-foot wide corridor to be retained and administered by BLM for linear rights-of-way. The conflict is between the proposed action, which does not follow the corridor, and the BLM management policy of using the corridor.
Summary	xviii	Under "Geology and Topography", second paragraph, first sentence; for permanent modification of the topography, include Alternative B (Sanpete Valley) Variation 2 (Thistle Creek), and Variation 3 (East Las Vegas). Alternative Band Variation 2 may include side-hill benching. Variation 3 would involve permanent regrading in the Las Vegas Dunes Recreation Area.	This additional detail is not necessary for the summary. The body of the EIS should be used for the decisions made by Federal agencies. It is possible that Variation 3, crossing 5 miles of the dune area instead of RMPP's 2 miles, would create greater topographic impact. This topographic impact would not necessarily be long term; even if it were, it would be of no significance to the use of the area. Alternative B and Variation 2 are now mentioned in the summary.
Summary	xix	There is no basis for stating "Temporary noise in excess of a sound pressure level of 55 dB(A) caused by construction would affect local residents along the right-of-way... recommendation...that the applicant design all new compressor stations so that the day-night sound level pressure of 55 dB(A) would not be exceeded..." The Environmental Protection Agency (EPA) published a proposed guideline in December 1980 for environmental noise entitled "Guidelines for Noise Impact Analysis". The approaches described in the document are not mandatory, nor are specific numbers which appear in the document intended to be construed as standards. This is a result of EPA's understanding that environmental noise is a human perception which has been predicted only in a statistical sense. Individuals differ considerably in their sensitivities to noise.	The EPA has identified an L_{dn} of 55 dB(A) as the maximum level which would not affect public health and welfare by interfering with speech or other activities in outdoor areas. Maintaining an outdoor L_{dn} below 55 dB(A) should also ensure adequate protection for the indoor noise environment (EPA 1974). EPA defines the L_{dn} as the $L_{eq}(24)$ with a 10-dB(A) weighting applied to nighttime sound levels (10 p.m. to 7 a.m.). The 10-dB(A) nighttime weighting represents the national ambient drop in noise levels from day to night in quiet environments. EPA identifies this reduction as the level necessary to protect against sleep interference. The noise levels that were identified as protecting individuals from annoyance and activity interference were derived from information on speech perception and interference. An outdoor L_{dn} of 55 dB(A) protects 95 percent of sentence intelligibility with normal voice levels 3.5 meters away (National Academy of Science 1977). The indoor L_{dn} of 45 dB(A) assures virtually 100-percent intelligibility inside buildings. Since a typical home may attenuate outdoor noise by 15 dB(A), an ambient L_{dn} of 55 dB(A) protects the indoor noise environment with a 5-dB(A) margin of safety.

Chapter	Page	Comment	Response
		For these reasons, RMPC does not believe that the available data supports a noise standard for construction activity and compressor stations. Further, background noise alone, under some natural circumstances, can be measured at levels exceeding 55 dB(A) depending on the specific method used to establish the Ldn. It is inappropriate for the FERC to establish such a standard when EPA has only proposed a guideline.	
Summary	xix	Under "Energy Efficiency", it should be stated that the fuel efficiency of the Northern System Alternative will decrease with the advent of Alaskan gas.	The decrease in fuel efficiency for the completed Western Leg, which assumes Alaskan gas is also flowing, is reflected in "Summary: Energy Efficiency."
Summary	xx	To be consistent with discussions elsewhere in the DEIS, Staff conclusions should make it clear that "the assumptions that the Western Leg will be completed south of Stanfield, Oregon, and that it can be prebuilt are essential to the feasibility of the Northern Systems Alternative".	Comment incorporated.
Summary	xx	The feasibility of the land management agencies' preferred variations is questionable and has been addressed in detail elsewhere in the technical and general comments.	No response required.
Purpose	1-1	In the first paragraph, next to the last sentence after the word "constructed" add the words "and operated by a partnership composed of Pacific Gas and Electric Company(PG&E) and Pacific Lighting Gas Supply Company (PLGS)". Also, substitute "Pacific Lighting Gas Supply Company (PLGS)" for "Pacific Lighting Service Company (PLS)".	Comment incorporated.
		Last Paragraph - The assumption that transportation service will be available for 100,000 Mcfd without new facilities is premature. While the Northwest, PGT, NGC, and PTS agreement provides for service on a firm basis, the agreement itself acknowledges that additional facilities may be required. No certificate has been obtained from the FERC for this transportation service.	No assumptions have been made. See "Low Flow Alternative" for additional information. In addition, no FERC certificate is necessary for short-term transportation agreements under section 284 of the implementing regulations of the Natural Gas Policy Act because El Paso and Northwest have received their order 60 blanket certificates authorizing such activities under Docket Nos. CP80-127 and CP80-163. PGT will have to file for this blanket authority.
Purpose	1-2	At the end of the first complete paragraph in the right-hand column, the sentence "Before Alaskan gas is available, the Western Leg may transport Canadian gas for a limited time", would be more accurate if it read: "The Western Leg transports Canadian gas and will, when Alaskan gas is available, transport Alaskan gas as well". The proposed revision is appropriate because the terms of the Canadian gas export licenses are not coterminus with the commencement of deliveries of Alaskan gas. Extensions of existing export licenses will be sought.	The text has been modified to show a possible use of the Western Leg south of Stanfield, Oregon.

Chapter	Page	Comments	
Purpose	1-3	Rather than stating that "Numerous companies are competing for gas supplies in the Rocky Mountain Region", it is more appropriate to state, "Numerous companies are engaged in acquisition of gas supplies in the Rocky Mountain Region. This should enhance the ability of the RMPP to obtain enough gas transportation agreements to support its project."	Mr. Richard E. Terry, representing the Trailblazer Pipeline Company and Overthrust Pipeline Company partnerships stated in the FERC hearing for the Trailblazer project in Docket No. CP79-80, et al. that ". . . we {the partners} are all in competition with each other." Furthermore, Mr. Robert W. Lindgren, Vice President and Chief Engineer of Natural Gas Pipeline Company of America, indicated in the same hearing that " . . . almost every major gas pipeline is actively seeking supplies in what I call generally the Rocky Mountain area." These statements are found on pages 236 and 227, respectively, of the hearing transcript.
Proposed Action	2-1	PG&E and PLGS will not submit a separate application to the BLM for the right-of-way since the application filed on September 8, 1980, is a consolidated application for the total 610 mile long project.	Comment incorporated.
Proposed Action	2-1	Rather than stating that the RMPC has no plans to expand the proposed project to an optimized capacity of 800,000 Mcfd, it is more correct to say RMPC has no definite schedule to do so at the present time.	The application filed before the FERC is for 413,000 Mcfd. This level constitutes the proposed action which the RMPC alleges it is able and willing to undertake.
Proposed Action	2-13	In Table 2-6 under California for Alternative A, Northern Systems, the miles of land crossed for private land has been transposed. ("148" should be "zero" and "zero" should be "148").	Appropriate changes have been incorporated into the FEIS.
Proposed Action	2-14	Under "Facilities", the compressor station will be 14,454 site-rated horsepower with a 7,227 horsepower spare unit. Add "approximately" to "15 cathodic protection stations", since the exact number of cathodic protection stations will not be determined until the pipeline is constructed and evaluated. Also, there are no oil treatment facilities proposed for the Sage Compressor Station.	Site-rated horsepower is used only in the air quality discussions. Page 1.3-11 of Exhibit Z-2 indicates 15 cathodic protection stations would be constructed. However, the last two comments are incorporated.
Proposed Action	2-17	In the left-hand column near the bottom of this page, delete "thus, they would require unknown lengths of electric powerline to be installed", since cathodic protection stations may be powered by other sources of electricity.	Comment reflected in text.
Proposed Action	2-17	Under "Land Requirements", last partial paragraph, the proposed permanent pipeline right-of-way would be 50 feet wide plus the width of the facility.	Comment reflected in text. Although the right-of-way application which PGT (RMPC) made was for a 50-foot wide permanent right-of-way plus the width of the facility, BLM has the authority to authorize any reasonable width up to 50 feet plus the width of the facility. The position of the BLM is that 53 feet is not necessary and up to 50 feet is reasonable.
Proposed Action	2-20	In the second line at the top of the page, delete the word "purchase" and insert the words "acquire easements for".	Comment incorporated.
Proposed Action	2-21	In paragraph two, line 10, delete "Each" and change "weld" to "Welds". 49 CFR 192 does not require that each weld be radiographically inspected.	Comment incorporated.
Proposed Action	2-22	In paragraph three, line 12, delete "cofferdams or retaining walls with riprap" and insert "bank protection structures". In paragraph five, line three, delete the word "weld".	No change required. Page 1.5-14 of Exhibit Z-2 indicates that these items could be used. The text does not identify all of the bank protection structures that would or might be used.
Proposed Action	2-25	In paragraph one, line five, change the word "tossed" to "ripped".	Comment incorporated.

Chapter	Page	Comments	
Proposed Action	2-25	Under " Operation and Maintenance", add the following to the first paragraph, "The California facilities will be operated and maintained by PG&E in accordance with California Public Utilities Commission (CPUC) General Order No. 112D".	Comment reflected in text.
Proposed Action	2-26	To the first sentence of the first full paragraph add "in accordance with DOT regulations". In the second sentence of the second paragraph, delete "In accordance with DOT regulations". There is no DOT regulation governing vegetation growing over a gas transmission pipeline.	No change required. Comment incorporated.
Proposed Action	2-27	To the list of "Federal Authorizing Actions" add "U.S. Fish and Wildlife Service, Section 7" Consultation for Threatened and Endangered Species". To the "State, County, and Local Authorizing Actions" under "Wyoming" it should be stated that separate permits are needed from the Air Quality Division and Water Quality Division of the Department Environmental Quality (DEQ) for a construction permit for a new source and permit to construct wastewater disposal facilities, respectively. Also, a permit to establish a landfill at the Sage Compressor Station would be needed from DEQ's Land Quality Division. A permit to appropriate ground water would be needed from DEQ's Land Quality Division. A permit to appropriate ground water would be needed from the State Engineer's Office. Under "Utah" delete "Approval to establish labor camps (spreads)" and "Conditional use permit" (Cache County Planning and Zoning Commission)", as they are not part of the proposed action.	Chapter 2 and appendix D contain authorizing actions which RMPC must obtain before constructing its proposed pipeline. The section 7 consultation for threatened and endangered species is a requirement from the Endangered Species Act for Federal authorizing agencies, not applicants, to consult with the FWS. In this case, BLM has initiated the consultation for all of the Federal agencies which have authorizing actions on the project.
Proposed Action	2-28	Under "Alternative A — Northern Systems Alternative" right-hand column, first full paragraph, PG&E's intrastate pipeline is not subject to the jurisdiction of FERC. Also, PG&E's Western Leg facilities, which are entirely within California, will be the subject of a future application to the CPUC. The CPUC has made no decision as to the sizing of the pipeline within the State of California. PGandE's existing pipeline from Oregon to Antioch is 299 miles not 296. The 240,000 Mcfd Pan Alberta gas belongs to PIT not PGT.	Comments noted. Corrections made.
Proposed Action	2-36	Under "Variation 2 — Thistle Creek Variation" change "Highway 91" to "U.S. Highway 6/50 and U.S. Highway 89". This variation also passes through the Red Narrows, a narrow canyon.	Please see text change in the description of the variation, chapter 2. No attempt was made to list every canyon or topographical feature along each route.
Proposed Action	2-36	East Las Vegas Variation - This variation crosses Nellis Air Force Base (Lake Mead Base) and the Nevada State National Guard Armory.	The East Las Vegas Variation would pass near the Nevada State National Guard Armory in the vicinity of Southwest's pipeline facilities.
Proposed Action	2-37	Under "Variation 6 — Daniels Canyon Variation" insert "of U.S. Highway 40" between "right-of-way" and "for" in line six.	Please see the suggested text change in chapter 2.

Chapter	Page	Comments	Response
Proposed Action	2-40	Under "RMPP Interrelationship With Other Planned Projects" most of the listed potential "conflicts" with the proposed action can be eliminated through careful planning of construction schedules and could even be considered compatible with certain other planned projects. The potential "conflicts" should be deemphasized in the FEIS.	The potential for conflicts does exist, and table 2-10 indicates possible sources of these conflicts. The conflicts would not necessarily occur, but they could occur if construction schedules are not carefully coordinated.
Proposed Action	2-47	In Table 2-11, under "Land Uses: Conflicts with Land Use Plans, Controls, and Constraints", delete the parenthetic expressions under Variation 2 (Thistle Creek) and also Variation 5 (Mill Creek) because the proposed route segment being compared is not actually a part of the Uinta National Forest.	See table 2-11. Appropriate corrections have been made.
Proposed Action	2-49	In Table 2-11, NO_x and CO emissions should be calculated on the basis of fuel consumption. That would eliminate present confusion over proposed horsepower requirements and "potential to emit". Since proposed fuel usage at the Sage Compressor Station is 2910 Mcfd, NO_x emissions should be 159 T/yr. Maximum ground level concentrations should then be revised accordingly, and there is no requirement for Prevention of Significant Deterioration (PSD) review. Applicant earlier supplied emission estimates based on proposed operating requirements of 54 site-rated horsepower. This has evidently led to confusion since Staff refers in several places to proposed installed horsepower totaling 31,800, which is the sea level rating. This horsepower cannot be developed at the site elevation. Only the site rated horsepower (14,454 HP) is required to transport 413,000 Mcfd.	See response to RMPC's General Comment: Air Quality.
Proposed Action	2-51	Under Table 2-12, in reference to compression horsepower and footnote "g", it should be stated that three units would be installed with two operating units at 14,454 site-rated horsepower and a 7,227 site-rated horsepower spare.	No change required. A site rating of 7,227 horsepower is equivalent to 10,600 nominal horsepower.
Proposed Action	2-52	Under "Proposed Action", lower elevation flood-plains, alluvial fans and smoother side slopes should not be included in Soil Group 1, which is defined as steep mountain slopes. The result is an overestimation of the amout of the steep mountainous soils which are of concern. The rationale for separating out Soil Group 1 is not clear (the Soils Technical Report does not elucidate). The report, Soils Of Utah, referenced in the Technical Report, reports higher erodibility values for some of the other Soil Groups such as Soil Group 5. It is possible that impacts of construction would be greater on erosion-prone soils with lower rainfall levels due to expected lower revegetation success than some of the soils included in Group 1.	Soil Group 1 includes narrow valleys, floodplains, smoother sideslopes, and alluvial fans within the mountain area that are too small and occur in a pattern too intricate to delineate at the scale used for preparation of general soil maps. Soil erodibility values are only one of the factors influencing soil erosion. Slope and length of slope, vegetation cover or cropping management, erosion control practices, and rainfall are other factors that strongly affect soil erosion and possible impacts. General soil groupings were prepared to identify soils considered most susceptible to impacts and not for comparison or rating. Each soil group represents different conditions; all are subject to potential impacts requiring more intensive erosion control, revegetation, and restoration measures. Soil Group 1 was of concern to the FS and, as CEQ regulations require, this issue was highlighted.

Chapter	Page	Comments	
Proposed Action	2-52	In the left-hand column, the first sentence of the fifth paragraph should state "The proposed action would cross two managed and two proposed recreation sites".	Appropriate revisions have been made to "Comparative Analysis and "Summary."
Proposed Action	2-52	In the right-hand column, fifth paragraph, second line, after the word "significant" add the words "but temporary". Also, there is no mention of the beneficial impacts (i.e., increase in local tax revenues and increase in economic trade) as a result of the proposed action. These benefits may balance some of the non-beneficial impacts and temporary inconveniences resulting from the work force influx.	Comment reflected in text.
Proposed Action	2-54	Under "Total System Comparison", change "90,000 Mcfd" to "60,000 Mcfd" in line six of paragraph three, as this is the EPNG gas dedicated to the project and available for delivery at Sumas, Washington.	The breakdown of the 90,000 Mcfd has been modified. (See PGT's October 27, 1980, data response, tab 5.)
Affected	3-1	To the last sentence of paragraph two add "as well as all alternatives and variations".	Appropriate change has been made to text.
Affected	3-4	Under "Other Significant Vegetation Species", the Juniperus scopulorum population is not located along the proposed route. The Terrestrial and Aquatic Biology Technical Report correctly locates it along the Central Nevada Alternative, west of Ely, Nevada (pages 9 and 82).	The paragraph has been deleted.
Affected	3-6	At least as of September 15, 1980 the gila monster was not on California's state list of special-status species. (California Department of Fish and Game; 1980;" "Endangered, Rare and Threatened Animals of California"; 4 pp. memo effective September 15, 1980). Nor is it discussed in the Threatened and Endangered Species Technical Report.	All references to the gila monster have been deleted.
Affected	3-6	Table 3-3 gives locations for all deer winter range along the proposed route and alternatives. What is the rationale for describing all of this habitat as "critical" winter range in the final paragraph on page 3-6? Big game range inventories published by the Utah Division of Wildlife Resources (e.g.: Guinta, B.D., 1979, "Big Game Range Inventory 1977", Fed. Aid Proj. W-65-R-D-26, publ. no. 79-3, UDWR, 174 pp.) can be used to distinguish between normal and severe-winter deer range. The critical range, it would seem, would be the severe-winter range.	All winter range is critical; areas that are essential to the survival of wintering deer are crucial winter ranges that are much smaller. "Critical winter range," as used in this EIS, carries the same meaning as "normal winter range" in the comment. "Crucial winter ranges," as used in this EIS, means the same area of "severe winter range" identified in the comment.

Chapter	Page	Comments	
Affected	3-7	Define the term "point site" as used in Table 3-4.	"Point site" has been added to the glossary.
Affected	3-7	In the first full paragraph, right-hand column, the statement that "the route would cross sheep ranges in the Sunrise Mountain-Frenchman Mountain-Lava Butte area south of Las Vegas", contradicts the statement of page 23 of the Terrestrial and Aquatic Biology Technical Report that "(N)either the Proposed Action nor any of the variations and alternatives actually go through any desert bighorn sheep ranges".	Pages 3-7 through 23 of the terrestrial and aquatic biology technical report have been changed to concur with this section of the EIS.
Affected	3-7	In Table 3-4, should the total mileage between MP 556 and MP 570 be 4 or 14?	In table 3-4, the total mileage between MP 556 and MP 570 should be "14," not "4," on all routes except "C" and "V-3." Also the total should read "35," not "25," on all routes except "C" and "V-3." Please see the changes to this table.
Affected	3-8	The Threatened and Endangered Species Technical Report points out (page 42) that none of the present range of the Utah prairie dog is in the proximity of the proposed action or its alternatives, in contrast to the statement in paragraph one that "The only small mammal species of environmental concern along this route would be the endangered Utah prairie dog...".	The paragraph has been rewritten to discuss only the white-tailed prairie dog in relation to the black-footed ferret.
Affected	3-8	Under "Birds Affected by the Proposed Action" the sandhill crane (Grus canadensis) should be discussed. According to J. A. Rensel of the Utah Division of Wildlife Resources (DWR), the proposed route would pass through sandhill crane light-feeding use areas, nest areas and pre-migratory staging areas in the Kamas Valley area of Utah. The Utah DWR April 1981 publication "Status of Selected Nongame Wildlife and Plant Species in Utah" classifies G. canadensis as "limited", which is defined as "any species of animal occurring in limited areas and/or numbers due to a restricted or specialized habitat or at the perimeter of its historic range".	The discussion of birds in chapters 3 and 4 has been expanded to include the sandhill crane.
Affected	3-10	It is unlikely that rough-legged hawks nest in Utah. Provide the source for the statement that nesting habitat for this species exists between Strawberry Valley and Sheep Creek.	Statement is correct. According to FS biologists, nesting habitat for this species does occur in these areas (FS 1980).

Chapter	Page	Comments	
Affected	3-11	Under "Federal and State Listed Species" it should be stated that the proposed route is slightly west of the black-footed ferret's historic range (Hillman and Clark, 1980, Mustela nigripes, Mammalian Species No. 126, Am. Soc. Mammalogists, 3 pp.). The first sentence, which states that the black-footed ferret occurs along the proposed route, is inaccurate unless presence of the ferret can be documented along the route. The second sentence should be qualified to indicate the unlikelihood of ferret presence.	Statement has been changed to reflect that the ferret may occur along the route.
Affected	3-12	Same comment as for page 2-52 for soils.	See the response to the last comment on the previous page.
Affected	3-13	Values in Table 3-9 for mileage and acreage conflict with values given in text for Soil Group 3 for Alternatives D and E. Totals of Soil Groups 1-8 for Alternatives D and F and Variations 2 and 6 do not sum properly. Data presented in Table 3-9 is misleading; i.e., precipitation for the Widstoe soil series is overstated (according to Soils Of Utah) thereby overestimating soil loss from erosion.	Because of a printing error, acreage and mileage totals for Soil Group 3 along Alternatives D, E, F, and Variation 2 were inaccurate in table 3-9. (Please see the corrections in table 3-9.) Data presented in table 3-9 is accurate. The Widstoe series is a representative soil of Soil Group 1 occurring in settings with annual precipitation of 14 to 22 inches. The 22 to 38 inches of annual precipitation in table C-1 in the soils and agriculture technical report is a printing error; it has been corrected to read "14 to 22 inches." Erosion rate calculations are based on 14 to 22 inches of annual precipitation.
Affected	3-14	In the Table 3-10 description, last line, "Rockford" should be "Rockport".	Refer to table 3-10 for the necessary correction.
Affected	3-15	In Table 3-10 under "Ancillary Facilities", "MP 4" should be "MM 4".	Appropriate changes have been made to table 3-10.
Affected	3-15	Since the location of the Cedar City maintenance base has not been established, delete the description of affected environment for visual resources in Table 3-10 for this facility.	Generalized conditions must be assessed to provide comparisons between the various routes. Admittedly, some facilities may ultimately be located where the physical conditions may be somewhat different than those anlayzed, but care was taken to select the most probable set of conditions for analysis.
Afected	3-20	In Map 3-3, the key for "Las Vegas Wash Wetlands Park (Proposed)" and "Frenchmen Mtn./Rainbow Gardens National Natural Landmark (Potential)" has been reversed.	Appropriate changes have been incorporated into the FEIS.
Affected	3-21	Table 3-17 erroneously states there are 88 miles and 1,065 acres of cropland crossed by the right-of-way for both the proposed action and Alternative A (Northern Systems).	Table 3-12 is correct. Coincidentally, both the proposed action and Alternative A, Northern Systems (worst case) rights-of-way cross approximately 88 miles and 1,065 acres of cropland each.
Affected	3-22	The first sentence under "Agriculture Affected by the Proposed Action" states that the proposed action will traverse "an undetermined acreage of prime agricultural land", while Table 3-12 states that "none" will. This inconsistency should be corrected.	Table 3-12 and the text are not meant to be consistent. Prime agricultural land is identified in table 3-12 only for surface facilities; this does not include the buried pipeline. Please refer to footnotes for table 3-12.

Chapter	Page	Comments	
Affected	3-24	Table 3-14 contains a number of errors such as, "2979 Employment"; higher total employed numbers than the estimated 1977 population for Uinta, Utah, Fillmore, Clark and San Bernadino counties; and tables A-1, A-3 thru A-7 cited as the source do not appear in Appendix A.	Comments reflected in text.
Affected	3-30	Under "Geology" delete reference to RMPP crossing the Hurricane fault Ref. Hintze, L.F., 1980; Geologic Map of Utah; Utah Geological & Mineral Survey; scale 1:500,00	Comment incorporated.
		On the right-hand column, paragraph two, delete "The crossings of these faults would occur approximately in the center of a zone where faulting may be expected" and substitute "The route has been selected to minimize potential impact from faulting".	The suggested substitution is an indication of RMPC's route selection process; it does not describe the route.
Affected	3-31	Data for Alternative A (Northern Systems) in Table 3-17 are transposed for intermittent, perennial and U.S. Fish and Wildlife Service (FWS) stream classifications for the "Best Case" and "Worst Case".	This correction has been made in the FEIS in chapter 3, "Water Resources."
Affected	3-33	Table 3-18 contains footnote "d" which provides NO_x emission standards for Wyoming for internal combustion engines. It would be more appropriate to cite the New Source Performance Standards for gas turbines for use in natural gas pipeline transmission systems.	Comment reflected in text.
Affected	3-36	Under "Federal Listed Species", add the following sentence to the last paragraph, "However, the desert tortoise is afforded protected status in California".	Because the desert tortoise has no Federal status in California but is protected under state regulations, it was not discussed in this section, but elsewhere in the wildlife section.
Affected	3-46	The Central Nevada Alternative crosses some bald eagle winter habitat. Thus, it could cross actual or potential habitat of three federally-listed species, not two, as stated under "Federal and State Listed Species".	The suggested change has been made to the description for the Central Nevada Alternative in chapter 3, "Federal and State Listed Species."
Affected	3-65	Under "Wildlife", change "State Listed Species" to "State Protected Species". In the first paragraph, line two, change "state-listed" to "state-protected".	The suggested changes have not been made because the present terminology is correct. The species are "listed" in the state; when they are listed, they are also "protected."
Affected	3-65	Under "Cultural Resources", change "would traverse" in the first line to "skirts". In line 10, state that Mt. Newberry is 15 miles north of the Ft. Mojave Variation.	Necessary changes have been made in chapter 3, "Cultural Resources."
Environmental	4-2	Under "Aquatic Biology", while significant impacts are stated to be those occurring within 2,000 feet of spawning areas, the DEIS does not state if there are any spawning areas in the 61 streams to be crossed by the pipeline.	No spawning areas were identified by any of the state wildlife management agencies, since exact crossings are not known at the present time.
Environmental	4-2	BLM's summary on public identification of issues indicated that impacts to aquatic species would be highlighted in the EIS. Further discussion of why the impacts would be insignificant is needed.	To make the document more useful, the EIS does not contain lengthy discussions of insignificant impacts. However, the terrestrial and aquatic biology technical report discusses the insignificant impacts to aquatic biology on page 98, and chapter 4 of the FEIS also briefly discusses impacts to aquatic biology under "Insignificant Impacts."

Chapter	Page	Comments	Response
Environmental	4-3	Permanent demand for housing and permanent demand on other infrastructures will not occur from the proposed action. Furthermore, an increase in total employment or an increase in retail sales would be beneficial impacts and should be noted in the DEIS as such.	This is implicit throughout the analysis. Increased employment and retail sales would be beneficial; however, these increases would be very small.
Environmental	4-4	Under "Aquatic Biology", the Provo Canyon Alternative, Thistle Creek (Variation 2) and Daniels Canyon (Variation 6) variations could very well result in routes paralleling streams closely enough for earth to spill into them. More extensive clearing of stream-bank vegetation may also result.	Utah Division of Wildlife Resources anticipates no significant impacts if "best practice" engineering is done along streams paralleled by the pipeline (Nish 1981).
Environmental	4-5	Under "Transportation Networks", the second paragraph should be modified to state that Alternative F (Provo Canyon) and Variations 2 (Thistle Creek) and 6 (Daniels Canyon) would cause major traffic disruptions on roads in canyons which they would parallel. In the third paragraph it should be stated that traffic disruptions for this alternative and these two variations would be significant.	According to the significance criteria for transportation networks identified in chapter 4, Impacts would significant if the traffic increase, particularly over the long term, would cause an instability of traffic flow, noticeable congestion, or a substantial increase in average travel time. Traffic delays of more than an hour during low use periods and more than 30 minutes during normal traffic flow would be significant. "Insignificant Impacts" states that the proposed action, alternatives, or variations passing through the canyon " would cause minor traffic disruption," primarily because the Utah Department of Transportation officials have stated that they would issue the necessary permits, should the pipeline be within the roadway right-of-way, only with a stipulation that traffic could be blocked no more than 30 minutes. Any road closures for blasting would probably be during low use periods and no longer than 30 minutes, according to the Director of the Utah Department of Transportation.
Environmental	4-6	Under "General Impacts" in the first sentence, delete "this includes an up to 50-foot wide right-of-way, plus an up to 50-foot wide temporary permit construction area", since this applies only to public lands; i.e., the permanent right-of-way proposed on private lands is 100 feet wide. Also map S-24 in the "Graphic Supplement" does not provide acres of each vegetation type removed along the proposed route, alternatives and variations.	The sentence has been clarified to incorporate private ownership. There was no intent to include in the Graphic Supplement the acres of vegetation types which would be removed. See table 3-1 for miles and acres of each vegetation type affected.
Environmental	4-7	Under "Species of Environmental Concern", the *Juniperus scopulorum* population is not located along the proposed route. It occurs along the Central Nevada Alternative.	The paragraph has been modified to reflect the comment. In addition, the species has been added to the Central Nevada Alternative discussions in chapters 3 and 4.
Environmental	4-7	Under "Impacts of the Proposed Action", substitute "company practice" for "safety and inspection regulations" in line one of paragraph two.	The paragraph has been revised to reflect this comment.
Environmental	4-8	Under "Mammals" substitute "may" for "would" in line two of paragraph three. Also, in the ninth paragraph, it seems unlikely that clearing the right-of-way will kill a significant number of cottontail rabbits. The Terrestrial and Aquatic Biology Technical Report conclusion (page 102) — "cottontail rabbit losses would be localized, insignificant and short term" - -should be in the DEIS.	The suggested changes have been made to chapter 4.

Chapter	Page	Comments	Response
Environmental	4-9	In paragraph one, disturbance of wintering flocks is not a likely impact to sage grouse if construction takes place as scheduled. Add to the paragraph on sage grouse: "The applicant has committed (Appendix C) to avoid, to the extent possible, construction during peak wildlife breeding periods or other critical times. If construction in critical sage grouse areas avoids the breeding period, impacts to this species should not be significant".	The statements about sage grouse are generic and do not necessarily apply to any particular route. Impacts to sage grouse have been determined for each route based upon some or all of the types of impacts noted in "Proposed Action: Wildlife" and the miles of habitat crossed. If construction scheduling does avoid the breeding season, it is true that impacts would be somewhat less than stated. However, there are many project variables to be finalized, including the determination of the year of construction; thus, there is no guarantee of avoiding "to the extent possible" the breeding season.
Environmental	4-9	Under "Aquatic Species", does the Utah DWR statement on impacts at stream crossings apply to Nevada and California also? If not, please cite the appropriate sources for these two states.	Information from the wildlife agencies in Nevada and California did not express any concern for stream crossings in their states (Molini 1981, Worthley 1980).
Environmental	4-9	Under "Federal Listed Species", insert "adverse" between "1973," and "impacts" in line two.	Appropriate change has been made to the text.
Environmental	4-10	Under "Black-footed Ferret", line one, change "Impacts" to "Potential impacts".	This paragraph lists only those impacts which could occur <u>if</u> a pipeline goes through ferret habitat. It does not indicate that they will occur. Impacts listed are generic and not specific for any route.
Environmental	4-16	In reference to the last paragraph, the Draft Management Master Plan for the proposed Clark County Wetlands Park is not anticipated to be completed until August. However, the Draft Comprehensive Plan for Clark County, Nevada (December 1980) recognizes the RMPP which is depicted on Figure 4-14. Also, the Clark County Department of Comprehensive Planning, in its "Las Vegas Wash Environmental Assessment" (December 1980), depicts the RMPP on Plate 10. Further, K. Conn, District Manager of BLM (Las Vegas District) states in his comment letter to this document that "The Rainbow Gardens area is an important utility corridor". RMPP corrected the routing depicted on Plate 10 in a December 5, 1980 letter.	The <u>Clark County Environmental Assessment</u> depicts the proposed action in figure 4-14 of Task 1, "Existing Conditions, Comprehensive Plan for Clark County, Nevada," and on page 10 in the <u>Las Vegas Wash Environmental Assessment</u>. However, neither of these depictions constitutes endorsement of the proposed RMPP. Clark County does not yet know if the project would conflict with either the Management Master Plan for the wetlands park or the Comprehensive Plan for Clark County.
Environmental	4-22	The heading "Cultural Resources" should be inserted between paragraphs three and four.	Appropriate change has been made to the FEIS.
Environmental	4-24	Under "Impacts of the Proposed Action", impacts on water resources should be quantified by specifying that <u>32</u> intermittent and <u>29</u> perennial streams would be crossed, rather than "many", in the first sentence.	The word "many" was used in this paragraph because the 61 listed streams are only a small portion of the total number of streams which would actually be crossed. The analysis of the stream crossings was based on 1:250,000-scale maps, from which 61 stream crossings were identified and named in the water resources technical report. It is from these 61 streams that the impacts are estimated for construction in and around the stream. The quantification has been added to chapter 4, "Water Resources."
Environmental	4-24	Under "Noise Quality", the DEIS correctly points out that the Noise Control Act of 1972 assigns primary responsibility for noise control to state and local governments. The noise levels in EPA's 1974 publication should not be construed as Federal ambient noise standards, as EPA considered neither cost nor technical feasibility. Therefore, it is inappropriate for FERC to attempt to establish the standard of 55 dB(A) for the Sage Compressor Station.	The FERC's environmental staff has presented the basis for its recommendation on the operational noise level maximum for the Sage Compressor Station. Only the FERC can make the determination as to whether this requirement is in the public interest. The staff notes that the applicant has not indicated in its comments or its filings that it has any economic or technical problems in meeting this ambient noise level.

Chapter	Page	Comments	
Environmental	4-25	Change "31,800 hp" to "14,45 hp" in line one of paragraph three in the right-hand column because only two units will be operated concurrently.	No change is necessary. The Sage Compressor Station would have 31,800 nominal or 21,681 site-rated horsepower installed. Site-rated horsepower is only used in the air quality sections of the FEIS.
Environmental	4-26	All potential emissions at Sage Compressor Station shown in Table 4-7 are overstated. Applicant supplied data based on site (rather than ISO) horsepower for the two turbines. The third unit will simply be standby. In order to eliminate the confusion and provide accurate emissions data, they should be calculated from AP-42, Compilation of Emission Factors, on the basis of fuel requirements. This is correctly shown in Table 4-7, as 2.91 MMcfd. On that basis, the correct potential emissions are as follows: NO_x 159 CO 64 HC 12 SO_2 0.32	All exhaust emissions have been recalculated for the FEIS. The modified exhaust emissions can be found in table 4-7. Calculation of the <u>maximum</u> potential to emit cannot be correctly <u>analyzed</u> by an average fuel consumption rate. The maximum potential to emit can only be calculated by assuming the maximum horsepower rating.
Environmental	4-27	In light of the preceding comment, the discussion of PSD review requirements is inaccurate.	Comment noted. See previous response.
Environmental Consequences	4-27	Last paragraph, left column should read "...new source performance standards ...for gas turbines for use in natural gas pipeline transmission service would limit NO_x emissions to 150 parts per million...	Comment reflected in text.
Environmental	4-27	The statement at the bottom of paragraph four, that "there are no definite plans to expand Sage Compressor Station" should be revised to state there is no <u>definite schedule</u>.	Comment reflected in text.
Environmental Consequences	4-28	Last full paragraph right column, should read "Class location (i.e., population density in an area that extends 220 yards on either side of the centerline of any continuous 1-mile length of pipeline)determines ..." (40 CFR 192)	Comment reflected in text.
Environmental	4-29	To the Class 3 location definition, add "A small well-defined outside area that is occupied by 20 or more persons during normal use, such as a playground, recreation area, outdoor theater, or other place of public assembly" (49 CFR 192.5).	Comment reflected in text.
Environmental	4-29	To line four of paragraph two in the right-hand column, add the following sentence "However, high pressure, large diameter welded steel natural gas pipelines have performed well in earthquakes".	The suggested sentence is correct; however, there is no need to add it to the text.
Environmental	4-31	Cite sources for Figure 4-4.	Comment incorporated.
Environmental	4-32	Cite sources for Tables 4-9, 4-10 and 4-11.	Comment incorporated.

Chapter	Page	Comments	
Environmental	4-33	Under "Gas Loss From Pipeline Rupture", right-hand column, change "Mcfd" to "Mcf", because the discussion involves volumes of gas instead of rates.	Comment incorporated.
Environmental	4-34	Cite sources for Figure 4-5.	Comment incorporated.
Environmental	4-35	Cite sources for Figure 4-6.	Comment incorporated.
Environmental	4-37	Under "Corrosion", the first sentence is confusing since AC and DC currents are mixed into the discussion. The effects discussed in the second sentence occur only at HVDC ground locations. The third sentence is not correct. The term "induced corrosion" used in line six of paragraph two is not correct.	Comments reflected in text.
Environmental	4-37	Under "MX Missile Siting Conflicts", first paragraph, line seven, change "southwest" to read "southeast".	Comment incorporated.
Environmental	4-38	Under the first paragraph in the left-hand column, it is difficult to conceive how a buried pipeline "would further reduce the quality of recreation in the Rainbow Gardens and the proposed Clark County Wetlands park". No significant recreational impacts would occur as a result of the proposed project. Also, in reference to the second paragraph in the same column, there could be a net <u>gain</u> in knowledge in history and prehistory due to the survey and excavation of sites that otherwise would go neglected.	As the paragraph states, the proposed pipeline project "would further lessen the natural and scenic quality . . . ." One of the reasons people enjoy the proposed Clark County Wetlands Park and proposed Frenchman Mountain-Rainbow Gardens National Natural Landmark is for the semi-primitive experience. Pipeline construction, although temporary, would disturb wildlife and waterfowl, create noise and visual intrusions, and generally diminish the quality of the passive and natural recreation experiences. Long-term impacts would basically be visual, further reducing the scenic qualities of these areas. This is stated in the cultural resource evaluation in chapter 4 as a beneficial impact.
Environmental	4-38	The word <u>may</u> should replace "would" under "Irreversible/Irretrievable Commitment of Resources", second line. Also, in the second paragraph, clarify what is meant by "salvaged".	The word "would" has been replaced with "may" in the referenced section of the FEIS. A definition for salvage archaeology has been added to the glossary.
Environmental	4-39	Under "Federal and State Listed Species", lines five and six, the phrase "if it were shot by construction workers" is unwarranted.	Possible wanton shooting by construction workers is a secondary or indirect impact from construction of this or any project. Wanton or casual shooting of wildlife is socially acceptable among some people and does occur. Generally, these people do not stop to consider whether an animal is classified as endangered or is "just another fox."

Chapter	Page	Comments	Response
Environmental	4-65	The DEIS states under "Recreation Resources", right-hand column, that "public sensitivity toward pipeline construction through the Daniels Canyon would be low to medium". The Recreation and Wilderness Technical Report states (page 39), "Public sensitivity to pipeline construction through the environmentally sensitive Daniels Canyon would be high". Explain the discrepancy.	The Daniels Canyon Variation has been dropped from further analysis. The Daniels Canyon Variation II, which would traverse the Strawberry Reservoir area, has been developed as a replacement; it is analyzed in chapters 3 and 4.
Conclusions	5-2	While the Department of the Interior land managing agencies have found the proposed route to be acceptable and reasonable, it is difficult to understand the rationale used in making the determination that the Daniels Canyon (Variation 6) and Thistle Creek (Variation 2) variations are preferred alternatives. Using data from the DEIS, the following highlights the deficiencies of these two variations:	No response required.

Daniels Canyon Variation

- o Permanent modification of topography (page xviii);
- o Would cross potential habitat of one federally listed plant species (page 2-61);
- o Would cross 158 more acres of big game winter range than the segment of the RMPP route it replaces (page 2-61);
- o Would cross 38 more acres of sage grouse habitat than the segment of the RMPP route it would replace (page 2-61);
- o Would cause significant impacts to recreational use at Strawberry Reservoir, compared to less significant impacts which would be caused by this segment of the RMPF route (page 2-61);

Daniels Canyon Variation
(Continued)

- Would not be in a designated corridor based on criteria in the utility rule in the proposed forest land management plan for the Uinta National Forest (page 2-61);
- Would cross 49 more acres of high density cultural resource sites than the proposed RMPP route (page 2-61);
- The geological hazards and topographical impacts associated with this variation are greater than those associated with the RMPP route. The Daniels Canyon Variation would be subject to almost twice as many miles of landsliding and would require more than 10 times the amount of sidehill construction (page 2-61);
- There are serious doubts regarding the technical feasibility of this variation (page 2-61);
- Between MP 11-30, the alternative would be located in the steep, confined walls of Daniels Canyon. U.S. Highway 40, fences and utility lines would be along the "corridor" (page 3-67).

Thistle Creek Variation

- Would disturb 37% more acres of native vegetation than the segment of the RMPP route it would replace (page 2-59);
- Would cross more acres of big game winter range, raptor habitat and golden eagle nest areas than would the segment of the RMPP route it would replace (page 2-59);
- 61 more acres of agricultural land would be disturbed (page 2-59);
- Significantly more "acceptable" levels of visual contrast would be exceeded (page 2-59);
- 35% more acres of potentially high cultural resource site density would be crossed (page 2-59);
- There is doubt regarding the feasibility of locating the pipeline in the canyon with the existing roads and railroad (page 2-59);

(Continued) Thistle Creek Variation

- o Seven instead of four streams would be crossed (page 2-59);
- o Routing would be within the steep, restricted Soldier Creek Canyon through mountainous terrain from MP 0 to 10, and through a steep, restricted canyon from MP 10 to 23 (page 3-62);
- o The variation is seven miles longer than the stretch of proposed route it would replace, which would require sidehill construction along about 50% of its length, as compared with 20% for the RMPP route (page 3-63);
- o Would have to be constructed in narrow canyons already occupied by either Soldier or Thistle Creeks, U.S. Highways 6 or 89 and the Denver and Rio Grande Western Railroad (page 3-63).

Chapter	Page	Comments	
Glossary	4	Substitute "structures" for "earthen dams" in the definition of "cofferdams". Delete "mile-wide" from the definition of "corridor". Substitute "an appropriate" for "45-degree" in the definition of "cross ditches".	Appropriate changes have been incorporated into the glossary.
Glossary	5	Delete "developed to protect these birds from predators" from the definition of "gallinaceous guzzlers".	The indicated change has been made to the glossary.
Glossary	7	Substitute "which is often poorly drained" for "which is often wet" from the definition of "swale". The term "topsoil" should be defined as follows; "Surface soil, containing and not to exceed the limits of the organic layer (A Horizon)". Substitute "control and/or measu.e flow" for "divert flow" in the definition of "weirs".	Appropriate changes have been incorporated into the glossary.
References	10	Many of these references do not appear in the DEIS. Additionally, there are several references which are missing: o Rocky Mountain Pipeline Company. Data Responses to FERC Staff Request: October 16, 1980.	The list of references identifies only the RMPC documents specifically cited in the text. The complete list of RMPC informational filings, available for public inspection in the FERC's Central Files, are all considered part of the application. Therefore, the references have not been incorporated into the FEIS.

- Reynolds, P. E. Vice President for Engineering and Construction, Pacific Gas Transmission Company. January 8, 1981. Erosion Control, Revegetation and Restoration Guidelines. (Letter to J. Bowles, BLM).
- Reynolds, P. E. September 29, 1980. Discussion of Applicant's concerns on Alternate Routes. (Letter to J. Bowles, BLM).
- Odegard, G. J., C. W. Meyer and M. A. Ryan. Responses to FERC Staff Request: December 15, 1980. (Telephone Conversation with K. Frye, FERC).
- Odegard, G. J. Applicant's General Comments on PDEIS: February 27, 1981. (Letter to J. Bowles, BLM).
- Odegard, G. J. Comments on Draft Cultural Resource Overview: January 13, 1981. (Letter to J. Bowles, BLM).
- Odegard, G. J. Comments on Draft Management Summary for Cultural Resources: February 17, 1981. (Letter to J. Bowles, BLM),
- Cassidy, L. S. Discussion of Side Slope Construction: March 19, 1981. (Letter to K. Williams, FERC).
- Cassidy, L. S. Comments on Draft Cultural Resources Memorandum of Agreement: May 14, 1981. (Letter to J. Bowles, BLM).

Chapter	Page	Comments	
Appendix	A-2	Add "PIT" to list of "Industries" receiving a copy of the DEIS.	Appropriate change has been made to appendix A of the FEIS.
Appendix	B-2	Under "Northwest Alaskan Pipeline Company (NAPC)" change "11" to "10". Under "Northwest Pipeline Corporation (NPC)", change "to California markets" to "for California markets through interconnection with other pipeline companies".	Comments incorporated.
		Designated affiliates for RMPC are: PGT: Rocky Mountain Gas Transmission Company EPNG: Coronado Pipeline Company PIT: Pacific Interstate Transmission Co.(Rocky Mountain) NPC: Northwest Rocky Mountain, Inc.	Comment reflected in text.

Chapter	Page	Comments	
Appendix	C-2	Under "Additional RMPC Mitigative Measures", change the third sentence to read: "The applicant will procure a contract for a cultural resource inventory of the route prior to construction". On the right-hand column, third line, insert "Where appropriate" in front of "Concrete-lined" and delete the words "would normally" after the word "channels" in line four. In line seven, change "plans to" to "may" and add "after completion of further engineering studies" to line eight. In line 34, change "present" to "available".	Comment incorporated.
Appendix	C-3	In the first paragraph, line eight, delete the words "before, during, and after discharge" and instead, add the phrase "as required by a permit".	Comment incorporated.
Appendix	C-3	On November 6, 1980 RMPP was asked by BLM to comment on the proposed "Erosion Control, Revegetation and Restoration Guidelines" in order to provide the EIS team a basis for impact assessment. These guidelines were modified by RMPP to reflect the measures presented in the Application and submitted to BLM on January 8, 1981, for all lands. They are included in Appendix C, now referred to as "Proposed by the RMPP". The BLM draft version has been reproduced in its entirety as being "For Use on Federal Lands".	Mr. Philip Reynolds, Vice President of Engineering and Construction for PGT, indicated in a letter filed with FERC on January 23, 1981, that the Erosion Control, Revegetation, and Restoration Guidelines (appendix C of the FEIS) submitted by the sponsors of the RMPP introduce no new information, and as a result, an amendment to the application is not required. Therefore, the applicant's mitigating measures apply to all lands crossed by the proposed project--if specified in the right-of-way agreement. As RMPC has indicated, the guidelines package submitted to BLM on January 8, 1981, are the review of the BLM "Guidelines" package. It essentially encompasses a reorganization of the methodologies in the original filing for a right-of-way. The BLM and FS developed the Erosion Control, Revegetation, and Restoration Guidelines for use on Federal lands and requested that RMPC review and adopt it for all lands. It contains more intensive practices, although it is not site-specific. It can be used to develop more specific mitigation. The two agencies are planning to include this package as a stipulation in the right-of-way grant, as stated in the introduction to that section.
		RMPC submitted the modified "guidelines" to be used for public lands. The erosion control and revegetation measures described in the application are appropriate at this level of project review. Specific measures should be developed with the land management agency as part of the right-of-way granting procedure after the exact alignment has been determined. Mitigative measures to be implemented on private lands will be the subject of easements across those lands.	Because the RMPC stated that it would implement its version of the Erosion Control, Revegetation, and Restoration Guidelines on all lands, BLM, FERC, and the FS have analyzed the impacts under that assumption and fully expect that RMPC will indeed implement those guidelines on all private lands, plus any additional measures required by the landowners.
Appendix	C-4	Under "Trenching and Preservation of Topsoil", line 10, change "in" to "on" in reference to storage of excavated materials.	Comment incorporated.
Appendix	C-5	Erosion Control... on Federal Lands - since the guidelines discussed refer to those to be implemented on public lands all reference to the "landowner" should be deleted.	The word "landowner" will not be deleted because some referenced practices would also apply to private land.
Appendix	C-6	Under "During Construction" - delete "on site", the availability of the reclamation specialist is all that is necessary.	The reclamation specialist will need to be available for onsite activities. This type of availability is of paramount importance and integral to the position.
		Under "sidehill cuts" - delete reference to approval by authorizing agency. This approval is implicit in the grant of right-of-way and notice to proceed on a specific alignment.	Approval by authorizing agencies is implicit in the grant of right-of-way and notice-to-proceed system. However, it is felt that emphasis must be given to sidehill cuts; thus, they are highlighted.
		Under "During construction activities near streams-add "as required by the Authorizing Officer", these procedures are not always necessary.	Appropriate change has been made to the text.

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Appendix	C-7	Under double-ditching change "as specified" to "when required." Under "The right-of-way of stream crossings", by "rock-mulch" is riprap intended?	It is felt that "as specified" is more appropriate than "when required." Yes, "rip-rap" is intended by "rock mulch."
		Under "In cropland areas" - change "unless objected to by the landowner" to "where practical and as required by the A.O." Change end of last sentence to read: "... runoff in areas where accelerated erosion by surface run-off is probable".	Please see text changes.
Appendix	C-8	Under "Rock mulches" - change "mulches" to "protection".	Rock mulch is a practice that effectively protects the specific soil condition identified.
		Under "Hydroseeding" - change "in critical areas" to "as determined by the authorizing officer and the reclamantion specialist."	Please see changes to the text on hydroseeding.
		Under "Grazing or mowing" - Delete first sentence restricting use after revegetation. The RMPC has no control over the management of surface uses	Grazing or mowing on Federal lands would be controlled by the Authorized Officer.
		Under "Areas of low annual percipitation - define low precipitation".	Please see text change which now defines low precipitation. Also refer to Soil Group 9 in chapter 3, "Proposed Action: Soils."
Appendix	C-9	Under "General", it should be clarified that the right-of-way applied for on public lands is a 50-foot temporary right-of-way and a 50-foot <u>plus the width of the facility</u> permanent right-of-way.	As discussed in a response to a previous comment, the application is for 50 feet plus the width of the facility; however, BLM has the discretion to authorize up to that width and is planning to authorize no more than a total of 50 feet for the pipeline, perhaps less in some areas. Aboveground facilities would, of course, need varying widths.
Appendix	C-9	Under "Vegetation" stockpiling and replanting of cacti would be implemented for BLM lands in Nevada and California, if required; state land portions of the route would be the subject of special state permits; and on private land, the landowner would make the decision as to disposition.	No response required.
Appendix	C-10	Revise the mitigation measure for the <u>Juniperus scopulorum</u> population to apply to the Central Nevada Alternative, not the proposed route.	The mitigation measure has been revised to reflect the correct route.
Appendix	C-10	Concerning tables for wildlife avoidance periods:	
		o On page C-9 it is stated that the mitigating measures that resulted from impact assessment apply to federal lands. Yet some of the avoidance periods (e.g., that for the waterfowl area between MP 36 and 39) are for private lands. Indicate that the applicant will follow such avoidance periods voluntarily, to the extent possible.	The suggested change has been made to the text of appendix C.
		o Areas of big game winter range should be subdivided into normal and severe-winter range. Normal-winter range should have a shorter avoidance period than severe-winter range.	Harassment affects big game animals on all winter ranges (Geist 1974).

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	o	Delete the avoidance period for big game winter range between MP 165 and MP 168. It is duplicative.	The avoidance period for big game winter range (MP 165 and MP 168) has been deleted from the table.
	o	The tables list some sage grouse habitat that is not identified in the Terrestrial and Aquatic Biology Technical Report. Specifically, the technical report (pages 28-29) identifies grouse habitat between MP 5 and MP 9 rather than MP 4 and MP 9 and does not identify grouse habitat at MP 18. If the technical report is correct, amend the avoidance period tables.	Appropriate changes have been made to appendix C.
	o	In some of the areas of sage grouse habitat, locations of strutting grounds are known (BLM, 1979, Randolph Planning Unit, Rich County, Utah, Grazing Management EIS; BLM, 1980, Mountain Valley Grazing Management EIS). In other areas they can be determined during preconstruction biological surveys. Indicate that the avoidance period for sage grouse habitat applies only where the route passes within two miles of a strutting ground.	Table C-1 has been completely revised to reflect these and other changes.
	o	If the alignment for the project remains as proposed, there should be no need for an avoidance period for the waterfowl area between MP 5 and MP 26. The proposed alignment is one-to-two miles west of and on the opposite side of Highway 16 from the waterfowl area. Perhaps areas such as this should have a footnote indicating that the avoidance period will apply only if alignment changes move the route into the critical area.	All avoidance dates and areas can be changed by the Authorized Officer as necessary.
	o	On some avoidance period tables, the footnote for raptor habitat states that the period applies only if construction would occur within one mile of an active raptor nest. On other tables, the critical distance is one-half mile. On the corresponding tables in the Terrestrial and Aquatic Biology Technical Report, the distance is consistently one-half mile. In the text of the technical report, it is one mile. Which is correct?	Tables within appendix C and within the terrestrial and aquatic biology technical report have been revised to reflect a 1-mile critical distance.
	o	Golden eagle nest areas should have the same footnote as raptor habitat, i.e., the avoidance period applies only if construction occurs within one or one-half mile of an active nest.	Corresponding tables in appendix C have been revised to reflect this comment.
	o	The avoidance period for the waterfowl area between MP 36 and MP 39 of the proposed route should be March 15 to June 15, not April 15 to July 15.	The dates are different for different mileposts because nesting dates vary north to south along the various routes.
	o	The Threatened and Endangered Species Technical Report lists several areas of bald eagle winter habitat along the proposed route, the Sanpete Valley Alternative and the Central Nevada Alternative (page	Tables C-1, C-3, and C-4 have been revised for clarification.

48). Only one area, at MP 155 of the proposed route, is assigned an avoidance period (although some are covered by avoidance periods for big game winter habitat). Why is it the only one?

- The Terrestrial and Aquatic Biology Technical Report (page 56) states that the golden eagle nests at MP 307 and MP 313 are seven and X (presumably six or seven) miles from the proposed route, respectively. The nest area from MP 477 to MP 488 is four miles from the proposed route. Impacts are unlikely if construction takes place at these distances from the nests. The avoidance periods for MP 307 and MP 313, at the least, should be dropped from the avoidance period tables.

  Table in appendix C has been revised; the avoidance periods for MP 307 and MP 313 have been deleted.

- The mileposts for quail management areas in the avoidance period tables are off by a few miles, based on a comparison of Maps S-10 and S-11 with Nevada Dept. of Fish and Game maps of guzzler locations.

  The mileposts indicated for quail guzzler locations were estimated from the location of the pipeline drawn on the wildlife-riparian, guzzler, and raptor nesting area maps from the BLM Las Vegas District. Once the pipeline is staked, areas of avoidance can be determined by the Authorized Officer.

- For quail management areas, indicate that avoidance periods will apply only where the staked right-of-way is within two miles of a guzzler.

  Tables in appendix C have been revised to incorporate this change to quail management areas.

- In Footnote "2", Table C-1, change "desert bighorn sheep habitat" to "a water source for desert bighorn sheep" for consistency with the other avoidance period tables.

  The footnote has been revised to reflect this comment.

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Appendix	C-16	The entire measure in the right-hand column pertaining to the authorized officer halting construction, should be deleted since under Section 28 of the Mineral Leasing Act the authorized officer has the authority to suspend construction (43 CFR 2883.5).	It is true that the CFR provides the Authorized Officer authority to suspend construction. However, in some cases, an already existing regulatory ability is highlighted in the EIS mitigation and in rights-of-way grant stipulations to ensure that necessary measures are not inadvertently overlooked.
Appendix	C-17	Under "Land Uses", in the left-hand column, the entire measure concerning abandonment should be deleted. Under 43 CFR 2883.6-8, an abandonment plan would be developed prior to decommissioning of facilities. The removal described in this measure may result in greater environmental impact.	The comment correctly states that an abandonment plan would be developed before facilities were decommissioned. However, in certain areas along the pipeline route, the Authorized Officer might determine that removal of the pipeline would be necessary. Thus, this requirement would need to be included in the abandonment plan.
Appendix	D-1	Insert "plus the width of the facility" between "wide" and "for" under item one in the right-hand column. Also, insert the same words in item two between the same words "wide" and "for".	Please see responses to previous comments on right-of-way width.
Appendix	D-4	See comment for page 2-27 for additions and deletions to the list of "State and Local Authorizations and Permits".	See response to your comment on page 2-27 of the DEIS.

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Appendix	D-4	Under "Utah", item 3a, delete item 3a in its entirety because no construction camps will be established. Also, no approval is necessary for establishing double-jointing yards. Item five should be deleted in its entirety because no construction will take place in Cache County.	Deletions have been made in chapter 2 and appendix D.
Appendix	D-5	It is doubtful that such a list of "BLM and FS General Measures" as recited in items 1 through 28 is appropriate. These should be developed between the applicant and the right-of-way granting authority. Specific comments follow:	No response required.
		Item 2. Access roads: while this measure requires maintaining access roads for public use, the "wildlife measure" on page C-15 requires decommissioning of construction access roads to eliminate public access. Further, item 23 states "no maintenance roads along the pipeline will be permitted".	The conflicts between items 2, 23, and the wildlife mitigation measure in appendix C have been resolved. Please see the text changes in appendices C and D.
		Item 12. Removal and stockpiling of topsoil should be determined on a site-specific basis; some areas have no "topsoil".	Item 12 indicates this possibility by the wording "unless otherwise directed." In those ares where there is no topsoil or where it is not necessary to replace soil strata in the original order, RMPC would be directed to waive the requirements.
		Item 13. This measure (crossing rivers, streams and washes at existing bridges and roads) should be applicable only to roads or ways providing access to the right-of-way.	Please see clarifying text change in appendix D.
		Item 15. Change "would" to "may" in lines one, three and seven.	It is felt that the wording is appropriate and necessary to ensure that excessive impacts to visual resources do not occur.
		Item 18. The use of helicopters would be based on construction requirements and discussions with appropriate land managing agency personnel. A cost-benefit analysis would be included.	Generally on-the-ground administration by the Authorized Officer or his/her designated representative includes discussions of where implementation of these general measures is necessary and reasonable.
		Item 19. Substitute "minimize the impact to the facility from mass movements" for "prevent the occurrence of mass movements" in lines seven and eight.	Mass movements of earth, etc., are a concern not only because of potential impacts to the pipeline facility but also because any increase in the frequency and/or intensity of movements caused by the pipeline installation increases the impacts to both physical resources and human values. The wording more accurately expresses the degree of concern about this potential for impact.
		Item 21. Preclearing is appropriate in heavily timbered areas, but not needed for mountain brush. This is subject to a site-specific evaluation.	It is felt that preclearing mountain brush is necessary in this part of the county where the mountain brush vegetative type (distinct from tree or forest types) includes closely growing oak brush up to 20 or more feet high.
		Item 22. Topsoil will be conserved where available. This is subject to a site-specific evaluation. See 12 above.	Please see response to your comment on item 12.
		Item 23. Conflicts with Item 2.	Please see the response to your comment on item 2 and the text changes in appendices C and D.
		Item 24. Reestablishment of vegetative cover during the 1 "ongoing working season" and "prior to the ongoing winter season" is an unreasonable requirement, particularly since RMPP would be	

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		precluded from construction until after July 15 due to wildlife avoidance periods along major segments of the northern portion of the route. This requirement is technically infeasible.	1	Before construction, the applicant would develop an operating plan which will identify areas where rehabilitation work, including reestablishment of vegetative cover, is technically infeasible. At the time of review of the operating plan, the Authorized Officer would consider the technical problems and work out a feasible modification of the requirement which would ensure that excessive erosion does not occur.
Appendix	E-1	In the table at the top of the page of the DEIS make the following changes: El Paso.. Import at Sumas, WA .. 60,000 Northwest System Supply .... 30,000 Also change line nine in paragraph four by deleting "and Northwest's" and by changing "90,000 Mcfd" to "60,000 Mcfd".		The breakdown of the 90,000 Mcfd has been changed. However, PGT's October 27, 1980, data response indicates (tab 5) that El Paso's 60,000 Mcfd and Northwest's 30,000 Mcfd would originate from Sumas, Washington.
Appendix	F-1	Under "Northwest/Southwest Alternative", right-hand column, line six, change "Rossville" to "Roseville".		Correction made.
Appendix	F-6	Under "Spanish Fork Canyon Alternative", line four, change "Bennett" to "Bench".		Appropriate change has been made to the text.
Appendix	G-1	Under Table G-1, for "Proposed Action", MP 195-200; should read "U.S. Highway 91" instead of "1".		Table G-1 has been substantially revised to incorporate this change as well as others.
Appendix	G-1	The fact that over 40% of the mileage within Soil Group 1 (114 miles), defined as subject to slides is within existing utility or transportation corridors (53 miles) is not discussed.		Approximately 10 to 30 percent of the areas in Soil Group 1 would be subject to slides. This applies to all areas of the soil group whether in existing utility and transportation corridors or not.
Appendix	J-1	The stated average loss of forage of two to five AUMs/mile is an overestimate. A 100-foot right-of-way would disturb 12 acres/mile, maximum. A loss of two to five AUMs/mile would require an average grazing capacity of 2.4 to four acres/AUM which is unrealistic for this region. Table J-1 indicated grazing capacities of three to 12 acres/AUM with an average of 6.4 acres/AUM and an average weighted for land status of 8.3 acres/AUM. Therefore, loss of forage should be from 1.4 to 1.9 AUMs/mile, maximum. However, these calculations ignore the fact that some land in the desert southwest is unsuitable for grazing due to excessive slope, lack of production, lack of water or lack of accessibility. The Hot Desert Grazing Management EIS reports that 24% of that land in Washington County, Utah was declared unsuitable for grazing due to the reasons cited above.		This analysis is an over-simplification of carrying capacity. AUM's vary from acre to acre, and it is easy to calculate from the table that much of the carrying capacity is 15 acres per AUM and over; the capacity of other lands may be only 1 acre per AUM. All routes were summarized and rounded to an average of 2 to 5 acres per AUM. Footnote C states that these calculations are only for lands suitable for grazing; this excludes over 1,000 acres of right-of-way for many of the alternatives because the lands are playas, salt flats, and hot desert areas.

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Appendix	J-2	Fencing of the right-of-way, as described in line five of paragraph two, should be done only as necessary in special areas to the specifications of the authorizing agency (C-8). Therefore, that agency would be responsible for minimizing impacts due to separating livestock forage from watering areas.	The boundaries of Henderson were obtained from the City of Henderson Planning Commission. Due to time constraints in preparing the FEIS, current corporate boundary changes under Senate Bill 206 have not been made. During Henderson's conditional use permitting process, the correct boundaries would be used.
Graphic Supplement	S-22	The boundaries of Henderson are shown to include the BLM lands requested under Senate Bill 206 and should be revised to show the <u>current</u> corporate boundaries. In the key, Rainbow Gardens <u>National</u> Natural Area should be referred to as <u>proposed</u>.	An errata sheet has been prepared for the <u>Graphic Supplement</u>.
Technical Report for Soils and Agriculture	viii	Thistle Creek Variation would traverse Spanish Fork Canyon to the west of Proposed Action.	Changes have been made where necessary and will appear in an errata sheet for the soils and agriculture technical report.
	4	Map 2 is not included in RMPC's copy of Technical Reports.	Thistle Creek Variation would traverse Spanish Fork to the west (instead of east) of the proposed action; appropriate change has been made.
	34	Would both the Proposed Action and the Northern Systems "worst case" temporarily disturb 1065 acres of cropland?	Map 2 is available in the other copies of the soils and agriculture technical report.
	39	"The Proposed Action would disturb a total of 1,395 acres of soils". However, 5,867 acres are referenced in EIS text. Also, the number of miles of Class I Soils does not correspond with Table 3-9.	Both the proposed action and the Northern Systems "worst case" scenarios would temporarily disturb 1,065 acres of cropland. Statement is not in error; therefore, no changes have been made.
	44	"The portion requiring critical erosion treatment would be avoided." The ELVV crosses more of the marsh land, approximately 2 miles versus 1000 to 1500 feet crossed by the Proposed Action. Any parallelling or crossing of the Las Vegas Wash would require "special treatment", due to the progressive nature of the erosion. Any reduction in severity is more than offset by the greater length.	The total of 1,395 acres of soils is in error (typographical); correct figure is 7,395 acres. The number of miles of Soil Group 1 for the proposed action <u>does</u> correspond with table 3-9.
	52-60	The comments submitted with respect to Appendix "C" of the DEIS apply to Appendix "A" of this Technical Report.	The statement is correct in the soils and agriculture technical report; therefore, no change has been made.
	79	Table C-1 lacks data for Soil Groups 3-9.	No response required.
	68-73	The relationship between Soil Symbols in Table B-1 and Soil Groups 1-9 is unclear.	Data was presented in the technical report only for selected soils representing Soil Groups 1 and 2. The purpose of data presented in table C-1 was to identify the effectiveness of several erosion control measures or combinations that could be implemented to control soil loss.
Hydrology	2	Impacts on water resources should be quantified by specifying that 32 intermittent and 29 perennial streams would be crossed, rather than many.	Soil relationship information between soil symbols in table B-1 and Soil Groups 1-9 <u>is explained</u> in the guide for using table B-1 (page 74).
Hydrology	7,8,9,	The five soil size distribution approximations shown in Figures 1, 2 and 3 were further reduced to the two curves shown in Figure 4, from which the D_{50} value was determined. At each approximation, the value that would indicate the 2	The word "many" was used here because the 61 named stream crossings are but a small number of the total number of crossings. It should be noted that the named stream crossings are the main ones.

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		lowest diameter particle, thus higher erodability, was selected. Therefore, this presents a worst case analysis; actual erodibility would be less than projected.	2.. These particle sizes were chosen because they represent the U.S. Department of Agriculture Soil Classification System. The calculations only show at what distance downstream a certain percentage of the load will be lost. This is not a best case or a worst case; rather, it is what will happen if sediment of this size is introduced into a flowing body of water under the given conditions.
Hydrology	16	The statement, "The quality of the test water will be monitored prior to filling the line, during discharge and after discharge", creates an open ended monitoring program that could cost considerable time and money. The technical report does not state what water samples would be tested for, or when to stop. The statement should be eliminated and replaced with "Hydrostatic test water operations will comply with applicable state water quality control regulations". Typically, the hydrostatic test water does not change in quality since the applicant will be testing new pipe and very little, if any, contaminant will be added to it.	This statement appears on pages 1.5-9 and 1.5-10 of the Amendment to Application for a Certificate of Public Convenience and Necessity, dated September 5, 1980, which was filed with FERC by the applicant on September 8, 1980. The statement referring to compliance with state and local regulations is made on page 21 of the water resources technical report.
Hydrology	20	A statement is made that disturbance during construction, "would be similar to major storm event". What is a major storm event? Is it a two year, 24 hour storm? In what way will it be similar? Stream quality data and calculations predicting quality must be provided to support such a statement.	The statement "similar to a major stream event" was made in comparison to the disturbance of the streambed or cross section during construction (3 to 5 days). Discharge is not an issue here; rather, the concern is the transport of an increased sediment load. Therefore, to tie the storm event to a defined storm event would be misleading.
Hydrology	20	Ground water in the southwest is a very sensitive issue. It would be better to state that "Springs or seeps encountered along the proposed route will be evaluated to reduce the chance of any adverse affect due to pipeline construction".	The dewatering that may be necessary for pipeline construction is expected to be so minor as to be insignificant. Stating that "springs and seeps encountered . . . will be evaluated" might create a costly monitoring program which the applicant has not been committed to and which is unnecessary.
Hydrology Technical Report	20	The statement, "It is expected that levels of contaminants, such as lubricants and fuel introduced..., will exceed state standards..." followed by "However, these ...violations of water quality will not be measurable" is not consistent. How can there be a violation if it cannot be measured? In the previous text there was no discussion of state standards. If the standards are to be introduced in the conclusions, some understanding of what the state standards are must be discussed in the text.	This statement is somewhat misleading. But it must be recognized that, at the point of entry, a drop of oil will exceed state standards. Farther downstream, mixing will be so complete that detection will be beyond the limits of the measuring devices.
Terrestrial and Aquatic Biology Technical Report	38	The peregrine falcon is never mentioned in the Threatened and Endangered Species Technical Report.	All references to the peregrine falcon have been deleted from the terrestrial and aquatic biology technical report.
	47	Most of the threatened or endangered warm-water fish of the Colorado River system are not discussed in the Threatened and Endangered Species Technical Report. Spawning areas that must be avoided should be delineated.	The FWS did not identify any threatened or endangered fish species except those mentioned in the threatened and endangered species technical report. The section 7 lists are included in the DEIS.

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Terrestrial and Aquatic Biology Technical Report	50	The gila monster is not mentioned in the Threatened and Endangered Species Technical Report.	All references to the gila monster have been deleted from the terrestrial and aquatic biology technical report.
	54	Would the proposed route actually cross any of the sage grouse strutting grounds identified? If not, change "cross or go within 2 miles of" to "go within two miles of".	According to the maps supplied by the Utah Division of Wildlife Resources, depending upon the exact alignment of the pipeline, strutting grounds could be crossed.
"	56	It is unlikely that rough-legged hawks nest in Utah.	See response to last comment of this letter.
"	97	The figure of 101 acres for all routes combined is meaningless since only one of the routes will be used. It would be better to give the maximum value for a single route, e.g., 20 acres for the Central Nevada Alternative.	This paragraph is intended only as an introduction to the discussion of all the routes. The figure of 101 acres has no significance other than to identify to the reader that impacts to streamside vegetation would be minimal.
"	101	Change "cross an estimated 25 miles (303 acres) of desert bighorn sheep range" to "cross an estimated ____ miles (____ acres) and pass near an additional ____ miles of desert bighorn sheep range". On page23 it is stated that "(N)either the Proposed Action nor any of the variations and alternatives actually go through any desert bighorn sheep ranges". In the DEIS (page 3-7), it is indicated that some bighorn range is crossed, but that mostly the route just passes near such range.	Suggested change has been incorporated into the terrestrial and aquatic biology technical report.
"	102	See comment for page 54.	See response to second comment on this page.
"	111	Since there are no known active nests within one mile of the Northern Systems Alternative (page 63), the paragraph on golden eagles should be revised or deleted.	The last sentence of the paragraph states that avoidance dates can be circumvented if there are no active nests within 1 mile of the construction area. Until the alignment is actually staked, it cannot be determined if nests are actually within 1 mile.
Threatened and Endangered Species Technical Report	2	Where is the appendix with the memoranda from the FWS that lists threatened and endangered species in the project area?	The appendix containing the section 7 correspondence was inadvertently omitted from the technical report. This information has been noted for the threatened and endangered species technical report and is also included in appendix H of this FEIS.
	4	In the fourth paragraph, change "as being in the vicinity" to "as possibly being in the vicinity".	The statement of "being in the vicinity" is correct; literature has indicated that the species placed on the map have been identified as being near the proposed route or alternatives.
"	21	It is stated that Cymopterus coulteri "could be affected by the Sanpete Valley Alternative", yet this species is not included in Table 5 (pages 67-69) or Appendix H of the DEIS.	Appropriate changes have been incorporated into both table 5 of the threatened and endangered technical report and appendix H of the FEIS.
"	26	The proposed action and the East Las Vegas Variation could cross habitat for Linanthus arenicola, a species on the Nevada watch list (Monzigo and Williams; 1980; Threatened and Endangered Plants of Nevada; USFWS, Portland; USBLM, Reno; 268 pp.). L. arenicola should be included in Table 5 (pages 67-69) and Appendix H of the DEIS.	Species which were on the Watch List but not included on the candidate list of the Federal Register were not included in the table. Other species designated as Watch List only have been deleted.
"	31	Penstemon garrettii habitat apparently occurs along the proposed route. In Table 5 (pages 67-69) and in Appendix H of the DEIS, it is recorded only for the Central Nevada Alternative and the Provo Canyon Alternative.	This species has been added to the tables in the threatened and endangered species technical report and appendix H of the FEIS.

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"	34	Phacelia utahensis may occur along the Sanpete Valley Alternative. Neither Table 5 (pages 67-69) nor Appendix H of the DEIS show this.	This species has been added to the tables in the threatened and endangered species technical report and appendix H of the FEIS.
"	34	Phlox glandiformis may occur along the proposed route. Insert an "x" under "RMPP" in Table 5 (pages 67-69) and Appendix H of the DEIS.	This species has been added to the tables in the threatened and endangered species technical report and appendix H of the FEIS.
"	39	Trifolium andersonii ssp. beatleyae is present within the corridor for the Central Nevada Alternative. It should be in Table 5 (pages 67-69) and Appendix H of the DEIS.	This species has been added to the tables in the threatened and endangered species technical report and appendix H of the FEIS.
"	47	The peregrine falcon should be included among federally listed birds within the project area.	The section 7 list of species furnished by the FWS did not list the peregrine as occurring along any of the routes, variations, or alternatives. Therefore, no change has been made.
Threatened and Endangered Species Technical Report	51	Critical habitat for the whooping crane also exists in Idaho, Colorado and New Mexico. The Idaho critical habitat (Grays Lake NWR) is some 25 miles from the Northern Systems Alternative.	No response required.
	70	It is only along the initial portion of the proposed route or any of the alternatives that impacts to the ferret are possible. In the third line of the first full paragraph, delete "which" and add "in the first 70 project miles" after "pipeline".	No statement as to the definite location of the black-footed ferret can be made at this time. Although the FEIS includes the biological opinion from FWS, until actual surveys would be conducted on the staked alignment, ferret locations would be unknown.
"	71	The discussion on the bald eagle mistakenly gives the impression that the proposed route and the Sanpete Valley Alternative are the only two alternatives that include bald eagle winter habitat. The Central Nevada, Sevier-Escalante Desert, West Salt Lake and Provo Canyon alternatives all include such habitat.	This discussion has been revised to reflect this concern and to clarify that other routes are included. Refer to the threatened and endangered species technical report errata sheet.
"	48	Table 2 is misleading. It fails to indicate that alternatives other than the proposed route also pass through or near all of the bald eagle winter habitat associated with "Proposed Action".	Table 2 of the threatened and endangered species technical report has been revised.
Recreation and Wilderness Technical Report	35	Potentially significant short-term impacts of the West Salt Lake Alternative on ORV activities in the Desert Mountain Area are described, yet these potential impacts are not mentioned in the DEIS (page 4-55).	A discussion of safety hazards to ORV enthusiasts has been added to "West Salt Lake Alternative: Recreation Resources," chapter 4 of the FEIS.
"	38	Potentially significant short-term impacts of the East Las Vegas Variation on ORV activities in the Las Vegas Sand Dunes Recreation Area are described. They are not mentioned in the DEIS (page 4-60), though potential impacts of the proposed route on ORV activities in this area are (page	A discussion of impact has been incorporated in "East Las Vegas Variation: Recreation Resources."

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		4-15). Since the proposed route crosses only a corner of the area and the East Las Vegas Variation crosses right through it (Map 3, page 10), it seems the greater potential impacts of the variation also deserve mention in the DEIS.	
"	46	In Nevada, one (not two) BLM WSAs would be crossed by the Central Nevada Alternative.	The errata sheet for the recreation and wilderness technical report reflects this comment.
Technical Report for Transportation Network	13	Alternate B - Number of crossings of US 189 between Cove and Marysville (MP 95 to MP 107) and in Centerville Canyon (MP 128 to MP 132) may be understated. Also local restraints may require that construction occur within the right of way of the highway.	USGS maps, scale 1:250,000, were used to determine paved road and railroad crossings for this analysis.
"	25	Provo Canyon - Construction may have severe impacts on other transportation systems paralleling the facility - these should be included in the analysis.	"Other" transportation systems within Provo Canyon (i.e., aqueduct, pipelines, etc.) would not likely experience severe impacts, since existing stipulations prohibit RMPC from interrupting service or encroaching upon these other transportation systems' rights-of-way. For example, footage requirements prohibit proposed facilities from being too close to existing facilities.
"	28	Variation 2 - The highways impacted by this variation are US 89 and US 50/6. RMPC' field studies reveal that multiple crossings of and possibly some construction within the right of way of US 50/6 and the railroad may be required. There may also be multiple crossings of US 89.	Because of construction technology, these impacts are considered short term, causing minor traffic delays of less than 30 minutes; therefore, the impacts would be insignificant.
"	30	Tab 18: V2-1 crosses US 50/6, V2-10 crosses US 89.	The errata sheet for the transportation networks technical report reflects this comment.
"	32	East Las Vegas Variation - the impact of construction on parallel facilities should be addressed. Note that while a "500' wide corridor" may be a part of the county plan, houses are currently being constructed between the flood control channel and the power line, the delinetors of the "corridor".	Information noted. Discussion in chapter 4 has been expanded.
"	40	Impacts during construction (Item 3) - Impacts are significantly different when a pipeline is constructed within a narrow highway right-of-way as opposed to a transverse crossing. When laying a 36-inch pipeline within the right-of-way of a two or three lane highway as in the situations that may occur with the Provo Canyon Alternate (Provo Canyon), Daniels Canyon Variation(Daniels Canyon), Thistle Creek Variation (Red Narrows), the Sanpete Valley Alternative (Circleville and Sevier Canyons), and possibly the Sevier-Escalante Desert Alternative and the Central Nevada Alternative (Leamington Canyon), traffic would be restricted to intermittent use of one lane serving as an alternating one-way road. Construction rates under these conditions could be as low as 300 to 800 feet per day. This impact is significant.	This impact would not be significant in canyon areas because traffic flows would experience only minor delays (between 5 to 30 minutes). Additionally, these possible delays would be short term and would not constitute long-term traffic delays or permanent changes in traffic flow patterns. Depending on the length of pipeline construction through the canyon, these minor traffic delays would exist anywhere from 4 to 8 weeks.

Chapter	Page	Comments	Response
Technical Report for Transportation Network	41	See discussion above, p. 40. Impacts on Sanpete Valley and Sevier-Escalante Desert Alternatives may be greater than Proposed Action.	See previous response.
"	42	West Salt Lake Alternative - See above discussion p. 40. The demand to minimize impact on traffic and the limited storage area would significantly decrease the rate of construction. Traffic delays and duration are understated. Impacts would be significant.	See response to previous comments.
		Provo Canyon - See above discussion p. 40. Traffic delays and duration on this congested highway are significantly understated. Impacts are significantly under estimated.	
"	43	Thistle Creek Variation - See above discussion p. 40. Traffic delays and duration are understated. Also variation follows US50/6 then US89.	See previous responses on this subject. Also, U.S. Highway 50/6 and U.S. Highway 89 have been added to the errata sheet for the transportation networks technical report.
"	43	Mill Creek Variation - This variation is not subject to typical canyon construction. Joint use of the highway right-of-way may not be required. Delays would be minimal and impact insignificant.	The canyon impacts for the Mill Creek Variation would be similar to those along the West Salt Lake Alternative (State Highway 36 through Emigration Canyon). Again, these impacts would be short term (a few weeks); traffic delays would be less than 30 minutes. At least one lane of traffic would be open at all times, except under special circumstances when blasting was necessary.
"	44	Daniels Canyon - See discussion for p. 40. Traffic delays and duration on this segment of U.S. Highway 40 are significantly underestimated. Preliminary estimates indicate Daniels Canyon would be severely impacted 4 to 8 months. Traffic delays during periods of normal traffic may be greater than one hour.	See response to comment regarding page 40 of the transportation networks technical report.
Technical Report for Visual Resources	10	MP 170-177 - Agrigarian use of this valley limits the exposure to "fall color" - delete "(excellent fall color)".	The phrase "(excellent fall color)" has been deleted in response to the comment for MP 170-177.
"	11	MP 190-195 - Because of land forms, it is doubtful that much of the construction would be visible from Nephi.	The description has been modified to indicate that "portions of the area can be seen from Nephi" in response to the comment for MP 190-195.
		MP 232 - 235 - US91 and 115 will ultimately occupy the same right-of-way.	
"	14&15	Ancillary facilities - Since the precise location of any maintenance base has not been determined, a specific discussion of these items is not appropriate.	Generalized conditions for each ancillary facility site were analyzed to provide a means of comparing the various routes. Some facilities may ultimately be located where the physical conditions may be somewhat different than those analyzed; however, the discussion will remain as presented.
Figure 2	5-2	Gypsum Cave site is shown on the map of Paleoindian sites in the study area. It is the only Paleoindian site near the proposed route. The text, however, acknowledges that the antiquity of this site has been disproved; it is now recognized	Necessary corrections have been made to the cultural resources technical report.

Chapter	Page	Comments
		as Archaic in age. In as much as Paleoindian sites, the depiction of Gypsum Cave as Paleo could misrepresent the pipeline's apparent impact on cultural resources.
		Additionally, Gypsum Cave is improperly located in relation to the proposed and variant routes in Figure F, p. 6-28. It should be shown just to the east of the proposed line.

PACIFIC GAS TRANSMISSION COMPANY

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SAN FRANCISCO, CALIFORNIA 94105
(415) 781-0474

PETER W. HANSCHEN
GENERAL COUNSEL

LEIGH S. CASSIDY
ROBERT B. McLENNAN
ATTORNEYS

September 8, 1981

Mr. Kenneth F. Plumb, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

Re: OPPR/DPC - EEB
Rocky Mountain Pipeline Project (RMPP)
Docket No. CP79-424
Case No. U-45957
RMPP DEIS

Dear Mr. Plumb:

Please find enclosed fifteen copies of corrections to "Rocky Mountain Pipeline Company's Technical Comments to the Draft Environmental Impact Statement", submitted August 21, 1981.

By copy of this letter we are also providing two copies of the corrections to the Department of Interior, Bureau of Land Management, and to the Forest Service. In addition, copies have been served upon all persons reflected in the Secretary's official service list.

Very truly yours,

LEIGH S. CASSIDY

LSC:at.

Enclosures

cc: Janis L. Bowles (2)
Rocky Mountain Pipeline Project Leader
Denver, Colorado

Kenneth Frye (2)
Federal Energy Regulatory Commission

Roland G. Robison, Jr. (2)
State Director
Utah Bureau of Land Management

James Butler (2)
Regional Energy Development Officer
Minerals Area Management
Region IV
U.S. Forest Service

CORRECTIONS TO ROCKY MOUNTAIN PIPELINE COMPANY'S TECHNICAL COMMENTS TO THE DEIS, DATED AUGUST 21, 1981

Page 6: The number in the tenth line of the third comment on this page should be 14,454.

Page 10: The last comment on this page is incomplete. The full text should read:

Environmental 4-2 BLM's summary document on public identification of issues indicated that impacts to aquatic species would be highlighted in the EIS. Further discussion of why the impacts would be insignificant is needed. State specifically the ways in which the impacts fail to meet the significance criteria for aquatic biology (page 4-2) and surface water (page 4-3). For example, how far from the proposed crossings are the nearest downstream spawning areas in the Class I, II and III streams? Why are these areas too far downstream to be affected by sediments suspended during construction? Each crossing of a Class I stream probably merits individual discussion. Also, make reference to the Terrestrial and Aquatic Biology Technical Report for a more complete discussion of aquatic impacts. Seasonal restrictions on stream crossings were apparently judged unnecessary due to their omission from the DEIS. However, the technical report (pages 96-97) suggests that they may be desirable, although of limited benefit. The intent of the DEIS should be clarified.

Page 11: The first comment on this page is incomplete. The full text should read:

Environmental 4-3 Under "Socioeconomics", the percentages criteria used for determining the significance of impacts should be based upon site-specific analyses along the route. Realistically,

No response required.

All concerns noted in this comment are identified in the detailed comments submitted on August 21, 1981; appropriate responses appear with those comments.

Comment			Response
		some areas will be able to absorb higher percentages than others and vice versa. Also, <u>permanent</u> demand for housing and <u>permanent</u> demand on other infrastructures will not occur from the proposed action. Furthermore, an increase in total employment or an increase in retail sales would be beneficial impacts and should be noted in the DEIS as such.	Regardless of the percentage criteria assigned, the impacts found along the routes examined were generally small except at Needles, California, and for portions of the Central Nevada Alternative. The EIS recognizes that there would be no significant permanent demands on housing and other infrastructure.
Page 13:		The second number in the first line of the first comment on this page should be <u>14,454</u>.	No response required.
Page 13:		The third comment on this page is incomplete. The full text should read:	
Environmental Consequences	4-27	In light of the preceding comment, the discussion of PSD review requirements is inaccurate. It is true that the Wyoming Department of Environmental Quality must make a determination of applicability of PSD requirements as a part of the New Source Review. However, as NOx emissions will be less than 250 tons/year, a negative determination is anticipated. It should also be noted the BACT determination, were PSD regulations found to be applicable, would be based on dry controls, not steam or water injection.	See the response to this comment in the original RMPC comments on the DEIS. Comment reflected in text.
Page 14:		The fourth comment on this page is incomplete. The full text should read:	
Environmental	4-36,37	Operating personnel should be listed along with construction personnel in Paragraph 2, Line 4 of the Joint Use of Utility Rights-of-Way section on Page 4-36. Lightning and Ground-Faulting Effects should be discussed separately. Corrosion should not be discussed in this section. The protective measure of solidly bonding the pipeline to the grounding network of the electric transmission system listed in the Electrostatic (Capacitive)	Comment incorporated. Lighting and ground-faulting as identified in the EIS are used interchangeably. This protective measure is identified in "Corrosion Control Problems and Personnel Hazard Control Problems Caused by HVDC and HVAC Transmission Systems on Non-Associated Underground Facilities " CIGRE Proceedings, August 21-24, 1974.

Coupling, Electromagnetic (Inductive) Coupling, and Lightning (Ground-Faulting) Effects section should definitely not be used. The statement about "...the magnitude of the electric circuits..." in Line 5 of the Electromagnetic (Inductive) Coupling section should be clarified. In Line 7, the term "leak resistance" should be changed to "coating conductivity". In Column 2, Line 4, "and could possibly damage equipment" should be added after "...pipeline operating personnel". Line 7 should read: "...increase the induced voltage in the pipeline significantly". Line 12 should read: "...aboveground pipe, and compressor stations". The "puncture of the pipeline steel" discussed at the end of Paragraph 2 of the Lightning (Ground-Faulting) Effects section is unlikely to happen. The first sentence of the Corrosion section on Page 4-37 is confusing since AC and DC currents are mixed into the discussion. The effects discussed in the second sentence occur only at HVDC ground locations. The third sentence is not correct. The term "induced corrosion" used in Line 6 of Paragraph 2 is not correct. More information on solutions to the problems discussed in the Joint Use of Utility Rights-of-Way section should be added.

Comment reflected in text.

Comments incorporated.

Comment reflected in text.

See response to these comments in the original RMPC comments on the DEIS.

More information on this subject can be found in the documents listed. There is no need for the EIS to examine this subject further.

In response to a deficiency question, on October 16, 1980, RMPC submitted a "Statement Concerning Compatibility of Gas Lines and Electric Transmission Lines" for the Rocky Mountain Pipeline Project. Referenced therein and attached were the following technical reports, which should be cited by the DEIS as sources for additional information:

The EIS does not list all the sources of information used to prepare it. See the response to comment on "References" (page 17 of RMPC's "General Comments") for additional information.

The American Gas Association (AGA) and the Electric Power Research Institute (EPRI) study, <u>Mutual Design Considerations for Overhead AC</u>

Transmission Lines and Gas Transmission Pipelines, September, 1978.

A paper presented by Charles Siegfried at the 1979 Gulf States Corrosion Seminar, "Prediction and Mitigation of the Effects of Soil Conducted Potential Gradients on Buried Pipelines Incurred by Ground Fault Alternating Current Discharge". He discussed, among other things, the problems in crowded utility corridors.

Two papers addressing the problems related to the co-existence of dc and pipelines, "Corrosion Control Problems & Personnel Hazard Control Problems Caused by HVDC and HVAC Tansmission Systems on Non-Associated Underground Facilities" CIGRE Proceedings, August 21-29, 1974, and "Co-existence Between HVDC Electric and Gas Pipeline Transmission Systems", A. W. Peabody, Gas Industries, May, 1977. Both papers discuss ground returns, ground faulting, and mitigation measures.

The summary volume of The Need for a National System of Transportation and Utility Corridors, D.O.I., July 1, 1975. This report stresses the factors to be considered in developing compatible systems and concludes that common corridors are feasible.

Page 19:	At the end of the first sentence of the second paragraph of the third comment on this page, after "public lands" add "and as a guideline for private lands".	Comment incorporated.
Page 25:	The following comments on the Technical Report for Water Resources (Hydrology) should be added:	

Hydrology	4	The floors of most flood plains are covered by at least two types of deposits. The coarsest material is deposited directly by the stream along its channel which is the material of concern under base flow conditions. The finer materials are spread across the upland floor plain. The finer upland materials are those that have been evaluated by the Soil Conservation Service (SCS) which were used for grain size distribution in the Report. The data in the SCS reports are a gross determination on alluvial soils for only three sieve sizes. The coefficient of uniformity and coefficient of curvature are not expressed. Therefore, the soils could be either well or poorly graded materials. Table 2 indicates the worst possible case, that is, it assumes the clay and silt fraction of the soils can be determined from the limited SCS data. Certainly they are not measured quantities by SCS. The D_{50} of the size distribution curve is estimated assuming a well graded material. This method of gross estimation of the distribution and channel soil significantly decreased the D_{50} value, a value which indicates higher erodibility.	The statement that "the finer upland . . . for grain size distribution" in the report is incorrect. When the Soil Conservation Service makes a soil survey, it maps and classifies all soils according to the U.S. Department of Agriculture soil classification system and soil taxonomy. The nomenclature used in the classification system allows the user to add a fourth component to these given grain sizes by adjusting the soils to a more or less "gravelly or sandy condition." Therefore, the grain sizes take these adjustments into account. The coefficients of uniformity and coefficient of curvature are not expressed because they are meaningless in this system; however, "typical" grain size analysis curves were drawn in plotting grain sizes to approximate the true curves. It is in fact true that the silt and clay fractions can be determined from the Soil Conservation Service soil series presented in the report. The percentages of soil separates (silt and clay) are extremely important in soil classification; they can be determined within 10-percent accuracy. The only way that accurate grain size distribution curves could be known would be to visit the site and sample the streambed. The scope of the problem was not significant enough to warrant this.
Hydrology	4	There are only five stream crossings evaluated for the proposed action. The crossing channel areas would normally be sampled and tested rather than upland soils as was done. Existing data on sediment deposition for western stream channels should be obtained from the Bureau of Reclamation or other available sources and utilized in the technical report.	Due to the small amount of data that was available for the streams in the project area, the values given in the technical report had to be used. They represent the transport of sediment under specific flow conditions (0.75 to 1.0 foot deep and 1.25 to 1.50 feet/second velocity); they are not intended to imply that these types of conditions exist at all times.
Hydrology	5	Average flow depth and velocity were calculated by summing the average flows and depths of each stream. Unfortunately, nature does not provide flows or depths that can be considered normally distributed. Plotting a histogram of the average flow depth data, a log-normal	

		distribution results. The majority of the average flows range from 0.75 to 1.0 feet in depth and average velocity from 1.25 to 1.5 ft/sec. Therefore, the normal distribution averages selected for the report are also high, indicating an erroneously high ability to erode the channel bottom.	
Hydrology	5	Each stream is unique by volume, velocity, and depths because it depends upon a unique geologic setting. The streams should not be averaged together as a normal distribution, but the mode should be determined for each stream using a log-normal distribution to determine the average velocity and depth.	
Hydrology	7-11	The streams should not be combined into general curves. After field measuring or use of Bureau of Reclamation data for the bed size distribution, the specific stream curve should be used and not averaged together.	If individual stream data are to be used, a monitoring and data gathering program would be required. Given the scope of the potential impacts, this was not warranted for the EIS.
Hydrology	13,14	Using these gross estimates, a travel distance for sediment was determined for the streams. However, this determination of sediment travel was not used to evaluate suspended solids loading. A single particle of clay or silt does not pose a problem. Will a plume be created which is estimated to be 200,000 mg/L or 1 mg/L above background concentrations? What is the existing background concentration of suspended solids? The USGS has stations on some of these streams showing stream quantity and quality data. These data should be presented. An estimate of quantities of sediment should be determined and their eventual distribution described mathematically.	Several sediment models were considered to estimate the amount of sediment that would be produced and how far it would be carried; none were reliable in this area, given the scarcity of data and the radical occurrence of rainfall events in this arid area.

CERTIFICATE OF SERVICE

I hereby certify that I have this day caused a copy of the foregoing corrections to "Rocky Mountain Pipeline Company's Technical Comments to the Draft Environmental Impact Statement" to be served upon each person designated in the official service list compiled by the Secretary in Docket No. CP79-424, in accordance with the requirements of Section 1.17 of the Commission's Rules of Practice and Procedure.

Dated at San Francisco, California, as of the 8th day of September, 1981.

LEIGH S. CASSIDY

J. Ross Nielsen
President

Strawberry Water Users Association

745 North 500 East P.O.Box 68 Payson, Utah 84651
Telephone 465-9273

Milton V. Theobald
Secretary-Treasurer
Manager

September 3, 1981

OFFICIAL FILE COPY

TO	INIT.	DATE
DOCKET		

CENTRAL FILES

Secretary
Federal Energy Regulatory Commission
825 North Capitol Street N.E.
Washington, D.C. 20426

Subject: Review of Draft Environmental Impact Statement for Rocky Mountain Pipeline Project; California, Idaho, Nevada, Oregon, Utah, and Wyoming (ER 81/1349)

Gentlemen:

We have reviewed the subject document and we feel that the proposed action and Variation 6 would affect the Strawberry reservoir as well as the land surrounding the reservoir.

Future coordination with the Strawberry Water Users Association will be necessary since we manage and control this land under a contract with the United States Government and the action would materially affect the land managed by Strawberry Water Users Association.

Comment noted.

Yours very truly,

Milton V. Theobald
Manager

MVT:ln

CC - Bureau of Reclamation

UTAH WILDLIFE FEDERATION
Affiliated with the National Wildlife Federation
P.O. Box 15636
Salt Lake City, Utah 84115

UTAH
WILDLIFE FEDERATION

17 September 1981

Bureau of Land Management
ATTN: Janis L. Bowles, Project Manager
555 Zang Street
Third Floor East
Denver, Colorado 80228

SUBJECT: Rocky Mountain Pipeline Project (RMPP)

Dear Ms. Bowles:

We have reviewed the RMPP draft environmental impact statement (Reference 801215080).

In consideration of impacts on Utah's wildlife, Alternative A would be perferable because it would not enter Utah. Of the other Alternatives entering Utah, Alternative C, Central Nevada, would cause the least damaging impacts on wildlife in Utah.

We do not oppose the proposed project, but we would oppose any other Alternatives in Utah other than Alternative C.

Thank you for the opportunity to evaluate and comment on this important project.

Sincerely,

Gerald E. Gordon

GERALD E. GORDON
Director for
Public Lands Policies

GEG:bjw

No response required.

COMMENTS FROM BLM PUBLIC HEARINGS

BLM held four public hearings to obtain comments on the RMPP DEIS. These hearings--held in Las Vegas, Nevada (August 3, 1981), and Cedar City (August 4, 1981), Provo (August 5, 1981), and Coalville (August 6, 1981), Utah--gave the public an opportunity to submit oral comments on the DEIS. Transcripts of those hearings are incorporated into the FEIS by reference.

Written comments were also accepted at the hearings. Those comments and responses to them appear in the preceding section. Summaries of the oral comments and responses to them appear on the following pages.

Witness	Hearing	Comment	Response
Max Lemon	Coalville, Utah	Requested a map showing the exact route of the proposed project so that individual landowners could determine if the pipeline would cross their property.	The exact alignment of the pipeline will not be established until the right-of-way is surveyed. It is represented as a 1-mile wide corridor in the EIS.
Neil D. Sussion Stan Bell, Wasatch County Farm Bureau Bill Roberts, President of the Summit County Farm Bureau	Provo, Utah Coalville, Utah Coalville, Utah	How were private landowners made aware of the proposed project, and were they involved in the scoping of the EIS?	"Proposed Action and Alternatives: Background" (chapter 2) identifies the official notices and public meetings that were held to obtain public comments. In addition, news releases were prepared and coverage by local newspapers and television stations were requested to alert the public to these hearings. The FERC and the BLM have complied with the Council on Environmental Quality's regulations, section 1506.6, "Public Involvement," to notify the public of this project.
John D. Keeler, Utah Farm Bureau Federation	Cedar City, Utah	Will communities near the proposed pipeline be able to obtain natural gas?	In response to a data request on this subject, the applicant indicated that: At the present time, RMP (applicant) proposes to transport natural gas through the Project for Project Partners. RMP is also willing to consider providing transportation service, on a contract basis, for natural gas that may be tendered by other shippers. The Project could be utilized to provide natural gas service to the communities in western Utah and the State of Nevada (particularly southwestern Utah and southeastern Nevada). The "local distributor" would be responsible for purchasing and delivering gas to be transported by the RMP.

Witness	Hearing	Comment	Response
Robert Ure, Kamas Soil District	Coalville, Utah	Is there enough gas supply to justify the proposed project?	Gas supply for the project is an issue that lies beyond the scope of the EIS. However, this valid concern will be evaluated by the FERC before a certificate of public convenience and necessity is issued to the applicant. This and other nonenvironmental issues will be evaluated by other technical staff members of the FERC, as indicated in the final paragraph of chapter 1.
Rudger M. McArthur Bill Roberts, President of the Summit County Farm Bureau Ennis Wright Robert Ure, Kamas Soil District	Cedar City, Utah Coalville, Utah Coalville, Utah Coalville, Utah	The width of the proposed 100-foot wide permanent right-of-way on private land should be limited to 50 feet; i.e., the right-of-way should be the same width on both public and private property.	The width and location of the construction and permanent rights-of-way are subject to the terms of the easement agreements between the pipeline company and the landowner. Table 6-1 shows the width of rights-of-way required by other natural gas transmission companies for the construction and operation of new interstate natural gas transmission pipelines. During field inspection of the proposed RMPP right-of-way, the BLM and FERC staffs observed no construction difficulties significantly different from those encountered on the public lands or those experienced by other interstate transmission pipeline companies operating in the region.
Reuben Jones	Cedar City, Utah	If a landowner has leased some or all of his property to a company for oil and gas exploration, what problems will develop if the RMPP goes through this land?	An interstate gas transmission pipeline presents minimal difficulties to an exploration company. If gas is found on property near the proposed transmission pipeline, it could be used to transport the newly discovered gas to market. The owners of the new facilities constructed to explore for or produce oil and gas need to be aware of the location of the transmission right-of-way so that they can take appropriate precautions when they are working in the immediate vicinity of the pipeline.

TABLE 6-1

RIGHT OF WAY REQUIREMENTS FOR NATURAL GAS TRANSMISSION PIPELINES IN THE GENERAL REGION

COMPANY	FERC DOCKET	LENGTH (Miles)	PIPE DIAMETER (Inches)	STATES CROSSED	RIGHT-OF-WAY WIDTH (FEET) a/	
					CONSTRUCTION	PERMANENT
RMPC	CP79-424	583	36	Wyoming Utah Nevada	100	100
Trailblazer Pipeline Company, et al.	CP79-80 et al.	797	36	Wyoming Colorado Nebraska	75	50
Trans-Anadarko	CP80-17	635	36	Texas Oklahoma Arkansas Louisiana	75	50
El Paso	CP79-337	60	24 and 30	Colorado New Mexico	60	40 additional adjacent to existing rights-of-way
Mountain Fuel	CP81-326	38.5	20	Wyoming Utah	unknown	50
Northwest	CP79-56	351	24 and 30	Oregon Idaho	75	50 for new; only 25 additional adjacent to existing 50 foot wide right-of-way
Pataya Storage Company	CP80-581	30	16	Arizona	50	40 to 50
CIG	CP81-328	300	20, 26, and 30	Wyoming Colorado Kansas Oklahoma	66	66

a/ These widths are for private land only.

Witness	Hearing	Comment	Response
Stan Bell, Utah Farm Bureau Bill Roberts, President of the Summit County Farm Bureau Max Lemon George Holmes, Chairman of the Wasatch County Commission John D. Keeler, Utah Farm Bureau Federation	Coalville, Utah Coalville, Utah Coalville, Utah Provo, Utah Cedar City, Utah	A number of individuals expressed concern about the applicant acquiring the RMPP right-of-way through eminent domain proceedings. The following excerpt from the Utah Farm Bureau policy represents the general position: Essential to the protection of private property rights is a method of compensating property owners for loss of present and future income-producing opportunities when property is taken through eminent domain proceedings, or when those income-producing opportunities are rejected through land use regulation. In instances where eminent domain proceedings are used to obtain easements, this compensation should be subject to periodic review and further compensation granted for loss of income-producing opportunity.	Compensation for the right-of-way easement and loss of present and future income-producing opportunities, long-term or otherwise, is negotiated between the applicant and the landowner. The legal issues raised are beyond the scope of an EIS.
Preston Marchant	Coalville, Utah	". . . there will be a depression or a raise, and who's going to pay for the hay that I'm going to lose and who's going to pay for the area--to irrigate, the	As indicated in chapter 2 under "Pipeline Construction," the applicant would compensate landowners for any loss of crops or other damages. If requested by the landowner, the applicant would also use double-ditching in

Witness	Hearing	Comment	Responses
		extra work of damming the water off where mine runs across that pipeline? This is--it's in my mountain meadow, the runs are all set. It flows down through there. It requires a minimum of irrigation, of ditching for the irrigation. It does require work, but a minimum of it. And now this pipeline will flow down through there, it will go down through there, and that will create a problem for years."	agricultural areas to conserve topsoil. Where the pipeline right-of-way crossed circular traveling sprinkler systems, the applicant would restore these areas by water-packing, by special compaction, or by soil bagging; where it disturbed surface flood-irrigated croplands, RMPC would waterflood or jet the backfill to compact the soil to its natural consistency. Additionally, cultivated land that has been compacted during construction would be loosened and restored to its preconstruction condition, in accordance with right-of-way agreements with the landowner. (See appendix C, "Erosion Control, Revegetation, and Restoration Guidelines Proposed by the RMPC.") Land structures such as contour terraces, drain ways, and ditches would be rebuilt. Finally, in comments filed in response to the DEIS, RMPC states that it "will not be an absentee owner (or construction contractor), but will continue to work with the individual landowners and tenants to correct any problems during the entire operating life of the pipeline."
R. L. Muirhead, Southwest Gas Corporation	Cedar City, Utah	"Southwest Gas Corporation supports the existing Rocky Mountain Pipeline project as it is presently proposed by the project sponsors. The proposed routing of the project will be a great benefit to Southwest Gas because of the proximity to the Las Vegas area. "El Paso Natural Gas Company is one of the Rocky Mountain project owners and is	No response required.

Witness	Hearing	Comment	Responses

Southwest Gas's major gas supplier by the Arizona and southern Nevada area.

"El Paso owns a main transmission pipeline system which extends from Texas to California. Southwest Gas's southern Nevada supply comes from this pipeline approximately 110 miles south of Las Vegas.

"This 110-mile pipeline connecting with El Paso's main line operates at maximum capacity on a cold winter day to provide gas service to southern Nevada residential and commercial customers of Southwest Gas. Substantial additions to this gas delivery system are necessary to maintain this service in southern Nevada. These expensive additions would not have been necessary if the Rocky Mountain project had been completed during 1982.

"El Paso has agreed that if this project is approved, authorization for at least two new delivery points to serve the southern Nevada customers of Southwest Gas will be requested from government authorities. This source of gas, virtually at our doorstep, should eliminate some planned costly future pipeline additions. The Rocky Mountain project is an economical and reliable means of providing increased gas service to this area.

Witness	Hearing	Comment	Response
		"Southwest Gas is purchasing gas from almost sixty wells in Utah and Colorado. This gas is presently transported to southern Nevada by means of New Mexico and Arizona. The proposed pipeline, upon completion, will be a far more economical and direct route for Southwest Gas and, ultimately, for the rate payer, by bringing the gas directly down the Rocky Mountain Pipeline from Utah and Colorado to southern Nevada.	
		"These are the reasons Southwest Gas Corporation supports the present Rocky Mountain Pipeline project routing proposal."	
Reuben Jones	Cedar City, Utah	"If a right-of-way for a pipeline goes through a piece of private property, is this right-of-way owned by the pipeline company, or what is the status of the 100-foot right-of-way?"	The 100-foot wide pipeline right-of-way traversing private property is usually negotiated as an easement, not purchased. The right-of-way agreement between the pipeline company and landowner should specify the rights of both parties. Generally, the negotiated agreement provides the pipeline company with the right to maintain, inspect, and repair the facilities and the right-of-way; the landowner is usually given the option of receiving gas service, paid a monetary fee for the easement, and allowed to use the land as before, especially for agriculture and grazing. There are, however, certain restrictions placed on the land used for the right-of-way. These usually prohibit permanent structures (such as houses, sheds,

Witness	Hearing	Comment	Response
			barns, etc.) built by the landowner. If the landowner is in doubt about certain issues, he or she may seek legal counsel or make sure that the right-of-way agreement he or she negotiates specifically and satisfactorily identifies and resolves his or her concerns.
Robert Ure, Kamas Soil District	Coalville, Utah	Landowners living in or near developing areas experience financial loss when a pipeline is constructed on their property since the pipeline preempts the construction of houses or other structures on the right-of-way.	The establishment of new pipeline easements can reduce the value of land where the land has development potential. Individual landowners who have plans for developing their property can protect their interests by requiring minor route modifications to avoid potential building sites. Pipeline companies normally will accommodate the landowner's requests during right-of-way easement negotiations.
John T. Holland, Peoa Pipeline Company	Coalville, Utah	" . . . we know from reading the news and listening to the news over the last several months, there have been a number of incidents of PCB accummulating in natural gas pipelines on the west coast. Maybe some of them PGT's, I don't know. But when that can happen and you are within 800 feet of a water source, of a culinary water source, then you are talking danger. And we think it's too dangerous.	Currently, all major natural gas pipeline companies in the United States are conducting an analysis to determine if PCB's exist in their transportation systems. If PCB's are found in a pipeline, the owner will be required to devise a plan to identify the source, collect, and dispose of the toxic chemicals. PCB's have not been detected flowing in the gaseous phase in any pipeline system. However, heavier-than gas substances (liquids, vapor) are usually trapped at the low points in a pipeline system and at valves, compressor stations, scrubbers, filters, and meters.

Witness	Hearing	Comment	Response
Robert Ure, Kamas Soil District	Coalville, Utah	Mr. Ure expressed the the following concerns in his testimony:	
		a) Joint-use of utility corridors	a) For the RMPP and all alternatives except for the Northern Systems Alternative, joint-use of existing utility corridors has been emphasized. All of the facilities for the Northern Systems Alternative would be constructed on or adjacent to existing rights-of-way.
		b) Safety of powerlines in joint-use rights-of-way	b) The applicant has not identified the safety precautions it would follow if the RMPP were constructed adjacent to high-tension powerlines in the Las Vegas area. However, electrical shock can occur under unusual circumstances such as when an individual comes in contact with an electrical support tower during a thunderstorm. The construction of a natural gas pipeline within the same right-of-way would not increase this risk when pipeline operation begins. The greatest risk of electrical shock would be present when the pipeline was under construction and the pipe was strung along the pipeline trench.
		c) Damage that may result from a rupture of a liquid pipeline.	c) Damage that may result from a natural gas pipeline rupture would not be as severe as a liquids pipeline rupture. Natural gas is buoyant; it would disperse rapidly following a rupture. If an explosion occurred, it would damage structures in the immediate vicinity of the pipeline. The ruptured pipeline would then merely act as a flare until the gas flow was stopped.

Witness	Hearing	Comment	Response
Vern Boyer	Coalville, Utah	". . . I have seen several breaks come, one in my field several years ago. And they lost enough gas to supply alot of people for a long time. And these breaks will come. When that fumes comes down where people's living, I want to tell you, it's pretty stout. And I know what will happen in the future with these other good people.	The accident rate for natural gas transmission pipelines has been discussed in chapter 4, "Proposed Action: Pipeline Safety." Natural gas usually is not odorized with mercaptans (sulfur-containing hydrocarbons) when it is transported in interstate transmission pipelines. However, natural gas is odorized when it enters distribution networks.
Rudger M. McArthur, Director, St. George Utilities and Public Works	Cedar City, Utah	Mr. Burgess indicated concern to me that the proposed route would traverse his property. He is a farmer in the Mountain Meadows area (approximately MP 380) which is completely surrounded by the Dixie National Forest. Would you consider the possibility of avoiding his land?	At this time, no final route has been selected nor any exact alignments for any of the alternatives. Should a mile-wide corridor route be selected in this area, the landowners could negotiate with the RMPC representatives on alignment which would bypass their land or conditions of easement which would meet their needs.
Barbara Starr, Cedar City Council, officially representing Cedar City and the Mayor	Cedar City, Utah	Approximately 75 percent of the land in Utah is owned by the Federal or state government or is Indian land. Because the private land is a small percentage, this project should be constructed so that minimal impacts would be made upon cultivated and prime agricultural lands.	Refer to chapter 4, "Proposed Action: Agriculture," and the mitigation measures listed in appendix C. Agricultural lands and prime agricultural lands are acknowledged, and efforts to minimize impact to these lands are emphasized throughout the EIS.

Witness	Hearing	Comment	Response
Reuben Jones	Cedar City, Utah	Why is the proposed action a preferred route when Alternative D parallels the railroad and the highway? Why is the one going through the virgin land preferred over the one that parallels the railroad and the highway?	The percentage of a pipeline route within existing corridors is only one factor considered before a preferred route is selected. As table G-2 indicates, 59 percent of the applicant's proposed route would be within existing corridors, while 61 percent of the Sevier-Escalante Desert Alternative (Alternative D) would be within existing corridors. Other factors that are considered in selecting a preferred route include environmental, economic, social, and political concerns, etc.
Reuben Jones	Cedar City, Utah	Several people have said that there would be very little impact on the vegetation etc., after the pipeline is in; after the area is reseeded, no difference could be detected after a few years. I would like to challenge that statement, because there are areas very near where this proposed line is going, that were homesteaded about 60 or 70 years ago and were farmed, and those areas are just as bare as this floor. Of course, they were not rehabilitated, just left. But the vegetation hasn't come back in these areas. The only thing that grows in these areas is halogeton and Russian thistle.	This concern is recognized in the EIS. Please refer to appendix C, "Erosion Control, Revegetation, and Restoration Guidelines." Efforts would be made to restore areas to near preconstruction conditions through continuing intensive implementation of applicable erosion control and restoration measures. The EIS also indicates ("Summary: Vegetation") a few small unquantifiable areas where adequate vegetation could not be established and which would require continuing intensive erosion control measures.

Witness	Hearing	Comment	Response
Stan Bell, Utah Farm Bureau	Coalville, Utah	We feel that public utilities should be required to provide economic impact statements when crossing private land, which are comparable to those required for crossing public land. We feel that those public utility companies should be required to comply with local land planning and zoning ordinances.	As part of this EIS process, some economic analysis has been prepared to determine impacts of a potential pipeline on the social and economic environment, including the impacts of crossing both public and private land. Please refer to the socioeconomic sections of the FEIS. Generally, when public utilities wish to place a pipeline or transmission line across land within a county or a city, they are required by that jurisdiction to obtain conditional use or other permits. As part of this permitting process, they usually have to comply with local zoning or get a variance.
Stan Bell, Utah Farm Bureau	Coalville, Utah	I would like to express concern about the Daniels Canyon Variation, as the DEIS indicated that there was serious question on its feasibility. In addition, there wasn't a great deal of question about that particular segment of the proposed pipeline that it was meant to replace.	The Daniels Canyon Variation has been dropped from further analysis in favor of the Daniels Canyon Variation II which would only pass through the Strawberry Reservoir area. Refer to chapters 3 and 4 of the FEIS for additional information.
Bill Roberts, President, Summit County Farm Bureau	Coalville, Utah	Why hasn't there been more input from the private landowners along the various pipeline routes? As Mr. Bell said before, 56 percent of this route is on private land; there's been no input from these private landowners.	Please refer to response to Neil D. Sussion, Utah Farm Bureau, Provo Public Hearings.

Witness	Hearing	Comment	Response
Bill Roberts, President, Summit County Farm Bureau	Coalville, Utah	The main problems that we have are in the Kamas Valley area. The proposed route goes through the meadow ground up there, and based on past experience with the Snyderville Sewer Drainage Improvement District, we are concerned about the proposed pipeline altering the water drainage pattern.	Concerns about surface water movement are addressed in appendix C, "Erosion Control, Revegetation, and Restoration Guidelines Proposed by RMPC: Backfilling and Grading." Concerns regarding the specific localized effects on subsurface water will require specific onsite planning by the company during construction to ensure impacts are minimized. Adequate implementation, then compliance and monitoring of the mitigation measures should be identified by the land-owners during their easement negotiations with the company to ensure successful restoration.
William Mace for George Wilson, Division of Wildlife	Coalville, Utah	The draft EIS has overlooked one area in the Kamas Valley area on the proposed route between MP 96 and MP 108 and that is the nesting habitat, staging and mating grounds for the sandhill crane. These privately owned meadows are used extensively for the raising of young cranes, and we feel that if this pipeline is constructed through these wet areas there would be a possibility of draining them, and they then could no longer be the habitat for the crane.	See response to comment on page 8, paragraph 5 of the RMPC's General Comments dated August 21, 1981, and the text changes in chapters 3 and 4, which include additional data on the sandhill crane.

Witness	Hearing	Comment	Response
Gerald Marchant	Coalville, Utah	I am against putting this pipeline through Kamas Valley in any way, shape, or form. There is absolutely no benefit to anyone in Kamas Valley. When you mention eminent domain, you haven't got enough money to go across my property without condemning it. This benefits strictly, California, and no benefit comes to us. It goes through agricultural land in Kamas Valley.	The West Kamas Valley Variation, Variation 8, has been developed and analyzed to provide an alternate route around Kamas Valley. Resource analyses and detailed descriptions of the alternative can be found throughout the EIS, especially in chapters 2, 3, and 4.
Gerald Marchant	Coalville, Utah	The pipeline would interfere with the present irrigation practices. There would always be either a hump or a depression after that pipeline is in; this always occurs and there's no way of getting around that. The possibility of the water going to the pipeline, going down, and following the pipeline is going to interfere with irrigation. The pipeline is going to interfere with cropping practices with the limited amount of topsoil we have on our farms. To move this topsoil and then replace it would be almost impossible.	Impacts to irrigation systems are discussed in chapter 4, "Proposed Action: Agriculture." Restoration of irrigated cropland is discussed in "Backfilling and Grading," included in the Erosion, Control, Revegetation, and Restoration Guidelines Proposed by the RMPC (appendix C). Adequate mitigation measures, compliance and monitoring, and crop loss compensation should be identified by each landowner during his or her easement negotiations with the pipeline company.

Witness	Hearing	Comment	Response
Gerald Marchant	Coalville, Utah	As a resident of Peoa, the proposed pipeline goes near our town water supply, closer than the present zoning laws will allow.	A 1-mile wide corridor was analyzed for the proposed pipeline. Although some preliminary staking has occurred, the proposed route has not yet received any approvals. In addition, the pipeline company must comply with zoning regulations of the state and local governments.
Preston Marchant	Coalville, Utah	There's a route through the west hills which bypasses Kamas Valley. You could put a pipeline there and it would not injure the valley	Variation 8, the West Kamas Valley Variation has been developed for this area. Refer to chapters 2, 3, and 4 for more detailed analysis.
Preston Marchant	Coalville, Utah	You are going to be near the head house for the Wooden Shoe Pipeline Company with your pipeline and I understand that is against the Summit County Planning Board requirements.	The pipeline route is analyzed for a 1-mile wide corridor. Although preliminary staking has occurred along certain stretches of the proposed route, final placement of the pipeline must comply with all county planning board requirements and policies.
Robert Ure, Chairman, Kamas Valley Soil Conservation District	Coalville, Utah	Peoa has three if not four springs that this pipeline is coming very close to, and the State law reads 1,500 feet away from any culinary water supply. I don't think it even says culinary. I think it says spring. The company is going to be in violation of that law if the pipeline goes through as planned.	Please see the response to the comment on the same subject in your letter received by the FERC August 28, 1981.

Witness	Hearing	Comment	Response
Robert Ure, Chairman, Kamas Valley Soil Conservation District	Coalville, Utah	The Kamas Valley Soil Conservation District is concerned that, if the pipeline were placed through Kamas Valley, it would interfere with subsurface water flow patterns.	Ground water flow would be disturbed during construction in limited areas near streams where the excavation might extend below the water table and <u>if</u> dewatering should be required. Normally, dewatering would not be required. Such disturbance would be small and limited to areas adjacent to the excavation. Previous flow patterns would resume shortly after backfilling.
Robert Ure, Chairman, Kamas Valley Soil Conservation District	Coalville, Utah	Irrigation will be a problem. There's always a dip and there's always a hump wherever that line goes. You just can't seem to get away from it. There is another possible problem that I don't know really will exist with this line or not, but the present line that I have going through my place is one that is a heating line. In the meadows the cows sill tend to hit this line in the winter because it's warm. As a result, they track mud leaving an impression, and making it very difficult to irrigate across this pipeline.	This pipeline would not be heated. The friction caused by the movement of natural gas would not create any significant heating effects to the surrounding soils. In addition, please see the response for Gerald Marchant's comments on this subject in the Coalville hearing.

Witness	Hearing	Comment	Response
Robert Ure, Chairman, Kamas Valley Soil Conservation District	Coalville, Utah	As far as the soil conservation district is concerned, you're hitting through our prime--it's not prime agricultural ground, but it's our prime ground. In the county we have 1,188,660 acres, 3 percent of this is irrigated farmland. The Kamas District, (24,107 acres) has 2 percent of the county. If you take this easement, you are removing 133 acres. I don't know exactly how you go about figuring the total number of acres affected. One formula to look at would tell us it's 209 acres; therefore 1 percent of our irrigated land would be affected by the pipeline going through the middle. We are certainly short on soils, as has been mentioned, and I don't think your double-trenching will do the job for you. I think you are going to have to put new soil on top to really get our vegetation to grow again. And when you put new soil in, you could further restrict our subsurface irrigation.	Please refer to the response to the comment on this subject in your letter received by the FERC August 28, 1981.

Witness	Hearing	Comment	Response
Robert Ure, Chairman, Kamas Valley Soil Conservation District	Coalville, Utah	Who is going to maintain the canals if they lose effectiveness because of being crossed by the pipeline? If the company is going to maintain this, which I think they should, will their responses to calls on breaks on the canals be timely, or will we lose our turn for irrigation water due to slow responses for maintenance.	Please see response to comment in your letter received by the FERC August 28, 1981.
Robert Ure, Chairman, Kamas Valley Soil Conservation District	Coalville, Utah	The company has told us that they will put collars along the pipe to stop the flow of water along the pipeline. Based on information I have received on the pipeline in Snyderville and the similar environment here, I don't think it will really work.	The collars that are placed around the pipeline are called antiseep collars. They are not intended to stop the flow of water; rather, their function is to slow water by increasing the length that it must travel. This process, slowing water beyond a "creep," allows the fill soil to perform as well as the existing soil, often better. These collars have been very successful in slowing and stopping water movement and the fine soil particles which it may carry. They are principally used in road culvert design, dams, and many other "wet structures."
John T. Holland, Director, Peoa Pipeline Company	Coalville, Utah	The State Board of Health does not allow construction, nor disturbance of the soil within 1,500 feet of the head house or spring area of a culinary water system. This pipeline is surveyed within 800 feet of that source, and we protest. We have letters from the State Board of Health and the State Department of Water Engineers telling us to protest. I don't know why	Please see the response to the comment on this subject made by Robert Ure, Chairman, Kamas Valley Soil Conservation District, in his letter received by the FERC on August 28, 1981.

Witness	Hearing	Comment	Response
		they didn't protest to you themselves, but it's against the law in the state of Utah.	
Gerald Young, Summit County Commissioner	Coalville, Utah	I would suggest that you take a good hard look at the little valley in Kamas, and see if there's not a better alternative line.	Refer to responses to Gerald and Preston Marchant, Coalville Hearing, regarding this same subject and to the EIS for the discussion of the new Variation 8, West Kamas Valley Variation.
Gerald Young, Summit County Commissioner	Coalville, Utah	The local residents will have a hard time keeping the meadows wet. They (RMPC) say that they will put blocks (collars) in along the pipelines, but these soils, some of which are just plain old river rock, are hard to block off once you disturb the topsoil.	Please refer to the response to the comment on pipeline collars made by Robert Ure, Chairman, Kamas Valley Soil Conservation District, Coalville hearing.
Kurt Weinrich, Boulder City	Las Vegas, Nevada	In the DEIS, several communities, including Boulder City, are not identified in terms of their requirements for condition and use permits or property crossings.	Please refer to the response to comment in the second paragraph of the letter from the City of Boulder City, Nevada, dated August 17, 1981.
Kurt Weinrich, Boulder City	Las Vegas, Nevada	Map S-11 of the Graphic Supplement does not show the municipal boundaries of Boulder City. Also, Variation 3 would not actually cross the Boulder City boundaries.	Map S-11 is a USGS map which is meant to indicate urbanized areas only; it is not intended to show municipal boundaries.
Pete Sturtevant	Las Vegas, Nevada	The East Las Vegas Variation discussion in the DEIS states, "This variation would cross the Las Vegas Wash area and in a broader floodplain than would the proposed action, but would avoid the portion involving	Chapter 4, "Proposed Action: Soils" has been revised to include information on this subject.

Witness	Hearing	Comment	Response
		critical erosion treatment." It gives a reference to a previous discussion concerning that topic, but I really don't find any discussion of any particular unusual erosion problems in the Wash area where the proposed action would cross. We suffer from an unusual problem in the Las Vegas Wash which is an area of severe local erosion, and the proposed action crossing would be just downstream from what we call the headcut or the neg (sic) point. I would like to see some acknowledgement of this local problem and some specific measures that could be employed to avoid further problems at this headcut area.	
L. R. Jester, Utah Department of Transportation	Provo, Utah	Mr. Jester expressed concerns about the Provo Canyon Alternative and the Daniels Canyon Variation.	Responses to further comments appear with your "Statement on the Draft Environmental Impact Statement" dated August 19, 1981. The Daniels Canyon Variation has been dropped from further analysis in the EIS. The Daniels Canyon Variation II through the Strawberry Reservoir area has been developed as a replacement; it is analyzed in chapters 2, 3, and 4.

Witness	Hearing	Comment	Response
Neil D. Sussion, Utah Farm Bureau	Provo, Utah	How are private citizens notified about projects like this? It appears that these hearings are the only meetings on this project and it also appears that the League of Women Voters were the only ones mentioned as having been contacted. People need an opportunity to express their concerns.	During the first steps of preparing this EIS, seven public scoping meetings were held to inform private citizens about the project and to receive their concerns about potential impacts from the proposed pipeline. These meetings were held in Utah, Nevada, and California in the fall of 1980. The times and locations of these meetings were announced in the major newspapers and on the radio. Federal EIS regulations require that public concerns be solicited by mail or through public meetings; thus, these meetings were held. Please refer to appendix A of the FEIS, which has been revised to include information omitted through a printing error. The appendix now includes a more representative listing of people receiving the EIS and includes information about obtaining the complete list from BLM or FERC. Also, <u>Public Identification of Issues for the Environmental Impact Statement: Rocky Mountain Pipeline Project</u>, developed to summarize the scoping meetings, is available on request.
Paul R. Larson, Utah Planning Commission	Provo, Utah	Mr. Larson expressed concerns about the Provo Canyon Alternative crossing the Wasatch fault and 13 others, Thistle Creek Variation, crossing 6 faults, and Mill Creek Variation crossing 4 faults. He also identified concerns about agricultural land used for fruit crops and fruit orchards. His concerns about impact to the Utah County population include the Springdale zoning ordinance, Wicks landslide area, Bridal Veil Falls area, and Vivian Park zoning.	Please refer to the responses to the letter from the Utah Planning Commission, dated August 5, 1981.

OFFICE OF THE STATE PLANNING COORDINATOR

SCOTT M. MATHESON, GOVERNOR

MARTHE F. DYNER, STATE PLANNING COORDINATOR

October 29, 1981

NOV 2 1981

RECEIVED

Janis L. Bowles, Project Manager
Bureau of Land Management
555 Zang Street
Third Floor East
Denver, Colorado 80228

Dear Ms. Bowles:

SUBJECT: Rocky Mountain Pipeline Project
State Application Identifier Number UT801215080

The attached comments were received in the State Clearinghouse on October 29, 1981. I realize that the comment deadline date for submission of comments on this project has long since expired, but feel these comments should be forwarded to you nevertheless.

Please address any questions you may have on these comments directly to Mr. Madsen at 801-533-5755.

Thank you for your consideration.

Sincerely,

Marthe F. Dyner

Marthe F. Dyner
State Planning Coordinator

124 STATE CAPITOL BLDG. • SALT LAKE CITY, UTAH 84114 • (801) 533-5245

This comment was received too late to incorporate into the body of chapter 6 or to make changes to the EIS. The Utah State Historic Society has not identified any significant impacts from the RMPP, alternatives, or variations, nor did the EIS scoping process. However, the applicant will have to comply with the requirements of Utah's state laws.

SCOTT M. MATHESON
GOVERNOR

STATE OF UTAH
DEPARTMENT OF COMMUNITY AND
ECONOMIC DEVELOPMENT

Division of
State History
(UTAH STATE HISTORICAL SOCIETY)

MELVIN T. SMITH, DIRECTOR
300 RIO GRANDE
SALT LAKE CITY, UTAH 84101
TELEPHONE 801/533-5755

October 27, 1981

Juline Christofferson
Office of State Planning Coordinator
124 State Capitol
Salt Lake City, Utah 84114

Dear Juline:

Having cleared up a couple of other projects, I finally made it through the draft E.I.S. for the Rocky Mountain Pipeline Project.

The total neglect of paleontological input in the study is an embarrassment. From my view the draft is inadequate as it ignores the requirements of the State Antiquities Law and does not even mention one of Utah's most sensitive and irreplaceable scientific and aesthetic resources.

Sincerely,

James H. Madsen Jr.
State Paleontologist

JHM/kj

PREPARERS FOR THE ROCKY MOUNTAIN PIPELINE PROJECT EIS

Agency Personnel	Education	EIS Responsibility
BLM		
Janis L. Bowles, Project Leader	BA, Environmental Studies	Project Leader Comparative Analysis, Land Managing Agencies' Preferred Alternative, Quality Control
Richard E. Traylor, Environmental Project Specialist	BS, Forestry MS, Forest Management	Environmental Coordinator, Quality Review
Alan E. Amen, Soil Scientist	BS, General Agronomy	Soils, Agriculture, Soils and Agriculture Technical Report **Portions of Appendix C**
Raymond J. Boyd, Wildlife Biologist	BS, General Science BS, Game Management MS, Range Management	Wildlife, Threatened and Endangered Species, Terrestrial and Aquatic Biology Technical Report, Threatened and Endangered Species Technical Report
Gerald P. Brandvold, Botanist	BS, Range Management	Vegetation, Forestry, Livestock, Appendix C, Terrestrial and Aquatic Biology Technical Report, Threatened and Endangered Species Technical Report
Larcie D. Burnett, Archaeologist	BA, Anthropology MA, Anthropology	Cultural Resources, Cultural Resources Technical Report
Roger Carmichael, Engineer	BS, Mechanical Engineering MS, Environmental Engineering PhD, Environmental Engineering	Overview, Route Alternatives and Variations, **Portions of** Appendix F
Donald E. Clark, Community Planner	BS, Landscape Design	Land Use Plans, Native American Issues, Land status data compilation
George E. Detsis, Environmental Specialist	BS, Recreation Administration MS, Forest Resources	Authorizing Actions, Recreation Resources, Transportation Systems, Wilderness, Appendix D, Recreation and Wilderness Technical Report, Transportation Networks Technical Report
Catharine A. Eckberg, Writer-Editor	BS, Environmental Planning	Editing
Jack D. Edwards, Economist	BA, Education MS, Agricultural Economics PhD, Economics	Appendix A and Portions of Appendix C
Gary R. Konwinski, Geologist	BS, Soil Science MS, Environmental Science Graduate Work in Geology and Water Resources	Water Resources, Water Resources Technical Report

LIST OF PREPARERS FOR THE ROCKY MOUNTAIN PIPELINE PROJECT EIS—Continued

Agency Personnel	Education	EIS Responsibility
Janet J. Parker, Writer-Editor	English, Chemistry	Editing BLM EIS sections, BLM Technical Reports; Production of EIS and all Technical Reports
Stanley V. Specht, Landscape Architect	BS, Landscape Architecture MLA, Landscape Architecture MUP, Urban Planning Graduate Work in Arctic Engineering	Visual Resources, Visual Resources Technical Report
Pete Van Wyhe, Supervisory Printing Specialist	BS, Business Management	Production of *Graphic Supplement,* EIS, and Technical Reports
Keith Francis, Lead Cartographer	BA, Geology MS, Remote Sensing	Cartographic and Graphic Work on *Graphic Supplement* some EIS Graphics, BLM Technical Report Graphics
Troy Bunch, Illustrator	AA, Art AAS, Audio-Visual Production	Cover, Technical Illustrations and Graphics in Technical Reports; EIS Graphics
Connie A. Hackathorn, Cartographer	Cartography, Psychology	Cartographic and Graphic Production of Technical Reports, *Graphic Supplement*
FERC		
Kenneth D. Frye, Chemical Engineer	BS, Chemical Engineering	Project Manager Purpose and Need, Description of Proposed Action, FERC Environmental Conclusions and Recommendations, table 6-1
Ann R. Aldrich, Technical Editor	BA, English MS, English PhD, English	Editing; Production Coordination
Leonard R. Crook, Jr., Economist	BA, History/Economics MA, History Graduate Work in Regional Economics	Socioeconomics, Comparative Analysis, Socioeconomics Technical Report
James P. Daniel, Environmental Biologist	BS, Wildlife Graduate Work in Environmental Biology	Mitigating Measures, **Portions of** Appendix C
Robert E. Klipfel, Jr., Civil Engineer	BS, Civil Engineering MS, Civil & Environmental Engineering	Appendix E
John E. Korzeniowski, Chemical Engineer	BS, Chemical Engineering Graduate Work in Environmental Medicine and Toxicology	Air Quality, Noise Quality, Pipeline Safety, Comparative Analysis

John S. Leiss, Geologist	BS, Earth & Planetary Sciences Graduate Work in Geology	Geology and Topography, Comparative Analysis
Cary D. Secrest, Soil Conservationist	BS, Soil Science	Socioeconomics, Comparative Analysis, Socioeconomics Technical Report
Allan V. Straughan, Physical Scientist	BS, Environmental Health	Energy Conservation, Appendix B
George H. Taylor, Jr., **Environmental Biologist**	BS, Biology Graduate Work in Biology	Northern Systems Alternative, Low Flow Alternative, No Action and Postponed Action, **Portions of** Appendix F, **Comparative Analysis**

COOPERATING AGENCIES

Theron Garth Heaton, Forester, Minerals/Energy Zone Liason, FWS	BS, Forest Management	FS-BLM RMPP Liasion, Interrelationship of Proposed Action and Alternatives
Walter D. Ray, Fish and Wildlife Biologist, FWS	BS, Game Management	FWS-BLM RMPP Liasion, Threatened and Endangered Species Technical Report
Carlos Lopez and Doug Muir, Soil Scientists, FS	Unknown	Appendix M, Excerpt from FS November 18, 1980 comments on Preliminary DEIS
Dwain E. McGarry and Carter E. Reed, Soil Scientists, FS	Unknown	Appendix M, Reconnaissance Geologic Report of the Proposed Utility Corridor in th Dairy Fork, Lake Fork and Little Clear Creek Drainages, Manti-LaSal National Forests

GLOSSARY

ALLUVIAL FANS--Fan-shaped deposits composed of eroded soil materials.

ALLUVIUM--Clay, silt, sand, gravel, or other loose stream-deposited material.

AMBIENT NOISE LEVELS--Expected background noise in an area.

ANIMAL UNIT MONTH--The amount of forage a cow and a calf (6 months of age and under) would consume in 1 month. This unit is used to calculate carrying capacity and serves as a **basis** for grazing fees.

ANCILLARY FACILITIES--Structures (compressor stations, power and communications lines, cathodic protection systems) which are necessary for the continuous operation or maintenance of the pipeline.

ASH FALLS--Deposition of airborne volcanic ash downwind from a volcano.

BACKFILL--Earth replaced after being excavated during construction.

BACKHOE--Self-propelled machine with an arm equipped with toothed shovel that scoops earth as the shovel is pulled toward the machine.

BADLAND--A landscape devoid of vegetation and eroded into an intricate maze of narrow ravines and sharp crests.

BERM--A slightly rounded crown of soil provided over the pipeline trench to compensate for settling of the backfill.

BIOME--A geographical area where plants exhibit similar characteristics.

BLADED OUT--To level the earth's surface with heavy equipment.

BLOCK VALVE--A valve which can be closed to isolate one section of pipe from the adjacent section.

BOOSTER STATION--Compressor station.

BORROW PIT--A pit from which earthern materials are excavated for **use** elsewhere.

BRAIDED STREAM--A stream that flows in several dividing and reuniting channels.

CATHODIC PROTECTION--Anticorrosion technique for metal installations--pipelines, tanks, buildings--in which weak electric currents are set up to offset the current associated with metal corrosion.

CHECK DAMS--An aboveground barrier built from timber and spaced on alternate sides of the right-of-way to break the flow of water runoff. Small dams used to control water flow during and after construction.

CHECK VALVE--Valve with a free-swinging tongue or clapper that permits fluid in a pipeline to flow only in one direction.

CHISELING--The loosening of soil without inversion and with a minimum of mixing of the surface soil in order to shatter restrictive layers (below normal plow depth) that could inhibit water movement or root development (called 'chiseling' when the restrictive layers are less than 16 inches deep).

COATING AND WRAPPING--An inert material coating pipeline and other buried facilities to protect the system from corrosion.

COFFERDAMS--**Structures** used at stream crossings to expose the streambed during construction.

CORRIDOR--**For purposes of this EIS, a mile-wide strip of land which the proposed project would be located within.**

CROSS DITCHES--An earthen dam built at **an appropriate** angle to the right-of-way to divert water across the right-of-way as quickly as possible and prevent backfill material from washing away.

CULTURAL RESOURCES--Those fragile and non-renewable evidences of human activity, occupation, or endeavor, reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features, that were of importance in human events. Cultural resources are further categorized in terms of their prehistoric and historic values; however, each of these aspects represents a part of the continuum of events from the earliest evidences of man to the present day.

DESERT PAVEMENT--A wind-eroded, smooth surface composed of rock fragments which protect underlying fine soil particles from further erosion.

DEWATERING--Removing water from the soil and/or a pipeline trench to aid construction.

DISPATCHER--Employee responsible for scheduling and controlling movement of natural gas through pipelines.

DISPERSED RECREATION--Camping in undeveloped sites and informal daytime recreation.

DIVERTING METHOD--A method of installing pipe in streams where the flow is temporarily diverted.

DOUBLE-DITCHING--The practice of separating the topsoil from the subsoil during trench excavation.

DOUBLE-JOINTING YARD--An assembly area where two sections of pipe are welded together and coated.

DURIPAN (Includes Hardpan)--A hardened or cemented soil horizon or layer. The soil material is sandy, loamy, or clayey and is cemented by silica, calcium carbonate, or other substance.

EASEMENT--Interest in land owned by another that entitles its holder to a specific limited use.

FAULT (Geotechnical)--Fracture in the earth's crust accompanied by a potential shifting of one side of the fracture in relation to the other side; the point at which a geological strata 'breaks off' or is sheared when a section of the strata drops because of settling.

FAULTING--The process of producing a fault, a surface or zone of rock fracture along which there has been displacement. Faulting generally extends into unconsolidated sediments on top of the faulted rock.

FEE TITLE--An estate of inheritance in land without limitation to any particular class of heirs or restrictions. Fee title is usually obtained for compressor station and maintenance base sites on private lands. (See also EASEMENT.)

FIELD--A geographic area in which wells produce from a continuous reservoir. Generally refers to the surface area, although it may refer to both the surface and the underground productive formations. Generally includes several pools and may include several separate reservoirs.

FLOW CONTROL VALVE--A valve which manually or automatically controls the quantity of natural gas flowing through the pipe.

FORB--A low growing broadleaf plant.

FOSSIL FUELS--Any hydrocarbon deposit that may be used for fuels; examples are petroleum, coal, and natural gas.

FRENCH DRAIN--A rock or gravel fill used to drain water.

FUGITIVE DUST--Airborne silt and clay particles.

g--The acceleration of gravity. Numerical value: 32 feet per second per second or 980 centimeters per second per second. Used in the EIS as a measure of the severity of ground motion.

GALLINACEOUS GUZZLERS--Artificial watering devices for quail, chukar, pheasant, etc.

GRADE--Degree of slope of a road, channel, or natural ground.

GRAPHIC SUPPLEMENT-- Map volume of the RMPP EIS.

GROUND MOTION--Vibration of the ground during an earthquake without permanent displacement. As used in this EIS, ground motion values relate to vibration in bedrock.

HERPETOFAUNA--Snakes, lizards, turtles, frogs, and other cold-blooded animals.

HINGELINE AREA--A portion of the North American Overthrust Belt, an area of potential oil and gas reserves in central and southern Utah, possibly extending into Nevada and Arizona.

HYDROCARBON FUELS--Fuel consisting of hydrogen and carbon such as oil, natural gas, etc.

HYDROSTATIC TESTING--Filling a pipeline or tank with water under pressure to test tensile strength.

INFRASTRUCTURE--The facilities, equipment, and services needed for a community to function. It includes roads, sewers, waterlines, police, fire protection, schools, etc.

INSECTIVORES--Relatively small insect-eating mammals (shrews, moles, etc.).

INTENSIVE FIELD INVENTORY--A complete surface inventory of a specific area.

INTERMITTENT STREAM--A stream which flows only during periods of precipitation.

LEKS--Sagegrouse strutting ground (courtship areas) generally found in open grassy areas and sagebrush.

LIQUEFACTION--Temporary transformation of a saturated cohesionless soil into a liquid similar to quicksand. The stimulus for the transformation is a jolt or shaking from earthquakes, explosions, etc.

LOOP--New section of pipeline parallel to an existing pipeline.

MAINLINE PIPE--The principal transporting pipe.

MANAGEMENT FRAMEWORK PLAN--BLM land **use** planning document.

MATS--A steel mesh net used to prevent materials from being thrown during blasting. A wood platform used in sets to support machinery on soft ground.

MEAN RECURRENCE INTERVAL--The period of time expected to pass between occurrences of some periodic event, based on a statistical evaluation of past occurrences. It is not an absolute value in a predictive sense. Fifty percent of the intervals would be shorter than the mean recurrence interval; 50 percent would be longer.

MITIGATION--The abatement of diminution of construction impact to the environment by (1) avoiding a certain action or parts of an action, (2) employing certain construction measures to limit the degree of impact, (3) restoring an area to preconstruction conditions, (4) preserving or maintaining an area throughout the life of a project, or (5) replacing or providing substitute resources to the environment.

MULCH--Materials such as wood chips or straw on the soil surface to prevent evaporation or erosion or to enrich the soil.

NATIONAL REGISTER OF HISTORIC PLACES--A list of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, and culture.

NONATTAINMENT AREA--A 'prevention of significant deterioration' area designated by EPA that exceeds the national ambient air quality standards for any of the six criteria pollutants.

OVERSTORY--A layer of vegetation, usually shrubs or trees, that forms a secondary layer of vegetation.

OVERTHRUST BELT--A portion of the North American Overthrust Belt whose proven and potential oil and gas resources lie in a generally north-south direction extending from Canada to Mexico, specifically, through Montana and along the western boundaries of Wyoming, Colorado, and northern Utah.

PEDIMENTS--Broad, flat or gently sloping, rock-floored erosion surfaces typically developed in an arid or semiarid region at the base of an abrupt mountain front. They are underlain by bedrock which may or may not be covered with a thin, discontinuous veneer of alluvium.

PETROGLYPHS--Figures, symbols, or scenes pecked or etched in rock.

PHYSIOGRAPHIC PROVINCES--Geographic regions that have distinct landforms resulting from significantly different geologic structures and climate.

PICTOGRAPHS--Painted pictures of animals, **humans**, mythical beings, and geometric or curvilinear designs.

PIPELINE WELDING--Bringing bevelled ends of two joints together and aligning them with line-up clamps. Qualified welders, under strict quality control conditions, join two sections of pipe using courses of weld-metal called beads in a series of passes designated as: 1) stringer bead, 2) hot pass, 3) third pass or hot fill (for heavy-wall pipe), 4) filler pass, and 5) final or capping pass.

PLAYAS--Level areas at the bottom of desert basins that are periodically flooded with water. Floodwater either evaporates or percolates into the playa bottom. Many playas are salty.

POINT SITE--Any point along the pipeline that is within 2 miles of a desert bighorn sheep watering site.

POOL--Underground oil or gas accumulation in porous and permeable rock produced by one or more wells.

POSSIBLE RESERVES--According to the Potential Gas Committee, the estimated quantity of gas available from new field discoveries in formations productive elsewhere within the same geologic province.

PREBUILD--To construct portions of a proposed pipeline system so that they can be used in conjunction with existing systems before the new system begins operation.

PRIME AGRICULTURAL LAND (also Prime Farmland)--Land that is best suited for producing food, feed, forage, fiber, and oilseed crops. The inventory of prime agricultural land is maintained by the **U.S. Department of Agriculture,** Soil Conservation Service.

PROBABLE RESERVES--According to the Potential Gas Committee, the estimated quantity of gas available by extending existing pools or discovering new pools in reservoirs productive elsewhere in existing fields; also, new pools within existing fields in formations productive elsewhere in the same geologic province.

PROVEN RESERVES--According to the Potential Gas Committee, the current estimated quantity of gas which geologic and engineering data demonstrate to be recoverable from known reservoirs under existing economic and operating conditions.

RECREATION RESOURCES--Formally designated areas and informal dispersed areas that are managed by Federal, state, and local agencies in order to preserve and further their **use** for play, amusement, or relaxation.

RELIEF VALVE--Valve that is set to open when pressure reaches a predetermined level.

RESERVOIR (petroleum)--A subsurface porous and permeable rock body in which oil and/or gas occur.

RETAINING WALL--A concrete, rock, or timber wall built from below the water level of a stream to a point above the high water level to control bank erosion.

REVETMENT--A measure to control bank erosion using a footing below the water level using a cofferdam. From this footing, two layers of riprap are laid up to the water level. This method continues up the slope or bank, using a single layer.

RIPARIAN VEGETATION--Vegetation which grows in and is dependent upon moist or wet soils.

RIPRAP--A foundation or erosion control device consisting of rocks thrown together without order.

ROCKLAND--Rough and broken land comprised mainly of rock outcrops.

SALINE SOIL--A soil containing soluable salts in a concentration that impairs growth of plants.

SALVAGE ARCHAEOLOGY--The recovery of archaeological data from a site that would otherwise be destroyed by a project.

SCOPING MEETING--A public meeting designed to determine significant environmental issues and concerns related to a proposed action.

SEISMIC EVENT--Earthquake.

SHALLOW SOILS--A soil where bedrock is within 20 inches of the surface.

SITE (CULTURAL RESOURCES)--A physical location of past human activities or events. It is a discrete locus of activity that is presumably interpretable. A site may be indicated by clusters of objects, presence of features, or occurrence of subsurface cultural bearing deposits. It is recognized that cultural resource sites are extremely variable in size and shape and may consist of secondarily deposited cultural resource remains.

SPECULATIVE RESERVES--According to the Potential Gas Committee, the estimated quantity of gas available either from new pool or field discoveries in formations not previously productive within a productive geologic province or from new field discoveries within a geologic province not previously productive.

SPREAD--A team of construction personnel and equipment required to construct an identified segment of pipeline.

STRATIGRAPHY--A branch of geology dealing with the classification, correlation, and interpretation of stratified rocks. Also, the sequence and description of such rocks in a specific area.

STRINGING PIPE--Placing sections of pipe end to end along a pipeline right-of-way in preparation for welding the joints together to form a pipeline.

SUBSIDENCE--A downward settling or sinking of the earth's surface with little or no horizontal motion (not the result of a landslide or slope failure). The term is not restricted by the rate, magnitude, nor **areal** extent of the phenomenon. The cause may be natural or artificial, e.g., solution, erosion, earthquakes, volcanism, or compaction or withdrawal of solids or fluids from the subsurface.

SUBSOILING--The loosening of soil to depths greater than 16 inches (see also 'CHISELING.'

SUBSTRATUM MATERIALS--Earthen or rock materials which are below the zone of soil formation.

SWALE--A depression which is often **poorly drained.**

TECTONIC--Relating to the study of the regional deformation of the earth's crust and the formation of structures, their origin, mutual relations, and evolution. Closely related to structural geology, which generally deals with more local effects.

TERRACE DITCH--An earthen dam placed across the right-of-way, generally on gently sloping areas where the trench traverses directly up and/or down the face of a hill to break up the flow of water down the face of the hill and/or right-of-way. Sandbag ditch breakers in the trench prevent erosion.

THROUGHPUT--The amount of gas passed through a pipeline.

TOPSOIL--**The surface tilled layer in cultivated areas or the uppermost layer of soil containing organic layer (A horizon).**

TRACTOR-DRAWN RIPPER--A large single tooth, often mounted on a bulldozer, used to fracture materials too hard for conventional earthmoving equipment to move.

UNDERSTORY--An underlying layer of low growing vegetation.

VISUAL RESOURCE MANAGEMENT--The planning, design, and implementation of management objectives to provide acceptable levels of visual impacts for all resource management activities.

WEIR--**A device which measures or regulates the flow of water in streams and supply ditches or canals.**

WET DITCH METHOD--A form of pipeline construction used at stream crossings where the trench is not dewatered and ditching soil is piled upon the stream's banks. This soil is later reused for backfill.

WORKING INTEREST--Portion of oil or gas production proceeds from which operating and development costs are paid.

ABBREVIATIONS AND ACRONYMS

A.C.--alternating current

AGA--American Gas Association

ANGTS--Alaska Natural Gas Transportation System

AQCR--air quality control region

AUM--animal unit month (see glossary)

BACT--best available control technology

BIA--Bureau of Indian Affairs

BLM--Bureau of Land Management

BR--Bureau of Reclamation

B.P.--before present

Btu--British thermal unit

ca--circa

CEC--California Energy Commission

CFR--Code of Federal Regulations

CIG--Colorado Interstate Gas Company

Cities--Cities Service Gas Company

CO--carbon monoxide

COE--U.S. Army Corps of Engineers

CPUC--California Public Utilities Commission

CUP--Central Utah Project

db(A)--decibels on the A-weighted scale

DEIS--draft environmental impact statement

DOI--U.S. Department of the Interior

DOT--U.S. Department of Transportation

EA--Environmental Assessment

El Paso--El Paso Natural Gas Company

EPA--U.S. Environmental Protection Agency

FAA--Federal Aviation Administration

FCC--Federal Communications Commission

FEIS--final environmental impact statement

FERC--Federai Energy Regulatory Commission

FLPMA--Federal Land Policy and Management Act

FS--U.S. Forest Service

FWS--U.S. Fish and Wildlife Service

g--gravity acceleration

HC's--hydrocarbons (nor ane)

HCRS--Heritage Conservation and Recreation Service

hp.--horsepower

HQ--headquarters

HVDC--high voltage direct current

IPP--Intermountain Power Project

KGRA--known geothermal resource area

kV--kilovolts

L_{dn}--day-night sound levels

L_{eq}--sound energy averaged over 24 hours

LNG--liquefied natural gas

Mbf--thousand board feet

Mcfd--thousand cubic feet per day

MFP--Management Framework Plan

mg--milligrams

MMI--Modified Mercalli Intensity

MOA--Memorandum of Agreement

Mountain Fuel--Mountain Fuel Supply Company

MP--milepost

MW--megawatt

NA--not applicable

NAAQS--national ambient air quality standards

NEPA--National Environmental Policy Act

NGC--Natural Gas Company of California

Northwest--Northwest Pipeline Corporation

NO_x--nitrogen oxides

NO_2--nitrogen dioxide

NPDES--national pollutant discharge elimination system

NPS--National Park Service

ORV--off-road vehicle

PG&E--Pacific Gas and Electric Company

PGT--Pacific Gas Transmission Company

PIT--Pacific Interstate Transmission Company

PLGS--Pacific Lighting Gas Supply Company

PLS--Pacific Lighting Service Company

PSD--prevention of significant deterioration

PTMAX--EPA's users network for applied modeling of air pollution point source model

PTS--Pacific Transmission Supply Company

RARE II--Second Roadless Area Review and Evaluation

ABBREVIATIONS AND ACRONYMS

ROW--right-of-way

RMPC--Rocky Mountain Pipeline Company

RMPP--Rocky Mountain Pipeline Project

SHPO--State Historic Preservation Office

SoCal--Southern California Gas Company

Southwest--Southwest Gas Corporation

SO_x--sulfur oxides

SO_2--sulfur dioxide

Trans-Anadarko--Trans-Anadarko Pipeline System

TSP--total suspended particulates

TUP--temporary **use** permit

UBC--Uniform Building Code

ug--microgram

UNK--unknown

USAF--U.S. Air Force

USC--United States Code

USGS--U.S. Geological Survey

VHF--very high frequency

VMS--Visual Management System

VQO--Visual Quality Objective

VRM--Visual Resource Management

WINGS--Wyoming Interstate Natural Gas System

WSA--Wilderness Study Area

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Appendix A
Consultation and Coordination

The key agencies involved in preparing the EIS evaluated the scope of the EIS after reviewing the data received from the 11 scoping meetings and letters received by BLM which identified specific issues of concern.

The following agencies, groups, institutions, and individuals will receive a copy of the DEIS:

FEDERAL GOVERNMENT AGENCIES

Department of the Interior

Office of the Secretary
Office of the Solicitor
Denver Office of the Secretary
Bureau of Land Management
Bureau of Indian Affairs
Bureau of Reclamation
Bureau of Mines
Fish and Wildlife Service
Geological Survey
National Park Service

Department of Agriculture

U.S. Forest Service

Department of Defense

U.S. Army Corps of Engineers
Air Force

Department of Transportation

Federal Highway Administration

Department of Energy

Environmental Protection Agency, Region 8

Advisory Council on Historic Preservation

Interstate Commerce Commission

STATE GOVERNMENTS AND AGENCIES

(Detailed list available upon request from Janis L. Bowles, BLM EIS Project Leader, 555 Zang Street, Third Floor East, Denver, Colorado 80228, phone (303) 234-6737 or Kenneth D. Frye, FERC Project Manager, 825 North Capitol Street NE, Washington, D.C. 20426, phone (202) 357-9039.)

California	A-95 Clearinghouse
	State liaison contact
Idaho	A-95 Clearinghouse
	State liaison contact
Nevada	A-95 Clearinghouse
	State liaison contact
Oregon	A-95 Clearinghouse
	State liaison contact
Utah	A-95 Clearinghouse
	State liaison contact
Wyoming	A-95 Clearinghouse
	State liaison contact

LOCAL GOVERNMENTS

(Detailed list available upon request from Janis L. Bowles or Kenneth D. Frye.)

Various commissioners, mayors, departments, **associations**

U.S. SENATORS AND REPRESENTATIVES

(Detailed list available upon request)

California

Idaho

Nevada

Oregon

Utah

Wyoming

STATE LEGISLATORS

(Detailed list available upon request).

California

Idaho

Nevada

Oregon

Utah

Wyoming

ENVIRONMENTAL GROUPS

Friends of the Earth

Izaak Walton League of America

National Audubon Society

Natural Resources Defense Council

National Wildlife Federation

Native Plant Society

Wilderness Society

Wildlife Society

(Individual and local group lists available upon request).

CITIZENS' GROUPS

Citizen's Advisory Council

League of Women Voters

National Cattlemen's Association

National Historical Society

National Wildhorse Association

National Woolgrowers Association

INDUSTRIES

El Paso Natural Gas Company

Intermountain Power Project

Mountain Fuel Supply Company

Northwest Pipeline Company

Pacific Gas and Electric Company

Pacific Gas Transmission Company

Pacific Interstate Transmission Company

Southwest Gas Corporation

(State and local industry list available upon request).

FERC SERVICE LIST

LIBRARIES

(Detailed list available upon request).

Depositories, libraries, cities, and counties along the RMPP.

INDIVIDUALS

(Detailed list available upon request from Janis L. Bowles or Kenneth D. Frye)

California

Idaho

Nevada

Oregon

Utah

Wyoming

Copies may be inspected at the following offices:

BUREAU OF LAND MANAGEMENT

Office of Special Projects, Washington, D.C.

Office of Special Projects, Denver, CO

California State Office, Sacramento, CA

Bakersfield District Office, Bakersfield, CA

California Desert District, Riverside, CA

Folsom District Office, Folsom, CA

Idaho State Office, Boise, ID

Burley District Office, Burley, ID

Idaho Falls District Office, Idaho, ID

Nevada State Office, Reno, NV

Battle Mountain District Office, Battle Mountain, NV

Ely District Office, Ely, NV

Las Vegas District Office, Las Vegas, NV

Oregon State Office, Portland, OR

Baker District Office, Baker, OR

Burns District Office, Burns, OR

Prineville District Office, Prineville, OR

Utah State Office, Salt Lake City, UT

Salt Lake City District Office, Salt Lake City, UT

Cedar City District Office, Cedar City, UT

Richfield District Office, Richfield, UT

FEDERAL ENERGY REGULATORY COMMISSION

Division of Public Information
825 North Capitol Street NE
Washington, D.C 20426

San Francisco Regional Office
555 Battery Street
San Francisco, CA 94111

Appendix B

RMPC Corporate Structure and National Gas Supply

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RMPC OWNERSHIP AND CORPORATE STRUCTURE OF THE PROJECT SPONSORS

The RMPC is composed of the following four companies: PGT, El Paso, PIT, and NPC. The flow diagram, figure B-l, depicts the relationships between these four companies, their affiliates, and their subsidiaries.

NOTE: On August 24, 1981, the RMPC's comments on the DEIS indicated that designated affiliates for RMPC are:

PGT: Rocky Mountain Gas Transmission Company El Paso: Coronado Pipeline Company PIT: Pacific Interstate Transmission Company (Rocky Mountain) NPC:Northwest Rocky Mountain, Inc.

The outline that follows lists the acronyms used in the flow diagram. Each major heading denotes a parent company. Each subheading denotes a subsidiary of the parent company related in some way to the RMPP. Each section describes that company's relationship to the RMPP.

El Paso Natural Gas Company (El Paso)

El Paso is a partner in the RMPC, owning 30 percent of the company. It is one of four natural gas companies that would receive gas as a result of the RMPP. Gas would be delivered to El Paso by displacement.

Northwest Energy Company (NEC)

NEC owns Northwest Pipeline Corporation, which is a partner in RMPC. NEC would not receive gas from the proposed RMPP.

Northwest Alaskan Pipeline Company (NAPC)

NAPC is one of **10** partners of the Alaska Northwest Natural Gas Transportation Company, which will construct the Alaskan natural gas pipeline.

Northwest Pipeline Corporation (NPC)

NPC is one of four partners in the RMPC, owning 10 percent of the company. NPC could transport some gas from the Rocky Mountain Overthrust Belt region California markets **through interconnections with other pipeline companies and** its existing transmission system.

Pacific Lighting Service Company (PLS)

PLS is one of four natural gas companies that would receive gas from the proposed RMPP. PLS and PG&E would jointly own the 36-inch diameter 27-mile long proposed intrastate pipeline in southern California. PLS, PG&E, and SoCal are also working together to obtain Alaskan gas supplies for consumption in California. PLS owns PIT.

Western Liquefied Natural Gas Terminal Company (WESTERN)

Western and PG LNG are cosponsoring the Western Terminal Project, which would receive Alaskan and Indonesian natural gas as LNG.

Pacific Alaska LNG Company (PA LNG)

PA LNG and Alaska California LNG Company (AC LNG) are cosponsoring the Pacific Alaska Project, which would liquefy Alaskan natural gas to be shipped to Western.

Pacific Lighting Marine Company (PLMC)

PLMC and Pacific Gas Marine Company (PGMC) are affiliates which would jointly own and operate the LNG vessels transporting LNG from Alaska to California for PA LNG and Western. This affiliation is known as the Pacific Marine Associates (PMA).

Pacific Interstate Transmission company (PIT)

PIT is a partner in the RMPC, owning 25 percent of the company.

Southern California Gas Company (SoCal)

SoCal is one of the four natural gas companies that would receive gas from the proposed RMPP. PLS, PG&E, and SoCal are working together to obtain Alaskan and Indonesian gas supplies for consumption in California.

Pacific Interstate Company (ARCTIC) (PITA)

PITA is the partner in the Alaska Northwest Natural Gas Transportation Company, representing PLS.

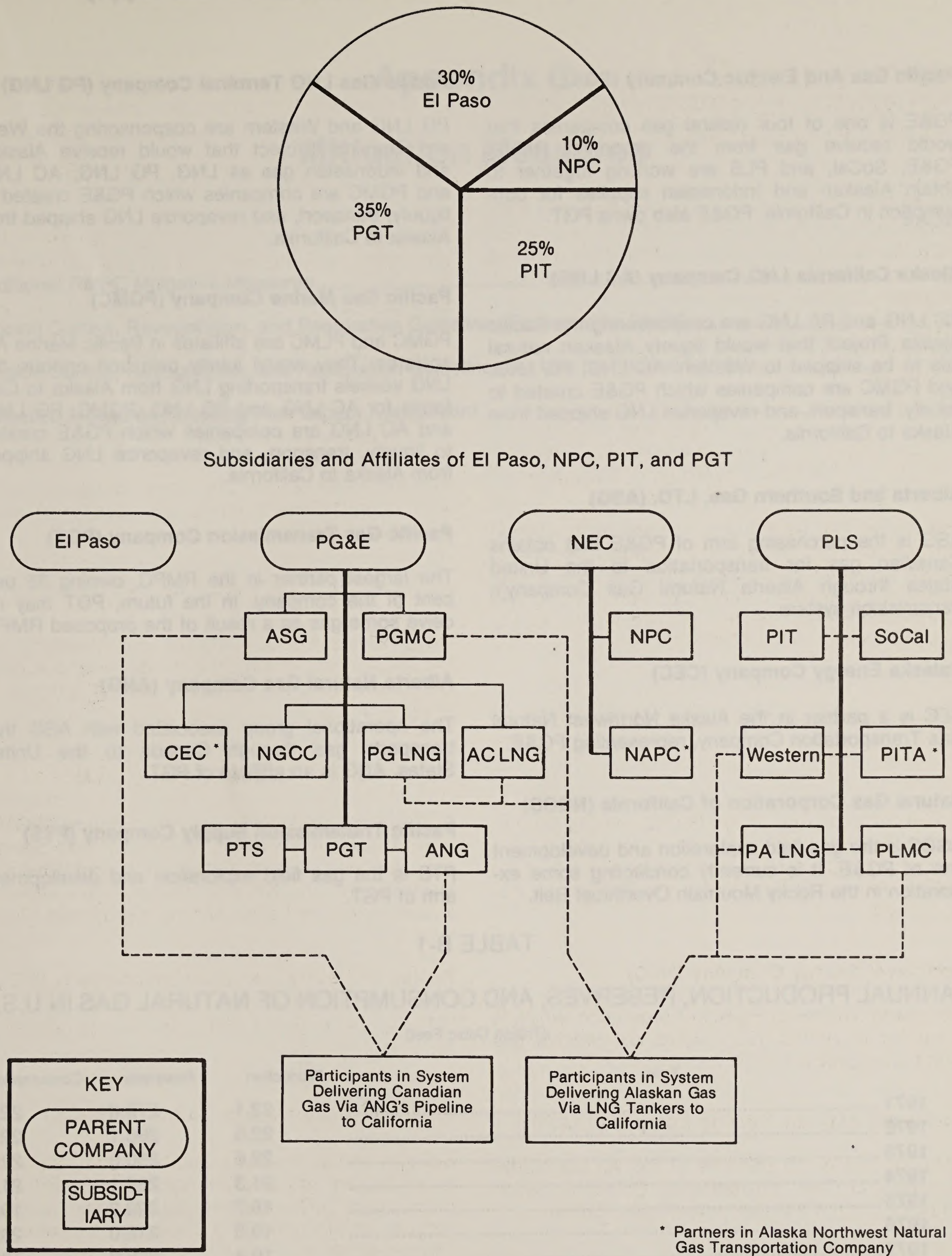


FIGURE B-1. RMPC OWNERSHIP AND CORPORATE STRUCTURE OF THE PROJECT SPONSORS

Pacific Gas And Electric Company (PG&E)

PG&E is one of four natural gas companies that would receive gas from the proposed RMPP. PG&E, SoCal, and PLS are working together to obtain Alaskan and Indonesian supplies for consumption in California. PG&E also owns PGT.

Alaska California LNG Company (AC LNG)

AC LNG and PA LNG are cosponsoring the Pacific Alaska Project that would liquefy Alaskan natural gas to be shipped to Western. AC LNG, PG LNG, and PGMC are companies which PG&E created to liquefy, transport, and revaporize LNG shipped from Alaska to California.

Alberta and Southern Gas, LTD. (ASG)

ASG is the purchasing arm of PG&E that obtains Canadian gas for transportation to the United States through Alberta Natural Gas Company's transmission system.

Calaska Energy Company (CEC)

CEC is a partner in the Alaska Northwest Natural Gas Transportation Company, representing PG&E.

Natural Gas Corporation of California (NGCC)

NGCC is the gas field exploration and development arm of PG&E. It is currently conducting some exploration in the Rocky Mountain Overthrust Belt.

Pacific Gas LNG Terminal Company (PG LNG)

PG LNG and Western are cosponsoring the Western Terminal Project that would receive Alaskan and Indonesian gas as LNG. PG LNG, AC LNG, and PGMC are companies which PG&E created to liquefy, transport, and revaporize LNG shipped from Alaska to California.

Pacific Gas Marine Company (PGMC)

PGMC and PLMC are affiliates in Pacific Marine Associates. They would jointly own and operate the LNG vessels transporting LNG from Alaska to California for AC LNG and PG LNG. PGMC, PG LNG, and AC LNG are companies which PG&E created to liquefy, transport, and revaporize LNG shipped from Alaska to California.

Pacific Gas Transmission Company (PGT)

The largest partner in the RMPC, owning 35 percent of the company. In the future, PGT may receive some gas as a result of the proposed RMPP.

Alberta Natural Gas Company (ANG)

The operational group associated with ASG that transports gas through Canada to the United States. ANG is an affiliate of PGT.

Pacific Transmission Supply Company (PTS)

PTS is the gas field exploration and development arm of PGT.

TABLE B-1

ANNUAL PRODUCTION, RESERVES, AND CONSUMPTION OF NATURAL GAS IN U.S.

(Trillion Cubic Feet)

Year	Production	Reserves	Consumption
1971	22.1	278.8	22.5
1972	22.5	266.1	22.7
1973	22.6	250.0	22.5
1974	21.3	237.1	21.3
1975	19.7	228.2	19.9
1976	19.5	216.0	20.2
1977	19.4	208.9	19.9
1978	19.3	200.3	19.8
1979	19.9	194.9	19.9

Note: Annual reserve data vary from year to year as a result of revisions and extensions of previous reserve estimates, new gas field discoveries, new reservoir discoveries in old gas fields, and annual production from existing reserves.

Source: American Gas Association 1979.

Appendix C

Mitigation Measures

PAGE

This appendix identifies four groups of mitigation measures. The first two are part of the applicant's proposed action; the third would be in addition to the applicant's proposal; the last would be implemented depending on the alternatives or variations selected by the FERC, BLM, and FS decision-makers. The impact analysis assumes incorporation into the project of **the** first two groups, proposed by RMPC, and the third, developed by the BLM and FS to be applied as one of the stipulations to the right-of-way grant. It does not assume incorporation of the fourth group. This group has been developed as a result of impact analysis and will be made part of the stipulations to the right-of-way grant.

The 'BLM and FS General Measures' presented in appendix D are also routinely required of similar projects in this part of the country to mitigate impacts. The analysis assumes that these measures will be implemented.

ADDITIONAL RMPC MITIGATIVE MEASURES

The following measures are proposed by the applicant. The impact analysis assumes these measures would be implemented.

To determine the actual construction right-of-way, the applicant would conduct air and limited ground reconnaissance surveys of the proposed corridor. In addition, specialized surveys focusing on hydrographic, topographic, geotechnical, seismic, archaeological, paleontological, and biological concerns would be conducted as necessary. The applicant **will procure** a contract for a cultural resource inventory of the **route prior to** construction. **All survey results would be used to determine the final pipeline alignment and design and to identify specific topics of concern.**

The final right-of-way would be selected to limit contact with highly erodible slopes, woodlands, and wetlands and to preserve the local aesthetic values, particularly at stream and river crossings and through areas where the right-of-way would be highly visible. The final route selection would also incorporate minor deviations prompted by environmental considerations, right-of-way easement acquisition, local terrain features, and land **use** patterns. If alignment changes could not be made, the applicant would undertake mitigation measures where practical.

The applicant would use the following mitigative measures during construction of the proposed pipeline. (Other mitigative measures are discussed under 'Construction, Operation, and Maintenance' in chapter 2.)

- Where appropriate, concrete-lined canals, irrigation ditches, and drainage channels would be crossed by boring and casing.
- Because of potentially severe erosion, the applicant **may** bore the Las Vegas Wash crossing **after completion of further engineering studies.**
- If new access roads were required, they would be located to minimize sidehill cuts and to avoid drainage bottoms and areas of grass, water tanks, and riparian vegetation.
- Any new borrow pits would be located only in areas authorized by landowners or responsible agencies.
- Where feasible, the applicant would feather the edges of the right-of-way vegetation to lessen the visual impact.
- To the extent possible, the applicant would avoid construction during peak wildlife breeding periods or other critical times.
- Dust would be controlled during construction by water sprinkling and controlling vehicle speed limits at work sites.
- Marketable timber cleared in national forests would be harvested and set aside as directed by the FS.
- **The proposed pipeline would be constructed by contractor(s) selected by the applicant through competitive bidding.** To ensure contract compliance, the applicant would have inspectors at the construction site to see that contractors carried out all construction in accordance with Federal and state regulations and project stipulations.
- During construction in a biologically sensitive area, a qualified biologist would be **available** to assure that planned mitigation measures were carried out and to recommend additional measures as necessary. Mitigation measures would be based on the applicant's preconstruction biological field surveys and consultation with wildlife agencies concerning unique or sensitive communities or habitats of threatened or endangered species. Further, a qualified archaeologist and paleontologist would be available as needed.
- Water for hydrostatic testing would be obtained from approved sources and pumped in a manner that would minimize alteration of streamflow conditions, fish and wildlife resources, or aesthetic values of an area. To prevent damage to aquatic organisms, water

intakes would be screened, and the rate of intake would be slow.

- If the hydrostatic test water were discharged into a dry waterway, the discharge rate would not exceed the reported flow during normal flow periods. If a watercourse were not available, the test water would be discharged to a temporary evaporation pond. The quality of the hydrostatic test water would be monitored **as required by a permit.** All applicable Federal and state water quality regulations would be met at the time of discharge.
- The proposed Sage Compressor Station would be designed to blend with the natural landscape. Consideration would be given to landscaping, plantings, colors compatible with the local environment, and nonreflective paint.
- The applicant would continue to work with the landowner to correct any problems resulting from the construction, maintenance, and operation of the proposed pipeline during its entire operating life.

EROSION CONTROL, REVEGETATION, AND RESTORATION GUIDELINES PROPOSED BY THE RMPC

On January 23, 1981, the applicant filed the following "Erosion Control, Revegetation, and Restoration Guidelines" with the FERC.

This filing **submission** consolidates its statement of restoration procedures. Site-specific plans would have to be developed after the exact alignment of the pipeline had been determined. **(Reynolds, January 8, 1981).**

Standard procedures for the Rocky Mountain Pipeline Project (RMPP) would include implementation of erosion control and revegetation measures to assure that lands disturbed by construction activities would be restored to a stable, productive, and aesthetically acceptable condition, similar to preconstruction conditions.

Because the proposed right-of-way is composed of many types of terrain, soils, vegetation, land uses, and climatic conditions, detailed site-specific reclamation plans would be developed prior to construction and would include sets of techniques and measures tailored to each condition encountered. Local expertise and locally effective reclamation methods would be considered when the site-specific procedures for the detailed reclamation plan are developed.

The rights and obligations of the RMPP applying to its use of private **lands** will be set out in the terms of the easement, an agreement between the RMPP and the landowner. Terms of the easement will include: the width and location of the right-of-way; the granting of permission to construct, replace, maintain, use, and remove facilities as described; the granting of right of ingress and egress to the facilities; the right to mark the facility; the obligation of the landowner to maintain cover over the buried facilities; some minimal restrictions placed on the **use** of the right-of-way by the landowner; and the restoration or mitigation measures that are to be performed by the RMPP to satisfy the requirements of the landowner. During the construction phase of the project, the applicant's representative would provide: (1) liaison with private landowners, Federal agency officials, and local governments; (2) expertise to direct applicable restoration procedures, where special conditions are encountered, without causing construction delays; and (3) favorable public relations.

General erosion control and restoration measures have been developed for the following areas:

- Right-of-way and Site Clearing
- Trenching and Preservation of Topsoil
- Backfilling and Grading
- Land Preparation and Cultivation
- Revegetation
- Maintenance and Monitoring
- Use of Biochemicals
- Construction Timing

Right-of-way and Site Clearing

Emphasis would be placed on protecting existing vegetation and minimizing disturbance of the existing environment.

o Land grading would be done only where necessary to accommodate construction equipment.

o Sidehill cuts will be bladed only enough to ensure a safe and stable plane for equipment usage.

o Vegetation will be cut close to the ground, with root systems left in place. The cut vegetation, including unmarketable timber would be stockpiled and later burned or shredded and chipped for **use** in restoration operations or disposed **of** at the discretion of the landowner or authorized agency official.

o Where the right-of-way crosses streams and other water bodies, construction techniques designed to minimize siltation and turbidity will be used.

o Operation will be conducted in a manner to minimize the induction of debris into any body of water.

o Design and construction of temporary roads would ensure proper drainage and minimize soil erosion. Following use, these roads would be removed and areas restored as required by agreements with the landowners. Restoration would be to the satisfaction of the landowner.

o Time interval between clearing operations and actual construction activities would be minimized.

Trenching and Preservation of Topsoil

Trenching methods and techniques would ensure that:

o When requested by landowners in agricultural areas, topsoil will be conserved and protected against possible loss. Upon completion of backfilling, the topsoil will be properly replaced over the graded or excavated areas. A 'double ditching' procedure will be used where such method will benefit the preservation of topsoil.

o Excavated materials will be stored on a strip approximately 25-feet wide along one side of the right-of-way. The remaining right-of-way will be used to provide access for construction equipment, to permit passage of equipment, to store supplies, and to construct the pipeline.

o Cofferdams or other diversionary techniques would be used where necessary to permit flow in one part of a stream while pipelaying construction occurs in another part.

Backfilling and Grading

The following backfilling and grading techniques would be used:

o The contour of the ground would be restored to permit normal surface drainage, a slight berm will be left over the pipeline which will compensate for natural subsidence of backfill.

o In sloping terrain, erosion control structures such as water bars, diversion channels, and terraces would be constructed to divert water away from the pipeline trench and reduce soil erosion along the right-of-way or other areas disturbed by the construction.

o All structures such as terraces, levees, underground drainage systems, irrigation pipelines, and canals would be restored to preconstruction conditions so that they would function as originally intended.

o The surface would be graded to conform to the existing surface of the adjoining areas except for a slight crown to compensate for natural subsidence. In cropland areas, especially border- and furrow-irrigated cropland, the backfill will be jetted to compact soil to its natural density and to match the bordering areas to allow surface irrigation.

o Materials unsuitable for backfilling or excess fill material would be disposed of in a waste area arranged by the project representative with the landowner or authorizing officials.

o Temporary work space areas used at stream and highway crossings and other special sites would be restored to approximately preconstruction condition to the satisfaction of landowner or authorizing officials.

o The right-of-way at stream crossings would be restored to a preconstruction state. The upland areas and banks would be revegetated to simulate preconstruction conditions. Where revegetation is not possible, the banks would be protected with rock. The streambed would be returned to its original elevation and grade.

Land Preparation for Seeding and Cultivation

Construction, backfilling, and grading activities commonly cause compaction and alter soil conditions that may affect soil productivity and/or seeding success in the right-of-way areas. The following practices and techniques would be used to improve these soil conditions, protect soil from erosion, and provide a favorable seedbed:

o In accordance with agreements with the landowner, cultivated land that has been compacted during construction will be loosened by use of a ripper, disc or harrow or other suitable equipment. Land structures, such as contour terraces, drain ways and ditches will be rebuilt.

o Where the right-of-way will be subject to strong erosional forces prior to vegetation reestablishment, straw will be mulched into the soil to promote physical stabilization. Snow fences will be constructed where appropriate to prevent further erosion.

- o In addition to installing erosion-control structures, erosion-prone areas will be reseeded, using supplemental fertilizers as necessary.
- o When needed, excess ditch spoil or rock may be used for erosion-control.
- o Soil areas with rock fragments, such as very coarse gravel, cobble, or stone scattered on the surface, would be restored to simulate the original preconstruction surface condition and to blend with the adjoining area.

Revegetation (Reseeding and Planting)

The loss of vegetation from lands disturbed by pipeline construction can be mitigated by satisfactory revegetation. To ensure a successful revegetation program, methods and procedures would be consistent with local climate and soil conditions and would consider recommendations of local experts. The following practices and techniques would be used in areas where reseeding is suitable:

- o A firm seedbed would be prepared prior to seeding. This may include a mulch of plant residues or other suitable materials. A cover crop may be needed in larger disturbed areas.
- o Seed would be planted by drilling, broadcasting, or hydroseeding.
  - Drill seeding with a grass drill equipped with depth bands would be used where topography and soil conditions allow operation of equipment.
  - Broadcast seeding would be used for inaccessible or small areas. Seed would be covered by raking or harrowing.
  - Hydroseeding would be done in critical areas, as determined by agency representative and the applicant.
- o Only species adapted to local soil and climatic conditions would be used. Generally, these would be native species; however, introduced species may be considered for specific conditions when approved by the landowner and regulatory authority. Seeding rates in critical area plantings and generally throughout the right-of-way will be determined to allow for seed mortality due to adverse growing conditions.
- o Seeding would be scheduled based on the assessment of local climatic conditions and the response of newly seeded grasses to such conditions.

Maintenance and Monitoring

The right-of-way would be inspected to monitor the success and maintenance of erosion control measures and revegetation programs on native grazing lands. The monitoring program would identify problem areas and corrective measures to ensure vegetation cover and erosion control. Certification of successful revegetation and erosion control would be based on compliance with right-of-way agreements.

Use of Biochemicals

Herbicides, or any other biochemicals, if required, will be those commercially available, approved by EPA, appropriate to be used for the situation at hand, and applied in full compliance with the manufacturer's instructions.

Construction Timing

Irrigated Cropland--Pipeline construction activities would be scheduled or other mitigative measures taken to minimize disruption of irrigation delivery systems during the major irrigation season, to reduce effects on crop production in areas of construction as well as adjoining irrigated cropland areas served by the systems.

EROSION CONTROL, REVEGETATION, AND RESTORATION GUIDELINES FOR USE ON FEDERAL LANDS

The following guidelines, developed by the BLM and FS, would be included as stipulations in the right-of-way **grants** issued to the RMPC.

Standard procedures for the Rocky Mountain Pipeline Project would include implementation of erosion control and revegetation measures to assure that lands disturbed by construction activities would be restored to a stable, productive, and aesthetically acceptable condition.

A detailed, site-specific reclamation plan would be developed and become part of the operation plan. Because the proposed right-of-way is composed of many types of terrain, soils, vegetation, land uses, and climatic conditions, the detailed plan would include sets of techniques and measures tailored to each condition encountered. Local expertise and locally effective reclamation methods would be followed when the site-specific procedures for the detailed reclamation plan are developed. The erosion control, revegetation, and restoration guidelines and plan would be implemented under the direction of the appropriate agency official.

Detailed information regarding applicable techniques and technical assistance to private landowners concerning erosion control measures and reclamation procedures would be obtained from the Soil Conservation Service through local Soil Conservation Districts. Technical assistance and approval of written plans for Federal lands would be obtained from the Bureau of Land Management and the U.S. Forest Service prior to any construction.

During construction of the project, an onsite reclamation specialist would be employed by the applicant to provide: (1) liaison with private landowners, Federal agency officials, and local governments; (2) expertise to direct applicable restoration procedures when special conditions are encountered, without causing construction delays; and (3) favorable public relations.

General erosion control and restoration measures have been developed for the following areas and will be included as part of the Operating Plan:

- Right-of-way and Site Clearing
- Trenching and Preservation of Topsoil
- Backfilling and Grading
- Land Preparation and Cultivation
- Revegetation
- Maintenance and Monitoring
- Use of Biochemicals

Right-of-way and Site Clearing

Emphasis would be placed on protecting existing vegetation and minimizing disturbance of the existing environment.

o Land grading would be done only on the area required for construction.

o Sidehill cuts would be kept to a minimum to ensure resource protection and a safe and stable plane for efficient equipment use. The authorizing agency would provide assistance and would approve sidehill cuts prior to construction.

o Existing ground cover such as grasses, leaves, roots, brush, and trees trimmings would be cleared **and piled** only to the extent necessary. Slash limbs and would be piled and later shredded and chipped for **use** in restoration operations or disposed of at the discretion of the authorized agency official.

o Trees and shrubs on the right-of-way that are not cleared would be protected from damage during construction.

o Where the right-of-way crosses streams and other water bodies, the banks would be stabilized to prevent erosion. Construction techniques would minimize damage to shorelines, recreational areas, and fish and wildlife habitat.

o Care would be taken to avoid oil spills and other types of pollution in all areas including streams and other water bodies and in their immediate drainage areas. All spills would be immediately cleaned up.

o Design and construction of all temporary roads would be based on an approved transportation plan and would ensure proper drainage, minimize soil erosion, and preserve topsoil. After abandonment, these roads would be closed and areas restored without undue delay or maintained at the discretion of landowners. Restoration, including redistribution of topsoil, would be to the satisfaction of landowner and/ or regulatory officials.

o During adverse weather conditions, as determined by the onsite reclamation specialist, the authorizing agency would issue stop and start orders to prevent rutting or excessive tracking of soil and deterioration of vegetation in the right-of-way area.

o During construction activities near streams or lakes, sedimentation (detention) basins and/or straw bale filters would be constructed to prevent suspended sediments from reaching downstream watercourses or lakes, **as required by the Authorized Officer.**

o Actual construction activities will immediately follow clearing operations, especially in areas of soil that are highly susceptible to wind or water erosion and other special areas.

Trenching and Preservation of Topsoil

Trenching methods and techniques would ensure that:

o Topsoil is removed from the trench area by double-ditching (i.e., windrowed separately, protected, and replaced last during backfilling). This procedure would be followed as specified by the authorizing officer.

o Remaining unearthed materials are removed and stored in a manner that facilitates backfilling procedures, **uses** a minimum amount of right-of-way area, and protects the excavated material from vehicular and equipment traffic.

o Cofferdams or other diversionary techniques would be used where necessary to permit flow in one part of a stream while pipelaying construction occurs in another part.

o A specific trenching and excavated material stockpiling procedure would be used on steep-sloping and rough, broken terrain to ensure minimum disturbance as outlined in the operations plan.

Backfilling and Grading

The following backfilling and grading techniques would be used:

o Backfill would be replaced in a sequence and density similar to the preconstruction soil condition.

o Backfilling operations would be conducted **as** in such a manner to minimize further disturbance of vegetation.

o The contour of the ground would be restored to permit normal surface drainage.

o In strongly sloping and steep terrain, erosion control structures such as water bars, diversion channels, and terraces would be constructed to divert water away from the pipeline trench and reduce soil erosion along the right-of-way and other adjoining areas disturbed during construction.

o All structures such as terraces, levees, underground drainage systems, irrigation pipelines, and canals would be restored to preconstruction conditions so that they would function as orginally intended.

o The surface would be graded to conform to the existing surface of the adjoining areas except for a slight crown over the trench to compensate for natural subsidence. In cropland areas, especially border and furrow irrigated cropland, the soils would be compacted and the crown would be smoothed to match the bordering area to allow surface irrigation.

o Topsoil would be uniformly replaced over the trench fill and other disturbed areas to restore productivity to its preconstruction condition.

o Materials unsuitable for backfilling or excess backfill material would be disposed as **of** arranged by the authorizing officials.

o Temporary work space areas used at stream and highway crossings and other special sites would be restored to approximate preconstruction conditions and to the satisfaction of authorizing officials.

o The right-of-way at stream crossings would be restored to a preconstruction state. The upland areas and banks would be revegetated to preconstruction conditions. Where this is not possible, they would be mulched with rock. The size of the rock mulch would be larger in diameter than materials excavated from the trench. The streambed would be returned to its original contours with sediments like those that were excavated.

Land Preparation for Seeding and Cultivation

Construction, backfilling, and grading activities commonly cause compaction and alter soil conditions that affect soil productivity and/or seeding success in the right-of-way area. The following practices and techniques would be used to improve these soil conditions, protect soil from erosion, and provide a favorable seedbed:

o In cropland areas, **as required by authorizing agency or** landowner, subsoiling or chiseling would be used to ensure that soil compaction is reduced and preconstruction soil permeability is restored.

o Chiseling would be used, unless objected to by the landowner or authorizing agency, in range land areas to reduce compaction and improve soil permeability. Pitting and contour furrowing as directed by the authorizing agency or landowner would be done on steeper slopes of disturbed areas to increase infiltration and to reduce runoff and erosion.

o Suitable mulches and other soil stabilizing practices would be used on all regraded and topsoiled areas to protect unvegetated soil from wind and water erosion and to improve water absorption.

o Special mulching practices or matting would be necessary in critical areas where wind and water are serious erosion hazards to protect seeding, seedlings after germination, and plantings.

o Commercial fertilizers would be applied to soil areas with low inherent fertility to maintain crop yields and establish grass seedings. Application rates would be commensurate with annual precipitation and available irrigation water.

o Seedbed for areas seeded to grass would be prepared to provide a firm and friable condition suitable for the establishment of grass stands.

o Rock mulches would be used in steep-sloping rock outcrop areas and low precipitation areas to reduce erosion and promote vegetal growth.

o Cultivation and land preparation operations on steeply sloping areas would be done on the contour to minimize erosion.

o Soil areas with rock fragments, such as very coarse gravel, cobble, or stone scattered on the surface, would be restored to the original preconstruction surface condition to blend with the adjoining area, to avoid a smooth surface right-of-way area, and to control accelerated erosion.

Revegetation (Reseeding and Planting)

The loss of vegetation from lands disturbed by pipeline construction can be mitigated only by satisfactory revegetation. To ensure a successful revegetation program, methods and procedures would be consistent with local climate and soil conditions and would follow recommendations and directions of local experts. Revegetation efforts would be continued until a satisfactory vegetative cover is established. The following practices and techniques would be used in areas where reseeding is suitable as determined by the authorizing agency:

o A firm seedbed would be prepared prior to seeding. This would include a mulch of plant residues or other suitable materials. A cover crop may be needed in larger disturbed areas.

o Seed would be planted by drilling, broadcasting, or hydroseeding. Drilling is the preferred method, because it is usually most successful.
- Drill seeding with a grass drill equipped with depth bands would be used where topography and soil conditions allow operation of equipment to meet the seeding requirements of the species being planted.
- Broadcast seeding would be used for inaccessible or small areas. Seed would be covered by raking or harrowing.
- Hydroseeding would be done in critical areas **determined by the reclamation specialist or Authorized Officer.**

o Only species adapted to local soil and climatic conditions would be used. Generally, these would be native species. However, introduced species may be considered for specific conditions when approved by the landowner and regulatory authority. Seeding rates in critical area plantings and generally throughout the right-of-way would be increased 100 percent over regular seeding rates to allow for seed mortality due to adverse growing conditions.

o Seed testing will be conducted to meet state, Federal, and agency seed requirements.

o Seeding would be done when seasonal or weather conditions are most favorable, and as determined by the landowner or Authorized Officer.

o Grazing or mowing would be delayed at least one season after seeding to provide time for vegetation to become established, especially in highly erodible areas, unless objected to by the landowner or lessee. Protective fencing may be necessary in special areas and will be constructed, maintained and removed according to authorizing agency specifications.

o In areas of low annual precipitation **(generally less than 8 to 10 inches),** where reseeding is not suitable or as successful, erosion control structures and measures would be applied on sloping areas to reduce accelerated erosion, to allow reestablishment of preconstruction surface soil conditions, and to allow natural revegetation.

o Trees and shrubs would be reestablished in areas as specified in the revegetation plan. 5o **Temporary and/or permanent structures would be installed by the company at specific locations along the right-of-way and other disturbed sites to prevent off-road vehicle access.**

Maintenance and Monitoring

Joint inspection of the right-of-way by the applicant and authorizing agency would be conducted to monitor the success and maintenance of erosion control measures and revegetation programs on native grazing lands for two growing seasons, or for a period determined by the landowner on private land, or the authorized agency official on state or Federal land. The monitoring program would identify problem areas and corrective measures to ensure vegetation cover and erosion control. Certification of successful revegetation and erosion control would be determined by the landowner or authorized agency official.

Use of Biochemicals

The **use** of biochemicals such as herbicides, fungicides, and fertilizer would comply with state and Federal laws, regulations and policy regarding the **use** of poisonous, hazardous, or persistent substances. State and Federal wildlife agencies would be contacted if application of any of these substances would be on or near sensitive wildlife areas. Application of these substances would be by ground methods. Prior to the **use** of such substances on or ne the permit or grant area, the applicant would obtain approval of a written plan for such **use** from the authorizing officer, landowner, and appropriat wildlife agency. The plan would outline the kind of chemical, methods of application, purpose of application, and other information as required, and would be considered as the authorized procedure for all applications until revoked by the authorizing officer, landowner, or appropriate wildlife agency. This plan will become part of the operation and construction plan.

Construction Timing

Irrigated Cropland--Pipeline construction activities would be timed, as possible, to avoid disruption of irrigation delivery systems during the major irrigation season, to reduce effects on crop production in areas of construction as well as adjoining irrigated cropland areas served by the systems.

MITIGATING MEASURES RESULTING FROM IMPACT ASSESSMENT

The following mitigation measures would be imposed on the Federal lands which the RMPP would traverse. **To the extent possible, it is hoped that the applicant will avoid critical periods voluntarily on private lands which would be crossed by the pipeline.**

General

MEASURE: The permanent right-of-way and the construction area covered by the temporary **use** permit will be no wider than 100 feet, per the applicat by the RMPC. The RMPC will employ two-toning or other methods necessary to stay within the 100-foot width. If additional width is necessary even with such construction methods, the Authorized Officer will prepare a supplementary environmental analysis (EA). The EA will be given high priority by the agency and will be prepared prior to surface disturbance outside of the 100-foot wide right-of-way. Mitigation developed in the EA will be applied as deemed necessary by the Authorized Officer in addition to the existing stipulations in the right-of-way grant and/or referenced construction-operating plan.

EFFECTIVENESS: The measure will help to ensure that excessive environmental disturbance would not occur. If additional construction width is necessary, the preparation of the site specific EA will allow the Authorized Officer to administer the project with adequate knowledge of the environmental consequences.

APPLICATION: The measure will be applied to the proposed action or to any of the alternatives and variations selected.

MEASURE: The Authorized Officer will work with the RMPC to locate and flag the 'feathered' vegetation edges to be kept clear of 2-inch diameter breast height shrubs or trees for visual safety inspection over the pipeline.

EFFECTIVENESS: In areas of a continuous pattern of vegetation the contrast would be significantly lessened by feathering straight-line clearings (overclearing in some locations and clearing less than the granted right-of-way width in other areas to simulate natural vegetative patterns).

APPLICATION: This measure will be applied to the proposed action and to any alternative or variation which is selected and will provide for visual mitigation and safety inspection by foot, horseback, vehicle, or airplane.

MEASURE: The far east side of the proposed action corridor from MP 136 to MP 140 should be followed in pipeline alignment.

EFFECTIVENESS: This would reduce impacts from construction by avoiding the slightly higher slopes and thus, the more dissected terrain. It would also avoid most or all of the aspen groves which could be traversed.

APPLICATION: This measure will be applied by the FS from approximately MP 136 through MP 140 of the proposed action in FS administration of the centerline staking process.

Vegetation

MEASURE: The larger species of cacti encountered through the desert areas will be stockpiled and replanted after right-of-way recontouring. Milepost areas and species requiring this procedure will be designated by the Authorized Officer. Where transplanting is impractical, BLM will offer the cacti for sale or giveaway or will authorize the RMPC to do so.

EFFECTIVENESS: Cacti species must sit with no root protection to develop a 'callus' before they are replanted; thus, this method would be horticulturally successful in preserving the plants.

APPLICATION: The measure will be applied to the proposed action and to any alternatives and variations selected which would traverse creosote bush, saltbush-greasewood, or other vegetation types which contain cacti species.

MEASURE: The **Central Nevada Alternative** will be aligned to avoid affecting a unique stand of Rocky Mountain red cedar *(Juniperus scopulorum)*, from MP 162 to MP 165.

EFFECTIVENESS: This action would be successful in eliminating significant effects on the tree stand.

APPLICATION: This measure will be applied to the **Central Nevada Alternative.**

Wildlife

Impacts to wildlife species and their habitats were assessed using the proposed construction schedule and a 1-mile wide corridor. Certain wildlife species would be adversely affected if pipeline construction took place in their habitats during critical periods in their life cycles. The proposed construction schedule would avoid many of these critical periods; thus, impacts are not anticipated. Other critical periods for wildlife coincide with the construction schedule. All critical habitats and **use** periods are listed on tables C-1 through C-8 for the proposed action, alternatives, and variations. Alignment of the pipeline could eliminate some of the areas; it could also add critical areas to the list.

MEASURE: The critical wildlife habitats and periods listed in tables C-1 through C-8 will be avoided during construction of the proposed action, unless direction is otherwise given from the authorized officer.

EFFECTIVENESS: Avoiding the areas listed in tables C-1 through C-8 would eliminate potential impacts to wildlife habitats and species of concern, including those which would be affected if the proposed construction schedule changes for any reason.

APPLICATION: The measure will be applied to the proposed action or any alternative and variation which is selected, as indicated by the following list:

Table C-1 Proposed Action
Table C-2 Alternative A--Northern Systems Alternative
Table C-3 Alternative B--Sanpete Valley Alternative
Table C-4 Alternative C--Central Nevada Alternative
Table C-5 Alternative D--Sevier-Escalante Desert Alternative
Table C-6 Alternative E--West Salt Lake Alternative
Table C-7 Alternative F--Provo Canyon Alternative
Table C-8 All variations

TABLE C-1 (Revised)

CRUCIAL WILDLIFE USE AREAS AND PERIODS TO BE AVOIDED ALONG THE PROPOSED ROUTE

Approximate MP	Dates When Construction Would be Avoided	Reason
0-43	November 15 to April 1	Big Game Winter Range
5-9	March 1 to June 30	[1]Sage Grouse Habitat
5-26	March 15 to June 15	Waterfowl Area
18	March 15 to July 15	[2]Raptor Habitat
22-26	March 1 to June 15	Sage Grouse Habitat
27-29	March 15 to July 15	Raptor Habitat
29	March 15 to July 15	[2]Golden Eagle Nest
30-41	March 1 to June 30	Sage Grouse Habitat
36-39	April 15 to July 15	Waterfowl Area
40	March 15 to July 15	Raptor Habitat
49-52	March 1 to June 30	Sage Grouse Habitat

TABLE C-1 (Revised)—Continued

Approximate MP	Dates When Construction Would be Avoided	Reason
49-52	November 15 to April 1	Big Game Winter Range
49-52	December 1 to March 31	Bald Eagle Winter Habitat
68-92	November 15 to April 1	Big Game Winter Range
83-86	December 1 to March 31	Bald Eagle Winter Habitat
96-108	March 15 to July 15	Sandhill Crane Habitat
129-158	March 15 to July 15	Raptor Habitat
130-140	April 15 to July 15	Waterfowl Area
134-139	March 1 to June 30	Sage Grouse Habitat
152-163	November 15 to April 1	Big Game Winter Range
155	December 1 to March 31	Bald Eagle Winter Habitat
165	March 15 to July 15	Golden Eagle Nest
165-169	March 15 to July 15	Raptor Habitat
165-170	November 15 to April 1	Big Game Winter Range
173-176	March 1 to June 30	Sage Grouse Habitat
182-184	November 15 to April 1	Big Game Winter Range
188-193	November 15 to April 1	Big Game Winter Range
210-224	November 15 to April 1	Big Game Winter Range
276-280	November 15 to April 1	Big Game Winter Range
281-284	March 1 to June 30	Sage Grouse Habitat
288-296	November 15 to April 1	Big Game Winter Range
290-294	March 1 to June 30	Raptor Habitat
303-312	December 1 to March 31	Bald Eagle Winter Habitat
356-358	March 1 to June 30	Raptor Habitat
358-360	December 1 to March 31	Bald Eagle Winter Habitat
363-369	December 1 to March 31	Bald Eagle Winter Habitat
367-379	November 15 to April 1	Big Game Winter Range
380-383	December 1 to March 31	Bald Eagle Winter Habitat
381-407	November 15 to April 1	Big Game Winter Range
393-403	December 1 to March 31	Bald Eagle Winter Habitat
404-407	March 1 to June 30	Raptor Habitat
435-445	May 15 to September 15	[3]Desert Bighorn Sheep Area
440-447	May 15 to September 15	[4]Quail Management Areas
463	May 15 to September 15	Desert Bighorn Sheep
477-488	March 1 to June 30	Golden Eagle Nesting Area
485	May 15 to September 15	Desert Bighorn Sheep
494	May 15 to September 15	Desert Bighorn Sheep
509-515	May 15 to September 15	Desert Bighorn Sheep
510-515	March 1 to June 30	Golden Eagle Nesting Area
537	May 15 to September 15	Desert Bighorn Sheep
539-541	May 15 to September 15	Quail Management Area
548	May 15 to September 15	Desert Bighorn Sheep
551-556	May 15 to September 15	Quail Management Area
556-570	May 15 to September 15	Desert Bighorn Sheep
560-578	May 15 to September 15	Quail Management Area

[1]This period should be avoided only if pipeline construction would pass within 2 miles of a strutting ground.

[2]This period should be avoided only if pipeline construction would occur within 1 mile of an active raptor nest.

[3]This period should be avoided only if pipeline construction would occur within 2 miles of a water source for desert bighorn sheep habitat.

[4]This period should be avoided only if pipeline construction would occur within 2 miles of a guzzler.

TABLE C-2 (Revised)

CRUCIAL WILDLIFE USE AREAS AND PERIODS TO BE AVOIDED ALONG THE NORTHERN SYSTEMS ALTERNATIVE (A)

Approximate MP	Dates When Construction Would be Avoided	Reason
0-10	November 15 to April 1	Big Game Winter Range
0-8	March 1 to June 30	Sage Grouse Habitat
18-24	March 15 to June 15	Waterfowl Area
33-40	November 15 to April 1	Big Game Winter Range
33-40	March 1 to June 30	[1]Raptor Habitat
34	March 1 to June 30	Sage Grouse Habitat
66-71	November 15 to April 1	Big Game Winter Range
66-88	March 1 to June 30	Raptor Habitat
142-167	March 1 to June 30	Raptor Habitat
142-167	March 15 to June 15	Waterfowl Area

[1]This period should be avoided only if pipeline construction would occur within 1 mile of an active raptor nest.

TABLE C-3 (Revised)

CRUCIAL WILDLIFE USE AREAS AND PERIODS TO BE AVOIDED ALONG THE SANPETE VALLEY ALTERNATIVE (B)

Approximate MP	Dates When Construction Would be Avoided	Reason
	Proposed Action MP	
0-43	November 15 to April 1	Big Game Winter Range
4-9	March 1 to June 30	Sage Grouse habitat
5-26	March 15 to June 15	Waterfowl Area
17-18	March 1 to June 30	Sage Grouse
18	March 15 to July 15	[1]Raptor Habitat
22-26	March 1 to June 15	Sage Grouse Habitat
27-29	March 15 to July 15	Raptor Habitat
29	March 15 to July 15	[1]Golden Eagle Nest
30-41	March 1 to June 30	Sage Grouse Habitat
36-39	April 15 to July 15	Waterfowl Area
40	March 15 to July 15	Raptor Habitat
49-52	March 1 to June 30	Sage Grouse Habitat
49-52	November 15 to April 1	Big Game Winter Range
68-92	November 15 to April 1	Big Game Winter Range
129-158	March 15 to July 15	Raptor Habitat
130-140	April 15 to July 15	Waterfowl Area

TABLE C-3 (Revised) —Continued

Approximate MP	Dates When Construction Would be Avoided	Reason
134-139	March 1 to June 30	Sage Grouse Habitat
152-163	November 15 to April 1	Big Game Winter Range
155	December 1 to March 31	Bald Eagle Winter Habitat
165	March 15 to July 15	Golden Eagle Nest
165-168	November 15 to April 1	Big Game Winter Range
165-169	March 15 to July 15	Raptor Habitat
165-170	November 15 to April 1	Big Game Winter Range
173-176	March 1 to June 30	Sage Grouse Habitat
	Sanpete Valley MP	
0-18	March 1 to June 30	Sage Grouse Habitat
75-154	November 15 to April 1	Big Game Winter Range
128-133	December 1 to March 31	Bald Eagle Winter Habitat
135-139	March 1 to June 30	Sage Grouse Habitat
144-148	March 1 to June 3	Sage Grouse Habitat
150-182	December 1 to March 31	Bald Eagle Winter Habitat
	Proposed Action MP	
356-358	March 1 to June 30	Raptor Habitat
367-379	November 15 to April 1	Big Game Winter Range
381-407	November 15 to April 1	Big Game Winter Range
404-407	March 1 to June 30	Raptor Habitat
435-445	May 15 to September 15	[2]Desert Bighorn Sheep Area
440-447	May 15 to September 15	[3]Quail Management Areas
463	May 15 to September 15	Desert Bighorn Sheep
477-488	March 1 to June 30	Golden Eagle Nesting Area
485	May 15 to September 15	Desert Bighorn Sheep
494	May 15 to September 15	Desert Bighorn Sheep
509-515	May 15 to September 15	Desert Bighorn Sheep
510-515	March 1 to June 30	Golden Eagle Nesting Area
537	May 15 to September 15	Desert Bighorn Sheep
539-541	May 15 to September 15	Quail Management Area
548	May 15 to September 15	Desert Bighorn Sheep
551-556	May 15 to September 15	Quail Management Area
556-570	May 15 to September 15	Desert Bighorn Sheep
560-578	May 15 to September 15	Quail Management Area

[1]This period should be avoided only if pipeline construction would occur within 1 mile of an active raptor nest.

[2]This period should be avoided only if pipeline construction would occur within 2 miles of a water source for desert bighorn sheep.

[3]This period should be avoided only if pipeline construction would occur within 2 miles of a guzzler.

TABLE C-4 (Revised)

CRUCIAL WILDLIFE USE AREAS AND PERIODS TO BE AVOIDED ALONG THE CENTRAL NEVADA ALTERNATIVE (C)

Approximate MP	Dates When Construction Would be Avoided	Reason
	Proposed Action MP	
0-43	November 15 to April 1	Big Game Winter Range
4-9	March 1 to June 30	Sage Grouse Habitat
5-26	March 15 to June 15	Waterfowl Area
17-18	March 1 to June 30	Sage Grouse
18	March 15 to July 15	[1]Raptor Habitat
22-26	March 1 to June 15	Sage Grouse Habitat
27-29	March 15 to July 15	Raptor Habitat
29	March 15 to July 15	[1]Golden Eagle Nest
30-41	March 1 to June 30	Sage Grouse Habitat
36-39	April 15 to July 15	Waterfowl Area
40	March 1 to June 30	Sage Grouse Habitat
49-52	November 15 to April 1	Big Game Winter Range
68-92	November 5 to April 1	Big Game Winter Range
129-158	March 15 to July 15	Raptor Habitat
130-140	April 15 to July 15	Waterfowl Area
134-139	March 1 to June 30	Sage Grouse Habitat
152-163	November 15 to April 1	Big Game Winter Range
155	December 1 to March 31	Bald Eagle Winter Habitat
165	March 15 to July 15	Golden Eagle Nest
165-168	November 15 to April 1	Big Game Winter Range
165-169	March 15 to July 15	Raptor Habitat
165-170	November 15 to April 1	Big Game Winter Range
173-176	March 1 to June 30	Sage Grouse Habitat
182-184	November 15 to April 1	Big Game Winter Range
188-193	November 15 to April 1	Big Game Winter Range
	Central Nevada MP	
5-13	November 15 to April 1	Big Game Winter Range
11-19	March 1 to June 30	Sage Grouse Habitat
19-27	November 15 to April 1	Big Game Winter Range
145-150	March 1 to June 30	Sage Grouse Habitat
152-154	March 1 to June 30	Raptor Habitat
156-158	November 15 to April 1	Big Game Winter Range
157-196	March 1 to June 30	Raptor Habitat
165-169	March 1 to June 30	Sage Grouse Habitat
170-185	November 15 to April 1	Big Game Winter Range
187-196	March 1 to June 30	Sage Grouse Habitat
200-207	March 1 to June 30	Sage Grouse Habitat
202-204	March 1 to June 30	Raptor Habitat
205-207	November 15 to April 1	Big Game Winter Range

TABLE C-4 (Revised).—Continued

Approximate MP	Dates When Construction Would be Avoided	Reason
224-230	November 15 to April 1	Big Game Winter Range
234-247	November 15 to April 1	Big Game Winter Range
235-238	March 1 to June 30	Raptor Habitat
235-240	May 15 to September 15	[2]Desert Bighorn Sheep Area
238-240	March 15 to June 15	Waterfowl Area
240-248	March 1 to June 30	Sage Grouse Habitat
310-313	March 1 to June 30	Raptor Habitat
329-331	March 1 to June 30	Raptor Habitat
334-341	March 1 to June 30	Raptor Habitat
385	May 15 to September 15	Desert Bighorn Sheep
402	May 15 to September 15	Desert Bighorn Sheep
428-435	November 15 to April 1	Big Game Winter Range
439-446	November 15 to April 1	Big Game Winter Range
484-487	December 1 to March 31	Bald Eagle Winter Habitat
485-487	March 1 to June 1	Waterfowl Areas
525-542	March 1 to June 1	Waterfowl Areas
565-569	March 1 to June 1	Waterfowl Areas

[1]This period should be avoided only if pipeline construction would occur within 1 mile of an active raptor nest.

[2]This period should be avoided only if pipeline construction would occur within 2 miles of a desert bighorn sheep water source.

TABLE C-5 (Revised)

CRUCIAL WILDLIFE USE AREAS AND PERIODS TO BE AVOIDED ALONG THE SEVIER-ESCALANTE DESERT ALTERNATIVE (D)

Approximate MP	Dates When Construction Would be Avoided	Reason
Proposed Action MP		
0-43	November 15 to April 1	Big Game Winter Range
4-9	March 1 to June 30	Sage Grouse Habitat
5-26	March 15 to June 15	Waterfowl
17-18	March 1 to June 30	Sage Grouse
18	March 15 to July 15	[1]Raptor Habitat
22-26	March 1 to June 15	Sage Grouse Habitat
27-29	March 15 to July 15	Raptor Habitat
29	March 15 to July 15	[1]Golden Eagle Nest
30-41	March 1 to June 30	Sage Grouse Habitat
36-39	April 15 to July 15	Waterfowl Area
40	March 15 to July 15	Raptor Habitat
49-52	March 1 to June 30	Sage Grouse Habitat
49-52	November 15 to April 1	Big Game Winter Range
68-92	November 15 to April 1	Big Game Winter Range

TABLE C-5 (Revised).—Continued

Approximate MP	Dates When Construction Would be Avoided	Reason
129-158	March 15 to July 15	Raptor Habitat
130-140	April 15 to July 15	Waterfowl Area
134-139	March 1 to June 30	Sage Grouse Habitat
152-163	November 15 to April 1	Big Game Winter Range
155	December 1 to March 31	Bald Eagle Winter Habitat
165	March 15 to July 15	Golden Eagle Nest
165-168	November 15 to April 1	Big Game Winter Range
165-169	March 15 to July 15	Raptor Habitat
165-170	November 15 to April 1	Big Game Winter Range
173-176	March 1 to June 30	Sage Grouse Habitat
182-184	November 15 to April 1	Big Game Winter Range
188-193	November 15 to April 1	Big Game Winter Range
Sevier-Escalante Desert MP		
5-13	November 15 to April 1	Big Game Winter Range
11-19	March 1 to June 30	Sage Grouse Habitat
19-27	November 15 to April 1	Big Game Winter Range
45-47	March 15 to June 30	Waterfowl Area
67	March 1 to June 30	Golden Eagle Nest
83	March 1 to June 30	Raptor and Golden Eagle Nesting Area
93	March 1 to June 30	Raptor and Golden Eagle Nesting Area
128	March 1 to June 30	Raptor and Golden Eagle Nesting Area
128-139	November 15 to April 1	Big Game Winter Range
135	March 1 to June 30	Raptor and Golden Eagle Nesting Area
Proposed Action MP		
367-379	November 15 to April 1	Big Game Winter Range
381-407	November 15 to April 1	Big Game Winter Range
404-407	March 1 to June 30	Raptor Habitat
435-445	May 15 to September 15	[2]Desert Bighorn Sheep Area
440-447	May 15 to September 15	[3]Quail Management Areas
463	May 15 to September 15	Desert Bighorn Sheep
477-488	March 1 to June 30	Golden Eagle Nesting Area
485	May 15 to September 15	Desert Bighorn Sheep
494	May 15 to September 15	Desert Bighorn Sheeop
509-515	May 15 to September 15	Desert Bighorn Sheep
510-515	March 1 to June 30	Golden Eagle Nesting Area
537	May 15 to September 15	Desert Bighorn Sheep
539-541	May 15 to September 15	Quail Management Area

TABLE C-5 (Revised).—Continued

Approximate MP	Dates When Construction Would be Avoided	Reason
548	May 15 to September 15	Desert Bighorn Sheep
551-556	May 15 to September 15	Quail Management Area
556-570	May 15 to September 15	Desert Bighorn Sheep
560-578	May 15 to September 15	Quail Management Area

[1]This period should be avoided only if pipeline construction would occur within 1 mile of an active raptor nest.

[2]This period should be avoided only if pipeline construction would occur within 2 miles of a desert bighorn sheep water source.

[3]This period should be avoided only if pipeline construction would occur within 2 miles of a guzzler.

TABLE C-6 (Revised)

CRUCIAL WILDLIFE USE AREAS AND PERIODS TO BE AVOIDED ALONG THE WEST SALT LAKE ALTERNATIVE (E)

Approximate MP	Dates When Construction Would be Avoided	Reason
	West Salt Lake MP	
0-10	November 15 to April 1	Big Game Winter Range
66-70	November 15 to April 1	Big Game Winter Range
73-86	November 15 to April 1	Big Game Winter Range
96-102	November 15 to April 1	Big Game Winter Range
120-128	March 1 to June 30	Sage Grouse Habitat
142-161	March 1 to June 30	Sage Grouse Habitat
150-161	March 1 to June 30	[1]Raptor Habitat
170-180	March 1 to June 30	Raptor Habitat
290-293	November 15 to April 1	Big Game Winter Range
292-297	March 1 to June 30	Sage Grouse Habitat
	Proposed Action MP	
276-280	November 15 to April 1	Bif Game Winter Range
281-284	March 1 to June 30	Sage Grouse Habitat
288-296	November 15 to April 1	Big Game Winter Range
290-294	March 1 to June 30	Raptor Habitat
307	March 1 to June 30	[1]Golden Eagle Nest
313	March 1 to June 30	Golden Eagle Nest
356-358	March 1 to June 30	Raptor Habitat
367-379	November 15 to April 1	Big Game Winter Range
381-407	November 15 to April 1	Big Game Winter Range
404-407	March 1 to June 30	Raptor Habitat
435-445	May 15 to September 15	[2]Desert Bighorn Sheep Area
440-447	May 15 to September 15	[3]Quail Management Areas

[1]This period should be avoided only if pipeline construction would occur within 1 mile of an active raptor nest.

[2]This period should be avoided only if pipeline construction would occur within 2 miles of a desert bighorn sheep water source.

[3]This period should be avoided only if pipeline construction would occur within 2 miles of a guzzler.

TABLE C-7 (Revised)

CRUCIAL WILDLIFE USE AREAS TO BE AVOIDED ALONG THE PROVO CANYON ALTERNATIVE (F)

Approximate MP	Dates When Construction Would be Avoided	Reason
	Proposed Action MP	
0-43	November 15 to April 1	Big Game Winter Range
4-9	March 1 to June 30	Sage Grouse Habitat
5-26	March 15 to June 15	Waterfowl Area
17-18	March 1 to June 30	Sage Grouse
18	March 15 to July 15	[1]Raptor Habitat
22-26	March 1 to June 15	Sage Grouse Habitat
27-29	March 15 to July 15	Raptor Habitat
29	March 15 to July 15	[1]Golden Eagle Nest
30-41	March 1 to June 30	Sage Grouse Habitat
36-29	April 15 to July 15	Waterfowl Area
40	March 15 to July 15	Raptor Habitat
49-52	March 1 to June 30	Sage Grouse Habitat
49-52	November 15 to April 1	Big Game Winter Range
68-92	November 15 to April 1	Big Game Winter Range
	Provo Canyon MP	
3-11	March 1 to June 30	Raptor and Golden Eagle Area
11-39	November 15 to April 1	Big Game Winter Range
21-39	March 1 to June 30	Raptor and Golden Eagle Area
87-105	November 15 to April 1	Big Game Winter Range
89-100	March 1 to June 30	Raptor and Golden Eagle Area
105-113	March 1 to June 30	Raptor and Golden Eagle Area
	Proposed Action MP	
214-224	November 15 to April 1	Big Game Winter Range
276-280	November 15 to April 1	Big Game Winter Range
281-284	March 1 to June 30	Sage Grouse Habitat
288-296	November 15 to April 1	Big Game Winter Range
290-294	March 1 to June 30	Raptor Habitat
307	March 1 to June 30	Golden Eagle Nest
313	March 1 to June 30	Golden Eagle Nest
356-358	March 1 to June 30	Raptor Habitat
367-379	November 15 to April 1	Big Game Winter Range

TABLE C-7 (Revised) —Continued

Approximate MP	Dates When Construction Would be Avoided	Reason
381-407	November 15 to April 1	Big Game Winter Range
404-407	March 1 to June 30	Raptor Habitat
435-445	May 15 to September 15	[2]Desert Bighorn Sheep Area
440-447	May 15 to September 15	[3]Quail Management Areas
463	May 15 to September 15	Desert Bighorn Sheep
477-488	March 1 to June 30	Golden Eagle Nesting Area
485	May 15 to September 15	Desert Bighorn Sheep
494	May 15 to September 15	Desert Bighorn Sheep
509-515	May 15 to September 15	Desert Bighorn Sheep
510-515	March 1 to June 30	Golden Eagle Nesting Area
537	May 15 to September 15	Desert Bighorn Sheep
539-541	May 15 to September 15	Quail Management Area
548	May 15 to September 15	Desert Bighorn Sheep
551-556	May 15 to September 15	Quail Management Area
556-570	May 15 to September 15	Desert Bighorn Sheep
560-578	May 15 to September 15	Quail Management Area

[1]This period should be avoided only if pipeline construction would occur within 1 mile of an active raptor nest.

[2]This period should be avoided only if pipeline construction would occur within 2 miles of a desert bighorn sheep water source.

[3]This period should be avoided only if pipeline construction would occur within 2 miles of a guzzler.

TABLE C-8 (Revised)

CRUCIAL WILDLIFE USE AREAS TO BE AVOIDED ALONG THE VARIATIONS

Approximate MP	Dates When Construction Would be Avoided	Reason
Thistle Creek Variation		
0-2	November 15 to April 1	Big Game Winter Range
8-27	March 1 to June 30	[1]Raptor Habitat
9-27	November 15 to April 1	Big Game Winter Range
0-27	December 1 to March 31	Bald Eagle Winter Habitat
East Las Vegas Variation		
14	May 15 to September 15	[2]Desert Bighorn Sheep
28-30	May 15 to September 15	Desert Bighorn Sheep
32	May 15 to September 15	Desert Bighorn Sheep
35	May 15 to September 15	Desert Bighorn Sheep
53	May 15 to September 15	Desert Bighorn Sheep

TABLE C-8 (Revised) —Continued

Approximate MP	Dates When Construction Would be Avoided	Reason
Mill Creek Variation		
0-21	November 15 to April 1	Big Game Winter Range
Daniels Canyon Variation II		
0-7	March 1 to June 30	Raptor Habitat
Moapa Variation		
22-30	March 1 to June 30	Golden Eagle Nest Area
30	May 15 to September 15	Desert Bighorn Sheep Area

[1]This period should be avoided only if pipeline construction would occur within 1 mile of an active raptor nest.

[2]This period should be avoided only if pipeline construction would occur within 2 miles of a desert bighorn sheep water source.

MEASURE: In order to reduce harassment to wildlife, particularly big game animals on their winter ranges, all construction access roads will be decommissioned to eliminate public access. If access roads are necessary for operation and maintenance, they must be approved by the authorized officer. **To protect sensitive wildlife habitat, the Authorized Officer may require that the roads** be clearly marked 'No Access Except Authorized Vehicles.' In high-use areas, BLM or FS may direct RMPC to install and maintain gates to limit access.

EFFECTIVENESS: This measure is anticipated to be successful in reducing increased public access to critical game areas which would be created by new access roads along the pipeline right-of-way. However, in some areas, vandalism to gates might require frequent RMPC monitoring and maintenance.

APPLICATION: This measure will be applied to the proposed action or to any alternative or variation which is selected.

MEASURE: No camping or parking will be allowed at or near any livestock watering source, artificial water source, or spring, so that **use** by wildl and domestic livestock will not be hampered. The restricted area will be determined by the authorized officer; the recommended distance is 2 miles for desert bighorn sheep and 1 mile in quail and other upland game bird areas.

EFFECTIVENESS: Restricting camping or parking by construction crews will eliminate harassment of animals needing water. This measure will be especially effective in minimizing impact during the summer in upland game bird management areas and desert bighorn sheep areas, but it will also alleviate unintentional interference with wildlife along the entire right-of- way.

APPLICATION: This measure will be applied to the proposed action and any alternative or variation which is selected.

MEASURE: Shortly before any construction activities begin in an area containing desert tortoise habitat, the Authorized Officer will survey and flag all tortoise burrows in the construcion zone.

Immediately prior to surface disturbance, all flagged tortoise burrows will be checked for tortoises by a qualified biologist, and all tortoises will be hand-removed and carried a designated distance away from the area of activity.

Prior to each day's work in areas containing desert tortoise habitat, the open trench will be patrolled by foot and any tortoises which have become trapped in the trench will be hand-removed and carried a designated distance away from the area of the days activity.

EFFECTIVENESS: The measure should help prevent most direct tortoise mortality in the construction zone.

APPLICATION: This measure will be applied to the proposed action and all alternatives plus the East Las Vegas and the Fort Mojave Variations.

Recreation Resources

MEASURE: To ensure the safety of ORV competitors and spectators participating in the Mint 400 ORV event, construction along the proposed route (approximately between MP **468** to MP 487, known also as the Dry Lake Valley) **and along the Moapa Variation (approximately between MP 11 to MP 14, Dry Lake Valley)** will not take place from **14** days before the Mint 400 event until 1 day afterward. After the pipeline is aligned, the Authorized Officer will designate the specific boundaries of the restricted area.

EFFECTIVENESS: This measure will help to ensure that construction of the pipeline does not unduly endanger the safety of the race spectators and participants. The length of the restriction will ensure that the people participating in the activities preceding the event are also protected. These activities (prerunning the race course and related casual uses) for events of this magnitude commonly occur a week or more in advance of the event.

APPLICATION: This measure will **also** be applied to the Sanpete Valley Alternative, Sevier-Escalante Desert Alternative, West Salt Lake Alternative, or the Provo Canyon Alternative, depending upon which is selected.

MEASURE: To reduce dust intrusion upon the recreational experiences of users of the Strawberry Reservoir Recreation area (approximately between MP 131 and MP 140), the RMPC contractor will be directed by the Authorized Officer to regularly spray dust abatement solvents or water along the pipeline construction route and dirt access roads.

EFFECTIVENESS: This measure will lessen ambient dust which may drift into intensively used recreation areas.

APPLICATION: This measure will be applied to the proposed action if it is selected.

MEASURE: To reduce dust intrusions upon the recreational experiences of users of the Frenchman Mountain-Rainbow Gardens Area and the proposed Clark County Wetlands Park (approximately between MP 496 and MP 501), the RMPC contractor will be directed by the Authorized Officer to regularly spray dust abatement solvents or water along the pipeline construcion route and dirt access roads.

EFFECTIVENESS: This measure will lessen ambient dust which may drift into the Frenchman Mountain-Rainbow Gardens proposed National Natural Landmark and the proposed Clark County Wetlands Park.

APPLICATION: This measure will be applied to the proposed action or to the Sanpete Valley Alternative, Sevier-Escalante Desert Alternative, West Salt Lake Alternative, or Provo Canyon Alternative, depending upon which is selected.

MEASURE: To reduce dust intrusions upon the recreational experiences of users on lands surrounding State Highway 36 within the Caribou National Forest along the West Salt Lake Alternative (approximately MP 10 to MP 22), the RMPC contractor will be directed by the Authorizing Officer to regularly spray dust abatement solvents or water along the pipeline construction route and dirt access roads.

EFFECTIVENESS: This measure will lessen ambient dust which may drift into FS recreation lands during peak weekend **use** (e.g. Emigration Canyon Campground and **diverse** recreation areas along State Highway 36, Strawberry Springs, etc.).

APPLICATION: This measure will be applied to the West Salt Lake Alternative if it is selected.

MEASURE: In order to reduce dust intrusions upon the recreational experiences of users of the west shore area of the Strawberry Reservoir along the Daniels Canyon Variation (approximately between MP 28 and MP 36), the RMPC contractor will be directed by the Authorized Officer to regularly spray dust abatement solvents or water along the pipeline construction route or dirt access roads.

EFFECTIVENESS: This measure will lessen ambient dust which may drift into the intensively used Strawberry Reservoir area.

APPLICATION: This measure will be applied to the Daniels Canyon Variation II if it is selected.

MEASURE: The Authorized Officer will direct the RMPC and its contractors to halt work in certain areas on certain holidays which are intensively used by the public. These include, but are not limited to, holidays and 3-day weekends such as Independence Day, Memorial Day, Labor Day, Thanksgiving, the 24th of July (or Pioneer Day in Utah), and the several weeks of regular deer season.

EFFECTIVENESS: This measure will lessen safety hazards and degradation of recreation experiences. Stopping work during deer season will lessen safety hazards to the construction crews and will help keep the deer from being driven from their habitual range.

APPLICATION: This measure will be applied to **any** route selected.

MEASURE: To ensure the safety of pipeline-related construction workers, all construction personnel working on the ground during hunting season are required to wear fluorscent colored vests (preferrably orange or yellow) in popular hunting areas designated by the Authorized Officer. Depending on state requirements for the hunting season period, this requirement will generally be applied from mid-September until the end of October.

EFFECTIVENESS: This measure will reduce the likelihood of pipeline-related construction worker being unmistakenly fired upon by hunters.

APPLICATION: This measure will be applied to all routes including the proposed action, all alternatives, all variations, or combinations thereof, depending upon which route is selected.

MEASURE: To ensure the safety of ORV recreationists using the Las Vegas Sand Dunes Recreation Lands, construction along the East Las Vegas Variation (approximately between MP 3 and MP 8) will not take place during heavy weekend use or from up to 14 days before any scheduled ORV event and 1 day afterward. The Authorized Officer will designate when and where conflicts, and thus construction restrictions, would occur.

EFFECTIVENESS: This measure will help to ensure that pipeline construction would not unduly endanger the safety of ORV race spectators and participants. The length of the restriction, should an ORV event conflict with pipeline construction, would ensure that the people participating in the activities preceding the event are also protected. These activities (prerunning any potential race course and related casual uses) for ORV events commonly occur a week or more in advance of the event. Heavy weekend use of the area, known as "free play activity," would also be protected by prohibiting pipeline construction on weekends within the Las Vegas Sand Dunes Recreation Lands.

Wilderness

MEASURE: The Central Nevada Alternative pipeline alignment will cross to the south side of U.S. Highway 6/50, east of the Notch Peak WSA (approximately MP 93). At MP 100, the alignment will be placed within the highway rigth-of-way for the length of the WSA's border. At approximately MP 102, where the Notch Peak WSA boundary leaves the highway, the pipeline alignment will return to the north side of the highway outside of the right-of-way. Permits from the Utah Department of Transportation will be required.

The Central Nevada Alternative pipeline alignment will be placed within the U.S. Highway 6 right-of-way (approximately at MP 308). This will require permits from the Nevada Department of Transportation.

EFFECTIVENESS: This measure would avoid permanent impairment of the lands suitable for preservation as wilderness, thereby allowing Congress to make the ultimate decision on these two WSA units, as mandated in section 603(c) of FLPMA.

APPLICATION: This measure will be applied to the Central Nevada Alternative if it is selected.

Land Uses

MEASURE: Upon abandonment, the Authorized Officer will require the RMPC to remove sections of pipe in certain areas and to rehabilitate the surface under the procedures required in the Erosion Control, Revegetation, and Restoration Guidelines for use on Federal lands.

EFFECTIVENESS: Such removal will eliminate potential conflicts with watershed productivity and other rights-of-way.

APPLICATION: This measure will be applied to the proposed action or to any of the alternatives and variations.

MEASURE: If the responsible officials select Alternative E, West Salt Lake, as the route for which a right-of-way would be granted, the route will be shifted within the Caribou National Forest to follow the transmission line corridor which parallels the alternative within 1 to 3 miles. A supplementary EA will be prepared before the right-of-way is granted to ensure adequate consideration of the resource.

EFFECTIVENESS: The transmission line corridor appears to be better suited for placement of a pipeline. However, the alternative was not redesigned to incorporate it. Consequently, unless the supplementary EA were to identify previously unknown resources which would be significantly affected, a shift of the route to follow the transmission line would be more compatible with multiple use of the resources.

APPLICATION: The measure will be applied to the West Salt Lake Alternative, if it is selected.

MEASURE: If the proposed action or any of the alternatives except the Northern Systems Alternative or the Central Nevada Alternative are accepted, the Moapa Variation will have to be incorporated.

EFFECTIVENESS: Federal legislation (P.L. 96-491) transferred approximately 70,000 acres of BLM land to the Moapa tribe. As part of that legislation, the U.S. reserved a 3,000-foot wide transportation corridor through the transferred lands. It is the intent that the right-of-way over the transferred lands will continue to be available for utility purposes under the same regulations, terms, and conditions as rights-of-way granted across other Federal lands. The Nevada State Director has indicated he would only approve rights-of-way which lead to and from the Moapa transportation corridor.

APPLICATION: The measure will be applied to the proposed action which is the Land Managing Agencies' preferred alternative, or Alternatives B, D, or E, if any of these should be selected.

Visual Resources

MEASURE: In visually sensitive areas on Federal lands, the pipeline alignment will take advantage of natural openings in forest and brush vegetation types, in order to lessen the visual straight-line effect of right-of-way clearings. The Authorized Officer will help to determine a balanced approach to visual, engineering, and restoration concerns. Visually sensitive areas are those where acceptable levels of visual contrast, based upon VRM Classes and VQO's, would be exceeded.

EFFECTIVENESS: Contrast ratings which were prepared for the areas of significant visual impact indicate that, in most cases, the portion of the proposed project which would create the greatest degree of unacceptable visual contrast would be the straight-line vegetative clearing limits. By routing the pipeline alignment into natural openings, the contrast would be significantly lessened.

APPLICATION: This measure will be applied to the proposed action and to any alternative or variation which is selected.

MEASURE: Clearing vegetation for the pipeline alignment in visually sensitive areas on Federal lands will incorporate feathering the edges when no natural vegetative openings occur. Visually sensitive areas are those where acceptable levels of visual contrast, based upon VRM Classes and VQO's, would be exceeded.

EFFECTIVENESS: Contrast ratings indicate that, in most cases, the components of the proposed project which would create the greatest degree of unacceptable visual contrast would be the clearing of vegetation to the edge of the right-of-way along a straight line. In areas of a continuous pattern of vegetation, the contrast would be significantly lessened by feathering straight-line clearings (overclearing in some locations and clearing less than the standard 100-foot wide construction right-of-way in other areas to simulate natural vegetative patterns).

APPLICATION: This measure will be applied to the proposed action and to any alternative or variation which is selected.

MEASURE: Where facilities would create unacceptable levels of visual contrast, choose building/construction material types and colors for above-ground facilities which would blend closely with natural conditions, where safety codes and technology permit.

EFFECTIVENESS: The visual contrast would be reduced allowing most facilities to blend more closely with natural surroundings, and meeting the visual objectives of the area.

APPLICATION: This measure will be applied to all above-ground facilities of the proposed action and to any alternative or variation which is selected.

Cultural Resources

MEASURE: Locate the valve station at MP 50 of the proposed action in such a manner as to avoid distraction for travelers along the Mormon Trail.

EFFECTIVENESS: The measure will help ensure that the Mormon Trail will not be downgraded from its existing condition by visual or physical intrusions.

APPLICATION: The measure will be applied to the proposed action or to any of the alternatives and variations that may intrude on the trail.

MEASURE: Locate the pipeine away from Cashe CAve in accordance with the Programmatic Memorandum of Agreement.

EFFECTIVENESS: The measure will help ensure that Cache Cave is not inadvertently damaged by pipeline construction and related activities.

APPLICATION: The measure will be applied to the proposed action.

Appendix D

Summary of Required Authorizing Actions

In order to implement the RMPP, certain Federal, state, and local authorizing actions would have to be taken. Examples of authorizing actions are approval of a certificate of public convenience and necessity, right-of- rigth-of-way grants, stream crossing permits, microwave communication licenses, and air quality permits. In general, the same authorizing actions would be necessary for the alternatives. These authorizing actions are listed below. This list is not complete, since detailed locations and construction plans and techniques are not yet developed.

To implement the RMPP, the following authorizing actions would be required by the certain Federal, state, and local agencies.

Federal Authorizations and Permits

FERC Co-lead agency

If the FERC approves the project, it would:

Issue a certificate to RMPC for construction, ownership, and operation of an interstate natural gas transmission system extending from the vicinity of Sage, Wyoming, through Utah and Nevada, to a point near Searchlight, Nevada, on the Nevada-California border. As part of its review process before making a determination on whether to issue a certificate, the FERC will examine such factors as the company's gas supply, the market to be served, proposed rates, engineering of the system, the environmental impact, and whether the project would be in the public interest. Authority for issuing the certificate is established by section 7(c) of the Natural Gas Act. The certificate would be issued by the five commissioners located in Washington, D.C.

Since the RMPC would own only the gas that is needed to initially fill the capacity of the proposed pipeline, additional applications to the FERC seeking authorization to transport and sell the gas that would be transported by the proposed project would have to be filed. It is not possible to predict the number of additional certificates this **might** involve until such filings are made.

If Northwest or El Paso propose to change their contractual obligations after obtaining authorization by the FERC, they would have to file new applications or seek amendments to their existing certificates.

Bureau of Land Management, U.S. Department of the Interior (BLM). Co-lead agency.

If the BLM approves the proposal, it would issue right-of-way grants across both public lands administered by the BLM and National Forest System Lands administered by the FS. Therefore, the BLM would:

1. Grant a right-of-way up to 50-feet wide for construction and operation of an interstate natural gas pipeline system across approximately 312 miles of Federal lands (BLM/FS-administered lands). The right-of-way would be issued by the BLM Utah State Director in Salt Lake City under section 28 of the Mineral Leasing Act of 1920 (as amended). Additionally, an undetermined number of right-of-way grants would be issued for all miles of permanent access roads on public lands to communication sites, utilities, and maintenance bases.
2. Grant a temporary **use** permit (TUP) up to 50-feet wide for construc immediately adjacent to the permanent right-of-way. The TUP's for the 262- 261-mile long proposed route which would cross lands administered by the BLM (not FS) would be issued by the BLM Utah Director under section 28 of the Mineral Leasing Act of 1920 (as amended). Additional TUP's would be granted for such actions as soil testing, seismic testing, storage yards, disposal sites, temporary access roads, etc., by the BLM District or Area Managers in the Salt Lake City, Richfield, and Cedar City Districts in Utah; the Las Vegas District in Nevada; and the Riverside District in California.
3. Grant the sale of common variety mineral materials such as sand, gravel, rock, and clay from public lands as authorized by title V of FLPMA. These grants would be issued by either the BLM District or Area Managers listed in item 2.
4. Grant an unknown number of rights-of-way for construction and operation of power transmission lines crossing public lands. The rights-of-way would be issued by the appropriate District

Manager in Wyoming, Utah, Nevada, and California.

5. Review and recommend to the National Park Service Interagency Archaeological Consulting Division the issuance of antiquities permits on lands administered by the BLM. This review would be made by the BLM Utah State Office, which would also recommend whether to issue antiquities permits.

BIA. Cooperating Agency.

If the proposal is approved, the BIA would:

1. Grant a 50-foot wide right-of-way for construction and operation across approximately 7 miles of tribal Indian lands in Nevada. The right-of-way would cross the boundary of the Moapa Indian Reservation, established in December 1980 within the Phoenix area jursdication of the BIA. The tribal council for the Moapa Indian Reservation would review and approve the right-of-way. In accordance with the Act of February 5, 1948, 62 Stat. 17(25 USC 323- 328), 25 CFR 161, authority to issue the right-of-way grant rests with the BIA superintendent in charge of the reservation which the project would cross.

2. Grant a 50-foot wide right-of-way for construction and operation across approximately 4 miles of tribal Indian lands in California. The right-of-way would cross the Fort Mojave Indian Reservation within the Phoenix area jurisdiction of the BIA. The tribal council for the Fort Mojave Indian Reservation would review and approve the right-of-way. In accordance with the act of February 5, 1948, 62 Stat. 17 (25 USC 323-328), 25 CFR 161, authority to issue the right-of-way grant rests with the BIA superintendent in charge of the reservation which the project would cross.

Bureau of Reclamation Cooperating Agency.

If the proposal is approved, the would issue licenses across both purchased and withdrawn land for three separate areas along the proposed route under the jurisdiction. Therefore, the would:

1. Grant a license for construction and operation across approximately a half mile of land purchased by the in the Rockport Lake State Recreation area. In accordance with the Reclamation Projects Act of August 4, 1939, 53 Stat. 1189, section 10, (Regulations Instructions part 215.6), authority to issue the license rests with the Regional Director, Upper Colorado Region, Salt Lake City, Utah.

2. Grant a license for construction and operation across approximately 18 miles of land withdrawn by in the Strawberry Reservoir area. The authorized officer and authority are the same as for the first authorizing action.

3. Grant a license for construction and operation across approximately 1 mile of land withdrawn by east of Las Vegas. In accordance with the authority previously discussed, the license would be issued by the Regional Director, Lower Colorado Region, Boulder City, Nevada.

4. **Grant a joint occupancy permit to cross several southern Nevada Water System pipelines. The application must be made through the Las Vegas Valley water district, operating agent for the Colorado River Commission, which forwards it to the Bureau of Reclamation.**

U.S. Forest Service, U.S. Department of Agriculture (FS). Cooperating Agency.

The BLM would issue the permanent construction and operation right-of-way grants to cross the 34 miles of National Forest System Lands. The FS would have to concur with the permanent right-of-way traversing the Uinta, Manti-LaSal, Fishlake, and Dixie National Forests before the BLM could issue such a right-of-way grant. Forest supervisors of the Uinta, Manti-LaSal, Fishlake, or Dixie National Forests would issue various temporary permits before, during, and immediately after construction. Before any permits or **uses** o National Forest System Lands were issued, site-specific environmental analyses would coordinate, mitigate, and formulate management requirements for the construction and **use** of National Forest System Lands. Therefore, the FS would:

1. Grant road and trail permits as needed for the construction or **use** roads and trails. All FS development roads used would require a road **use** permit dictating safety measures, required improvement work, and maintenance responsibilities during and after the pipeline construction. All roads on National Forest System Lands would be constructed following FS approval based on specific analyses of suggested locations. Road and trail permits for construction or **use** of roads and trails across National Forest System Lan would be issued under the authority of 36 CFR 251.50, Land Uses.

2. Grant temporary special **use** permits for planning, survey, study, a construction. Equipment storage, staging, or temporary crew quarters would require temporary special **use** permits. These permits would be issued unde the authority of 36 CFR 251.50, Land Uses.

3. Grant mineral materials permits to remove common variety materials such as sand, gravel, rock, and clay from National Forest

System Lands, authorized by 36 CFR 251.4, Disposal of Materials.

4. Grant timber sale contracts or permits for sale and disposal of timber and other vegetative material from National Forest Lands. Timber removed from National Forest System Lands would be sold to the RMPC contractor and removed from the forest or completely disposed of as directed by the FS. Authority to issue these contracts or permits derives from 36 CFR 223.1, Sale and Disposal of Timber.
5. Grant antiquities permits to examine ruins, excavate archaeological sites, and collect objects of antiquity from National Forest System Lands. Authority to issue these permits is contained in 16 USC 431-433, Antiquities Act of 1906; 16 USC 551, Organic Act of 1897; and 43 CFR 3, Preservation of American Antiquities.
6. Grant special **use** permits for permanent communication sites, elect power transmission lines, cathodic protection needs, etc., on National Forest system lands. These facilities would be authorized under 36 CFR 251.50, Land Use.

U.S. Army Corps of Engineers, U.S. Department of the Army (COE).

Under section 404 of the Clean Water Act of 1977, as implemented by the COE regulations (33 CFR 323), placement of dredged or filled material for bedding or backfilling pipeline crossings at streams or rivers is permitted under the Nationwide Permit for utility lines (33 CFR 323.4 and 323.4-3), provided that the conditions outlined in appendix D-3 are met. A "utility line" is defined by the Nationwide Permit as any pipe or pipeline for the transportation of any gaseous, liquid, liquefiable, or slurry substance, for any purpose, and any cable, line, or wire for the transmission for any purpose of electrical energy, telephone and telegraph messages, and radio and television communications. The permits would be necessary for streams crossed by the proposed pipeline 'below the headwaters,' defined as the point on a stream where the average annual flow is more than 5 cubic feet per second. A Nationwide 404 Permit would be required for the RMPP from either the COE Los Angeles or Sacramento District.

The COE has the discretionary authority to require individual Section 404 Permits for all or portions of the pipeline crossings if the District Engineer determines that the concerns of the aquatic environment indicate a need for such action (33 CFR 323.4-4). An Individual Section 404 permit would be required for RMPC to place fill material in a stream for a construction pad or to divert the flow of any of the streams (i.e., **use** cofferdams). No Individual Section 404 Permit would be required for construction above the headwaters.

Individual Section 404 permits would be necessary along the proposed action for construction involving streams (in Washington, Utah, Lincoln, and Clark Counties in Nevada, and San Bernardino County in California) that drain into the Virgin River or the Colorado River below Lees Ferry. The Los Angeles District of the COE would issue these Section 404 permits.

The COE has established the following procedures for processing applications for individual (section 404) Department of the Army permits:

1. Based on project description supplied by the participating companies, the appropriate COE District Office(s) determines whether an individual Department of the Army permit is required.
2. The COE District Office distributes a public notice requesting comment on the permit applications. Comments are received for 30 days.
3. Following the comment period, all public input is evaluated. If requested, the COE District Engineer may require a formal public hearing. Upon receipt of comments, the District Engineer will offer the applicant an opportunity to resolve any potential adverse impact. The District Engineer will also make a public interest review, and should the review be positive, a Department of the Army permit will be issued.
4. If a formal public hearing is necessary, all public input and pertinent information will be reevaluated, and the COE District Engineer will make a decision about the Department of the Army permit.
5. The Department of the Army can decide to issue the permit 30 days after the RMPP **FEIS** is filed with the EPA, if all the COE permit procedures have been completed.
6. The COE also requires a consent to those portions of the pipeline crossing lands over which the United States acquired only an easement interest (Federal Government's fee ownership). Processing would be concurrent with that of the permit application.

National Park Service, U.S. Department of the Interior (NPS)

Due to the abolishment of the Heritage Conservation and Recreation Service, the NPS now authorizes antiquities permits following review and recommendations from the BLM state offices. This procedure contrasts with the FS, which has its own authority to issue antiquities permits. Under current law, the NPS grants antiquities permits to examine ruins, excavate archeological sites, and collect objects of antiquity from public lands adminstered by the BLM. These permits are granted by the Interagency Archaeological Consulting Division of the NPS, based on BLM recommendations, under the authority of the Antiquities Act of 1906.

Federal Communications Commission

A separate operating license for each new repeater station would be necessary. RMPC intends to **use** existing communications sites wherever possible. Authority for issuing the microwave licenses is contained in the FCC Rules and Regulations (Volume V, parts 90 and 94, 47 CFR) which governs private repeater stations.

EPA

The EPA would issue **NPDES** permit(s) for all potential sites where water used to hydrostatically test for leaks in the proposed pipeline would be discharged. The permit(s) would specify the terms and conditions under which discharge could occur, including the quality of the discharge water. Application for NPDES permits in Utah would be filed with EPA's Region 8 Office in Salt Lake City. Jurisdiction for NPDES permits for Wyoming, Nevada, and California has been delegated to the states.

U.S. Fish and Wildlife Service

The Fish and Wildlife Service would review the section 404 permits which the Army COE issues for stream crossings. Reviews would consider the impacts to endangered and threatened species which could be impacted by such stream crossings

State and Local Authorizations and Permits

The following permits might be required.

Wyoming

1. Permits from the Department of Environmental Quality would be necessary.

a) Construction permits for wastewater disposal facilities required by the Water Quality Division. NPDES permits for all discharges of polluted hydrostatic water would be required.
b) Construction permit for Sage Compressor Station required by the Air Quality Division (new air quality source).
c) Permit for landfill at the Sage Compressor Station issued by the Land Quality Division. Additionally, a permit to appropriate ground water would be required.

2.Permit to appropriate ground water would be required by the State Engineer's Office.

Utah

1. **Verbal permission to survey and a right-of-way grant to cross all state lands would be issued by the Utah State Department of Lands and Resources.**
2. A right-of-way grant to cross approximately 1 mile of state park lands would be issued by the Division of Parks and Recreation for the Rockport Lake State Recreation Area.
3. An encroachment permit to cross state and interstate highways or place the pipeline within an existing utility corridor would be issued by the Utah Department of Transportation.
4. Permits to comply with environmental regulations would be issued by the Utah Department of Health, Division of Environmental Health. These include:

a) Construction permits to cross streams on state lands.

b) Air quality permits (dependent upon construction techiques).

5. Permits to survey on state lands for archaeological and historical purposes **would be** issued by the Utah Division of State History.
6. A conditional **use** permit would be issued by **Utah County**
7. **Written approval of the State Engineer would be required for any stream alteration.**

Nevada

1. A permit for package sewage treatment or septic tanks that might be required for construction camps would be issued by the Nevada Division of Environmental Protection, Water, and Air Quality.
2. Land clearing permits for state lands would be issued by the Nevada Division of Environmental Protection, Water, and Air Quality. A portion of the proposed project would go through a nonattainment area and would have to meet the lowest achievable emission control.
3. Waste water discharge permits would be issued by the Nevada Division of Environmental Protection, Water, and Air Quality.

4. Revocable or encroachment **permits and occupancy permits** to cross a state highway or to place the pipeline within an existing highway right-of- way would be issued by the Nevada Department of Transportation, District 1. **District Engineers should be contacted for permits.**
5. Permits to survey on state lands for archaeological and historical resources would be issued by the Nevada State Museum in Carson City, Nevada.
6. A conditional **use** permit to cross unincorporated areas within Clar County would be required. Following a public hearing which would be held by the Clark County Planning Commission, the permit would be issued by the Clark County Board of Commissioners. This permit is authorized under title 29 of the Clark County Code.
7. A conditional **use** permit to cross within the city limits of Hender would be necessary. Following a public hearing by the City of Henderson Planning Commission, the permit would be issued by the Henderson City Council. Authority for this permit falls under title 19 of the Henderson Municipal Code (Nevada Revised Statutes 278).
8. **A conditional use permit to cross within the city limits of Bou City would be necessary.**
9. **A watering permit from the Clark County Health District would be required.**
10. **Permits for pipelines crossing certain segregated lands in Eldorado Valley would be issues by the Colorado River Commission of Nevada.**

California

1. A certificate of public convenience and necessity from the CPUC authorizing PG&E and the PLS to construct and operate a 27-mile long 36-inch diameter pipeline within California would be required.
2. A construction permit with attached safety standards would be issued by the California Office of Safety and Health Administration.
3. **Encroachment permits to cross under Interstate Highway 40 and state route 95 would be issued by the California Department of Transportation.**
4. Clearance for any archaeological and historical resources encountered on state lands being crossed would be necessary from the SHPO.
5. Contingent on state agency review; the following permits might also be necessary:
   a) Water discharge permits issued by the Water Resources Control Board, Colorado River Basin Regional Board in Palm Desert, California.
   b) Burning permits for any cleared material.
   c) County easements to cross county drainages.
   d) Excavation permits to cross county roads.
   e) Easements issued by the Water Conservation District.
   f) Permits to cross ditches issued by the Irrigation Districts.

BLM and FS General Measures

The right-of-way grant issued by the BLM and **TUP's** operation and construction plans issued and developed by the BLM and FS would include general and specific stipulations. These measures for lands administered by both the BLM and FS would include, but not be limited to, the following *general conditions*:

1. The applicant shall conduct all activities associated with the project in a manner that will avoid or minimize degradation of air, land, and water quality. In the construction, operation, maintenance, and abandonment of the project, the applicant shall perform its activities in accordance with applicable air and water quality standards, related facility siting standards, and related plans of implementation, including but not limited to, the Clean Air Act, as amended (42 USC 1321).
2. **Access roads necessary** for operation and maintenance of the natural gas pipeline will be clearly identified. **Some of** these access roads will ostensibly be open for public use, including but not limited to, **ORV** vehicular travel.
3. A transportation plan would be submitted for review and approval by the BLM and FS. This plan would cover approval of temporary, reconstructed, and newly constructed roads and would include clearing work, rehabilitation, and **uses** associated with transportation needs. Overland access could be specific in lieu of road construction or reconstruction.
4. As a minimum, a reclamation and revegetation plan including those items described in appendix C will be required for all Federal land crossings.
5. If a natural barrier used for livestock control is broken during construction, the applicant will adequately fence the area to prevent drift of livestock. In pronghorn ranges, the fence may

have to be constructed to allow for animal passage. Fence specifications would be determined on a case-by-case basis.

6. Gates or cattle guards on established roads on public land will not be locked or closed by the applicant.
7. Garbage and other refuse will be disposed **of** in an authorized disposal site or landfill. Engine oil changed on public and National Forest lands will be contained in suitable containers and disposed as refuse; no fuel, oil, or other hydrocarbon spills are permitted. If such a spill accidentally occurs, the contaminated soil is to be excavated and the Authorized Officer notified immediately.
8. Permittees and other regular users of public lands and National Forest affected by construction of the project will be notified in advance of any construction activity that may affect their businesses or operations. This will include but not be limited to signing of temporary road closures, removal and/or cutting of fences, disturbances to range improvements, or other range use-related structures.
9. The applicant will meet all stipulations detailed in a Programmatic Memorandum of Agreement (PMOA) between the Advisory Council on Historic Preservation and the BLM to fulfill all Federal and state cultural resource legal requirements.
10. The applicant (RMPC) would comply with applicable Federal and state laws and regulations concerning the **use** of pesticides (i.e., insecticides herbicides, fungicides, rodenticides, and other similar substances) in all activities and operations. The RMPP would obtain approval of a joint operation plan (BLM/FS) prior to the **use** of such substances from the BLM and/or FS Authorized Officer(s). The plan would provide the type and quantity of material to be used; the pest, insect, fungus, etc., to be controlled; the method of application; the location of storage and disposals of containers; and other information that the BLM District Managers or Forest Supervisor may require. The plan would be submitted no later than December 1 of any calendar year that covers the proposed activities for the next fiscal year (i.e., December 1, 1980, deadline for a fiscal year 1982 action). If the need for emergency **use** of pesticides is identified, the **use** would be approve BLM District Managers or Forest Supervisors. The **use** of substances on or the rights-of-way and temporary permit areas would be in accordance with the approved plan. A pesticide would not be used if the Secretary of the Interior has prohibited its use. A pesticide would be used only in accordance with its registered **uses** and with other Secretarial limitations. Pesticides would be permanently stored on Federal lands.
11. All existing improvements along facilities would be protected and damage would repaired.
12. Removal and stockpiling of topsoil would be required at all construction sites unless otherwise directed.
13. **When providing access to the pipeline right-of-way,** all rivers, streams, and washes would be crossed at existing roads or bridges, except at locations designated by the appropriate authorizing agency official. The applicant would be required to install culverts or bridges at points where new permanent access roads would cross live streams to allow unobstructed fish passage. Where drainages would be crossed by temporary roads, dirt fills or culverts would be placed and removed upon completion of the project. Any construction activity in a perennial stream would be prohibited unless specifically allowed by the appropriate authorizing agency official. All stream channels and washes would be returned to their natural state. **Such construction, when it would occur on National Forest Land, would be managed under the restrictions in the FS and Department of Agriculture Policy Statement No. 2019, dated July 8, 1980.**
14. On areas which would be cleared of vegetation by construction or other activity associated with this project, vegetation would be reestablished under the direction of the officer in charge. Vegetation cleared during construction would be disposed **of** per authorizing agency direction. Where commercial tree species are cut, the trees would be measured and commercially sold per direction of the FS.
15. The applicant would prepare a plan to minimize visual impacts from structures. The applicant would prepare photographic simulations of areas in which facilities are proposed within foreground-middleground areas of high scenic value or sensitivity. Using the simulation as a guide, the applicant would design and locate the pipeline route and ancillary structures to blend into the existing environment. The authorizing agency would evaluate and approve measures before construction began.
16. The applicant would be required to control noxious weeds in areas where soil surface had been modified or natural vegetation had been removed. Noxious weeds would be controlled in areas designated by FS official.

17. A fire control plan would be prepared by the applicant, and this plan would be made part of the construction and operation plan.

18. Helicopters would be used to string pipe and deliver equipment in areas where access to the terrain or management constraints preclude standard construction methods or where designated by the FS.

19. Areas subject to mudflows, landslides, mudslides, avalanches, rock falls, and other types of mass movement would be avoided where practical in locating the linear facilities. Where such avoidance is not practical, the design, based upon detailed field investigations and analysis, would provide measures to prevent the occurrence of mass movements.

20. Clearing in timbered areas to reduce fire hazard will be limited to the working space right-of-way.

21. The authorizing agency will require preclearing of mountain brush and tree-covered areas prior to dozer or maintenance blade work. Preclearing will involve handwork in cutting of brush and trees with removal by proper equipment to designated areas.

22. All topsoil on public lands and National Forest land will be conserved for reclamation requirements; excess topsoil will be stockpiled at designated locations.

23. Where possible, the right-of-way **itself** will be used as **an access** road **only** during the construction period. The authorizing agencies will require that the **access** roads **paralleling this pipeline** be closed and vegetative cover reestablished. No maintenance roads along the pipeline **route** will be permitted. **Any other roads providing access to the pipeline will be restricted by the provisions in item 2.**

24. In public lands and National Forest land, the reestablishment of vegetative cover as well as watershed stabilization measures will have the requirement of completion during the ongoing working season and prior to the ongoing winter season.

25. On public land and National Forest land, trees and brush (indigenous species) will be established according to the revegetation and rehabilitation plan contained within the construction and operation plan.

26. The FS and BLM will direct RMPC to control **ORV** vehicle use the right-of-way. Such specified control could include use of physical barriers, replanting trees, or other reasonable means of vehicle control.

27. Existing soils and geological data will be gathered and used to achieve maximum revegetation and soil erosion mitigation responses.

28. Construction equipment must be refueled and maintained outside of stream channels in areas designated by the authorizing agency.

COE Prescribed Management Practices

The COE has prescribed management practices that should be followed, to the maximum extent practical, for discharges covered by the Nationwide Permit (items 1 through 8 below). Additionally, certain conditions **(33 CFR 323.4- 3(b))** must be met under the Nationwide Permit authority (items 9 through 17 below). For further detail, please refer to the COE Permit Program, "A Guide for Applicants," November 1, 1977.

1. Discharges of dredged or fill material into United States water should be avoided or minimized through the **use** of other practical alternatives.

2. Discharges in spawning areas during spawning seasons should be avoided.

3. Discharges should not restrict or impede the movement of aquatic species indigenous to the waters, impede the passage of normal or expected high flows, or cause the relocation of the waters (unless the primary purpose of the fill is to impound waters).

4. If the discharge creates an impoundment water, adverse impacts on the aquatic system caused by the accelerated passage of water and/or the restriction of its flow should be minimized.

5. Discharges in wetlands areas should be avoided.

6. Heavy equipment working in wetlands should be placed on mats.

7. Discharges into breeding and nesting areas for migratory waterfowl should be avoided.

8. All temporary fills should be removed in their entirety.

9. There cannot be any change in preconstruction bottom contours. (Excess material must be removed to an upland disposal area.)

10. The discharge cannot occur in the proximity of a public water supply intake.

11. The discharge cannot occur in areas of concentrated shellfish production.

12. The discharge cannot destroy a threatened or endangered species as identified under the Endangered Species Act or endanger the critical habitat of such species.
13. The discharge cannot disrupt the movement of those species of aquatic life indigenous to the waterbody.
14. The discharge must consist of suitable material free from toxic pollutants in other than trace quantities.
15. The fill created by a discharge must be properly maintained to prevent erosion and other non-point sources of pollution.
16. The discharge must not occur in a component of the national wild and scenic river system or in a component of a state wild and scenic river system.
17. No access roads, fills, dikes, or other structures can be constructed below the ordinary high water of the streams under the Nationwide Permit. These structures would require separate section 404 permits.

Appendix E

Engineering Analysis of Selected Alternatives

The general flow formula developed by the American Gas Association (AGA) was used in this analysis (AGA 1965). This formula has been incorporated into a computer program which estimates pipeline looping and compression requirements for natural gas transmission systems.

The engineering analysis considers two flow levels to calculate the facility requirements of the alternative systems. Case I assumes the 413,000 Mcfd volume proposed; Case II assumes the RMPC optimized design volume of 800,000 Mcfd. The sources and volumes of gas assumed in this analysis are as follows:

Company	Source	Gas Volumes (Mcfd) Case I	Case II
El Paso	Import at Sumas, Washington	**60,000**	**60,000**
Northwest	Import at Sumas, Washington	**30,000**	**30,000**
NGC	Red Wash Area, Colorado	50,000	50,000
Chevron	Big Piney, Wyoming	151,000	178,000
Unknown	Sage, Wyoming	122,000	482,000
	Totals	413,000	800,000

These sources and volumes are based on Northwest flow diagrams and conversations with Northwest personnel (RMPC 1980a, 1980c; Fowler 1980). The Sage, Wyoming, volumes were assumed to be gathered adjacent to and delivered to the Northwest pipeline at the proposed RMPP connection.

The RMPC would construct 610 miles of 36-inch diameter pipeline to transport 413,000 Mcfd. This analysis compares the RMPP to six alternatives. It does not analyze the additional fuel gas, pipeline, and compression facilities that might be required on Northwest's system to implement the RMPP for either Case I or Case II. Additional Northwest facilities may be necessary to transport El Paso's and Northwest's 90,000 Mcfd of 'committed' RMPP gas from Sumas, Washington, to Sage, Wyoming. The applicant has indicated that additional facilities might be required on Northwest's system only for the 800,000-Mcfd level. These additional facilities consist of approximately 63 miles of 24-inch and 19 miles of 36-inch diameter looping and 15,230 **horsepower** of compression on Northwest's system north of Sage, Wyoming. The additional compression on Northwest's system would be installed at existing stations.

Since the applicant has not identified either the sources or the exact volumes of gas that each source would supply to the RMPP for either the 413,000- or 800,000-Mcfd levels, it is not possible to establish the exact alternative facility requirements on Northwest's system that would be required to deliver gas to the Sage Compressor Station for the RMPP. The identified facilities are only one possibility for a hypothetical supply situation. At this time, Northwest's specific requirements are not known.

Tables E-1 and E-2 compare the alternative transportation systems to the RMPP.

TABLE E-1 (Updated)

COMPARISON OF RMPP ALTERNATIVE TRANSPORTATION SYSTEMS: CASE I

Facilities	RMPP	[a]Northern Systems (42-Inch)				Northwest/El Paso			North-South (42-Inch)			Central Nevada	West Salt Lake	Northwest/PGT/PG&E (36-Inch)			
		Northwest	PGT	PG&E	Total	North-west	El Paso	Total	North-west PGT/ PG&E	Northwest El Paso	Total			North-west	PGT	PG&E	Total
System Length (Miles)	610	583	335	[b]299	1,217	500	480	980	1,217	980	2,194	862	719	583	335	299	1,217
Miles of New Pipe (36-Inch)	610	76.8	--	[c]148	225.1	413	320	733	[c]148	388	536	862	719	77	236	[c]340	653
Additional Compression (Horsepower)	21,200	400	12,750 [d](2,450)	8,450 (5,200)	21,600 (8,050)	350	8,000	8,350	6,450 (2,070)	3,820	10,270 (5,890)	25,650	23,350	400	--	--	400
Incremental Fuel (Million Cfd)	2.91	7.06	13.79 (8.66)	6.93 (4.68)	27.78 (20.22)	5.94	17.06	23.00	9.32 (6.25)	13.44	22.76 (19.69)	3.52	3.20	7.06	6.09	3.84	16.99

[a]Western Leg completed.

[b]This number represents only the distance from the Oregon-California border to Antioch, California.

[c]PG&E and SoCal pipeline facilities south of Antioch, California (the Brentwood-Panoche Junction and Hinkley-Adelanto pipelines).

[d]The values in parentheses indicate facility and fuel requirements if a 48-inch diameter Western Leg were constructed instead of a 42- inch diameter system.

TABLE E-2 (Updated)

COMPARISON OF RMPP TO ALTERNATIVE TRANSPORTATION SYSTEMS: CASE II

Facilities	RMPP	[a]Northern Systems (42-Inch)				Northwest/El Paso			North-South (42-Inch)			Central Nevada	West Salt Lake	Northwest/PGT/PG&E (36-Inch)			
		North-west	PGT	PG&E	Total	Northwest	El Paso	Total	Northwest PGT/PG&E	North-west El Paso	Total			North-west	PGT	PG&E	Total
System Length (Miles)	610	583	335	[b]299	1,217	500	480	980	1,214	980	2,194	862	719	583	335	299	1,217
Miles of New Pipe (36-Inch)	610	390	--	[c]148	538	496	538	1,034	[c]225	733	958	862	719	390	318	[c]444	1,152
Additional Compression (Horsepower)	84,800	8,900	[d]84,020 (18,775)	40,930 (13,025)	133,850 (40,700)	49,700	17,200	66,900	21,600 (8,050)	8,350	29,950 (16,400)	120,200	99,450	8,900	15,700	6,850	31,450
Incremental Fuel (Million Cfd)	11.56	12.08	34.45 (20.75)	17.03 (10.86)	63.56 (43.51)	17.34	18.08	35.42	27.62 (20.22)	23.0	50.62 (43.22)	16.54	13.61	12.08	10.24	5.56	27.88

[a]Western Leg completed.

[b]This number represents only the distance from the Oregon-California border to Antioch, California.

[c]PG&E and SoCal pipeline facilities south of Antioch, California.

[d]The values in parentheses indicate facility and fuel requirements if a 48-inch diameter Western Leg were constructed instead of a 42- inch diameter system.

NORTHERN SYSTEMS ALTERNATIVE

The engineering analysis for the Northern Systems Alternative examines staged facility requirements for the alternative. First, the requirements on Northwest's system were determined. Then requirements for PGT's and PG&E's systems were analyzed assuming both a prebuilt and a fully completed Western Leq.

The facility requirements estimated for Northwest's system **use** winter conditions as the worst case because these conditions would require the maximum pipeline facilities. This analysis includes all existing and certificated facilities on Northwest's system as the base case and assumes that 36-inch diameter pipe would be used for all looping. The results of this analysis for Northwest are presented in table E-3.

TABLE E-3

FACILITY REQUIREMENTS ON NORTHWEST SYSTEM FOR NORTHERN SYSTEMS ALTERNATIVE

Compressor Station	MP	Additional Compression (Horsepower)		Total Looping (Miles)	
		Case I	Case II	Case I	Case II
Kemmerer	0.0	---	---	21.7	32.8
Pegram	33.5	---	---	7.0	31.8
Soda Springs	66.4	---	---	22.8	36.4
Lava Hot	102.8	---	2,100	---	37.8
Pocatello	142.9	---	---	25.3	74.9
Burley	217.8	---	1,950	---	84.8
Mt. Home	302.6	---	400	---	32.2
Caldwell	385.4	---	---	---	59.3
Baker	485.6	---	---	---	---
[a]Stanfield	583.6	400	4,450	---	---
TOTALS		400	8,900	76.8	390.0

[a]This would be a new compressor station.

The existing PGT transmission system is designed to transport 1,028,000 Mcfd south from Stanfield, Oregon, and to deliver 980,000 Mcfd to PG&E at the Oregon-California border. PG&E's transmission system then carries the gas farther south to its market area. This system was used as the base case for the analysis. The facility requirements south of Antioch, California, were not analyzed. The applicant has indicated that a 120-mile long pipeline between Brentwood and Panoche Junction and a 28.3-mile long pipeline between Hinkley and Adelanto might be required. These facilities have been added into the totals as a worst-case possibility. If any facilities south of Antioch were required, the CPUC would have to authorize their construction and operation.

Two flow scenarios were considered to determine facility needs on PGT's and PG&E's systems. Each scenario examines both 42- and 48-inch diameter looping.

The first scenario examines the incremental expansion of the Western Leg to transport RMPP gas. This would be equivalent to 'prebuilding' portions of the Western Leg to transport RMPP gas before Alaskan gas starts to flow. The looping mileage, incremental fuel consumption, and compression facilities required for this scenario are shown in table E-4. The location of the 'prebuilt' pipeline looping is shown in table E-5.

TABLE E-4

FLOW SCENARIO I: PGT/PG&E FACILITY REQUIREMENTS

Size	Incremental Flow (Million Cfd)	Looping (Miles)	Incremental Fuel (Million Cfd)	Incremental Horsepower
42-Inch Diameter Pipeline	200	180	10.00	-
	413	380	10.10	-
	640	516	10.05	100
	800	565	11.35	4,550
	1,053	613	15.41	21,500
	1,440	630	41.80	125,250
48-Inch Diameter Pipeline	200	170	9.99	-
	413	350	10.12	-
	640	476	10.03	-
	800	534	10.25	600
	1,053	582	11.76	7,350
	1,440	621	17.78	31,800

Note: Base flow = 1,028 million cfd at Stanfield; Base fuel = 34.49 million cfd

The second scenario assumes that the PGT and PG&E systems (631 miles) have been completely looped (i.e., the Western Leg has been completed). The incremental fuel and additional compression facilities required on these systems for a range of flow levels are shown in table E-6. This table shows how fuel **use** on the Western Leg would be affected by an increase from the flow (0 Mcfd is equivalent to 1,028,000 Mcfd at Stanfield) to 1,440,000 Mcfd, the volume which includes both the Alaskan gas volume of 640,000 Mcfd and the maximum RMPP volume of 800,000 Mcfd. The lo-

TABLE E-5

PGT AND PG&E FACILITY REQUIREMENTS FOR THE NORTHERN SYSTEMS ALTERNATIVE

	Compressor Station	MP	[a]42-Inch Prebuilt Western Leg				48-Inch Prebuilt Western Leg				42-Inch Completed Western Leg		48-Inch Completed Western Leg	
			Additional Compression (Horsepower)		Total Looping (Miles)		Additional Compression (Horsepower)		Total Looping (Miles)		Additional Compression (Horsepower)		Additional Compression (Horsepower)	
			Case I	Case II	Case I	Case II	Case I	Case II	Case I	Case II	Case I	Case II	Case I	Case II
PGT	[b]Stanfield	0.0	--	--	34.0	42.1	--	--	32.1	40.9	--	--	--	--
	Ione	42.1	--	1,560	25.3	41.3	--	--	24.0	38.8	8,925	24,500	2,450	12,300
	Kent	90.9	--	--	40.4	53.7	--	--	37.9	50.2	--	7,250	--	--
	Madras	147.7	--	--	27.9	42.6	--	--	26.0	39.8	1,450	14,650	--	2,125
	Paulina	195.4	--	--	31.0	48.6	--	--	29.1	45.7	--	11,200	--	500
	Diamond Junction	252.1	--	--	48.5	65.9	--	--	40.0	62.5	--	8,000	--	--
	Bonanza	321.8	--	--	[c]21.3	33.5	--	--	20.1	31.6	2,375	18,420	--	3,850
		Subtotal	--	1,560	228.4	327.7	--	--	209.2	309.5	12,750	84,020	2,450	18,775
PG&E	Tionesta	359.7	--	--	30.2	48.9	--	--	28.3	45.8	--	5,250	--	--
	Burney	417.4	--	--	38.2	59.2	--	--	34.5	54.5	--	7,250	--	--
	Gerber	484.0	--	--	27.1	48.6	--	--	25.2	48.6	--	9,450	--	--
	Delevan	532.6	--	2,975	56.1	80.4	--	600	52.3	75.8	8,450	18,980	5,200	13,025
	Antioch	631.2	--	--	--	--	--	--	--	--	--	--	--	--
		Subtotal	--	2,975	151.6	237.1	--	600	140.3	224.7	8,450	40,930	5,200	13,025

[a]All looping begins on the discharge side of the indicated compressor station.

[b]Location of interconnection of Northwest and PGT transmission systems.

[c]This looping starts on the discharge side of the Bonanza Compressor Station and would continue into California. Therefore, part of the looping would be on PG&E's system.

TABLE E-6

FLOW SCENARIO II: PGT/PG&E FACILITY REQUIREMENTS

Incremental Flow (Million Cfd)	42-Inch Diameter Pipeline		48-Inch Diameter Pipeline	
	Incremental Fuel (Million Cfd)	Incremental Horsepower	Incremental Fuel (Million Cfd)	Incremental Horsepower
0	[a]-26.58	0	-28.14	0
100	-24.86	0	-26.78	0
200	-22.87	0	-25.39	0
300	-20.56	0	-23.80	0
400	-17.90	0	-22.01	0
413	-17.52	0	-21.76	0
500	-14.65	0	-19.99	0
600	-11.19	0	-17.72	0
640	-9.68	300	-16.73	0
700	-7.27	1,400	-15.16	0
800	-2.83	4,850	-12.31	750
900	2.17	9,600	-8.90	2,550
1,000	7.80	15,550	-5.39	5,550
1,053	11.06	21,500	-3.39	7,650
1,100	14.12	27,050	-1.52	9,550
1,200	21.20	45,250	2.76	13,800
1,300	29.12	74,500	7.47	18,500
1,440	41.80	125,250	14.88	31,800

Note: Base flow = 1,028 Million Cfd (at Stanfield) Base fuel = 34.49 Million Cfd

[a]Negative figures represent a fuel savings over the base fuel requirements.

cation of the additional compression for this scenario is shown on table E-5.

Table E-7 shows the total facility requirements for the Northern Systems Alternative if sections of the Western Leg are prebuilt. If the Western Leg is never completed, the totals in this table would represent the requirements of this alternative.

Table E-8 identifies the alternative's looping, compression, and fuel requirements if the Western Leg has been completed. However, although the facilities required for the Western Leg are an integral part of the engineering analysis, they should not be considered in comparing the Northern Systems Alternative to the RMPP, since those facilities will be constructed regardless of the Northern Systems Alternative.

Natural gas imports from Canada provide a significant portion of the gas consumed on the west coast. The authorized Canadian import volumes from 1980 to 1993 are shown in table E-9. These volumes are subject to minor delivery reductions as early as 1982. If these contract licenses expire, PGT and PG&E would suffer a serious loss of gas supply and proportionately increased capacity on their northern transmission systems. The Northern Systems Alternative analysis assumes that the Canadian import volumes would remain constant at the 1980 volume (1,219,000 Mcfd).

TABLE E-7

FLOW SCENARIO I: NORTHERN SYSTEMS ALTERNATIVE (PREBUILT WESTERN LEG)

Facilities	42-Inch Diameter Pipeline		48-Inch Diameter Pipeline	
	Case I	Case II	Case I	Case II
Miles of New Pipe				
Northwest, 36-Inch	77	390	77	390
PGT	228.4	327.7	209.2	309.5
PG&E	151.6	237.1	140.3	224.7
[a]PG&E/SoCal, 36-Inch	148	148	148	148
Total	605	1,103	575	1,072
Additional Compression (Horsepower)				
Northwest	400	8,900	400	8,900
PGT	-	1,560	-	-
PG&E	-	2,975	-	600
Total	400	13,435	400	9,500
Operational Fuel Increase (million cfd)				
Northwest	7.06	12.08	7.06	12.08
PGT	6.25	6.69	6.23	6.22
PG&E	3.85	4.66	3.89	4.03
Total Incremental Fuel (Million Cfd)	17.16	23.43	17.18	22.33

[a]Facilities south of Antioch, California: PG&E--120 miles of new pipeline from Brentwood to Panoche Junction; SoCal--28.3 miles of looping between Hinkley and Adelanto.

TABLE E-8

FLOW SCENARIO II: NORTHERN SYSTEMS ALTERNATIVE (COMPLETED WESTERN LEG)

Facilities	42-Inch Diameter Pipeline		48-Inch Diameter Pipeline	
	Case I	Case II	Case I	Case II
Miles of New Pipe				
Northwest, 36-Inch	77	390	77	390
PGT	--	--	--	--
PG&E	--	--	--	--
[a]PG&E/SoCal, 36-Inch	148	148	148	148
Total	225	538	225	538
Additional Compression (Horsepower)				
Northwest	400	8,900	400	8,900
PGT	12,750	84,020	2,450	18,775
PG&E	8,450	40,930	5,200	13,025
Total	21,600	133,850	8,050	40,700
Operational Fuel Increase (Million Cfd)				
Northwest	7.06	12.08	7.06	12.08
PGT	13.79	34.45	8.66	20.75
PG&E	6.93	17.03	4.68	10.86
Total Incremental Fuel (Million Cfd)	27.78	63.56	20.22	43.51

[a]Facilities south of Antioch, California: PG&E--120 miles of new pipeline from Brentwood to Panoche Junction; SoCal--28.3 miles of looping between Hinkley and Adelanto.

TABLE E-9

AUTHORIZED NATURAL GAS IMPORTS FROM CANADA (Million Cfd)

Importing Company	1980 After July 1	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
[a]PGT GL-3	429	429	429	429	429	429	353	87						
PGT GL-16	231	231	214	210	210	210	210	210	184					
PGT GL-24	224	224	218	218	218	218	218	218	218	218	218	199	125	103
PGT GL-35	189	189	189	189	189	171	85	38						
Subtotal	1,073	1,073	1,050	1,046	1,046	1,028	866	553	402	218	218	199	125	103
PGT/NW GL-4	146	146	140	140	140	105	70	34						
Total	1,219	1,219	1,190	1,186	1,186	1,133	936	587	402	218	218	199	125	103

[a]"GL-3" and similar designations identify the contracts for these gas volumes.

NORTHWEST/PGT/PG&E ALTERNATIVE

The basis for the flow analysis of the Northwest/PGT/PG&E Alternative is the same as that used for the Northern Systems Alternative, except that the pipeline expansion for this alternative considers only 36-inch diameter looping for all three transmission systems. The looping mileage, incremental fuel consumption, and compression facilities for Case I (413,000 Mcfd) are shown in table E-1 and for Case II (800,000 Mcfd) in table E-2. These facilities would include a new compressor station at Stanfield, Oregon, for both cases. All other additional compression requirements would be added at existing compressor stations.

This alternative does not consider Alaskan gas volumes. The facilities shown in tables E-1 and E-2 would be required to transport the RMPP gas volumes and thus, are not part of the Western Leg facilities. When the Alaskan gas volumes become available, the Western Leg would be required in addition to these facilities.

NORTHWEST/EL PASO ALTERNATIVE

The facility requirements for the Northwest/El Paso Alternative are based on existing system requirements to deliver 410,000 Mcfd--the volume of Northwest's firm transportation agreements with other interstate pipeline companies--to the Ignacio (Colorado) Compressor Station. (See table E-10 for the increments of this volume.) In order to transport the base volume, this analysis for the Northwest system also includes a new 3,730-hp. Cortez Compressor Station, located approximately half the distance between the existing Moab and Ignacio Compressor Stations. This facility has not been proposed nor authorized and would have to be constructed for Northwest to transport 410,000 Mcfd. The base case for this analysis also includes all existing and certificated facilities on this system.

The facility estimates calculated for the Northwest system used summer conditions as the worst case. El Paso's facility estimates were based on winter conditions.

The facility requirements for the Northwest/El Paso Alternative are shown in tables E-1 and E-2 for Case I (413,000 Mcfd) and Case II (800,000 Mcfd), respectively. A 36-inch diameter pipe was assumed for all pipeline looping in this alternative. The facility requirements for Case II include a new 15,500- hp. Cisco Compressor Station between the existing Rangely and Moab Compressor Stations on the Northwest system. All other additional compression for this alternative would be located at existing sites.

TABLE E-10

NORTHWEST'S FIRM TRANSPORTATION AGREEMENTS WITH REDELIVERY TO EL PASO AT IGNACIO, COLORADO

FERC Docket No.	Status	Transporting For	From	Volume (Mcfd)
CP78-119	Ordered: 7/18/79	Michigan-Wisconsin Pipeline Co.	Creston Nose, WY	15,000
CP78-165	Ordered: 7/18/79	Michigan-Wisconsin Pipeline Co.	Lincoln Road, WY	10,000
CP78-183	Ordered: 4/17/79	Natural Gas Pipeline Co. of America	Bar X Field, UT	25,000
CP79-56	[a]Ordered: 1/11/80	PIT	Stanfield, OR	240,000
CP78-546 CP78-547	Ordered: 4/5/78	Southwest Gas Corporation (Southwest)	Grand and Uintah Counties, UT	6,000
CP78-546	Ordered: 11/9/79	Southwest	Garfield and Mesa Counties, CO	14,000
CP79-115	Ordered: 8/9/79	Cities	Moxa Arch Area, WY	100,000
			TOTAL	410,000

[a]Appeal pending.

NORTH/SOUTH ALTERNATIVE

The North/South Alternative would conceptually split the gas volume proposed for transportation by the RMPP into two equal flows, sending half of the gas north to Stanfield and the other half south toward El Paso's system. Case I would send 200,000 Mcfd in each direction; Case II would send 400,000 Mcfd each way. The facility requirements for this alternative are shown in tables E-11 and E-12. Table E-11 represents the facility requirements if the Western Leg has not been completed; table E-12 assumes the Western Leg has been completed. Since a 42-inch diameter pipe size was selected for the Western Leg by former Secretary of Energy, Charles Duncan, table E-12 does not consider a 36-inch diameter pipeline.

The facility estimates for this alternative were calculated using the same assumptions as those for the Northern Systems, Northwest/El Paso, and Northwest/PGT/PG&E Alternatives.

TABLE E-11

FLOW SCENARIO I: NORTH/SOUTH ALTERNATIVE

Facilities		36-Inch Diameter Pipeline		42-Inch Diameter Pipeline		48-Inch Diameter Pipeline	
Component	Company	Case I	Case II	Case I	Case II	Case I	Case II
Miles of New Pipe							
	Northwest (36-Inch)	[a]227	[b]490	227	490	227	490
	El Paso (36-Inch)	161	320	161	320	161	320
	PGT	200	236	180	207	170	191
	PG&E	-	192	-	173	-	159
	[c]PG&E/SoCal (36-Inch)	148	148	148	148	148	148
	Total	736	1,386	716	1,338	706	1,308
Additional Compression (hp)							
	Northwest	-	750	-	750	-	750
	El Paso	3,820	8,000	3,820	8,000	3,820	8,000
	PGT	-	-	-	-	-	-
	PG&E	-	-	-	-	-	-
	Total	3,820	8,750	3,820	8,750	3,820	8,750
Operational Fuel Increase (Million Cfd)							
	Northwest	2.85	13.00	2.85	13.00	2.85	13.00
	El Paso	11.06	17.06	11.06	17.06	11.06	17.06
	PGT	10.03	6.09	10.00	6.25	9.99	6.23
	PG&E		3.84		3.85		3.89
Total Incremental Fuel (Million Cfd)		23.94	39.99	23.91	40.16	23.90	40.18

[a]No pipeline looping is required north of Kemmerer, Wyoming, because this volume of gas could be exchanged for an equal amount of Pan Alberta gas, authorized in FERC Docket No. CP79-56. No compression would be needed.

[b]North of Kemmerer, Wyoming, 77 miles of pipeline would be required.

[c]Facilities south of Antioch, California: PG&E--120 miles of new pipeline from Brentwood to Panoche Junction; SoCal--28.3 miles of looping between Hinkley and Adelanto.

TABLE E-12

FLOW SCENARIO II: NORTH/SOUTH ALTERNATIVE

Facilities: Component	Facilities: Company	42-Inch Diameter Pipeline: Case I	42-Inch Diameter Pipeline: Case II	48-Inch Diameter Pipeline: Case I	48-Inch Diameter Pipeline: Case II
Miles of New Pipe					
	Northwest (36-Inch)	227	490	227	490
	El Paso (36-Inch)	161	320	161	320
	PGT	-	-	-	-
	PG&E	-	-	-	-
	[a]PG&E/SoCal (36-Inch)	148	148	148	148
Total		536	958	536	958
Additional Compression (Horsepower)					
	Northwest	--	750	--	750
	El Paso	3,820	8,000	3,820	8,000
	PGT	6,450	12,750	2,070	2,450
	PG&E	--	8,450	--	5,200
Total		10,270	29,950	5,890	16,400
Operational Fuel Increase (Million Cfd)					
	Northwest	2.85	13.00	2.85	13.00
	El Paso	11.06	17.06	11.06	17.06
	PGT	8.85	13.79	5.78	8.66
	PG&E	--	6.77	--	4.50
Total Incremental Fuel (Million Cfd)		22.76	50.62	19.69	43.22

[a]Facilities south of Antioch, California: PG&E--120 miles of new pipeline from Brentwood to Panoche Junction; SoCal--28.3 miles of looping between Hinkley and Adelanto.

CENTRAL NEVADA ALTERNATIVE

The Central Nevada Alternative would require approximately 862 miles of 36-inch diameter pipeline. It would originate at Sage, Wyoming, and follow the proposed RMPP route south approximately 196 miles. It would then proceed approximately 666 miles across central Nevada and California, eventually connecting with two existing intrastate pipelines in California--PG&E's pipeline about 30 miles west of Barstow and SoCal's pipeline near Victorville. (See the *Graphic Supplement* for a map showing this alternative.)

Analysis indicates that one new compressor station would be needed to transport the initial 413,000 Mcfd of RMPP gas. Three additional booster compressor stations and an enlarged Sage Compressor Station would be required to transport 800,000 Mcfd. The design and operation of the alternative pipeline is assumed to be equivalent to that of the proposed RMPP; therefore, the same gas receipt and delivery pressures and maximum allowable operating pressure were used as design parameters. The compression requirements, milepost locations, and fuel consumption for Case I (413,000 Mcfd) and Case II (800,000 Mcfd) are shown in table E-13. The location of the booster compressor station sites are preliminary.

This analysis has examined only the facility needs between Sage, Wyoming, and the delivery point in California.

WEST SALT LAKE ALTERNATIVE

The West Salt Lake Alternative would require the construction of the Kemmerer and Pegram Loops of the Northern Systems Alternative. It would also require construction of approximately 719 miles of 36-inch diameter pipeline. This pipeline would begin at the Northwest system approximately 15 miles north of the existing Pegram Compressor Station. It would follow a meandering southerly route which would bypass the Great Salt Lake to the north and west. It would proceed approximately 363 miles to the RMPP route near Filmore, Utah, then follow the RMPP route approximately 356 miles to southern California. (See the *Graphic Supplement* for a map showing this alternative.)

TABLE E-13

COMPRESSION REQUIREMENTS FOR CENTRAL NEVADA ALTERNATIVE

Volume	Description	MP	Volume of Gas Compressed (Million Cfd)	Required Horse-power	Fuel Gas (Million Cfd)
Case I: 413,000 Mcfd	Sage Compressor Station	0.0	409.5	25,650	3.52
Case II: 800,000 Mcfd	Sage Compressor Station	0.0	793.0	52,400	7.02
	Station No. 1	210.0	789.8	22,850	3.21
	Station No. 2	420.0	786.2	25,650	3.60
	Station No. 3	614.0	783.5	19,300	2.71
TOTALS				120,200	16.54

Analysis indicates that a new compressor station, Montpelier, located where this alternative departed from Northwest's transmission system, would be required to transport the initial 413,000 Mcfd of RMPP gas. Three additional booster compressor stations and an enlarged Montpelier Compressor Station would be required to transport 800,000 Mcfd. Since the design and operation of the alternative pipeline is assumed to be equivalent to that of the proposed RMPP, the same gas receipt and delivery pressures and maximum allowable operating pressure were used as design parameters. The compression requirements, milepost locations, and fuel consumption for Case I (413,000 Mcfd) and Case II (800,000 Mcfd) are shown in table E-14. The locations of the booster compressor station sites are preliminary.

This analysis examines only the facility needs between the Northwest pipeline system and the delivery point in California.

TABLE E-14

COMPRESSION REQUIREMENTS FOR WEST SALT LAKE ALTERNATIVE

Volume	Description	MP	Volume of Gas Compressed (Million Cfd)	Required Horse-power	Fuel Gas (Million Cfd)
Case I: 413,000 Mcfd	Montpelier Compressor Station	[a]0.0	409.8	23,350	3.20
Case II: 800,000 Mcfd	Montpelier Compressor Station	[a]0.0	793.0	52,400	7.02
	Station No. 1	190.2	790.4	18,800	2.63
Case II: 800,000 Mcfd	Station No. 2	380.2	787.7	19,200	2.69
	Station No. 3	570.2	786.4	9,050	1.27
TOTALS				99,450	13.61

[a]MP 0 is located where the alternative would leave the Northwest transmission system.

Appendix F
Alternatives Considered but Eliminated from Detailed Study

TOTAL SYSTEM ALTERNATIVES

The six total project/system alternatives which were considered but eliminated from detailed consideration would **use** existing pipeline system routes and might also establish new pipeline alignments. These alternatives, shown on map F-1, include the Northwest/Southwest (ABCIJFGHNO), Northern Route (AIEFGHNO), Northern Route and Southwest Gas (AIJFGHNO), Northwest/El Paso (AKLM), Northwest/PGT/PG&E (ABCDEFGHNO), and North-South Alternatives (ABCDEFGHNO and AKLM). Table F-1 compares the length of these alternatives to the RMPP at the proposed volume of 413,000 Mcfd. The amount of compressor fuel gas was not determined for the Northwest/Southwest, Northern Route, and Northern Route and Southwest Gas Alternatives. Since these alternatives would require longer pipeline construction than the proposed route without introducing any significant environmental advantages, the analysis of these three alternatives was limited primary to environmental impact. MAP F-1

In addition to primary environmental impact, the Northwest/El Paso, Northwest/PGT/PG&E, and North-South Alternatives were analyzed for operational effects of fuel use. A more detailed discussion of the engineering aspects of these systems can be found in appendix E.

TABLE F-1

COMPARISON OF LENGTH OF TOTAL SYSTEM ALTERNATIVES TO RMPP

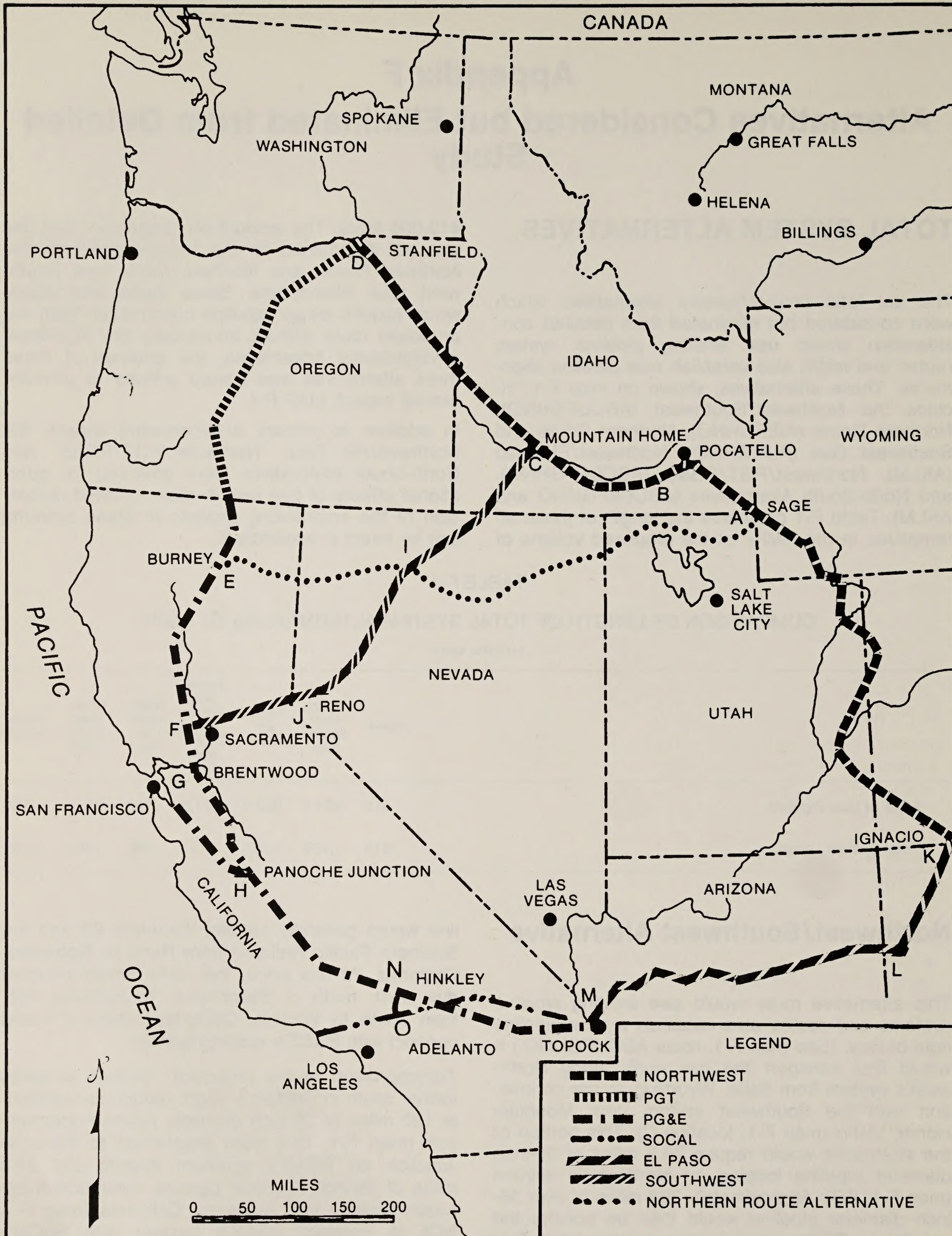
(413,000 Mcfd)

	RMPP	North-west/ South-west	North-ern Route	North-ern Route and South-west Gas	North-west/ El Paso	North-west PGT/ PG&E	North-South
Miles of New Pipeline	610	694.1	893.3	871.3	733	653.1	736
Total System Length	610	1,198	1,225	1,157	980	1,607	2,587

Northwest/Southwest Alternative

This alternative route would **use** existing pipeline systems and routes also establish a new pipeline right-of-way. (See map F-1, route ABCIJFGHNO.) It would first transport the gas north along Northwest's system from Sage, Wyoming, to the connection with the Southwest system near Mountain Home, Idaho (map F-1, location C). This portion of the alternative would require 76.8 miles of 36-inch diameter pipeline looping on Northwest's system (map F-1, AB). Approximately 303 miles of new 36-inch diameter pipeline would then be constructed parallel to Southwest's existing system (map F-1, CIJ) from Mountain Home to Reno, Nevada. Transportation of gas from Nevada to California would require approximately 166 miles of new pipeline (map F-1, JF) from Reno to a connection with PG&E's system near Winters, California. This pipeline would generally parallel Interstate 80 and the Southern Pacific Railroad from Reno to **Roseville,** California. At this point, the route would proceed due west, north of Sacramento to Highway 565, then south to Winters, California, where it would connect with PG&E's existing system.

Transportation of the proposed volumes to areas farther south in California might require an additional 120 miles of 36-inch diameter pipeline construction (map F-1, GH) from Brentwood to Panoche Junction on PG&E's southern system and 28.3 miles of 36-inch diameter pipeline construction between Hinkley and Adelanto, California (map F-1, NO) to connect PG&E's system with SoCal's system. However, in its November 12, 1980, data response discussed in relation to the Northern Systems Alternative, the applicant does not definitely state that this construction would be required to transport the gas south from Brentwood. Therefore,



MAP F-1. ALTERNATIVE PIPELINE CORRIDORS

the pipeline construction required for this alternative could total approximately 694 miles.

The Northwest/Southwest Alternative would require numerous major river crossings. These include the Bear River in Wyoming; Portneuf, Raft, Snake, Bruneau, and Owyhee Rivers in Idaho; South Fork Owyhee, North Fork Little Humboldt, Little Humboldt, and Truckee Rivers in Nevada; and the Sacramento River in California.

The Owyhee, North Fork Little Humboldt, Little Humboldt, and Truckee River crossings would occur at Class I points having the highest fishery resource value. In the area of the pipeline crossing, the Truckee River also contains two federally protected fish species, the Lahontan cutthroat trout (threatened) and the cui-ui or lakesucker (endangered). The Lahontan cutthroat trout may also be found in several of the Humboldt River tributaries that would be crossed by the alternative along Southwest's system in Nevada. The peregrine falcon, an endangered species, is known to nest along the drainage of the Snake River.

Generally, the Northwest/Southwest Alternative would cross several mountain ranges that are separated by alluvial basins and desert plains. In several areas near Reno, the terrain is particularly rocky and steep.

In western Nevada and eastern California, the alternative would traverse the Toiyabe and Tahoe National Forests, areas of high recreational interest. This alternative would also require construction near such urban areas as Sparks and Reno, Nevada and Auburn, Roseville, and Woodland, California.

A particular constraint on this alternative would be its passage through the Sierra Nevada Mountains in eastern California. Construction of the pipeline adjacent to the existing transportation corridors in this area and within the mountainous terrain of the Sierra Nevadas could be difficult; the terrain would also cause construction difficulties.

The Northwest/Southwest Alternative would transport the gas a total of **1,198** miles. Because it would require 84 more miles of pipeline construction than the proposed route and would cross difficult and sensitive areas in California, it was eliminated from further study. If the 148.3 miles of pipeline south of Brentwood are not required, this alternative would only be 545.8 miles long. Although the alternative would be shorter than the RMPP, the Northern Systems Alternative would still be superior because of its 76.8-mile length.

Northern Route Alternative

The Northern Route Alternative (map F-1, AIEFGHNO) would require pipeline construction in Utah, Nevada, and California and also **use** PG&E's existing pipeline system in California. Beginning at Sage, Wyoming, the alternative route would pass south of Logan, Utah, and north of the Great Salt Lake to Highway 30. It would parallel Highway 30 to Interstate 80, then proceed west, paralleling Interstate 80 to Dunphy in Eureka County, Nevada. The alternative would continue west, paralleling the Western Pacific Railroad to Floka Siding in Humboldt County, Nevada. From this point, the route would proceed due west to Burney, California.

This alternative would require construction of 615 miles of 36-inch diameter pipeline between Sage and Burney (map F-1, AIF). An additional 135 miles of 36-inch diameter pipeline looping (map F-1, EFG) on PG&E's system would also be required to transport gas from Burney to PG&E's load center at Antioch in the San Francisco Bay area. The applicant's response discussed in relation to the Northern Systems Alternative indicates that transportation of the proposed volumes to areas farther south in California might require an additional 120 miles of pipeline construction connecting Brentwood with Panoche Junction on PG&E's southern system and 28.3 miles of pipeline construction between Hinkley and Adelanto. Thus, the Northern Route Alternative could require construction of 898.3 miles of pipeline to transport the gas approximately **1,225** miles.

The majority of the Northern Route would traverse the Great Basin in northern Nevada and require crossing several north-to-south mountain ranges. In Utah, this alternative would require construction through the Blacksmith Fork Canyon within the Caribou National Forest; in this area, it would also traverse portions of the Hardware Range Game Management Area. In northern Nevada, this alternative might cross the South Fork, Battle Mountain, and Winnemucca Indian Reservations.

The Northern Route Alternative would also require crossings of the Humboldt River and several tributaries within its drainage. These crossings might affect the habitat of the Lahontan cutthroat trout, a federally listed threatened fish species. Other major river drainages which would be crossed by this alternative include the Bear and Little Bear Rivers in Utah and the Pitt and Fall Rivers in California.

In northern California, the alternative would cross the Shasta and Modoc National Forests. This general area contains extensive recent lava flows and fault blocks. Lassen and Shasta Counties have active nests for the bald eagle, a federally listed endangered species.

Construction of the pipeline looping south of Burney would generally be within the Central Valley of California, an area of extensive cultivated agriculture. Additional constraints on this alternative include numerous BLM WSA's in central and northern Nevada and in northern California.

The Northern Route Alternative would also require 288 more miles of pipeline construction than the proposed route. Consequently, it was not considered further.

Northern Route and Southwest Gas Alternative

Another alternative would combine a major part of the Northern Route Alternative and Southwest's pipeline corridor, then follow the PG&E system south to Panoche Junction (map F-1, AIJFGHNO). This alternative would transport the proposed volumes of gas from Sage Creek Junction along the Northern Route Alternative, through northern Nevada to the Southwest system in Humboldt County, Nevada (map F-1, location I). This part of the alternative would require approximately 410 miles of pipeline construction. The alternative route would then parallel Southwest's existing pipeline right-of-way south to Reno, Nevada, for 147 miles.

The remaining part of this alternative route would be similar to the route southwest of Reno described for the Northwest-Southwest Alternative. It would include 166 miles of new pipeline from Reno to Winters in California. Because of the RMPC data response (quoted in the discussion of the Northern Systems Alternative), 120 miles of pipeline construction between Brentwood and Panoche Junction and 28.3 miles of pipeline construction between Hinkley and Adelanto were included in the analysis.

The Northern Route and Southwest Gas Alternative, which would transport the gas **1,157** miles, could require 871.3 miles of new pipeline construction.

The alternative would cross the Bear and Little Bear Rivers in Utah, the Humboldt and Truckee Rivers in Nevada, and the Sacramento River in California. The endangered fish species that might be encountered in the Humboldt and Truckee Rivers are the same as those described for the Northwest/Southwest Alternative. Also, similar to the Northwest/Southwest Alternative, this alternative would require a passage through the Sierra Nevada Mountains in eastern California.

Because it would require construction of 261 more miles of pipeline than the proposed project and would cross heavily forested and potentially sensitive areas, this alternative was not analyzed in any further detail.

Northwest/El Paso Alternative

The Northwest/El Paso Alternative shown on map F-1 (AKLM) would deliver the Rocky Mountain gas to southern California by expanding the capacity of Northwest's and El Paso's existing transmission systems. This alternative was analyzed for the 413,000-Mcfd volume proposed by the RMPC. Northwest would receive the gas approximately 15 miles northwest of its existing Kemmerer Compressor Station near Sage, Wyoming (map F-1, location A) and transport it about 500 miles south to its Ignacio Compressor Station in La Plata County, Colorado (map F-1, location K). From Ignacio, El Paso would transport the gas southwest approximately 480 miles to a connection with PG&E's system at the Arizona-California border (map F-1, location M).

Additional engineering information for the Northwest/El Paso Alternative can be found in appendix E. The facilities would be constructed adjacent to existing pipeline rights-of-way. This alternative would require approximately 733 miles of 36-inch diameter pipeline looping (413 miles adjacent to Northwest's system, 320 miles along El Paso's system) and approximately 8,350 **horsepower** additional compression (350 **horsepower** along Northwest's system; 8,000 **horsepower** along the El Paso system). The incremental fuel consumption for the proposed volume would be about 7.9 times greater than that of the RMPP. This alternative would also require a new 3,730-horspower compressor station (Cortez) approximately half the distance between the existing Moab and Ignacio Compressor Stations on the Northwest pipeline system.

The required pipeline looping for this alternative would generally parallel and gradually cross the Rocky Mountains along the Northwest system. The scenic and wilderness qualities of this region have prompted numerous national parks, monuments, and recreation areas to be established there. The alternative could probably avoid many of these areas, but it might cross Arches National Park, Flaming Gorge National Recreation Area, San Juan and Ashley National Forests, and the Southern Ute and Navajo Indian Reservations. Additional pipeline looping might be required for a route deviation to avoid the Arches National Park.

Construction adjacent to the Northwest system would encounter extremely rugged terrain. Looping along the Northwest system would also traverse the drainage basins of the Green, White, Colorado, and San Juan Rivers.

The topography along the El Paso system varies from badlands to predominantly flat terrain, including several desert areas. Pipeline looping along this system could require crossings of the Coconino, Kaibab, and Prescott National Forests, and the Little Colorado River drainage basin.

Because the Northwest/El Paso Alternative would require 123 miles more pipeline construction than the proposed route, it was not analyzed in any further environmental detail.

This alternative was also analyzed for the 800,000-Mcfd volume. (See appendix E for the engineering analysis of this alternative.) For this level of operation, the Northwest/El Paso Alternative would require approximately 1,034 miles of 36-inch diameter pipeline looping and approximately 66,900 **horsepower** of additional compression. The incremental fuel consumption for this level would be about 3 times greater than that of the proposed RMPP. A new compressor station would also be required on Northwest's system between its existing Rangely and Moab Compressor Stations in addition to the Cortez Compressor Station discussed for the 413,000-Mcfd level.

Because the 800,000 Mcfd level would require at least 424 miles more pipeline construction than the proposed route and create additional impact adjacent to both Northwest's and El Paso's existing systems, it was eliminated from any further detailed study.

Northwest/PGT/PG&E Alternative

The Northwest/PGT/PG&E Alternative would transport the proposed volumes of gas by constructing 36-inch diameter pipeline looping adjacent to the Northwest, PGT, and PG&E existing systems. (On map F-1, this alternative is ABCDEFGHNO.) The proposed gas volumes would either be transported on the Northwest system to a connection between the Northwest and PGT systems at Stanfield, Oregon (map F-1, location D) or be transported by Northwest to its market areas in exchange for natural gas from other sources which it would deliver to the PGT system at Stanfield, Oregon, or Spokane, Washington, the two points where the existing PGT and Northwest systems interconnect. From either Spokane or Stanfield, or both, PGT would transport the gas on its existing system to a connection with PG&E's system at the Oregon-California border. The gas would then be transported by PG&E through its existing system to its load center at Antioch.

This portion of the alternative would require 76.8 miles of 36-inch diameter looping on Northwest's system and a total of 428 miles of 36-inch diameter looping on PGT's and PG&E's systems. Again, as for the Northern Systems Alternative, in order to transport the proposed volumes south from PG&E's load center at Antioch, RMPC has indicated that an additional 120 miles of pipeline between Brentwood and Panoche Junction and 28.3 miles of pipeline between Hinkley and Adelanto might be required. Therefore, the Northwest/PGT/PG&E Alternative could require 653.1 miles of pipeline construction to transport 413,000 Mcfd; it would be 43.1 miles longer than the proposed RMPP. The alternative would transport the gas a total of **1,607** miles.

Another version of this alternative, the Northern Systems Alternative, would reduce the pipeline required to only 225.1 miles of new construction by modifying the design and operation of pipeline looping that has been authorized but not constructed on the PGT and PG&E transmission systems. (See the Northern Systems Alternative discussion for more information.) Because the Northern System Alternative is superior to the Northwest/PGT/PG&E Alternative, the latter alternative was not analyzed in any more detail.

North-South Alternative

The North-South Alternative would combine the existing systems described in the Northwest/PGT/PG&E Alternative and the Northwest/El Paso Alternative. The facility requirements for this alternative, constructed adjacent to the existing rights-of-way of these systems, would allow half the gas volumes to be transported north and half to be transported south from the Rocky Mountain Overthrust Belt. Additional engineering information for the North-South Alternative can be found in appendix E, table E-11.

The combined **use** of these two total system alternatives was first anal for transporting 400,000 Mcfd of gas, approximating the proposed RMPP volumes. Under this hypothesis, 200,000 Mcfd of gas would be transported north through the Northwest/PGT/PG&E systems and 200,000 Mcfd of gas would be transported south through the Northwest/El Paso systems. Transportation of these volumes would require a total of 736 miles of 36-inch diameter pipeline looping adjacent to the Northwest, El

Paso, PGT, and PG&E systems. This total includes 120 miles of pipeline between Brentwood and Panoche Junction and 28.3 miles of pipeline between Hinkley and Adelanto, south of Antioch, California. Additional compression (3,820 **horsepower**) would be required only on El Paso's system. The incremental fuel consumption for transporting the 400,000- Mcfd gas volumes would be about 23 Mcfd.

This alternative would require 126 more miles of pipeline than the proposed project.

This alternative was also analyzed at the 800,000 Mcfd gas level. At this volume, 400,000 Mcfd of gas would be transported north through the Northwest/PGT/PG&E systems; 400,000 Mcfd of gas would be transported south through the Northwest/ El Paso systems. A total of 1,386 miles of 36-inch diameter pipeline looping would be constructed, and approximately 8,750 **horsepower** of additional compression would be required. The incremental fuel consumption for transporting 800,000 Mcfd would be about 3.5 times greater than that of the same expansion volumes for the RMPP.

Because this alternative could require at least 776 miles more pipeline construction than the proposed route to transport 800,000 Mcfd, as well as additional pipeline construction adjacent to Northwest's, El Paso's, PGT's, and PG&E's existing systems, it was eliminated from any further detailed study.

If the 148.3 miles of pipeline south of Brentwood were not required, the North-South Alternative would only be 587.7 miles long. Since it would not be significantly shorter than the RMPP and would consume significantly more fuel gas, the alternative was not analyzed in further environmental detail.

ROUTE ALTERNATIVES

Salt Lake Valley Alternative

The Salt Lake Valley Alternative would follow the proposed action to MP 35, pass southwest to Croydon, Utah, and cross the Wasatch Range through Weber Canyon, following Interstate Highway 30N. It would then emerge from the canyon by Hill Air Force Base and turn south, bordering the west side of Salt Lake City, and continue south to merge with the proposed action at MP 182 east of Delta, Utah.

This alternative was eliminated from further consideration for several reasons. The Wasatch Range is highly faulted in the vicinity of Weber Canyon. Several years ago, Mountain Fuel evaluated Weber Canyon as a route for a 21-inch diameter gas pipeline and decided that the canyon was already too congested: it contains a 16-inch diameter natural gas pipeline, two oil pipelines, two railroad tracks, a **BR** canal, a four-lane interstate highway, a high-voltage electric transmission line, a railroad power and signal line, and interstate and local telephone cables. The company decided that construction would be difficult (Carricaburu 1977). The urban congestion in Salt Lake City would also have caused extensive right-of-way and construction difficulties.

Spanish Fork Canyon Alternative

The Spanish Fork Canyon Alternative would leave the proposed route at approximately MP 150, pass through Spanish Fork Canyon, and emerge from the canyon near East **Bench,** Utah. It would then pass along the toe of the mountains paralleling U.S. Highway 91 and the railroad, pass west of Nephi, and rejoin the proposed action near Nephi at MP 197.

This alternative was eliminated from further consideration due to the anticipated congestion of the existing facilities in Spanish Fork Canyon.

Cedar City Alternative

The Cedar City Alternative would depart from the proposed route at MP 340, follow a paved road to Cedar City, pass west of Cedar City, and parallel U.S. Highway 91. It would then pass south of St. George, Utah, and continue to follow Highway 91 to Glendale, Nevada, where it would rejoin the proposed action at MP 459. It was considered but eliminated because it offered no environmental advantages to offset its increased length.

Moapa-Las Vegas Alternative

This alternative would follow the proposed action until near Glendale, Nevada, at about MP 460. It would then pass west of Interstate 15, U.S. Highway 91, and the railroads. The alternative would parallel these facilities, then cross north of Nellis Air Force Base and west of Frenchman Mountain. It would continue between East Las Vegas and Henderson and rejoin the proposed action at MP 542.

The Moapa-Las Vegas Alternative was modified using suggestions from the applicant and local agencies and refined into the East Las Vegas Variation **and Moapa Variation** which **were** studied in detail as Variations 3 **and 7 respectively.**

Warm Springs Alternative

The Warm Springs Alternative would allow the RMPP to serve as a collection pipeline for Utah gas development, if such development occurs.

This alternative would follow the proposed action until MP 366 near Newcastle, Utah. It would then follow Utah Highway 56 to the Utah/Nevada state line, where the highway becomes Nevada Highway 25. The alternative would follow Highway 25 to Panaca, Nevada, where it would merge with U.S. Highway 93, and then follow Highways 93 and 25 to Crystal Springs, Nevada. It would follow Nevada Highway 25 to Warm Springs, Nevada, where it would connect with the Central Nevada Alternative at MP 300.

Since it would require a longer pipeline but offered no environmental advantages, the Warm Springs Alternative was eliminated from further consideration.

Variation 1--Strawberry Reservoir Variation

This variation would provide an alternative route around the east side of Strawberry Reservoir. It would lessen the recreational and visual impacts on the area. No additional aboveground facilities would be required. The Strawberry Reservoir Variation was eliminated from detailed evaluation because it offered no significant environmental advantages. However, it would cross the Uinta and Ouray Indian Reservation and a steep scenic gorge called 'The Narrows.' The portion of the proposed action which it would replace has no similar environmental problems.

Variation 3b--Hollywood Boulevard Variation

The Hollywood Boulevard Variation would have provided another route through greater metropolitan Las Vegas in addition to the proposed action and the East Las Vegas Variation. The variation was considered by the BLM Las Vegas District Office and field checked in November 1981.

The variation would deviate from the East Las Vegas Variation at approximately the southwest corner of section 11, T20S, R62E, and parallel Hollywood Boulvard in a southerly direction, passing immediately to the west of the Clark County advanced wastewater treatment plant. It would then cross the Las Vegas Wash at a point just east of the East Las Vegas Variation.

This variation was determined to be unviable because the route would be constrained by residential encroachment in the segment between Bonanza Road and Charleston Boulvard. (Refer to map S-22 of the Graphic Supplement for these locations.) Residential growth and large estates in this area precluded further analysis of this variation. Deviation to the east of the residential development was not feasible because of the vertical slopes of the Frenchman Mountain. Deviation to the west would have encountered more urban development and problems associated with the Sloan's ditch.

Variation 6--Daniels Canyon Variation

This variation would depart from the proposed route at MP 107.8 near Heber City, Utah, cross the proposed route three times, and rejoin it at MP 156. The 52-mile long variation would replace 48 miles of the proposed action. Construction would be along the road right-of-way for at least 7 miles in the narrow portion of Daniels Canyon. The above-ground facilities and components for the variation would be similar to those for the proposed action.

The variation would follow existing roads and corridors. It was developed to provide an alternate route around the potential soils problems and planning conflicts along the proposed action.

This variation was analyzed in the DEIS. However, during the public comment period, several commentors identified problems and impacts which would result from using this variation. In addition, the FS determined that only a small segment of the variation had merit. Therefore the Daniels Canyon Variation was dropped from further consideration. Its replacement, Daniels Canyon Variation II, is discussed in the body of the FEIS.

Appendix G

Location of Pipeline Routes in Existing Corridors

The Federal Land Policy and Management Act of 1976 mandates BLM and the FS to consider how well project proposals follow existing corridors. Consequently, each alternative was analyzed to determine which portions would be within an existing utility or transportation corridor. A map reconnaissance of each route was conducted using USGS 1:250,000-inch scale maps. If an existing road, railroad, or utility line was within 1 mile of the alternative, the route was considered to be within that corridor. The information contains some data gaps and should not be considered as all inclusive.

The results of this analysis are shown in table G-1 and G-2.

TABLE G-1

LOCATION OF PIPELINE ROUTE IN EXISTING CORRIDORS

	MP	Utility/Transportation Corridor
Proposed Action	0-9	Other roads
	9-24	Utah State Highway 16
	27-38	Other roads
	43-44	Other roads
	50-52	Other roads, Interstate Highway 80(1)
	65-84	Utah State Highway 133
	85-91	Interstate 80, U.S. Highway 189A, Union Pacific Railroad, other roads
	96-99	U.S. Highway 189A
	99-105	Other roads
	105-108	U.S. Highway 189A
	122-130	Other roads
	130-134	U.S. Highway 40
	134-140(?)	Other roads
	146-190	Moon Lake'electrical transmission lines
	185-195	Utah State Highway 132
	195-200	U.S. Highway 1, Union Pacific Railroad
	200-205	Union Pacific Railroad
	205-214	U.S. Highway 91, Union Pacific Railroad
	214-224	U.S. Highway 91
	232-275	U.S. Highway 91
	279-290	Other roads
	296-303	Other roads, powerline(?)
	303-308	Other roads
	317-333	Other roads
	349-389	Other roads, telephone line, Utah State Highway 18, and IPP
	396-408+(?)	Telephone line and IPP
	450-466	U.S. Highway 91
	480-483	Other roads
	486-490	Other roads
	490-492	Other roads, IPP,
	498-502	Other roads, IPP
	505-511	Other roads, powerline, road
	512-520	U.S. Highway 95, IPP
	520-558	U.S. Highway 95
	561-591	Other roads, telephone line
Alternative A, Northern Systems Alternative		
Kemmerer Loop		
	0-12	Pipeline, U.S. Highway 30N, Union Pacific Railroad
	12-21.7	Pipeline

TABLE G-1—Continued

	MP	Utility/Transportation Corridor
Pegram Loop		
	34.5-39	Pipeline
	39-41	Pipeline, U.S. Highway 30N, Union Pacific Railroad
Soda Springs Loop		
	66.3-73	Pipeline, U.S. Highway 30N
	73-74	Pipeline, U.S. Highway 30N, Union Pacific Railroad
	74-78	Pipeline
	78-85	Pipeline, U.S. Highway 30N, Union Pacific Railroad
	85-89	Pipeline
Pocatello Loop		
	143-151	Pipeline
	151-168	Pipeline, Interstate 15W
Brentwood-Panoche Segment		
	0-7	Pipeline
	7-11	Pipeline, Southern Pacific Railroad, California State Highway 33
	11-17	Pipeline
	17-48	Pipeline, Interstate Highway 580, Interstate Highway 5
	48-66	Pipeline
	66-69	Pipeline, interstate Highway 5
	69-73	Pipeline
	73-84	Pipeline, Interstate Highway 5
	84-96	Pipeline, Interstate Highway 5
	96-107	Pipeline, Interstate Highway 5, powerline
	107-108	Pipeline
	108-120	Pipeline, powerline
Hinkley-Adelanto Segment		
	0-2	Pipeline
	2-4	Pipeline, road
	4-8	Pipeline
	8-28	Pipeline, Union Pacific Railroad, Atchinson, Topeka, and Santa Fe Railroad, road
Alternative B, Sanpete Valley Alternative	0-9	Other roads
	9-24	Utah State Highway 16
	27-38	Other roads
	43-44	Other roads
	50-52	Other roads, Interstate Highway 80(1)
	65-84	Utah State Highway 133
	85-91	Interstate 80, U.S. Highway 189A, Union Pacific Railroad, other roads
	96-99	U.S. Highway 189A
	99-105	Other roads
	105-108	U.S. Highway 189A
	122-130	Other roads
	130-134	U.S. Highway 40
	134-140(?)	Other roads
	146-176	Moon Lake'electrical transmission line
	176-B120*	U.S. Highway 89, Railroad, and IPP*
	B125-B131	U.S. Highway 89, and IPP
	B163-B171	U.S. Highway 91, Interstate Highway 15, and IPP
	B184-B200	Telephone line and IPP
	356-389	Utah State Highway 18, IPP, and telephone line
	396-408+(?)	Telephone line
	450-466	U.S. Highway 91
	480-483	Other roads
	486-490	Other roads

TABLE G-1—Continued

	MP	Utility/Transportation Corridor
	490-492	Other roads, railroads, IPP
	498-502	Other roads, IPP
	505-511	Other roads, powerline, IPP
	512-520	U.S. Highway 95, IPP
	515-558	U.S. Highway 95
	561-591	Other roads, telephone line
Alternative C, Central Nevada Alternative	0-9	Other roads
	9-24	Utah Stte Highway t6
	27-38	Other roads
	43-44	Other roads
	50-52	Other roads, Interstate Highway 80(t)
	65-84	Utah State Highway 133
	85-9t	Interstate 80, U.S. Highway 189A, Union Pacific Railroad, other roads
	96-99	U.S. Highway t89A
	99-t05	Other roads
	t05-108	U.S. Highway t89A
	t22-130	Other roads
	130-134	U.S. Highway 40
	t34-140(?)	Other roads
	t46-190	Moon Lake[1] electrical transmission line
	C0-C33	State Highway t32 and IPP
	C33-C45	U.S. Highways 6 and 50 and railroad
	C45-C157	U.S. Highways 6 and 50 and IPP
	C169-C460	U.S. Highway 6
	C210-C220	Mt. Wheeler electrical transmission lines
	C484-C491	U.S. Highway 395
	C52t-C596	U.S. Highway 395 and railroad
	C60t-C608	U.S. Highway 395
	C6t3-C666	U.S. Highway 395
Alternative D, Sevier-Escalante Desert Alternative	0-9	Other roads
	9-24	State Highway t6
	27-38	Other roads
	43-44	Other roads
	50-52	Other roads, Interstate Highway 80(t)
	65-75	Utah State Highway t33
	79-84	Utah State Highway t33
	85-9t	Interstate 80, U.S. Highway 189A, Union Pacific Railroad, other roads
	96-99	U.S. Highway 189A
	99-t05	Other roads
	105-t08	U.S. Highway t89A
	t22-t30	Other roads
	130-134	U.S. Highway 40
	134-t40(?)	Other roads
	146-t90	Moon Lake[1] electrical transmission line
	D0-D33	State Highway t32
	D33-D43	U.S. Highways 6 and 50 and railroad
	D58-Dt24	State Highway 257 and Union Pacific Railroad
	Dt00-Dt60	IPP
	Dt60-D185	IPP
	Dt24-D164	Union Pacific Railroad
	364-389	Telephone line and IPP
	396-408(?)	Telephone line
	450-466	U.S. Highway 9t
	480-483	Other roads
	486-490	Other roads
	490-492	Other roads, railroads, IPP
	498-502	Other roads, IPP
	505-51t	Other roads, powerline, IPP
	5t2-520	U.S. Highway 95,IPP
	515-558	U.S. Highway 95
	561-591	Other roads, telephone line
Alternative E, West Salt Lake Alternative		
Kemmerer	A0-A22 & 33-40	U.S. Highway 30, State Highway 89, and railroad
	E0-E43	State Highway 34
	E46-E59	State Highway 23 and railroad
	E72-E80	Union Pacific Railroad
	E2t6-E232	Interstate Highway 80 and railroad
	E336-E363	Railroad
	254-275	U.S. Highway 91
	279-290	Other roads
	296-303	Other roads, powerline(?)
	303-308	Other roads
	317-333	Other roads
	349-389	Other roads, telephone line, Utah State Highway 18, IPP
	396-408+(?)	Telephone, IPP
	450-466	U.S. Highway 9t
	480-483	Other roads
	486-490	Other roads
	490-492	Other roads, railroads, IPP
	498-502	Other roads, IPP
	505-5t1	Other roads, powerline, IPP
	5t2-520	U.S. Highway 95, IPP
	520-558	U.S. Highway 95
	561-591	Other roads, telephone line
Alternative F, Provo Canyon Alternative	0-9	Other roads
	9-24	State Highway t6
	27-38	Other roads
	43-44	Other roads
	50-52	Other roads, Interstate Highway 80(t)
	65-84	Utah State Highway t33
	85-9t	Interstate 80, U.S. Highway t89A, Union Pacific Railroad, other roads
	96-99	U.S. Highway 189A
	99-t05	Other roads
	t05-108	U.S. Highway 189A
	F16-F29	U.S. Highway t89, railroad, pipeline
	F39-F47	State Highway 80
	214-224	U.S. Highway 9t
	232-275	U.S. Highway 9t
	279-290	Other roads
	296-303	Other roads, powerline(?)
	303-308	Other roads
	317-333	Other roads
	349-389	Utah State Highway 18, other roads, telephone line, IPP
	396-408+(?)	Telephone line and IPP
	450-466	U.S. Highway 9t
	480-483	Other roads
	486-490	Other roads
	490-492	Other roads, railroads, IPP
	498-502	Other roads, IPP
	505-5tt	Other roads, powerline, IPP
	5t2-520	U.S. Highway 95, IPP
	520-558	U.S. Highway 95
	56t-591	Other roads, telephone line
Variation 2, Thistle Creek Variation	(entire)	State Highway 89 and Denver & Rio Grande Western Railroad
Variation 3, East Las Vegas Variation	16-20 & 20-24	Water-Wastewater line right-of-way and unnumbered road
	24-28	Highway 515 proposed right-of-way
	49-59	U.S. Highway 95
Variation 4, Fort Mojave Variation	None	None
Variation 5, Mill Creek Variation	0-4	U.S. Highways 6 and 50 and Denver and Rio Grande Western Railroad
Variation 6-II, Daniels Canyon Variation II	3-5	Strawberry Ridge Road (dirt transmission line maintenance road)
Variation 7, Moapa Variation	0-7	Navajo-McCullough powerline
	7-t8	P.L. 96-491 3,000-foot wide corridor
	t8-3t	Navajo-McCullough powerline

*Bt20 Refers to MP t20 on Alternative B.

[1] Moon Lake and Intermountain River Project (IPP) both have proposed electrical transmission lines. The routes for these lines and the corridors they would follow are referred to here.

TABLE G-2

PERCENTAGE OF PIPELINE ROUTES WITHIN EXISTING CORRIDORS

Alternative	Alternative Length (miles)	Length Alternative within Existing Utility/Transportation Corridor (miles)	Percent of Alternative Length within Existing Utility/Transportation Corridor (percent)
Proposed Action	610	442	72
Northern Systems Alternative	225	222	99
Sanpete Valley Alternative	630	446	71
Central Nevada Alternative	862	747	87

TABLE G-2—Continued

Alternative	Alternative Length (miles)	Length Alternative within Existing Utility/Transportation Corridor (miles)	Percent of Alternative Length within Existing Utility/Transportation Corridor (percent)
Sevier-Escalante Desert Alternative	622	544	87
West Salt Lake Alternative	747	370	50
Provo Canyon Alternative	619	360	58
Thistle Creek Variation	27	27	100
East Las Vegas Variation	59	22	37
Fort Mojave Variation	10	0	0
Mill Creek Variation	21	4	19
Daniels Canyon Variation II	7	2	29
Moapa Variation	31	31	100
West Kamas Valley Variation	15	0	0

Appendix H

Affected Threatened and Endangered Species

The following information identifies the current status of threatened and endangered vegetation species that might be affected by the proposed pipeline route, its alternatives, and variations. Table H-1 summarizes this information. Direct impact to those species cannot be assessed until an alignment is staked and a biological survey is conducted to locate species or populations near that line.

TABLE H-1 (Revised).

THREATENED AND ENDANGERED VEGETATION SPECIES

(That Have a High Probability of Being Located Along the Pipeline Route, Alternative, or Variation)

Species	Status	RMPP	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Variation 5
Agave utahensis var. eborispina	C	X		X		X	X	X	
Allium passeyi	C						X		
Amsinckia grandiflora	RE		X						
Arctomecon californica	C	X		X		X	X	X	
Aretomecon humilis	E	X		X		X	X	X	
Asclepias eastwoodiana	C				X				
Astragalus callithrix	C				X				
Astragalus calycosus var. monphyllidius	C					X			
Astragalus desereticus	C	X		X	X	X			
Astragalus funereus	C				X				
Astragalus lentiginosus var. latus	C			X					
Astragalus uncialis	C				X				
Chorizanthe spinosa	C				X				
Cryptantha hoffmannii	C				X				
Cuscuta warneri	C					X			
Cymopterus coulteri	C			X					
Echinocerous englemannii var. purpureus	E	X		X		X	X	X	
Eriogonum eremicum	C				X				
Eriogonum nanum	T				X				
Eriogonum ostlundii	C			X					
Eriogonum vestitum	C		X						
Lesquerella garrettii	C							X	
Machaeranthera kingii	C								
Mentzelia argillosa	C			X					
Penstemon bicolor Ssp. bicolor	C	X		X		X	X	X	
Penstemon garrettii	C	X			X			X	
Penstemon tidestromii	C	X			X	X			
Phacelia anelsonii	C	X		X		X	X	X	
Phacelia argillacea	E				X				X
Phacelia utahensis	C								
Phlox glandiformis	C	X		X		X	X	X	
Puccinellia parishii	C		X						
Sclerocactus polyancistrus	C				X				
Spartina gracilis	R				X				
Sphaeralcea caespitosa	C				X				
Tropidocarpum capparideum	RE		X						
Trifolium ardersoni Ssp beatleyae	C				X				

C=Currently under review, *Federal Register* 1980; considered as a candidate for formal listing.
E=Listed as endangered in *Federal Register* 1980.
T=State listed as threatened; no protection under state law.
R=Rare in California; common elsewhere.
RE=Rare and Endangered in California; protected under state law.

The Endangered Species Act of 1973 requires, under Section 7 that any Federal agency carrying out any action that might affect an endangered species must consult with the Fish and Wildlife Service concerning the effects of the project on threatened or endangered species. The correspondence contained in this section of the appendix are the responses supplied to BLM concerning the RMPP by the Fish and Wildlife Service.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

AREA OFFICE - IDAHO AND OREGON
4620 OVERLAND ROAD, ROOM 238
BOISE, IDAHO 83705
FTS: 554-1960 / COMM: 208/384-1960

SPECIAL PROJECTS
STAFF

NOV 17 1980

RECEIVED

NOV 14 1980

TO: Team Manager, Special Projects Environmental Impact Team, Bureau of Land Management, 3rd Floor East, 555 Zang Street, Denver, CO 80228

FROM: Area Manager, U.S. Fish and Wildlife Service, Boise, ID

SUBJECT: Rocky Mountain Pipeline Project - Threatened and Endangered Species List

This is in response to your October 1 letter to our Regional Director requesting a list of threatened and endangered species for the subject Proposed Action Route and several alternatives. This list does not include information on the Northern Systems Alternative, outlined in your letter of November 7. That information is still being compiled and will be sent later.

Attached is a list of federally listed and candidate threatened and endangered species which may occur along the proposed and alternative routes (Attachment A). The list fulfills the requirement of the Fish and Wildlife Service under Section 7(c) of the Endangered Species Act. Your ESA requirements are outlined in Attachment B. The candidate species are those presently being reviewed by this Service for consideration as endangered or threatened. It should be noted that candidate species have no protection under the Endangered Species Act, but are included for your early consideration. It is possible the candidates could become formal proposals and be listed during the construction period, thereby falling within the scope of Section 7 of the ESA.

Should your biological assessment determine that a listed species is likely to be affected (adversely or beneficially) by the project, your agency should request formal Section 7 consultation through this office. Even if your biological assessment shows a "no effect" situation, we would appreciate receiving a copy of your assessment for our information. If only candidate species may be affected, then you should consider informal consultation with our Endangered Species Team at the above address. One benefit of informal consultation is to provide your agency with the necessary planning alternatives should a proposed or candidate species become listed before completion of a project.

Also attached is a list of Recovery Team Leaders for those species along the route which have had teams established (Attachment C). I have also included the names and addresses of contacts in each state which can furnish you with specific references and/or biological information for each species. We feel you would obtain more complete and timely information by writing to these people directly than if we had tried to gather the information and bibliographies ourselves and passed them on to you.

If you have any additional questions regarding your responsibilities under the Act, please contact Mr. Jay Gore, Endangered Species Team Leader, FTS 554-1806 or (208) 334-1806. Your interest in endangered species is appreciated.

Sincerely yours,

L. A. Mehrhoff
Area Manager

Attachments

LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES, AND CANDIDATE SPECIES THAT MAY OCCUR WITHIN THE AREA OF THE PROPOSED ROCKY MOUNTAIN PIPELINE NUMBER 1-4-81-SP-12

E = Endangered
T = Threatened

PROPOSED ACTION ROUTE

LISTED

Wyoming: E Bald Eagle (*Haliaeetus leucocephalus*)
E Black-footed ferret (*Mustela nigripes*)

Utah: Bald Eagle (Ogden, Salt Lake, Price, Delta, Richfield, Cedar City)
E Utah Prairie Dog (*Cynomys parvidens*) (Cedar City)
T Desert Tortoise (*Gopherus agassizii*) (Cedar City)
E Dwarf Bear Poppy (*Arctomecon humilus*) (Cedar City)
E Purple spined hedgehog cactus (*Echinocereus engelmannii* var. *purpureus*) (Cedar City)
E Siler Cactus (*Pediocactus sileri*) (Cedar City)

Nevada: None

California: E Yuma clapper rail (*Rallus longirostris yumanensis*)

CANDIDATE

Utah: King woody aster (*Machaeranthera kingii*) (Salt Lake)
MacBride scorpion plant (*Phacelia anelsonii*) (Cedar City)

Nevada: Desert Tortoise

Plants

Ivory-spined agave (*Agave utahensis* var. *eborispina*)
California bear poppy (*Arctomecon californica*)
Geyer's milk-vetch (*Astragalus geyeri* var. *triquetrus*)
Nye milk-vetch (*Astragalus nyensis*)
Pinion forget-me-not (*Cryptantha tumulosa*)

California: Desert tortoise

ALTERNATIVE A

LISTED

Utah: Bald Eagle (Ogden, Salt Lake, Delta)
Peregrine Falcon (*Falco peregrinus anatum*) (Salt Lake)

ALTERNATIVE B

LISTED

Utah: Bald Eagle (Price, Richfield, Cedar City)
Utah prairie dog (Cedar City)

CANDIDATE

Utah: *Townsendia aprica* (Richfield)
Sclerocactus pubispinus

ALTERNATIVE C

LISTED

Utah: Bald Eagle (Delta)

Nevada: Bald Eagle

California: Bald Eagle
E Owens pupfish (*Cyprinodon radiosus*)

CANDIDATE

Nevada: Relict (=Steptoe) dace, (*Relictus solitarius*)
White faced ibis (*Plegadis chiki*)
Railroad Valley springfish (*Crenichthys nevadae*)

Plants

Eastwood's milkweed (*Asclepias eastwoodiana*)
Callaway milk-vetch (*Astragalus callithrix*)
Single-leaved Torrey's milk-vetch (*Astragalus calycosus* var. *monophyllidius*)
Death Valley milk-vetch (*Astragalus funereus*)
Spotted milk-vetch (*Astragalus lentiginosus* var. *latus*)
Winged milk-vetch (*Astragalus pterocarpus*)
Currant milk-vetch (*Astragalus uncialis*)
Rosy pincushion cactus (*Coryphantha vivipara* var. *rosea*)

Hoffmann's cryptantha (*Cryptantha hoffmannii*)
Bristly cryptantha (*Cryptantha interrupta*)
Hitchock's bladder-pod (*Lesquerella hitchockii*)
Watson's rabbitbrush (*Haplopappus watsonii*)
Daisy-leaved aster (*Machaeranthera leucanthemifolia*)
Sand beard-tongue (*Penstemon arenarius*)
Ruby Mountains primrose (*Primula capillaris*)
Mojave fish-hood cactus (*Sclerocactus polyancistrus*)
Tufted globe mallow (*Sphaeralcea caespitosa*)
Beatley's five-leaved clover (*Trifolium andersonii* ssp. *beatleyae*)

California: Owens tui chub (*Gila bicolor snyderi*)

Plants

Mojave spineflower (*Chorizanthe spinosa*)
Desert cymopterus (*Cymopterus deserticola*)
Parish's alkali grass (*Puccinella parishii*)
Mojave fish-hook cactus (*Sclerocactus polyancistrus*)

ALTERNATIVE D

LISTED

Utah: Bald Eagle (Price, Richfield, Cedar City)
Utah Prairie Dog (Cedar City)

ALTERNATIVE V-1

LISTED

Utah: Bald Eagle (Salt Lake)

ALTERNATIVE V-2

LISTED

Utah: Bald Eagle (Price)

ALTERNATIVE V-3

CANDIDATE

Nevada: Desert Tortoise

Plants

Ivory-spined agave (_Agave utahensis_ var. _eborispina_)
California bear poppy (_Arctomecon californica_)
Geyer's milk-vetch (_Astragalus geyeri_ var. _triquetrus_)
Nye milk-vetch (_Astragalus nyensis_)
Pinion forget-me-not (_Cryptantha tumulosa_)

CRITICAL HABITAT

Desert Tortoise, Utah Population
Washington County, Utah.

E½ Sec. 13 and 24, T. 43 S. R. 20 W.;
S½ Sec. 7, all Sec. 8-28, E½ Sec. 29, SE¼ Sec. 5, SW¼ Sec. 4, T. 43 S., R. 19 W.;
All Sec. 7-10, 15-22, 28-30, and W½ Sec. 27, T. 43 S. R. 18 N.

SPECIAL PROJECTS
STAFF

JAN 15 1981

RECEIVED

United States Department of the Interior

FISH AND WILDLIFE SERVICE
AREA OFFICE COLORADO—UTAH
1311 FEDERAL BUILDING
125 SOUTH STATE STREET
SALT LAKE CITY, UTAH 84138

IN REPLY REFER TO:

January 8, 1981

MEMORANDUM

TO: Team Manager
Special Projects Environmental Team
Bureau of Land Management
Denver, Colorado

FROM: Acting Area Manager
Area 5
Fish and Wildlife Service
Salt Lake City, Utah

SUBJECT: Rocky Mountain Pipeline Project

This memorandum was prepared in response to your December 21, 1980 request for a supplemental list of threatened and endangered species. Your concern is whether additional species would be impacted by alternative routes of the Rocky Mountain Pipeline not addressed in earlier requests for species lists.

We prepared the following list of species after analyzing the routes of the new alternatives.

1. West Salt Lake Alternative (E)

   The bald eagle is a winter resident and ranges over much of the area of the proposed route. No nest sites are known in the area of concern. We are not aware of any additional listed, proposed, or candidate species near the West Salt Lake Alternative.

2. Provo Canyon Alternative (F)

   Although no large concentrations are known, bald eagles may be observed in the canyon between November and April. No nest sites are known in the canyons. Again, we have no knowledge of other listed, proposed, or candidate species along this alternative.

3. Mill Creek Variation (V-5)

   No federally listed, proposed, or candidate species occur along the Mill Creek route.

4. Daniels Canyon Variation (V-6)

   No federally listed, proposed, or candidate species occur along the Daniels Canyon route.

No critical habitat has been designated for any species in Utah.

A portion of the West Salt Lake Alternative (E) route passes through Preston, Idaho. The Boise Area Office of the Fish and Wildlife Service should be contacted for a list of species in Idaho. This office has the main responsibility of coordinating our agency's concerns with the Bureau of Land Management. Therefore, all requests for information should be addressed to the Area Manager in Boise. They will notify our office if information from Utah is needed. In this manner, the Boise Office will be kept informed of all aspects of the project.

William C. White

United S)tes Department of th(Interior

FISH AND WILDLIFE SERVICE

AREA OFFICE - IDAHO AND OREGON
4620 OVERLAND ROAD, ROOM 238
BOISE, IDAHO 83705
FTS: 554-1960 / COMM: 208/384-1960

SPECIAL PROJECTS STAFF

JAN 19 1981

RECEIVED

JAN 14 1981

To: Team Manager, Office of Special Projects, Bureau of Land Management, 3rd Floor East, 555 Zang Street, Denver, CO 80228

From: Area Manager, U.S. Fish and Wildlife Service, Boise, ID

Subject: Rocky Mountain Pipeline Project - Threatened and Endangered Species List

This is in response to your letter of November 7 requesting supplemental lists of threatened and endangered species for the Northern Systems Alternative. Sacramento and Salt Lake Area Offices will be responding directly to your December 24 request. The changes outlined in your letter of December 24 to this office did not require any additional species being included on this list for Idaho.

Attached is a list of federally listed and candidate threatened and endangered species which may occur along the Nothern Systems alternative route (Attachment A). The list fulfills the requirement of the Fish and Wildlife Service under Section 7 (c) of the Endangered Species Act. Your ESA requirements are outlined in Attachment B. The candidate species are those presently being reviewed by this Service for consideration as endangered or threatened. It should be noted that candidate species have no protection under the Endangered Species Act, but are included for your early consideration. It is possible the candidates could become formal proposals and be listed during the construction period, thereby falling within the scope of Section 7 of the ESA.

Should your biological assessment determine that a listed species is likely to be affected (adversely or beneficially) by the project, your agency should request formal Section 7 consultation through this office. Even if your biological assessment shows a "no effect" situation, we would appreciate receiving a copy of your assessment for our information. If only candidate species may be affected, then you should consider informal consultation with the appropriate Endangered Species Team (Sacramento, Salt Lake, Billings or Boise). One benefit of informal consultation is to provide your agency with the necessary planning alternatives should a proposed or candidate species become listed before completion of a project.

Attachment C lists the Recovery Team Leaders for those listed species along the route which have had teams established and which were not included in our original species list of November 14, 1980.

I also wish to correct an inaccuracy on that original species list of November 14. The white-faced ibis should not have been included as a candidate species. I apologize for any inconvenience this error may have caused you.

If you have any additional questions regarding your responsibilities under the Act, please contact Mr. Jay Gore, Endangered Species Team Leader, FTS 554-1806 or (208) 334-1806.

Kenneth R. Hogg
for L. A. Mehrhoff
Area Manager

Attachments

cc: Regional Director, Portland, OR (AFA-SE)
ES Field Supervisor, Boise, ID
Endangered Species Team, Sacramento Area Office
Endangered Species Team, Salt Lake Area Office
Endangered Species Team, Billings, MT

JMGebhardt:ff

LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES, AND CANDIDATE SPECIES THAT MAY OCCUR WITHIN THE AREA OF THE PROPOSED ROCKY MOUNTAIN PIPELINE NUMBER 1-4-81-SP-12a

E = Endangered
T = Threatened

NORTHERN SYSTEMS ALTERNATIVE
(as outlined in BLM letter of Nov. 7, 1980)

LISTED

Wyoming: E Bald Eagle (Haliaeatus leucocephalus)
E Black-footed ferret (Mustela nigripes)

Utah: Bald Eagle

Idaho: E Whooping Crane (Grus americana) - migration (Pegram, Soda Springs, Lava Hot Springs Compressor Station Sections)
E Bald Eagle (Pocatello C.S. Section)

California: E San Joaquin Kit Fox (Vulpes macrotus mutica)
E Blunt-nosed Leopard Lizard (Gambelia (= Crotaphytus) silus)
E Lange metalmark butterfly (Apodemia mormo langei) (near Antioch)

CANDIDATE

California: San Joaquin dune beetle (Coelus gracilis)

Plants - Notice of Review 45 FR 82480
December 15, 1980

slough thistle (1) (Cirsium crassicaule)
hispid bird's-beak (2) (Cordylanthus mollis ssp. hispidus
* palmate bird's-beak (1) (Cordylanthus palmatus)
Contra Costa buckwheat (1) (Eriogonum truncatum)
Idria buckwheak (2) (Eriogonum vestitum)
delta coyote-thistle (1) Eryngium racemosum
Contra Costa baeria (1) Lasthenia conjugens
caper-fruited tropidocarpum (1) Tropidocarpum capparideum
large-flowered fiddleneck (1) Amsinckia grandiflora
forked fiddleneck (2) Amsinckia vernicosa var. furcata
San Joaquin Valley saltbush (2) Atriplex patula ssp. spicata

* possibly extinct sp.
(1) Currently under review - information sufficient for listing.
(2) Under review - information insufficient for listing at present.

FEDERAL AGENCIES' REQUIREMENTS UNDER SECTION 7(c)

Biological Assessments

This process is initiated by a Federal agency in requesting a list of proposed and listed endangered and threatened species that may be within the area of a construction project.[1/] The purpose of the assessment is to identify any proposed and/or listed species which are/is likely to be affected by a construction project. The assessment should be completed within 180 days after initiation of the assessment (or within such a time period as is mutually agreed to by our two agencies). No irreversible commitment of resources is to be made during the biological assessment process which would result in violation of your requirement under section 7(a) of the Act. Planning, design, and administrative actions may be taken by your agency; however, no construction may begin.

Your agency should conduct an on-site inspection of the area to be affected by the proposal which may include a detail survey of the area to determine if the species is present and whether suitable habitat exists for either expanding the existing population or for potential reintroduction of the species. Review literature and scientific data to determine species distribution, habitat needs, and other biological requirements. Interview experts including those within Fish and Wildlife Service, National Marine Fisheries Service, State conservation departments, universities and others who may have data not yet published in scientific literature. Review and analyze the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat. Analyze alternative actions that may provide conservation measures. At the conclusion of the assessment as described above, the Federal agency shall prepare a report documenting the results. The report shall also include a discussion of study methods used, any problems encountered, and other relevant information. The report should be forwarded to this office.

1/ "Construction Project" means any major Federal action which significantly affects the quality of the human environment designed primarily to result in the building or erection of man-made structures such as dams, buildings, roads, pipelines, channels, and the like. This includes Federal actions such as permits, grants, licenses, or other forms of Federal authorization or approval which may result in construction.

Recovery Team Leaders or Contacts

Blunt-nosed Leopard Lizard

Mr. John Brode
California Department of Fish and Game
Inland Fisheries Branch
1701 Nimbus Road
Rancho Cordova, CA 95670
(916) 355-0842

San Joaquin Kit Fox

Mr. John Gustafson
California Department of Fish and Game
Endangered Wildlife Program
1416 Ninth Street
Sacramento, CA 95814
(916) 322-1260

Lange's Metalmark Butterfly

Mr. Joseph Dowhan
U. S. Fish and Wildlife Service
1230 "N" Street
Sacramento, CA 95814
FTS: 488-2791

SPECIAL PROJECTS
STAFF

FEB 17 1981

RECEIVED

United States Department of the Interior

FISH AND WILDLIFE SERVICE

AREA OFFICE
2800 Cottage Way, Room E-2740
Sacramento, California 95825

In reply refer to: SESO
#1-1-81-SP-78

Memorandum

FEB 11 1981

To: Team Manager, Office of Special Projects, Bureau of Land Management, 3rd Floor East, 555 Zang Street, Denver, Colorado 80228

From: Area Manager, Sacramento, California (SESO)

Subject: Request for Supplement List of Endangered and Threatened Species in the Area of the Rocky Mountain Pipeline Project - Alternate Route

As requested by letter from your agency dated December 24, 1980, you will find attached a list of listed endangered and threatened species (Attachment A) that may be present in the area of the subject project. To the best of our knowledge no proposed species occur within the area. The list is intended to fulfill the requirement of the Fish and Wildlife Service to provide a list of species under Section 7(c) of the Endangered Species Act, as amended. Please see Attachment B for your requirements.

Also for your assistance, we have included a list of species that are candidate species. These species are presently being reviewed by our Service for consideration to propose and list as endangered or threatened. Candidate species have no protection under the Endangered Species Act and are included for your consideration as it is possible the candidates could become formal proposals and be listed during the construction period.

Upon completion of the Biological Assessment (see Attachment B), should you determine that a listed species is likely to be affected (adversely or beneficially), then your agency should request formal Section 7 consultation through our office at the letterhead address. If there are both listed and candidate species (if included in the assessment) that may be affected and if requested, we will informally consult on the candidate species during the formal consultation. However, should the assessment reveal that only candidate species may be affected, then you should consider informal consultation with our office.

One of the benefits of informal consultation to the consulting agency is to provide the necessary planning alternatives should a candidate species become listed before completion of a project. Informal consultation may also be utilized prior to a written request for formal consultation to exchange information and resolve conflicts with respect to listed species.

If the Biological Assessment is not initiated within 90 days of receipt of this letter, you should informally verify the accuracy of the list with our office.

Should you have any additional questions regarding this list or your responsibilities under the Act, please contact Mr. Ralph Swanson at (FTS) 448-2791 or (916) 440-2791. Thank you for your interest in endangered species, and we await your assessment.

Attachments

THIS LIST SUPPLEMENTS PREVIOUS LISTS TRANSMITTED BY OUR SERVICE ON NOVEMBER 14, 1980 (1-4-81-SP-12) AND JANUARY 14, 1981 (1-4-81-SP-12a).

LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES, AND CANDIDATE SPECIES THAT MAY OCCUR IN THE AREA OF THE PROPOSED ROCKY MOUNTAIN PIPELINE PROJECT ALTERNATIVE ROUTE FROM ADELANTO TO NEAR HINKLEY #1-1-81-SP-78

LISTED SPECIES

Mohave tui chub, Gila bicolor mohavensis

PROPOSED SPECIES

None

CANDIDATE SPECIES

Least Bell's vireo, Vireo bellii pusillus
Desert tortoise, Gopherus agassizi

Plants

Alkali mariposa, Calochortus striatus
Mojave spineflower, Chorizanthe spinosa
Desert cymopterus, Cymopterus deserticola
Parish's alkali grass, Puccinellia parishii

FEDERAL AGENCIES' REQUIREMENTS UNDER SECTION 7(c)

Biological Assessments

This process is intitiated by a Federal agency in requesting a list of proposed and listed endangered and threatened species that may be within the area of a construction project.[1/] The purpose of the assessment is to identify any proposed and/or listed species which are/is likely to be affected by a construction project. The assessment should be completed within 180 days after initiation of the assessment (or within such a time period as is mutually agreed to by our two agencies). If the Biological Assessment is not initiated within 90 days of receipt of the species list, your agency should informally verify the accuracy of the list with our Service. No irreversible commitment of resources is to be made during the Biological Assessment process which would result in violation of your requirement under section 7(a) of the Act. Planning, design, and administrative actions may be taken by your agency; however, no construction may begin.

Your agency should: conduct an on-site inspection of the area to be affected by the proposal which may include a detailed survey of the area to determine if the species is present and whether suitable habitat exists for either expanding the existing population or for potential reintroduction of the species; review literature and scientific data to determine species distribution, habitat needs, and other biological requirements; interview experts including those within Fish and Wildlife Service, National Marine Fisheries Service, State conservation departments, universities and others who may have data not yet published in scientific literature; review and analyze the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat; analyze alternative actions that may provide conservation measures. At the conclusion of the assessment as described above, the Federal agency shall prepare a report documenting the results. The report shall also include a discussion of study methods used, any problems encountered, and other relevent information. Upon completion, the report should be forwarded to our Area Manager (2800 Cottage Way, Room E-2740, Sacramento, California 95825).

1/ "Construction Project" means any major Federal action which significantly affects the quality of the human environment designed primarily to result in the building or erection of man-made structures such as dams, buildings, roads, pipelines, channels, and the like. This includes Federal actions such as permits, grants, licenses, or other forms of Federal authorization or approval which may result in construction.

IN REPLY REFER TO:

1792 (142)
RMPP

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
SPECIAL PROJECTS STAFF
3rd FLOOR, EAST
555 ZANG STREET
DENVER, COLORADO 80228

February 20, 1981

MEMORANDUM

To: Regional Director, U.S. Fish and Wildlife Service, Portland, OR

From: Team Manager, Office of Special Projects, BLM

Subject: Request for Endangered Species Consultation - Rocky Mountain Pipeline Project

The enclosed material is being submitted as the biological assessment which is required under Section 7 of the Endangered Species Act. The 15 federally listed species that are discussed in the enclosure are species that the U.S. Fish and Wildlife Service (FWS) determined could occur on or along the Rocky Mountain Pipeline Project (RMPP) and alternative routes (map enclosed). These species were noted in letters from the FWS to the Bureau of Land Management (BLM) dated 11/14/80, 1/8/81, 1/14/81, and 2/11/81 (copies enclosed). BLM has determined that 8 of the 15 species would not be affected by the project, and seven species have been placed in the "may effect" category. These seven species are the black-footed ferret, San Joaquin kit fox, bald eagle, Yuma clapper rail, blunt nosed leopard lizard, dwarf bear poppy, and purple-spined hedgehog cactus.

The extent of the project impacts on any of these species are not completely known at the present time, as inventories on these species have not been conducted. Before inventories can be completed, BLM will have to approve one of the project routes, and issue a right-of-way permit to the Rocky Mountain Pipeline Company so that a staked line showing the exact location of the pipeline can be established. Only when the exact line is located can surveys for these species be conducted. Once surveys are completed and ways to eliminate or alleviate impacts to these species are determined, BLM can issue the Notice-to-Proceed for construction of the pipeline.

The BLM, by this memorandum, is officially requesting Section 7 consultation on the RMPP. Any correspondence should be directed to the Team Manager of this office at the above address. We would like to include your biological opinion in the RMPP Final Environmental Impact Statement, therefore we need to receive your official opinion no later than August 10, 1981. You may contact Janis Bowles, Project Leader or Ray Boyd, Wildlife Biologist (FTS 234-6737) of my staff if you have any specific questions.

Enclosure

Charles R. Tullos

Biological Ass ᷊ment of Threatened or Endangered ᷊pecies
Affected by ᷊e Rocky Mountain Pipeline Project ᷊RMPP)

This biological assessment presents data on seven listed species that could occur on or along the proposed RMPP natural gas pipeline (see attached map). These species are included in the U.S. Fish and Wildlife Service (FWS) Section 4(c) consultation lists furnished to the Bureau of Land Management (BLM) in letters dated 11/14/80, 1/8/81, 1/14/81, and 2/11/81.

Based upon data in the assessment, BLM has determined that 8 of 15 species would not be affected by the RMPP. Seven species, however, have been determined to be in a "may effect" category. These seven species are the black-footed ferret, San Joaquin kit fox, bald eagle, Yuma-clapper rail, blunt nosed leopard lizard, dwarf poppy, and purple-spined hedgehog cactus.

Each of the species that have been determined to be in a "may effect" category are discussed below to indicate why the "may effect" determination was made. The other 8 species are discussed in the Threatened and Endangered Species Technical Report which is attached.

Each of the 7 species in the "may effect" category are discussed individually from the standpoint of historical occurrence near the pipeline and anticipated impacts caused by the project.

Historical Background and Occurrence Near the RMPP Pipeline.

Black-Footed Ferret. The black-footed ferret (*Mustela nigripes*) may be the rarest animal on the North American continent (Gates 1973). Original range of the black-footed ferret and prairie dogs coincide in presettlement times. The black-footed ferret occupied almost all the mid- and short-grass prairie region from Saskatchewan and Alberta in the north to areas of New Mexico and Texas in the south (Gates 1973). The black-footed ferret studies of recent times suggest that, while still rare in South Dakota, it may be most abundant in that state (Linder and Hillman 1973; Henderson, et al. 1974). The black-footed ferret was listed as endangered when the endangered species list was first compiled in 1964 (Gates 1973).

Intensive studies of the black-footed ferret to obtain information on its life history were not started until 1964 when a family of ferrets was discovered in Mellette County, South Dakota. Up to that time there was very little in the literature on this predatory mammal. If a concentration of ferrets remains in North America it probably occurs in South Dakota (Snow 1972; Henderson, et al. 1974).

The prairie dog is the ferret's main source of food. The effect of ferrets on prairie dog populations depends on the size of the town and number of ferrets present. Parts of towns frequented by ferrets are thinly populated while densities are higher where ferrets are occasional. When a ferret is active during the day, the prairie dogs stay above ground. In the locality of the ferret they may appear very agitated. The prairie dogs frequently cover up the burrows in which ferrets are present or apparently where there is an odor of recent ferret presence. The ferrets seem to have no difficulty digging out of these situations (Snow 1972; Martin and Schroeder 1978).

Observations to date hav 'een made of single adults and f' 'lies. The female alone cares for the youn, although occasionally the male m.. stay in the same town. Observers to date have been unable to study young ferrets until they appear above ground, which is generally when they are about half grown. The young ferrets at times may sun-bathe. Both the young and the adults are primarily nocturnal. The behavoir patterns of the different families that have been observed are essentially the same (Snow 1972).

Because very little population data is available, it is difficult to determine whether or not the total population is declining. The ferret apparently has never been common and has always been difficult to observe. Most ferrets have been observed in association with prairie dogs, and the reduction in numbers of ferrets (Snow 1972; Henderson et al. 1974).

Potential Impacts

Colonies of prairie dogs are potential habitat for the black-footed ferret (Henderson, et at. 1969; Snow 1972; Clark 1977; Martin and Schroeder 1978). Prairie dog colonies could potentially occur on or along portions of the pipeline in western Wyoming and northeastern Utah which fall into the historical range of the ferret. In recent years the ferret has been reported from both these states (Clark and Dorn 1979; Schroeder 1980 personal communication).

While prairie dog colonies still exist in the states as detailed above, the colonies have been much reduced and isolated as a result of efforts to control prairie dog populations. Any prairie dog colony could provide suitable habitat for the black-footed ferret but several towns, including some large ones, in relatively close proximity and with a stable prairie dog population appear to be necessary for the maintenance of a ferret population (Black-footed Ferret Recovery Team 1978; Colorado Division of Wildlife 1978; Queal, et al. 1977).

The disturbance associated with pipeline construction could result, at least temporarily, in the loss of portions of some prairie dog colonies. The amount of habitat (or colonies) disturbed during pipeline construction is limited when viewed from an acreage assessment (a 100-foot wide right-of-way converts to 12.12 acres per mile).

If any prairie dog colonies would be traversed by the pipeline in western Wyoming and northeastern Utah, a "may effect" from construction will exist until appropriate surveys have failed to locate a ferret in these towns. Based upon data from the two states involved, it is anticipated that there will be a "no effect" determination as far as the project impacting ferrets during the operation, maintenance and abondonment of the project. However, since there is a "may effect" determination for the ferret during construction activities, an approved FWS survey is recommended for the pipeline route in the two states prior to issuance of the Notic-to-Proceed.

San Joaquin Kit Fox. The San Joaquin kit fox (*Vulpes macrotis mutica*) is ecologically adapted to the dry desert shrub biome found in the San Joaquin Valley of California. Habitat types occupied by this animal in the arid climate of this area varies with much of it being grassland, primarily annual grasses on the western side of the San Joaquin Valley. Toward the southern end, perennial shrubs su as saltbrush, seepweed, pickle-' d, iodine bush, alkali heath and the introduced tumbelweed begin to occur among the grasses. On the valley floor, these species are intermixed.

Apparently a suitable den is a critical habitat requirement as the kit fox uses dens all year round. Cahalane (1947) indicated that kit fox dens are usually found on flat ground, on a sand dune, or near the crest of a small bank or arroyo wall. He also stated that these foxes live in a sandy plains habitat because of the rodents that are also found in that habitat type.

Occupied dens can be recognized by mounds of fresh earth which are deposited at the entrances during the excavation of the den. Fresh scats, animal remains, and tracks will also be present. Shallow forms in which these foxes rest in the shade of adjacent shrubs have also been observed near den entrances. Unoccupied dens can be recognized by a weathered appearance, rounded den entrances, and cobwebs across the tunnel openings.

Loss of suitable habitat appears to be a limiting factor for the San Joaquin kit fox. From 1960 to 1970 there was a 34 percent reduction in the native habitat of this fox. More acres are being put into cultivation every year, decreasing the amount of habitat available for the San Joaquin kit fox (Laughrin 1970).

The kit fox is basically nocturnal. Most hunting is done after dark, although kit foxes have been seen hunting as early as one hour before sunset (Laughrin 1970; Morrel 1972). The basic categories of food items are small mammals, small birds, small reptiles, amphibians, and insects. Prey varies with the area.

Little is yet known about the reproduction of kit foxes. Breeding season generally extends from late December through January and in some situations to early February. Gestation is assumed to be the same as for the red fox, 49-55 days. In the southern deserts, kit foxes may be born as early as February, but most pups farther north are born in March or early April (Snow 1973).

The Northern Systems Alternative, if selected, may affect the kit fox or its habitat along the route from milepost (MP) 70 to the end of the line near Panoche Junction, a total distance of about 46 miles. Construction of the pipeline here could destroy dens and other important habitat resulting in the death or displacement of kit foxes. Displaced and remaining foxes would have to subsist in less habitat of a lesser quality than before. The potential for detrimental effects upon this species possibly would be less where the route might be adjacent to existing highways. A survey would be necessary to determine the presence or absence of kit foxes along the route alignment. Neither the proposed action nor any of the other alternatives or variations would affect the San Joaquin kit fox. This species would not be affected by the operation, maintenance, or abandonment of this project.

Bald Eagle. The bald eagle (*Haliaeetus leucoacephalus*) occurs throughout the United States and northward (FWS 1980). They are found primarily along the coasts of North America and around inland lakes and rivers from the Gulf of Mexico north to the artic (Snow 1973).

All states which would c tain components of the RMPP are luded in the range of the bald eagle. These habitat areas are all in Utah and California, and eagles occuring there will be winter residents.

The bald eagle was listed as endangered throughout the 48 conterminous states in February 1978 (Federal Register 2/14/78).

The bald eagle is associated primarily with riparian habitat, including coasts, rivers, and lakes, usually nesting near bodies of water where they feed. Selection of nesting sites varies depending on the species of trees growing in a particular area. The tops of tall trees, either living or dead, are generally preferred. Regardless of this variation in sites, there are certain general elements which seem to be consistent. These include: (1) the proximity of water (usually within a half mile) and a clear flight path to a close point on the water; (2) the largest living tree in a span; and (3) an open view of the surrounding area. The proximity of good perching trees may also be a factor in site selection. An otherwise suitable site may not be used if there is excessive human activity in the area (FWS 1980a).

Wintering bald eagles move southward and gather along rivers, lakes, national wildlife refuges, and other places where food is available. Lakes and dams constructed on the Mississippi and the Missouri Rivers have modified the distribution of some wintering bald eagles (Snow 1973). The National Audubon Society's Continental Bald Eagle Project results (winter counts in January) indicated wintering bald eagles concentrated in four areas: (1) approximately one third of the entire continental United States population occurs in the Mississippi Valley; (2) 20 percent are found in the Northwest (Washington, Oregon, Idaho, and Montana); (3) 15 percent occur in Florida (a resident breeding population which is also present in winter); and (4) 5 percent are located along the Middle Atlantic States, particularly the Chesapeake Bay Region (Snow 1973).

Eagles found at roosts during winter and at other times apparently have an attraction to particular trees and even to favorite limbs. These trees are usually large and open and have sufficient room for take off and landing, but they are not noticeably different from the other trees in the same general area. A favorite tree may hold several eagles before nearby trees are used (Sprunt 1972; Snow 1973).

During 1975 and 1976, the number of breeding pairs in the lower 48 states was estimated at 700 to 1,000. Eagle populations in Canada and Alaska are much higher and appear to be doing well (FWS 1980a). While the breeding season of bald eagles varies with latitude, the general tendency is for winter breeding in the South with a progressive shift toward spring breeding in the north. In Florida some breeding activity may occur almost year round, except for perhaps in mid-summer.

The former and present distribution of the bald eagle are essentially the same, but numbers in the continental U.S. are reduced from former abundance (Snow 1973). In some areas of the country, pesticide residues in eagles have apparently played a significant roll in their decline. Studies have shown that high residue levels, particularly of dieldrin, have lowered reproductive success by rendering the egg shells thin and easily broken. In other locations, including large parts of Florida, the most significant factors have probably been loss of fe ing and nesting sites, and human sturbance during the nesting period. Additional factors responsible for the eagles decline include illegal shooting, loss of nest trees, and electrocution (FWS 1980a).

Potential Impacts

No bald eagles are known to nest near any of the routes, but over-wintering bald eagles may be encountered, particularly in the vicinity of major river crossings (National Wildlife Federation 1979). All states traversed by the alignments have known populations of wintering bald eagles. Most of these birds are located near large rivers, reservoirs, or lakes.

Only the winter habitat of the bald eagle in Utah would be encountered by construction of the proposed project. Approximately 37 miles of such habitat would be traversed by the proposed action and 37 miles would be affected by construction of the Sanpete Valley Alternative. If large roost trees (see Sprunt 1972) were to be destroyed by pipeline construction in these areas, the project could indirectly affect the wintering populations of bald eagles. Since the pipeline construction schedule is planned from May through October, bald eagles would not be in the area during the construction period and thus would not be directly affected. The bald eagle would not be affected by construction on other alternatives or variations nor by the operation, maintenance, or abandonment of the project.

Yuma Clapper Rail. The Yuma clapper rail (Rallus obsoletus yumanensis) inhabits fresh water marshes and adjacent irrigation canals along the Colorado River from the Colorado River Delta, Mexico, north to Topock Marsh, Arizona. Its range also extends west to the Salton Sea, California, and east to Picacho Reservoir, Arizona. The population probably exceeds 1,700 birds (Yuma Clapper Rail Recovery Team 1977). Some small areas of habitat occur along the Colorado River from 10 to 15 miles north of Needles, California, but clapper rails have not yet been recorded there (Gould 1975).

Some of this habitat lies along the proposed route of the pipeline between MP 588 and MP 596. Smith (1974) determined that preferred rail habitat at the Havasu National Wildlife Refuge was mature cattail-bulrush stands in shallow water near high ground.

The Yuma clapper rail was listed as endangered throughout its range by the Department of the Interior in March 1967 (Federal Register 3/11/67).

Knowledge of rail migration is limited to that relating to the period they occur in the United States. Rails reach their breeding areas along the lower Colorado River and Salton Sea starting in mid to late April. Most of the population remains until mid-September and by October most of the rails have departed. Small numbers of rails may remain along the Colorado River during some winters. Rails have been observed during the winter months in Topock Marsh southest of Needles, California, (Yuma Clapper Rail Recovery Team 1977).

Rails are selective, opportunistic, and limited in their variety of foods by the habitat areas they c   ıpy during migration (Ohmart and   nlinson 1977). Crayfish are the main food of the Yuma Clapper rail along tne Colorado River. It also feeds on small fish, clams, isopods, snout bettles, water beetles, and other insects.

Destruction of habitat is probably the primary factor limiting the Yuma clapper rail. The preliminary findings of Ohmart and Smith (1973), indicate that the availability of crayfish may determine rail population density.

The proposed action of the RMPP (see attached map) may encounter or approach some small areas of potential summer habitat at the extreme northern edge of the rails range near Needles, California. These areas can be found in an 8 mile portion between about MP 588 and MP 596 of the proposed action route. Since no rails have been recorded in this area, construction of the pipeline probably would have no effect on the species. If the alignment were to avoid marshy areas altogether and construction were to occur in late summer or fall, the potential for detrimental effects would be greatly lessened.

Blunt Nosed Leopard Lizard. The blunt nosed leopard lizard (*Crotaphtus silus*) originally ranged in the San Joaquin Valley and the adjacent foothills of San Joaquin County south into San Luis Obispo County, California.

It is now found in scattered locations in San Joaquin Valley, in the foothills of Tulare and Kern Counties and up the eastern portions of the Coast Range foothills in Fresno, Kern, Madera, Merced, San Luis Obispo, and Tulare Counties (Stebbins 1954; U.S. Department of the Interior 1968; California Department of Fish and Game 1972).

The blunt nosed leopard lizard was listed as endangered throughout its range by the Department of the Interior in March 1967 (Federal Register 3/11/67). Supplemental protection is provided by the State of California which also classifies this lizard as endangered.

The blunt nosed leopard lizard occurs in sparsely vegetated plains, alkali flats, low foothills, canyon floors, large washes and arroyos. It is usually found in a sandy location but sometimes in coarse, gravelly soil and hardpan.

It prefers places with scattered low bushes, but otherwise open habitat. In areas heavily covered with *Atriplex polycarpa* or *Allenrolfea occidentalis* it is absent or scarce, presumably because of reduction of speed in locomotion and foraging.

Population numbers are not known; however, Shepparts (1970) considered the mean density of lizards to be 100 per square mile.

Population density is somewhat correlated with the abundance of mammal burrows, primarily those belonging to kangaroo rats and abandoned squirrel burrows. Lizards may also be found in abandoned badger dens and gopher burrows. Temporary cover such as rock pines, trash piles, and brush are used by immature lizards, but adults will usually enter burrows for safety (Montanucci 1965, 1970; Stebbins 1954; California Department of Fish and Game 1972).

The blunt nosed leopard lizard is an active, diurnal species that is very elusive, wary, and moves rapidly. When a lizard is approached, it lies flat and motionless. As a person moves nearer, it may suddenly dash to a burrow. When cover is scarce, it may run a considerable distance, stop, crouch low, and run again.

Activity is partly correlated with temperature. In early June the adults appear around 8:30 a.m. at a surface temperature of 82^{o}F. and proceed to sun themselves. Most lizards take cover when the air temperature reaches 106^{o}F., seeking shade in burrows, under bushes, or by fence posts (Snow 1972).

Habitat for the blunt nosed leopard lizard may exist along the route of the Northern Systems Alternative of the RMPP in Merced and Fresno Counties. Montanucci (1965) listed specific areas where lizards and/or suitable habitat were located in 1965. The area closest to the route of the Northern Systems Alternative is 20 miles south of Dos Palos or just north of the route in the vicinity of MP 103 to MP 105.

If chosen, the Northern Systems Alternative may affect the blunt nosed leopard lizard or its habitat in Merced and Fresno counties, California. On this route, the pipeline could encounter these animals or their habitat anywhere between MP 60 and the route's end at Panoche Junction, a total distance of about 56 miles. Lizards and/or their habitat may be affected especially in the vicinity of MP 103 and MP 105, a known habitat location. A survey would be necessary to determine the presence or absence of leopard lizards along the route alignment. The detrimental effects of the project could be direct losses of lizards and their eggs by crushing in burrows during construction as well as destruction of habitat. Neither the proposed action nor any of the other alternatives or variations would affect this species. The blunt nosed leopard lizard would not be affected by operation, maintenance, or abandonment of the project.

Dwarf Bear Poppy. The dwarf bear poppy (*Arctomecon humilis*) is found in portions of Washington County, Utah, at elevations ranging from 2,300 to 3,000 feet above sea level. This species is usually found on soils derived from the Moenkopi Formation on alluvium and sandy clay soils. It inhabits low rolling hills and bluffs in a warm desert shrub community.

Welsh and Thorne (1979) mapped locations of this species in habitats similar to those traversed by the proposed action route of this project.

The disturbance associated with pipeline construction could result in the complete destruction of an unknown number of these plants, therefore, a "may effect" situation exists for this plant until surveys are completed to locate populations of this endangered species and methods of alleviating impacts are formulated.

Purple Spined Hedgehog Cactus. The purple spined hedgehog cactus (*Echinocereus engelmannii* var. *purpureus*) has been reported from the Washington County area in Utah at elevations around 2,900 feet above sea level. It is commonly found in areas where outcrops of Navajo Sandstone appear and seems to grow best on sandy clay soils in a desert shrub community. In 1979, Wel-h and Thorne mapped locations wher- this plant can be found and some of these -neral locations are located in a. as where the proposed action is proposed to be constructed.

The disturbances associated with the construction of a pipeline could result in direct mortality of some of these plants. Therefore, a "may effect" determination exists for this plant until a staked right-of-way is located and botanical surveys are completed to determine the presence or absence of this plant on the pipeline right-of-way.

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SPECIAL PROJECTS STAFF

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
AREA OFFICE
2800 Cottage Way, Room E-2740
Sacramento, California 95825

NOV 19 1981

In reply refer to: SESO

Memorandum

To: Team Manager, Special Projects Staff, Bureau of Land Management, 555 Zang Street, Denver, Colorado 80228

From: Area Manager, Sacramento, California (SESO)

Subject: Endangered Species Formal Consultation, Rocky Mountain Pipeline (1-1-81-F-126)

This memo constitutes our Biological Opinion, pursuant to Section 7 of the Endangered Species Act of 1973 (ESA), as amended, on Right of Way (ROW) approval for the subject project as requested in your memo of July 13, 1981. We have considered the effects of the proposed pipeline route and several alternative routes on a number of endangered species (E) and threatened species (T) in Utah, Idaho, Nevada, Oregon, and California. These species are:

black-footed ferret	Mustela nigripes
bald eagle	Haliaeetus leucocephalus
Utah prairie dog	Cynomys parvidens
desert tortoise	Gopherus agassizi
Yuma clapper rail	Rallus longirostris yumanensis
blunt-nosed leopard lizard	Gambelia silus
San Joaquin kit fox	Vulpes macrotis mutica
hedgehog cactus	Echinocereus engelmannii subsp. purpureus
dwarf bear poppy	Arctomecon humilis
Owens pupfish	Cyprinodon radiosus
Mohave tui chub	Gila bicolor mohavensis

Three endangered species (Lange's metalmark butterfly, peregrine falcon, and siler cactus) were originally included in our lists pursuant to Section 7(c) of the ESA, but will not be considered further in this Opinion. After reviewing the project in detail, we have concluded that the proposal will not affect these species or their habitats.

Candidate species (C) do not enjoy protection under the ESA. We emphasize their importance to the Federal agencies because candidate species are being considered for protected status by our Service and may be added to the endangered species list in the future. While many candidate animals and plants were included in our Section 7(c) list responses (November 14, 1980, January 14, 1981, and February 11, 1981), we will treat only those species that we believe will be impacted by the project. These are the desert tortoise (outside its Critical Habitat on Beaver Dam Slope), and Railroad Valley springfish. Our recommendations concerning candidate species are provided as technical assistance to assist you in project planning.

On October 19, 1981, we requested an extension of the consultation period to allow more detailed formulation of specific recommendations for the project. BLM concurrence in this extension was received on October 29, 1981.

Also on October 19, we received a letter from the Federal Energy Regulatory Commission (FERC) which also has an action role in the Federal authorization of the subject project. We interpreted this letter (dated Octobert 13, 1981) as a request to join the formal consultation process with your agency. We, therefore, consider FERC to be a joint consultor with your agency and a copy of this Opinion has been sent to FERC.

To assist in determining whether this project would jeopardize any threatened or endangered species or adversly modify designated Critical Habitat, we appointed a Consultation Team consisting of Service biologists from our Area Offices in Sacramento, California, Boise, Idaho, Salt Lake City, Utah, and Billings, Montana. Our office was assigned the lead responsibility to prepare and release the Biological Opinion.

Accompanying your request for consultation was a copy of the Draft Environmental Impact Statement Rocky Mountain Pipeline Project (Case No. U-45957) (DEIS) and the Draft Technical Report for Threatened and Endangered Species (Technical Report), both dated July 1981.

A Biological Assessment (BA) prepared pursuant to Section 7(c) of the Endangered Species Act of 1973, as amended, was also included in your transmittal. It addressed seven endangered species that you considered may be affected by construction. These reports, together with information from our files, constitute the information base for this Opinion. Copies of pertinent reports, documents, and records are in the administrative record at our office and are incorporated by reference in this Opinion.

Project Description

The proposed project is an interstate natural gas transmission system that will extend 583 miles from Sage, Wyoming, south through Utah to near Searchlight, Nevada. There it will connect with another transmission facility and extend an additional 27 miles before joining existing east-west trending systems. This constitutes the proposed route (PR) as requested by the applicant. Major components of the proposed system are a 36-inch diameter steel pipe, a 31,800 hp compressor station on 15 acres at Sage, Wyoming, and ancillary facilities such as maintenance bases, metering, valving, and communications facilities. The applicant proposes to transport 413,000 cubic feet per day (Mcfd) of natural gas to existing transmission systems in southern California.

A number of major alternative routes and minor variations to the proposed route are also being considered by the applicant. Of the major alternative routes under consideration the most radically different are the Northern Systems Alternative (A), and the Central Nevada Alternative (C). Alternative A would utilize, almost exclusively, existing (or soon to be built) natural gas pipelines through Idaho to Oregon and then south through California. Only short segments of new pipeline, primarily on the terminal end of the system in California, would be required.

Alternative C, the Central Nevada Alternative, would be the same as the PR up to Milepost (MP) 195, south of Nephi, Utah. From that point, Alternative C generally follows existing highway corridors and proceeds west through Utah, central Nevada, and then south through the Owens Valley in California.

The other alternatives are relatively major deviations from the PR designed to avoid specific problems along portions of the PR. They are summarized below:

Name	Route
B - Sanpete Valley	Departs PR at MP 176, through Sanpete Valley roughly parallel and east of PR. Rejoins PR at MP 356.
D - Sever-Escalante	Departs PR at MP 196, follows existing highways and utilities west of PR and rejoins at MP 364.
E - West Salt Lake	Departs Alternative A at Montpelier, ID, MP 49, passes west of Great Salt Lake and rejoins PR at MP 254.
F - Provo Canyon	Departs PR at MP 108, passes through Provo Canyon and rejoins PR at MP 214.

Eight variations, or minor detours, along the PR are being considered to address local (usually social) conflicts.

The Alternatives and variations are depicted in the attached map figure. For a more detailed description of the routes and facilities refer to Chapter 2 of the DEIS and the Graphic Supplement.

Pipeline construction will commence with BLM approval of a 100-foot wide ROW along a single selected route. The ROW will be cleared of all vegetation and bladed flat with bulldozers if necessary. A 5.5-foot wide trench (bottom width) will be cut to a depth sufficient to cover the pipe with at least 18 inches of soil. About 30 percent of the route should require blasting to dig the trench. Construction will be confined to the ROW except for necessary supportive facilities as described below.

Construction camps will be needed to construct Alternative C. The number, size, and location of these camps will not be determined until after route selection (Bowles, pers. comm.).

Borrow pits for gravel that may be required will be identified as needed. Borrow will come from existing, established sources when possible. New sources for borrow will only be exploited 1) when existing sources are not economically available (within 7-10 miles) and 2) appropriate reviews and authorizations are secured from surface land owners, be they private or public (Bowles, pers. comm.). Temporary access roads, and evaporation ponds for hydrostatic test water are also project features that are as yet undefined.

After backfilling the trench, all surplus debris and trash will be disposed of at approved disposal sites. Temporary roads, new borrow pits, other disturbed areas and all but a 10 foot corridor on either side of the pipe will be restored and/or revegetated to preproject conditions according to ROW agreements.

Periodic inspection of the ROW will be performed aerially, on foot, or by vehicle. Vegetation will be completely controlled with herbicides only at the Compressor Station and the valving works. Along the ROW, only deep rooted shrubs or trees that could damage the pipe will be controlled.

While there are no definite plans for expansion, the proposed pipeline design allows for expansion to 800,000 Mcfd by the addition of three compressor stations along the route (PR) and two more compressors at the Sage, Wyoming site.

At the end of its useful life (a minimum of 20 years), the system will be purged of all gas, sealed and abandoned in place. All above-ground facilities will be removed and disturbed land restored to preproject conditions.

Biological Opinion

It is our Biological Opinion that the Rocky Mountain Pipeline Proposed Route, or any of its Alternatives or variations, is not likely to jeopardize the continued existence of the bald eagle, whooping crane, hedgehog cactus, dwarf bear poppy, desert tortoise (Beaver Dam Slope threatened population), Yuma clapper rail, Owens pupfish, or Mohave tui chub.

Based on the information available at this point in project planning, we are unable to render a Biological Opinion on the effects of the project on the black-footed ferret, blunt-nosed leopard lizard, San Joaquin kit fox, or Utah prairie dog. The Proposed Route and/or Alternatives have sufficient potential for habitat damage that additional specific information on the Alternative selected is needed regarding the effects on these species. An extended consultation period will be required to gather the necessary information, evaluate the material, and render an Opinion. The additional biological information needed to complete this consultation is specified at the end of this Opinion. We have also included recommendations to conserve other species not otherwise jeopardized by this project.

Species Accounts

We will limit our discussion of species in this Biological Opinion to those listed endangered or threatened species that we have concluded will be affected by the PR (with variations) or Alternative routes. Candidate species for which we have substantial recommendations to reduce or offset adverse impacts are also included.

Black-footed ferret, *Mustela nigripes* (E)

The black-footed ferret is probably one of the rarest mammals in North America. Its existence was not even recognized until 1851 when John James Audubon described it from skins. It is a large (22 inches long) weasel-like animal with yellowish-brown to buffy body, black forehead, black-tipped tail and black feet. Its historic range is the mid- and short grass prairies from Montana and North Dakota south to Arizona, New Mexico and Texas. The ferret has never been common and little is known about its life history. The ferret's secretive nature and nocturnal habits make observation difficult. One important fact is well-known and that is the vital ecological link between the ferret and prairie dogs. The ferret feeds mainly on prairie dogs. It hunts underground within the prairie dogs' labryinthine towns and utilizes the burrows for denning sites and shelter. To feed a pair of adults with four young, a prairie dog town of at least 15 acres would probably be required. Young ferrets are born underground in the spring. By fall the young disperse to lead solitary lives.

Evidence for the existence of ferrets in northeastern Utah and southwestern Wyoming has been accumulating in recent years. In 1978 a black-footed ferret skull was found in a coal lease area located in Uinta County, Wyoming, approximately 27 miles south of Kemmerer and 17 miles east of the Utah-Wyoming state line. The following year another survey of the same area revealed two more ferret skulls (BLM, 1979).

The Northern Systems Alternative (A) would pass through southwestern Wyoming which is considered one of the most probable locations for remnant ferret populations in the state. An unconfirmed sighting in

August 1981, near Baggs, Wyoming, and the discovery of a carcass of a black-footed ferret in September 1981, near Pitchfork, Wyoming, support this contention. In October 1981, a confirmed sighting of a live ferret occurred near Pitchfork.

In Utah five alleged sightings of the ferret have occurred from 1977 to 1979 between the town of Woodruff, Utah, and Neponset Reservoir to the south. The PR would pass through this area.

Bald eagle, Haliaeetus leucocephalus (E)

Bald eagles (Haliaeetus leucocephalus) occur throughout the United States and northward. They are found primarily along the coasts of North America and around inland lakes and rivers from the Gulf of Mexico north to the arctic.

The bald eagle was listed in February 1978 as endangered throughout 44 conterminous states and threatened in Washington, Oregon, Minnesota, Wisconsin, and Michigan.

Wintering bald eagles move southward and gather along rivers, lakes, national wildlife refuges, and other places where food is available. Lakes and dams constructed on the Mississippi and the Missouri Rivers have modified the distribution of some wintering bald eagles. The National Audubon Society's Continental Bald Eagle Project (winter counts in January) indicate wintering bald eagles concentrate in four areas: (1) approximately one third of the entire continental United States population occurs in the Mississippi Valley; (2) 20 percent in the Northwest (Washington, Oregon, Idaho, and Montana); (3) 15 percent in Florida (a resident breeding population which is also present in winter); and (4) 5 percent along the Middle Atlantic States, particularly the Chesapeake Bay Region.

During the winter, the bald eagle becomes very gregarious. Many individuals will roost in the same tree. Eagles found at roosts during winter and at other times apparently have an attraction to particular trees and even to favorite limbs. These trees are usually large with open canopies and have sufficient room for takeoff and landing, but they are not noticeably different from the other trees in the same general area. A favorite tree may hold several eagles before nearby trees are used. These night roosts are consistently used during the winter and during successive years. From these nights roosts the birds range over large hunting areas with associated hunting roosts. Weather conditions also dictate use of roost and hunting areas. During fair weather they will use open valley and river bottom roosts and during inclement weather retreat to more protected canyon roosts.

The bald eagle is a fairly common winter resident in Utah. During the winter of 1981, 742 birds were estimated to be in the state (UDWR, 1981). This was one of the highest state totals in the nation.

In January, 1981, during the Midwinter Bald Eagle Count, a total of 91 bald eagles were observed in Nevada. Thirteen percent (12 birds) were sighted in Lincoln and Clarks counties, which the PR will traverse (Herron, pers. comm.). During the same Count, 735 bald eagles were counted in Idaho. Seventeen percent (125) of these birds were in counties in which the Northern Systems Alternative (A) would be located.

Determining winter habitat for the bald eagle is difficult due to the species' mobility and adaptability. As stated previously, the bald eagle normally winters along rivers and lakes, but some populations can be found in sagebrush valleys far from water. Here they prey on jackrabbits and winter-killed deer.

Utah Prairie Dog, Cynomys parvidens (E)

The Utah prairie dog (Cynomys parvidens) is the western-most member of this genus. The range of this species is the most restricted of all prairie dogs in the United States. They are found only in Beaver, Wayne, Piute, Sevier, Garfield, and Iron Counties, Utah. The population in the 1920's was estimated to be 95,000 animals but has declined to a current estimate of about 6,000. Reasons for this decline have been attributed to climatic changes, disease, overgrazing, poison programs, and habitat loss.

Prairie dogs are gregarious animals and live in large colonies. They do not travel or migrate great distances from their burrows. Prairie dog towns are generally found in swales at low to medium elevations, generally from 5,000 feet to 9,000 feet. Moist vegetation is available in these areas even during drought. Utah prairie dogs also can be found in cultivated alfalfa fields.

Well drained soils are essential for Utah prairie dog towns as they rarely build mounds around burrow entrances to prevent flooding. Deep soils are also needed to allow sufficient depth for protection from predators and adverse temperature.

Reproduction of Utah prairie dogs occurs in early spring with a gestation period of approximately 30 days. Litter sizes range from two to six. The pups reach adult size by October and are sexually mature when they are one year old.

Adult males cease surface activity in August and September. Juveniles remain above ground one to two months longer than parents. During November through February prairie dogs remain below ground.

Desert Tortoise, Gopherus agassizi (T)

The desert tortoise inhabits the Lower Sonoran Lifezone from southern Nevada, extreme southwestern Utah, and southeastern California southward to northern Sinaloa, Mexico. Its distribution is not continuous. Isolated populations of various age and size classes probably exist surround by unfavorable habitats (Dodd, 1981). Its habitat varies from riverbanks, dunes, washes, and oases to rocky slopes where firm ground allows easy construction of burrows. This tortoise is active during the day when temperatures are low (in spring and early summer) but becomes nocturnal as daytime temperatures rise. During hotter days of the year refuge is sought in shallow, temporary burrows (from two to four feet long and a few inches deep) and in the shade of rocks and trees. Deeper burrows (20 to 30 feet long), called dens, are permanent retreats where numerous individuals congregate during winter hibernation and estivation (Stebbins, 1954; Berry, 1974). A tortoise may dig just 2 to 4 summer holes per year (Coombs, 1977). Radio telemetry indicates that tortoises return repeatedly to the same burrow after daily foraging (BLM, 1973). To protect against high summer temperatures tortoises may excavate a shallow hole almost anywhere. Woodbury and Hardy (1948) counted four times as many summer holes as deeper winter dens.

The range of an individual tortoise covers between 10 and 100 acres and typically crosses into that of neighboring conspecifics. This tortoise is completely herbiverous favoring grasses and blossoms of plants in the family Asteraceae. Eggs are laid during spring and summer in shallow depressions dug by the female. Incubation lasts approximately 100 days with young emerging in September and October. A clutch of eggs typically numbers between two and nine.

The Beaver Dam Slope population segment of the desert tortoise was listed as a threatened species by the Federal Government in 1980. A 35 square mile area in Washington County, Utah, was designated as Critical Habitat. Elsewhere in its range, the desert tortoise is considered a candidate species and is not protected by Federal law. All states within the species' range have enacted laws that prohibit the collecting or killing of desert tortoises.

The desert tortoise populations have been dramatically influenced by habitat degradation primarily caused by agriculture, cattle grazing, ORV use, and private collection. These activities cause indirect mortality by collapsing burrows and altering the composition of vegetation, and direct mortality by crushing and removal from the wild. The Beaver Dam Slope population may have once numbered about 2,000 individuals based on a count of 400 dens in the Beaver Dam Mountains. Today the Beaver Dam Slope population is probably about 350 individuals.

Yuma Clapper Rail, <u>Rallus</u> <u>longirostris</u> <u>yumanensis</u> (E)

The Yuma subspecies is one of seven races of rail known from the U.S. and the Pacific coast of Mexico. It is unique, however, because it is the only subspecies that occurs exclusively in fresh (or brackish) water, and is the only migratory rail. Originally thought to be restricted to the Colorado River Delta in Sonora, Mexico, the Yuma clapper rail is now known to occur along the Colorado River edge as far north as Topock Marsh, 2 miles east of Needles, California. The bird is also known from the marshes along the southeastern edge of the Salton Sea in California and along the Gila River near Tacna, Arizona. The rail winters probably in coastal and inland marshes and mangrove wetlands in Mexico.

The clapper rail prefers shallow marshes with mature stands of cattails (_Typha_) and bullrush or tule (_Scirpus_) with high ground nearby (Smith, 1974). Typical highground habitats have an overstory of saltcedar (_Tamarix_) and an understory of iodine bush (_Allenrolfia_) (Tomlinson and Todd, 1973) The primary food sources are invertebrates—crayfish, clams, water beetles—and small fish.

The reproductive biology of the rail is poorly known due to the secretive nature of the bird. Eggs are laid in the spring (April-May) in nests built in small shrubs or on hummocks just above the water in dense cattails. Incubation is probably 21-23 days as for other rails. Clutch size may be 6 or 7 eggs.

The rail was listed as endangered in 1970 primarily due to its limited breeding habitat and small population size. Population estimates in 1973 and 1974 indicate the population may be stable at about 900 birds, although census techniques are not considered accurate because of the secretive behavior of the rail.

It is uncertain whether rail populations have declined. The bird was never subject to hunting or collecting pressure. Habitat destruction by channelization of the Colorado River has unquestionably destroyed fresh water marsh. Interestingly, dams on the river may have created marsh habitat as well. The rail may now be at its furthest point north in its historical range due to the presence of dams (Omart and Smith, 1973). While the theory is not universally accepted, it is difficult to dispute (Ferrier, 1976).

Recovery of the Yuma clapper rail to non-endangered status depends on protecting fresh water marshes from degradation by dredging and filling. Pollution of marshes by insecticides or sewage can kill birds directly, affect their reproduction, or reduce their food supplies.

Whooping crane, _Grus americana_ (E)

The whooping crane is America's best known endangered species. Whereas the bird once nested widely throughout northern North America, now only 75 birds occur in the wild migrating between Wood Buffalo National Park in Canada to Aransas National Wildlife Refuge on the Gulf coast. The crane, its breeding habitat and wintering areas have all been severely reduced by nearly all of the white man's activities and his mere presence in North America.

Since 1975, in an attempt to establish a second flock of whooping cranes, eggs have been placed in the nests of greater sandhill cranes (Grus canadensis) at Grays Lake National Wildlife Refuge, Idaho. The young whooping cranes have been reared by foster-parent sandhill cranes. To date, 15 whooping cranes are living in the wild as a result of this effort. However, no natural reproduction has yet occurred from whooping cranes in this population.

Near Alternative A, whooping cranes from the Gray's Lake Refuge population are known to summer at Bear Lake National Wildlife Refuge, Idaho. Also, the Green River, which originates in Wyoming and flows into Utah, is used extensively by whooping cranes during the summer and while on fall and spring migration. A tradition of wintering on the Bosque Del Apache National Wildlife Refuge, New Mexico, has been established by the introduced population which then returns to Grays Lake in the spring.

Blunt-nosed Leopard Lizard, Gambelia silus (E)

The blunt-nosed leopard lizard once ranged throughout the San Joaquin Valley, inhabitating the sparsely vegetated valley areas, foothills, and canyons. Agriculture, mineral resource development, and ORV use have resulted in extirpation of the species from about 50 percent of its former range.

Preferred habitats are ecotonal areas comprised primarily of grasses, with an interspersion of other vegetation. These areas have best been described by Twisselmann (1967) in his description of the Alkali Sink, Lower Sonoran Grassland and the Upper Sonoran Sub-shrub associations.

The lizard is active during the spring (emerging about April 1) and summer months and hibernates below ground throughout the winter. Daily activity is limited to the early morning and late afternoon hours to avoid the heat of the day. The insectivorous leopard lizard spends the majority of its time hunting for food and retreats to a burrow to escape the rising temperatures (Montanucci, 1965). Being unable to dig through hard packed or rocky substrates, the BNLL exploits existing rodent burrows. Lizard densities have been linked to the availability of abandoned burrows (BLM, 1972).

Relevant literature indicates that natural lizard densities are low--about 0.5 to 1.0 animal per acre (Recovery Team, 1980). Individuals apparently occupy large areas (about 40 acres) relative to their size.

Land development of all types has reduced blunt-nosed leopard lizard populations in California. Leveling has destroyed burrows and populations have been compressed onto remaining lands. Further land conversion threatens the continued existence of the species. The Recovery Plan for the lizard emphasizes the need for habitat protection through easements or acquisition as the primary means to conserve the species.

San Joaquin kit fox, Vulpes macrotis mutica (E)

Like the lizard, the kit fox once ranged throughout the southern half of the San Joaquin Valley floor. Kern County has historically been prime habitat for the fox. As native land has disappeared for agriculture, the kit fox populations have dwindled. The fox, however, shows a remarkable adaptability to man-altered habitat and is sighted in agricultural fields and around human settlements.

The fox roams an ill-defined range, hunting at night and sleeping in a number of different dens. Its chief prey species are rodents, rabbits and birds. The abandoned excavations of badgers and gophers are exploited by the fox who deepens the burrows for resting and mating. Morrell (1972) indicated a home range of 1,280 acres in his study on Elk Hills Naval Petroleum Reserve. Knapp (1978) concluded an average minimum home range on the undisturbed valley floor was 265 acres. During summer and fall most adults are solitary and are found in small dens (i.e., one to three entrances) (Morrell, 1972). An individual fox may use four or five different dens in summer months and use less in other months of the year. Since the kit fox is not a strong digger most dens are excavated in sandy substrate or are enlargements of either badger dens or ground squirrel burrows in hard-pan soils. Preferred sites are open areas on flat or gently sloping terrain with grass or scattered brush for cover. Thickly vegetated areas are less desirable (Morrell, 1972). Old dens are used repeatedly as day or nighttime hunting or resting cover. Most dens are vacant at any given time. Maternal dens take years to develop usually expanding and adding additional entrances to existing dens. Maternal dens are multiple-hole dens (i.e., usually four or more entrances). Active dens typically have freshly excavated dirt, fresh tracks, scats and food remains around the entrance. These dens are used repeatedly by paired adults. Families have exclusive denning locations although the home ranges of different family groups may overlap.

The fox is usually monogamous. They do not breed successfully their first year (Morrell, 1972). The reproductive season begins in September and October when females reoccupy and clean the larger dens. Adult kit fox begin pairing in late fall, October to November, and males join the females in the maternal dens. At this time, adult fox remain close to the maternal dens. Pupping occurs in February and March. Adults attend the litter for about four months. In late June or early July, the family group disperses. Pups sometimes stay together for a time after the family breaks up.

Purple-spined hedgehog cactus, Echinocereus engelmannii subsp. purpureus (E)

The purple-spined hedgehog cactus has been reported only from one locality north of St. George, Washington County, Utah, at elevations around 2,900 feet above sea level. Urban development around St. George may have been a factor in the decline of the cactus. Little is known about the species other than it is found in areas where outcrops of Navajo Sandstone appear and seems to grow best on sandy clay soils in a desert shrub community. The cactus was listed as an endangered species on October 11, 1979.

Dwarf Bear Poppy, Arctomecon humilis (E)

The dwarf poppy is believed endemic to the Virgin River Valley, Washington County, Utah. Three population centers are known to exist, all within 6 miles of St. George, at elevations of 2,300 to 3,000 feet above sea level. This species is usually found on soils derived from the Moenkopi Formation on alluvium and sandy clay soils. It inhabits low rolling hills and bluffs, on open slopes, in a warm desert shrub community. It was listed as an endangered species on November 6, 1979.

The dwarf bear poppy is a branched herb with leaves clustered close to the ground. The conspicuous flowers are attractive and overcollection and the rapid growth of St. George may be factors in the status of the plant.

Railroad Valley Springfish, Crenichthys nevadae (C)

The genus Crenichthys is endemic to Nevada and includes only two species, C. nevadae and C. baileyi. C. baileyi is found only in the White River, Pahranagat, and Moapa Valleys of the southeastern portion of the state. The Railroad Valley springfish is endemic to Railroad Valley, Nye County, Nevada, where it inhabits six separate thermal springs with water temperatures ranging between 83°F and 96°F (LaRivers, 1962). Its diet includes aquatic invertebrates such as insects, amphipods, ostracods, and mollusks. Vegetative material is also ingested because it is substrate for the preferred invertebrates. Spawning occurs throughout the year but is correlated with photoperiod. The greatest spawning activity occurs during spring and summer and the least during fall and winter. This reproductive strategy is common among desert fishes. Females produce eggs that are fertilized externally and deposited on vegetation for incubation.

Two of the six habitats are on the Duckwater Indian Reservation (T13N, R56E, S32 and T12N, R56E, S5) and four are on Lockes Ranch (T8N, R55E, S14 and S15). The two sets of springs are approximately 40 air-miles from one another. The species was introduced into Chimney Springs approximately six miles south of Lockes Ranch and into a spring at Sodaville, Mineral County, Nevada. The success of these introductions is mixed. The population in Chimney Spring was extirpated when the spring dried during the summer of 1981, and the habitat at Sodaville has been altered by the mining company owning the spring and its water. Indian irrigation projects have threatened the springfish population at Duckwater. The existence of this species in introduced habitats is therefore tenuous.

This springfish is being considered for listing because its habitats are being threatened by drying attributed to agricultural diversion of surface waters and groundwater pumping, and oil exploration. Populations are additionally threatened by the introduction and establishment of aquarium fishes which have detrimentally influenced other native fishes of the southwest (Minckley and Deacon 1968).

Owens pupfish, Cyprinodon radiosus (E)

The Owen's pupfish is the only cyprinodont native to the Owens Valley, California. It is unique because its range is the furtherest north of all Death Valley fish. It originally occurred throughout the Owens River System from Fish Slough, Mono County, to Lone Pine, Inyo County, California (Courtois and Tippets, 1979). The fish was at one time abundant in virtually every shallow slough, pool, and ditch in the Owens Valley. Water diversions and competition with exotic fish (largemouth bass as a sport fish and mosquito fish as a vector control measure) introduced into the Owens River System has caused the severe decline in the species.

The pupfish was believed extinct in 1948 but was rediscovered in 1956 and 1964. Today it occurs in only three locations—a total of 6 acres of habitat—representing about 1 percent of the original habitat for the species. The Owens Valley Native Fish Sanctuary at Fish Slough is 5.6 acres of wetland on BLM administered land north of Bishop, California. BLM Springs (0.2 acres) is southeast of the Sanctuary and is also on BLM land. The third habitat for the species, Warm Springs (0.2 acres) is south of Bishop.

Pupfish populations usually fluctuate seasonally with changes in water level, temperature and salinity. Spawning occurs from April-October when water temperatures exceed 20°C. Few fish survive winter periods of low water and increased salinity and temperature.

The three tiny refugia face continual threats from low water conditions and illegal introductions of predators, mainly crayfish and largemouth black bass. At least three additional refugia as well as active management and protection at the existing refugia are needed to reduce the threats to survival of this unique desert fish.

Mohave tui chub, Gila bicolor mohavensis (E)

The mohave chub is a large lacustrine minnow (up to 30 cm) and the only native fish known from the Mohave River drainage in San Bernardino County, California. In addition, the chub is unique in that its pharyngeal teeth have brood flat surfaces adapted to grinding plankton, an unusual specialization for fishes from arid regions (Soltz, 1978).

The Mohave chub has declined dramatically due to hybridization with the Arroyo Chub introduced to the Mohave River System in 1938. By 1967 the pure strain Mohave Chub was completely eliminated from the Mohave River.

Until 1969 the chub occurred only in Lake Tuendae at Fort Soda (Soda Springs) near Baker, California. In that year nine introductions to other refugia occurred in an attempt to assure the survival of the species. Today only three habitats at Fort Soda are considered to support genetically pure populations of Mohave chub. These sites, however, support a total of perhaps 20,000 fish. Searches of all aquatic habitats in the area have so far failed to discover any additional populations of the fish.

As with the Owens pupfish refugia, the three chub habitats face serious and constant threat. Growth of emergent vegetation, accumulation of debris, and flash floods could quickly exterminate the entire species unless constant attention is directed toward protection and management.

Analysis of Impacts

The following analysis of impacts will consider each project Alternative individually from MP zero to its terminous, beginning with the PR. Species will be considered in the order they are likely to be encountered along the Alternative route.

Proposed Route

The Rocky Mountain Pipeline would cross areas in southwestern Wyoming and northeastern Utah (MP 0 to MP 40) that contain habitat for prairie dogs and hence black-footed ferrets. Evidence for the existence of ferrets in this area has been mounting in recent years. The construction of the pipeline through prairie dog towns could have a negative impact on ferrets in the area by crushing their dens and by otherwise damaging the prairie dog colonies. Indiscriminate shooting of prairie dogs could represent a secondary impact on ferrets.

Prairie dogs will pioneer new areas for towns and this should be a consideration in planning, construction, and future maintenance. If prairie dog towns develop along the route between the conclusion of formal consultation and the time of construction or between construction and maintenance actions, the potential for conflicts with ferrets could arise.

It should be possible to identify and avoid prairie dog towns (and thus ferrets) during route selection after the ROW grant. The following table gives the location of prairie dog towns near the project where ferrets may occur.

Table 1

White-tailed Prairie Dog Colonies On or Near
The Proposed Route In Rich County, Utah (BLM, 1977)

Mile Post	Legal Description (Salt Lake Base Meridian)
5-9	Township 9 North, Range 7 East, Sections 4, 5, 8, 9
26	Township 10 North, Range 7 East, Section 36
	Township 9 North, Range 7 East, Section 1, 12
33-37	Township 9 North, Range 8 East, Sections 16-21, 28-33
	Township 9 North, Range 7 East, Sections 13, 14, 22-28, 33-36
	Township 8 North, Range 8 East, Sections 4-9, 17-20, 30, 31
	Township 8 North, Range 7 East, Sections 1-5, 7-36
	Township 8 North, Range 6 East, Sections 24, 25, 36
	Township 7 North, Range 7 East, Sections 1-7, 10, 11
	Township 7 North, Range 6 East, Sections 1, 12

The information presented in the DEIS and the analysis in the BA are not sufficient to determine the extent of potential impacts on the ferret. Specific additional information is needed as detailed at the end of this Opinion. The information needed relates to determination of the presence of ferrets along the ROW.

Current ferret locating techiques are limited and their inadequacy must be recognized. Ferret searches need only be conducted in those prairie dog towns that would be impacted by construction. Surveys should be conducted between 15 May and 30 October, but as close to the actual construction as reasonable to minimize the possibility of ferrets moving into the area in the interim.

The operation, maintenance and abandonment of the pipeline should have minimal impact on the ferret. However, if major pipeline repair is needed in an active prairie dog town a survey for ferrets should be required.

The PR will traverse bald eagle winter roosting habitat along its route in Utah, and in Lincoln and Clark Counties, Nevada. If pipeline construction is from April to October, wintering bald eagles will not be directly affected.

The difficulty in determining bald eagle winter habitat that is to be crossed by the pipeline in Utah is indicated by the figures in the Technical Report and figures calculated from the Endangered and Threatened Wildlife Critical Habitat Recommendations for Utah prepared by the Utah Bureau of Land Management. The Technical Report lists 37 miles of eagle habitat crossed by both the proposed action and the Sanpete Valley Alternative. A rough calculation from the BLM report lists 19 miles for the PR, 98 miles for the Sanpete Valley Alternative, and 6 miles for the Sevier-Escalante Alternative. Where and when bald eagles roost depends on the daily weather, intensity of the winter, and prey availability.

Pipeline construction through roosting areas would be harmful if it destroyed individual roost trees that have been used for many years. This is particularly important along rivers or streamside habitats where loss of trees could affect both resting and feeding activities.

Since eagles are attracted only to certain trees, loss of these trees could force the eagles to use alternate roost sites or to leave the area entirely.

It should be possible to avoid the loss of known or suspected winter roost trees in selecting the project centerline. Special attention will be necessary along specific segments of the PR to achieve this end. We have a number of recommendations to offer in this regard.

Operation, maintenance or abandonment of the project will have little or no effect on wintering bald eagles.

The PR passes west of recorded collection sites of the purple-spined hedgehog cactus and the dwarf bear poppy. However, it would be short-sighted to consider presently known collection localities as representing the entire range of the species.

The elevation of the PR through Washington County, Utah, is from about 6,000 feet in the northeast to 3,000 feet in the southwest (DEIS, S-8). We consider these elevations to be too high for both species. Despite the fact that the pipe traverses a desert-scrub vegetative community, we do not believe either listed plant is likely to occur along the route.

The PR passes west of the designated Critical Habitat of the desert tortoise. Since the tortoise is protected as threatened only within its Critical Habitat, selection of the PR will not impact the threatened species. However, the tortoise is found elsewhere in Utah, Arizona, Nevada, and California. Individuals protected within the 35 square miles may even wander outside the boundaries. The actual extent of suitable habitat for the tortoise is about 80 square miles west of the Beaver Dam Mountains. It is inappropriate to consider that tortoises destroyed outside the CH will not affect the survival of the species simply because they are not listed as threatened species.

The adverse impact of pipeline construction through southwestern Utah, southern Nevada, and California (MP 400-610) may be more significant for tortoises than for any other species considered. Impacts will accrue from construction, operation, maintenance, and general public access provided into an area that is presently rather unused and inaccessible. Tortoises will be crushed or otherwise killed by construction equipment within the ROW. If construction occurs in the summer months when tortoises are active, it is likely that individuals will seek shade under parked construction vehicles (Berry, pers comm.). If workers are not alert to this fact, a considerable loss of tortoises could result. Individual animals collected by workers or others may be removed from the area and kept as pets even though this is prohibited by state law. Vehicular traffic for maintenance purposes will be infrequent, but any new roads will allow access that could result in higher levels of road kill and increased collection.

The Technical Report notes that construction of the pipeline through this corridor would alter approximately 101 miles of tortoise habitat (between Mileposts 441 and 493, 520 and 540, and 551 and 580). A 100 foot ROW represents about 1,225 acres of habitat to be impacted. Not only will a tremendous amount of habitat be altered, but some of it will be of good quality habitat supporting a comparatively large, dense population of tortoises. The three reaches mentioned above roughly correspond to known areas of high density for the tortoise--East Mormon Mountains, Moapa Valley, and Paiute Valley (Berry, pers. comm.). ROW relocations through these areas should be considered. More field survey work on tortoises to supplement our existing information would assist in relocating the pipe to an area of less impact on the tortoise. An experienced field biologist should be employed to conduct this work. Selection of any Alternative other than the PR would reduce the impact to the desert tortoise.

A number of other actions, primarily the avoidance of new access roads within the tortoise range, could help to reduce impacts on the population. The goal should be to prohibit public ingress following completion of the project.

The Bureau of Land Management in California has long sought to protect the desert tortoise through land acquisition in areas where the species exists in high densities and where BLM already manages extensive public land holdings. Two areas are the Desert Tortoise Natural Area and Chuckwalla Bench. Both are Areas of Critical Environmental Concern where BLM is desirous of acquiring private inholdings. To offset project losses not otherwise eliminated by our recommendations, the applicant should be required to purchase habitat in one of these designated ACEC. Our Service or your California Desert District Office can provide assistance.

The most northerly extent to date of the Yuma clapper rail is Topock Marsh immediately across the Colorado River (east) from the terminous of the PR (MP 600-610). The PR approaches the river on the west side to connect into the existing North Needles Compressor Station, then immediately diverges from the river to the South Needles Compressor Station.

The Yuma Clapper Rail Recovery Team has prepared maps of recommended Essential Habitat for the species. (Our Service generally proposes Essential Habitat for Critical Habitat designation under Section 4 of the ESA.) Topock Marsh has been recommended as Essential Habitat. The Recovery Team has made no recommendations for Essential Habitat on the west bank of the Colorado River in the vicinity of the PR. We consider what little marsh habitat exists on the west bank to be insignificant to the support of the Yuma clapper rail.

Alternative A - Northern Systems Alternative

Black-footed ferrets may occur within the first 20 miles (MP 0 - 20) of this Alternative. Our prior discussion of impacts is applicable.

Whooping cranes that summer on Bear Lake National Wildlife Refuge will be in the vicinity of MP 30-40 of the Northern Systems Alternative. Construction near the refuge will consist of seven miles of looping pipeline probably near the existing Northwest Pipeline. Cranes utilizing the refuge should not be disturbed by this comparatively minor work. Through observations and the use of radio telemetry we have determined that immature and adult whooping cranes migrate from Bear Lake Refuge southeast to the Green River passing over the Alternative A (and the PR) alignment(s). However, we do not expect birds to stop, rest, or feed along the alignment(s).

Likewise we do not expect Alternative A to have any adverse effect on bald eagles in Idaho. Unlike in Utah, eagles nest in Idaho, but the nearest active eagle nest site is 68 miles north of Alternative A (MP 80) on the South Fork of the Snake River. Bald eagles that winter in Idaho leave by mid-March, migrate northeast across northwest Montana and nest on the shores of Great Bear Lake and Great Slave Lake, Northwest Territories, Canada. Nearly all bald eagles have migrated out of the area of impact by mid-April.

Alternative A enters the recognized general range of the blunt-nosed leopard lizard between Milespost 20 and 40 in Central California. The 120 miles of new pipeline construction required to complete Alternative A will be along the extreme western edge of the leopard lizard range. To the extent that the route is confined to existing agricultural fields, the leopard lizard will not be encountered. Pipeline reaches that traverse native range, partially disturbed grazing lands, or fallow agricultural fields (5-10 years or more) may adversely impact on the species. Trenching for the pipe may destroy burrows, individual animals and, in the late summer, eggs. Construction activities could lead to road kill of lizards since construction coincides with emergence and surface activity of the species (April 1). The construction of access roads and evaporation ponds for hydrostatic test water will also impact the blunt-nosed leopard lizard if located in habitat for the species.

Following construction, the lizard may return to the ROW after a short period of time, particularly if rodents reinhabit the area. These are both likely occurences in our opinion.

The ROW proposed for Alternative A is probably optimum for minimizing disturbance to leopard lizards. It parallels Interstate 5 so closely that it is difficult to conceive of serious habitat disruptions. Still, the lizard is known from low elevation foothills and only careful scrutiny of the selected centerline will determine whether the pipe can avoid serious conflicts with the species. Since this information is not available in the DEIS, Technical Report, or BA we cannot evaluate the full range of possible impacts to the leopard lizard. Specific additional information is needed and is detailed at the end of this Opinion.

Alternate A is entirely within San Joaquin kit fox range from MP 0 to the terminous at MP 120. Given the abundance of kit fox sightings in the corridor between I-5 and the foothills (CDFG, 1975) we expect that kit fox will be encountered during construction or this Alternative. Kit fox dens within the ROW will probably be lost by trenching, bulldozing, or general vehicle traffic. Individual animals may be entombed within dens as they seek sanctuary from construction activities. Road kills due to increased traffic on access roads are also possible impacts that will accompany the selection of Alternate A.

Loss of unused single-hole dens will probably not be significant to the population but destruction of maternal dens (multiple hole dens) would be particularly serious to the species and should be avoided. Many pipelines have been approved and constructed within kit fox range without jeopardizing the species. Provided the necessary planning is completed, Alternative A could also be authorized. However, the information at hand in the DEIS, Technical Report, and BA is not adquate to determine the full scope of impacts to the kit fox. Additional specific information is needed and is detailed at the end of this Opinion. Aerial surveys in conjunction with ground surveys will be needed to avoid specific conflicts with San Joaquin kit fox.

<u>Alternative B - Sanpete Valley</u>

Alternative B follows the PR to MP 176 and beyond MP 376. Thus our discussions of impacts on ferrets, bald eagles, the two plants, the desert tortoise, and Yuma clapper rail apply.

The Sanpete Valley Alternative would cross a concentration of Utah prairie dogs from approximately MP 160 to MP 180. We disagree with the BA assertion that the project will have no effect on this species. Pipeline construction through this area could damage or destroy colonies. Trenching could eliminate individual burrows and heavy equipment could cause cave-ins of burrows entombing dogs. Some prairie dogs would leave the area because of the disturbance, others would remain and be killed. If construction were to occur prior to the dispersal of the young in June or July, there would be a potential for a greater loss of prairie dogs. Post-construction impacts as well as impacts from abandonment of the pipe would be minimal or non-existent.

It should be possible to route Alternative B through the Sanpete Valley without undue perturbation of Utah Prairie dog towns provided that careful planning guides selection of a centerline. However, it is also possible to jeopardize the continued existence of the species by careless disregard of this matter. The DEIS, Technical Report, and BA do not provide adequate information to determine the full scope of impacts that may accrue from selection of this alternative. Specific additional information is needed and is detailed at the end of this Opinion.

Alternate C - Central Nevada

This Alternative route follows the PR to MP 195 south of Nephi, Utah. The impact discussion, for the PR, for black-footed ferret and bald eagle (to MP 195) is thus applicable.

At about MP 260, Alternative C traverses Lockes Ranch, one of only two habitats of the candidate Railroad Valley springfish. The springs at Lockes Ranch appear to be within the ROW corridor and may be directly altered by construction. While the ROW is north of Highway 6, the outflow of Big Spring, the main refugia for the springfish, also parallels Highway 6 on the north. Springfish are abundant in the outflow stream. Trenching through the Big Spring outflow would result in the direct loss of many springfish and the almost certain destruction of a major portion of their habitat. Careless disposal of excess soil, construction debris, and hydrostatic test water could pollute the spring resulting in secondary impacts to the fish.

Surface water extractions from the Lockes Ranch springs or groundwater pumping to secure hydrostatic test water could adversely affect the habitat of the Railroad Valley springfish. As such, alternative sources of water should be secured to test this section of the pipe.

Alteration of the expected magnitude could eliminate springfish populations at Lockes Ranch and dramatically degrade the status of this species. These habitats are extremely localized making it difficult to conduct construction activities in any portion of their water source or spring outflow without degrading the habitat to an unacceptable degree. The pipeline corridor in this reach should be relocated away from Lockes Ranch and the Big Spring outflow so as to avoid primary or secondary impacts on the aquatic habitats.

Alternative C passes between the Owens pupfish refugia at Fish Slough (3 miles west of MP 458) and Warm Springs (1 mile east of MP 472) (Technical Report). We do not believe there can be direct construction impacts at these distances. In selecting a centerline there should be no reason to approach the refugia.

Surface or groundwater extractions for pipe testing could influence the refugia springs depending on the amount of water required. Water for construction and testing should be sought from sources other than the springs near Owens pupfish refugia.

The Mohave tui chub population in Lark Seep Lagoon, China Lake Naval Weapons Station, is more than 10 miles east of Alternative C at MP 590. At this distance we believe this population to be well protected from project impacts, both primary and secondary.

Cumulative Effects

The cumulative effects of the Rocky Mountain Pipeline are limited to those projects that are interrelated to or interdependent on the proposed action. Interrelated projects are extensions of or later phases of the proposed project, while interdependent actions are those which have no independent utility apart from the proposed action. Expansion of the pipeline capacity from 413,000 Mcfd to 800,000 Mcfd of natural gas is the only action that we can identify that can be considered cumulative to the proposed project. To achieve such expansion would require three additional compressor stations along the PR (MP 104.5, MP 229.5, and MP 349.5) in Utah, and two additional compressor units at the Sage, Wyoming station. Alternative A cannot be expanded due to limitations on the existing pipelines. The other Alternatives and variations could be expanded with the addition of compressor stations. The number and location of these compressors has not been determined.

Regarding the PR, at each new compressor location there are wildlife issues to be considered: Sage, Wyoming-black-footed ferret; MP 104.5-bald eagle winter roosting; MP 349.5-desert tortoise (possibly). Additional habitat losses represent additional impacts to the species concerned. However, 15 acres at each site is not likely to result in serious cumulative effects. Furthermore, it is likely that compressor stations can be relocated within a limited range along the route in response to specific wildlife conflicts. If a decision is made to expand the system, such conflicts can be identified within the overall environmental review process that will precede approval to expand.

Biological Opinion

It is our Biological Opinion that the Rocky Mountain Pipeline Proposed Route, or any of its Alternatives or variations, is not likely to jeopardize the continued existence of the bald eagle, whooping crane, hedgehog cactus, dwarf bear poppy, desert tortoise (Beaver Dam Slope threatened population), Yuma clapper rail, Owens pupfish, or Mohave tui chub.

Based on the information available at this point in project planning, we are unable to render a Biological Opinion on the effects of the project on the black-footed ferret, blunt-nosed leopard lizard, San Joaquin kit fox, or Utah Prairie Dog. The Proposed Route and/or Alternatives have sufficient potential for habitat damage that additional specific information on the Alternative selected is needed regarding the effects on these species. An extended consultation period will be required to gather the necessary information, evaluate the material, and render an Opinion. Specific information needed to conclude this Opinion will of course be dependent on the route selected.

If the Proposed Route is approved, please provide:

Results of aerial and/or ground searches of white-tailed prairie dog towns within the ROW between MP 0 and MP 40. Surveys for ferrets within or near any prairie dog towns located should be conducted in accordance with the attached draft "Black-footed Ferret Survey Procedures." Initial examination should be undertaken as soon as the ROW is established but may need to be repeated just prior to construction disturbance in or near any prairie dog town.

If Alternative A is approved, please provide:

1. Results of aerial and/or ground surveys for white-tailed prairie dog towns within the ROW between MP 0 and 20. Surveys should be conducted in accordance with the attached draft "Black-footed Ferret Survey Procedures." Initial examination should be undertaken as soon as the ROW is established but may need to be repeated just prior to construction disturbance in or near any prairie dog town.

2. Results of ground surveys for blunt-nosed leopard lizards within the ROW between MP 30 and MP 120 in the Central Valley of California. A strip census or plot census technique following the general guidance in the attached brochure should begin after April 1 to coincide with lizard emergence. Particular attention must be paid to the time of day, air temperatures, and ground temperatures.

3. Results of aerial surveys and ground searches for San Joaquin kit fox along the entire ROW (MP 0-120) in the Central Valley of California. Low level aircraft overflights should first be used to locate potential kit fox dens. Each den should be visited on the ground to determine if it is a San Joaquin kit fox den and if it is actively used. The size and shape of the opening, presence of tracks, and prey remains are all indicators that should be a part of this survey effort.

If Aternative B is approved, please provide:

1. Information requested for the Proposed Route.

2. Results of adequate surveys for Utah prairie dog towns between MP 160 and MP 180. The Utah Division of Wildlife Resources should be contacted and may be able to conduct such surveys or provide technical assistance.

The conduct of scientifically sound wildlife surveys is often a complex matter and may be beyond the capabilities of the applicant and Federal action agencies. Our descriptions here must necessarily be brief, but we are available for technical assistance once route selection is complete.

Selection of the Proposed Route may have substantial negative impacts on the candidate desert tortoise outside its Critical Habitat. Both primary construction impacts and secondary effects from increased access to desert tortoise habitats will be factors. We have a number of recommendations to reduce such impacts (see below).

Approval of Alternative C, with a ROW through the Lockes Ranch in Nevada, poses a serious threat to the Railroad Valley springfish. Construction that crosses the spring outflows could well destroy the species. We recommend a relocation of the ROW to avoid spring outflows as the only means to protect this candidate fish (see below).

In furtherance of the purposes of the Endangered Species Act (Sections 2(c) and 7(a)(1)) which mandates Federal agencies to utilize their authorities to carry out programs for conservation of listed species, we recommend that a number of actions be stipulated on the ROW grant. The applicant should be required to complete these actions prior to the final notice to proceed with construction. The intent of these recommendations is to avoid unnecessary conflicts with endangered species. We have also organized our various recommendations in tabular form, by Alternative, to add clarity.

Proposed Route

1. A survey for bald eagle winter roost trees through Utah and Nevada should be undertaken following final selection of the route. The centerline of the pipeline should be designed to minimize the loss of roost sites. In particular, all large trees suitable for eagle winter roosting along rivers and streams should be preserved, if possible.

2. Construction on the PR between MP 400 and 610 should be accomplished in the winter months--November through February--to reduce loss of desert tortoises through collision with construction vehicles.

3. The applicant/BLM should contract the services of an experienced desert tortoise field biologist to provide technical assistance and perform field survey work between MP 400 - 610 of the PR. Specifically, this individual would:

a) Conduct or supervise a field survey for desert tortoises to identify high density areas to be avoided by the project centerline. The ROW from MP 400 to the California border should be surveyed, except for MP 495-520 (Las Vegas). Particular emphasis should be placed in three aresas mentioned below in Recommendations 4, 5, and 6.

b) Immediately prior to construction, supervise active searches for desert tortoises in winter dens that may specifically conflict with the ROW.

4. .Relocate ROW between MP 418-454 (approximate) to the northwest along the base of the East Mormon Mountains to avoid a particularly high density desert tortoise population.

5. Relocate ROW between MP 455-480 (approximate) southeast towards the Muddy Mountains to avoid a particularly high density tortoise area.

6. Relocate ROW between MP 550-575 (Searchlight, NV to the California border) to parallel Highway 95/146 to avoid a particularly high density tortoise area.

7. Temporary construction access roads between MP 400 and 610 of the PR should be prohibited altogether if possible. Necessary access should be via the ROW itself. If temporary construction access roads are absolutely mandatory in this reach, any roads crossing BLM land should be abandoned and actively restored to natural conditions as per the DEIS discussion immediately after installation of the pipeline is complete. Barriers such as fences, berms, or ditches, as appropriate, should be placed across roads to discourage public use. A 100 foot long reach of road beyond the barrier should be disked to obliterate the road, further discourage public access, and encourage revegetation.

8. Essential temporary access roads in the MP 400-610 reach, that cross other than public or federal lands, should also be restored as per #7 above. While BLM has no authority to direct compliance, moral suasion should be utilized as much as possible.

9. Construction crews working beyond MP 400 of the PR should be informed that the desert tortoise is protected by state laws in Utah, Nevada, and California and that it is illegal to kill, harass, or collect them as pets. Construction workers should be asked to drive with care at all times to avoid collisions with tortoises. Further, crews should be instructed to watch for tortoises under parked vehicles and relocate any tortoises found within the construction zone to a safe area in the vicinity.

10. All routine inspections of the ROW from MP 400 to 610 should be conducted by aerial survey to reduce the need for access roads, and the road kill of desert tortoises occasioned by even infrequent inspection traffic along the ROW.

11. If the applicant is unable to comply with our foregoing recommendations to reduce impacts to the desert tortoise, then BLM should attach a stipulation that the applicant purchase and donate to the BLM, lands within the Desert Tortoise Natural Area and/or Chuckwalla Bench Area of Critical Environmental Concern.

Alternate C

12. If Alternate C is approved, relocate the ROW to avoid Section 15 entirely. We suggest that the ROW diverge from Highway 6 midway through Section 11, and pass through Sections 10, 9, and 16 before reapproaching Highway 6.

13. No groundwater or surface water extractions should be permitted from springs in the vicinity of Lockes Ranch. Any water needed for construction or hydrostatic testing of the pipe should be imported.

14. No groundwater or surface water extractions should be permitted from springs in the vicinity of the Owens pupfish refugia (MP 450 and 480). Water for construction and hydrostatic testing of the pipe along this reach should be imported.

Alternative D

15. Recommendation #1 above for eagle winter roost surveys is appropriate for the entire length of this route.

We request that this formal consultation remain open past release of this Biological Opinion so that continued coordination, particularly the evaluation of additional biological information, can take place. We would appreciate notification of your intent regarding the various requests and recommendations in this Opinion. Mr. Ralph Swanson, in our Endangered Species Office (FTS 448-2791), is our principal contact on this matter.

Enclosures

cc:
Regional Director, Portland, OR (AFA-SE)
Director, Washington, D.C. (OES)
Federal Energy Regulatory Commission, Washington, D.C.

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TABLE OF RECOMMENDATIONS

Alternative	Species Affected	Mileposts	Recommendations
Proposed Route	Black-footed ferret	0-40 (intermittent see text of B.O.)	1. Survey for BFF in prairie dog towns crossed by ROW-see attached methods. 2. Transmit survey results to FWS to conclude formal consultation.
	Bald eagle	Utah and Nevada	1. Conduct field search for winter roost trees; locate center line to avoid loss of roost trees or potential roost trees. 2. Avoid loss of potentially suitable winter roost trees at all stream or river crossings.
	Desert tortoise	400-610	1. Construction from November through February. 2. Prohibit access roads; access via ROW. 3. Relocate ROW between MP 418 and 454, MP 455-480, and MP 550-575 (see text). 4. If construction roads are necessary, restore all access roads on federal land to exclude public use. Use gates, berrus, ditches as appropriate. 5. If construction roads are necessary, encourage restoration of roads on non-federal land. 6. Employ experienced desert tortoise biologist to conduct field survey prior to construction and give additional techinical assistance on ROW relocations. 7. Routine maintenance surveys of pipe should be conducted by aerial overflights. 8. Inform all construction workers of protected status of tortoise. Request workers to watch for tortoises that may seek shade under parked vehicles. Remove tortoises to avoid unnecessary losses. 9. As an alternative to offset impacts, acquire land in Desert Tortoise Natural Area and/or Chuckwalla Bench ACEC.

Alternate A (Northern Systems Alternative)	Black-footed ferret	0-20 (intermittent see text of B.O.)	1. Survey for ferret in prairie dog towns crossed by ROW- see attached methods. 2. Transmit survey results to FWS to conclude formal consultation.
	San Joaquin kit fox	0-120	1. Aerial search for kit fox dens; ground search follow-up to determine if dens are San Joaquin kit fox. 2. Night spot-lighting survey to determine presence of kit fox. 3. Transmit survey results to FWS to conclude formal consultation.
	Blunt-nosed leopard	30-120	1. Survey of leopard lizard habitats crossed by ROW-see attached methods. 2. Transmit survey results to FWS to conclude formal consultation.
Alternate B	Black-footed ferret	(see above)	1. Recommendations for PR apply.
	Bald eagle	(see above)	1. Recommendations for PR apply.
	Desert Tortoise	(see above)	1. Recommendations for PR apply.
	Utah prairie dog	160-180	1. Examine selected ROW for conflicts with Utah prairie dog towns; coordinate field reviews with Utah Division of Wildlife Resources, and FWS. 2. Transmit Utah prairie dog survey results to FWS to conclude formal consultation.

Alternate C (Central Nevada)	Black-footed ferret	(see above)	1. Recommendations for PR apply.
	Bald eagle	(see above)	1. Recommendations for PR apply.
	Railroad Valley springfish	264	1. Relocate ROW to avoid Section 15 and Lockes Ranch altogether. 2. Water for hydrostatic testing not to be drawn from surface springs on Lockes Ranch or groundwater near Lockes Ranch.
	Owens pupfish	458, 472	1. No surface or groundwater extractions for construction or hydrostatic testing that will affect flows or water levels in spring habitats.
Alternate D (Sever-Escalante)	Bald eagle	entire length	1. Recommendations for PR apply

The draft "Black-footed Ferret Survey Procedures" and the brochure concerning the strip census technique for blunt-nosed leopard lizards mentioned in the Biological Opinion letter are not included in this FEIS. The documents are available from the Fish and Wildlife Service Area Office in Sacramento, California, or the Bureau of Land Management's Environmental Impact Statement Office in Denver, Colorado.

Appendix I

Visual Resources Management Methodologies

The BLM's Visual Resource Management (VRM) system and the FS's Visual Management System (VMS) were used to analyze the landscape which the proposed action, alternatives, and variations would traverse.

To compare the visual impact of the RMPP and its alternatives, the VRM system was applied to lands managed by the BLM, as well as other Federal lands (other than National Forest lands for which the VMS procedure was applied), and state, local, and private lands.

The following three sections describe the VRM system, the VMS, and the BLM contrast rating procedure. A further explanation of each process may be found by referring to the sources used as a basis for the discussion.

THE BLM VISUAL RESOURCE MANAGEMENT SYSTEM

The VRM system is an analytical process that identifies, sets, and meets objectives for maintaining scenic values and visual quality (BLM 1978b, 1980f).

The system is based on research that has produced ways of assessing aesthetic qualities of the landscape in objective terms. Aesthetic judgments considered extremely subjective were found to have identifiable, consistent qualities that can be described and measured. Whatever the terrain (and whoever the observer), perception of visual quality in a landscape seems to be based on three common principles:

- Landscape character
- Influence of form, line, color, and texture
- Visual variety

Landscape character is primarily determined by the four basic visual elements of form, line, color, and texture. Although all four elements are present in every landscape, they exert varying degrees of influence. The stronger the influence exerted by these elements, the more interesting the landscape. The more visual variety in a landscape, the more aesthetically pleasing the landscape. Variety without harmony, however, is unattractive, particularly if alterations (cultural modifications) are made carelessly.

The VRM system (see figure I-1, for flow diagram) involves a four-step process: 1) determining the scenic quality of a landscape, 2) measuring the visual sensitivity of an area, 3) determining distance zones, and 4) compiling all the information into management classes for guidance in assessing environmental impact. Figure I-1

Scenic Quality

Scenic quality is perhaps best described as the overall impression retained after driving through, walking through, or flying over an area of land. In the VRM process, rating scenic quality requires a brief description of the existing scenic values in a landscape.

When inventoried, an area is first divided into subunits that appear homogeneous, generally in terms of landform and vegetation. Each area is then rated by seven key factors: landform, vegetation, water, color, influence of adjacent scenery, scarcity, and cultural modification. A standardized point system assigns great, some, or little importance to each factor. The values for each category are calculated and, according to total points, three scenic quality classes are determined and mapped:

Class A--Areas that combine the most outstanding characteristics of each rating factor.

Class B--Areas which combine some outstanding features and some that are fairly common to the physiographic region.

Class C--Areas where the features are fairly common to the physiographic region.

Sensitivity Levels

Although landscapes have common elements that can be measured, there is still a subjective dimension to landscape aesthetics. Each viewer brings perceptions formed by individual influences, culture, visual training, familiarity with local geography, and personal values.

To measure regional and individual attitudes in evaluating a landscape, visual sensitivity is determined in two ways:

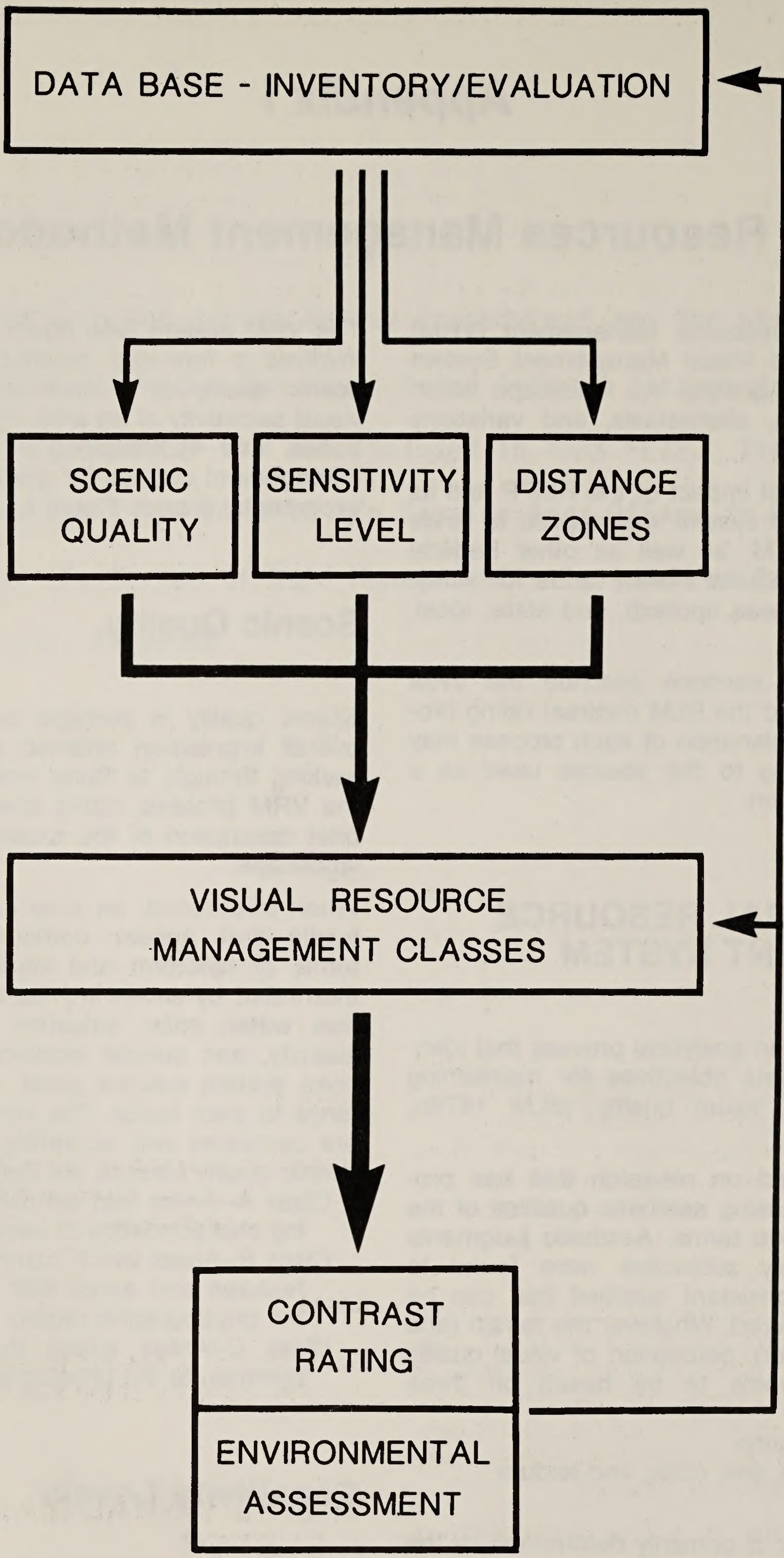

FIGURE I-1 THE VISUAL RESOURCE MANAGEMENT SYSTEM PROCESS

Use volume

Frequency of travel through an area (by road, trail, and river) and **use** that area (for recreation, camping, and events) are tabulated. The area is then assigned a high, medium, or low rating according to predetermined classifications.

User or public reaction

Public groups are familiarized with the area (if necessary) and asked to respond to activities that will modify that landscape. The concern they express about proposed changes in scenic quality is also rated high, medium, or low.

The various combinations of **use** volume and user reaction for each are converted by a matrix to an overall sensitivity rating of high, medium, or low. A map is then developed that illustrates these sensitivity levels.

Distance Zones

The visual quality of a landscape (and user reaction) may be magnified or diminished by the visibility of the landscape from major viewing routes and key observation points.

A landscape scene or 'seen area' can be divided into three basic distance zones: 1) foreground/middleground, 2) background, and 3) seldom-seen. Because areas that are closer have a greater effect on the observer, such areas require more attention than do areas that are farther away. Distance zones allow consideration of the proximity of the observer to the landscape.

Selection of the key viewing points and accurate assessment of distance zones require some judgment. Where several viewing routes exist, what is foreground from one route may be background from another. In that case, the more restrictive designation is thus used. Atmospheric conditions may also modify the perception of distance.

The process culminates in a final distance zone map.

Management Classes

Management classes describe the different degrees of modification allowed to the basic elements of the landscape. Class designations are derived from an overlay technique that combines the maps of scenic quality, sensitivity levels, and distance zones. The overlays are used to identify areas with similar combinations of factors. These areas are assigned to one of five management classes according to predetermined criteria. The resulting map of contiguous areas sharing the same VRM class is used to assess the visual impact of proposed development.

The five classes are:

Class 1

This class provides primarily for natural ecological changes; management activities are to be restricted and are not to attract attention.

Class 2

Changes in basic elements by management activities should not be evident in the characteristic landscape.

Class 3

Contrasts to the basic elements may be evident and begin to attract attention, but they should remain subordinate to the existing characteristic landscape.

Class 4

Alterations may attract attention but should repeat the form, line, color, and texture characteristics of the landscape.

Class 5

Rehabilitation is needed to restore the landscape to the character of the surrounding landscape.

THE FS VISUAL MANAGEMENT SYSTEM

The VMS establishes criteria for identifying and classifying scenic qualities as well as aesthetic concern for those qualities on National Forest lands (FS 1974). The process establishes quality objectives for altering the visual resource by recognizing the great variation in visual strength of the various types of natural landscapes and their inherent capabilities to accept change.

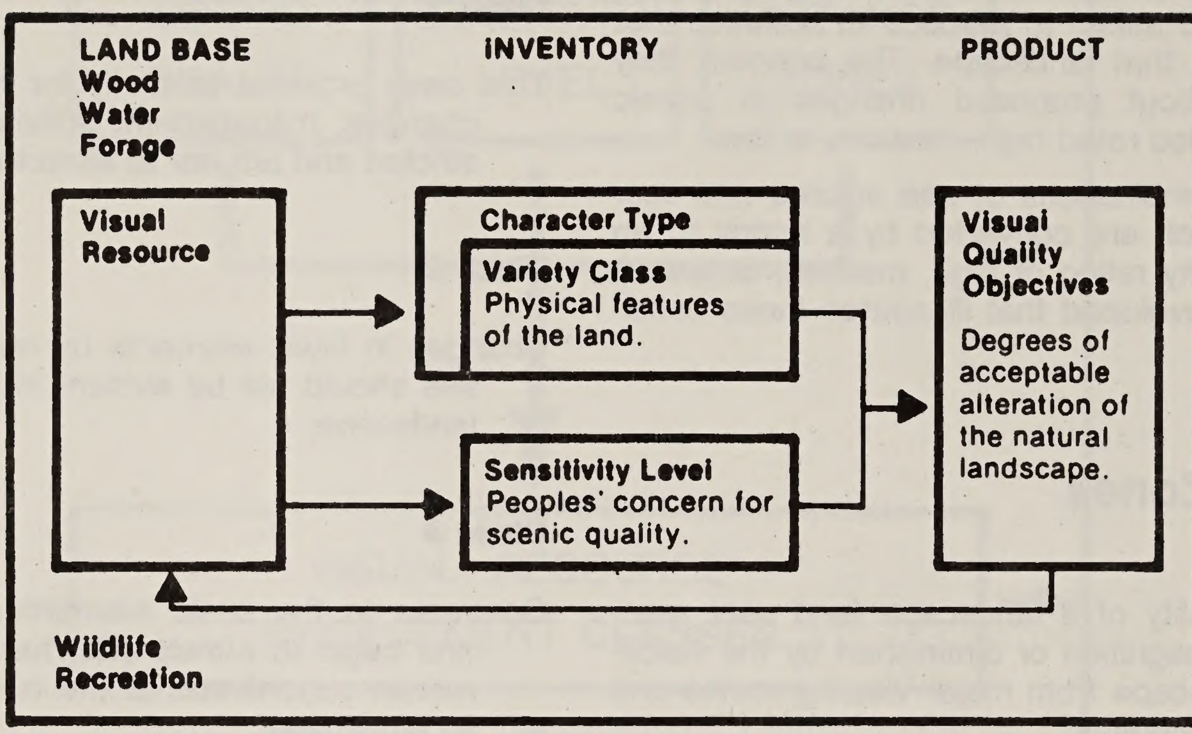

FIGURE I-2 THE VISUAL RESOURCE MANAGEMENT SYSTEM PROCESS

In this process, a particular landscape is placed within a framework for analysis. (See figure I-2 for diagram.) The framework is the character type or common distinguishing visual characteristic of landform, water forms, and vegetative patterns based upon physiographic regions as defined by Nevin M. Fenneman **(1931)**. The characteristic landscape is the naturally established landscape being viewed; it serves as the final basis for analyzing and comparing the appropriateness of a management activity against the prescribed VQO. Figure I-2

The VQO incorporates the extreme variability of the land's scenic quality, the visual sensitivity of the land, and the ability of various forest landscapes to undergo alteration.

Variety Classes

Variety classes are obtained by classifying landscapes into those where the scenic quality is most important and those where it is of lesser value. The classification is based on the premise that all landscapes have some value, but those with the most variety or diversity have the greatest potential for high scenic value. There are three variety classes which identify the scenic quality of the natural landscape:

Class A, Distinctive

Areas where features of landform, vegetative patterns, water forms, and rock formations are of unusual or outstanding visual quality. They are usually not common in the character type.

Class B, Common

Areas where features contain variety in form, line, color, and texture or combinations thereof, but which tend to be common throughout the character type and are not outstanding in visual quality.

Class C, Minimal

Areas where features have little change in form, line, color, or texture. Includes all areas not included in Classes A and B.

Sensitivity Levels

Sensitivity levels are a measure of people's concern for the scenic quality of the National Forests. These levels are determined for land areas viewed by those who are traveling through the forest on developed roads and trails, are using areas such as campgrounds and visitor centers, or are recreating at lakes, streams, and other water bodies. All National Forest land is seen at least by aircraft users; therefore, some degree of visitor sensitivity exists for the entire land base.

Three sensitivity levels, each identifying a different level of user concern for the visual environment, are employed:

Level 1, Highest Sensitivity

Level 1 includes all areas seen from *PRIMARY* travel routes, **use** areas, and water bodies where, as a minimum, at least one fourth of the forest visitors have a *MAJOR* concern for the scenic qualities. Level 1 also includes all areas seen from *SECONDARY* travel routes, the **use** area, and water bodies where at least three-fourths of the forest visitors have a *MAJOR* concern for the scenic qualities.

Level 2, Average Sensitivity

Includes all areas seen from *PRIMARY* travel routes, the **use** are and water bodies where fewer than one-fourth of the forest visitors have a *MAJOR* concern for scenic qualities. Level 2 also includes all areas seen from *SECONDARY* travel routes, **use** areas, and water bodies whe least one fourth and not more than three-fourths of the forest visitors have a *MAJOR* concern for scenic qualities.

Level 3, Lowest Sensitivity

Includes all areas seen from *SECONDARY* travel routes, **use** areas water bodies where less than one-fourth of the forest visitors have a *MAJOR* concern for scenic qualities and all National Forest land not seen from any travel route, **use** area, or water body. (Level 3 does not include any area seen from *PRIMARY* routes or areas.)

Sensitivity levels are correlated with distance zones of foreground, middleground, and background for seen areas established in the sensitivity level determination. This step correctly emphasizes the viewers' concern for scenic quality within the system.

Visual Quality Objectives

The VQO's are designed to develop measurable standards or objectives for the visual management of all National Forest lands. The objectives are based upon the previously determined variety classes and sensitivity levels. They are represented by five terms which can be defined as visual resource management goals.

Preservation (P)

Preservation allows for ecological changes only. Management activities, except for very low visual impact recreation facilities, are prohibited.

Retention (R)

Activities may only repeat form, line, color, and texture which are frequently found in the characteristic landscape.

Partial Retention (PR)

Management activities must remain visually subordinate to the characteristic landscape. Activities may repeat or introduce form, line, color, or texture common to the characteristic landscape, but changes in their size, amount, intensity, direction, pattern, etc., must remain visually subordinate to the characteristic landscape.

Modification (M)

Modification activities may visually dominate the original characteristic landscape. However, vegetation and landform alteration must borrow from naturally established form, line, color, or texture so completely and at such a scale that the visual characteristics are those of natural occurrences within the surrounding area or character type. Additional elements must remain visually subordinate to the proposed composition.

Maximum Modification (MM)

Vegetation and landform alterations may dominate the characteristic landscape. However, when viewed as background, the visual characteristics must be those of natural occurrences within the surrounding area or character type. When viewed as foreground or middle ground, they may not appear to borrow completely from naturally established form, line, color, or texture.

Unacceptable Modification (UM)

Management activities demonstrate excessive modification in the landscape regardless of the distance from which the management activity is observed. Usually the size of the activity is not to scale or is so excessive as to contrast with the characteristic landscape.

THE BLM VISUAL RESOURCE CONTRAST RATING SYSTEMS

The objective of the visual resource contrast rating system is to provide a measure of whether the proposed action will meet the requirements of the assigned VRM classes (FS 1974, BLM 1978b, BLM 1980f). The degree to which a management activity adversely affects the visual quality of a landscape depends on the extent of visual contrast that is created between the activity and the existing landscape character. Contrast is measured by separating the landscape into land and water surfaces, vegetation, and structures and then predicting the magnitude of contrast with the basic elements (form, line, color, and texture) for each of these major features. Assessing the degree of contrast will indicate the severity of impact and will guide the plans for mitigating the contrasts to meet the requirements of the VRM classes. Contrasts are considered from the most critical viewpoints for distance, angle of observation, length of time, relative size of the project, season of the year, light, and the effects of time on the healing process.

The following parameters have been applied to determine if the proposed action will meet the requirements of the assigned VRM classes.

Class I: The degree of contrast for any one element may not exceed a weak degree of contrast (Ix), and the total contrast rating for any one feature may not exceed I0.

Class 2: The degree of contrast for any one element may not exceed a moderate value (2x), and the total contrast rating for any feature may not exceed I2.

Class 3: The degree of contrast for any one element should not exceed a moderate value (2x), and the total contrast rating for any feature may not exceed 16.

Class 4: The total contrast rating for any feature should not exceed 20.

Likewise, the following guidelines have been used to determine if the proposed action would meet the requirements of the assigned VQO on National Forest lands.

Duration of Visual Impact

Preservation (P)

Only ecological change is permitted.

Retention (R)

Immediate reduction in form, line, color, and texture contrast should be accomplished either during construction or immediately after.

Partial Retention (PR)

Reduction in form, line, color, and texture contrast should be accomplished as soon after project completion as possible or, at a minimum, within the first year.

Modification (M)

Reduction in form, line, color, and texture contrast should be accomplished in the first year or, at a minimum, should meet existing regional guidelines.

Maximum Modification (MM)

Reduction of contrast should be accomplished within 5 years.

DEGREE OF CONTRAST

For purposes of this project, the contrasts for each VQO should not exceed the parameters established for the following comparable VRM Classes:

FS VQO's	BLM VRM CLASSES
Preservation (P)	Class 1
Retention (R)	Class 2
Partial Retention (PR)	Class 3
Modification (M) and Maximum Modification (MM).	Class 4
Unacceptable Modification (UM).	Class 5

Specific contrasts in form, line, color, and texture indicate problems that could require design mitigation. Applying design procedures to the proposed action could eliminate or reduce visual contrasts to meet the visual planning objectives stipulated in the VRM class designations. If this were done, the project would be reassessed to determine if it could meet the area's visual goals and if not, to what degree the landscape's visual resource would be affected.

Appendix J

Livestock Grazing

Livestock Grazing

Livestock grazing is probably the largest consumptive **use** of the land that would be affected by the proposed project, alternatives, and variations.

Cattle, sheep, and horses graze on small family farms that run a few animals to supply dairy and meat products for the family, market, and privately owned land. Many family operations depend upon state and Federal lands to support their livestock operation. BLM lands are grazed primarily in late fall, winter, or spring; FS lands are grazed during the summer.

Many livestock operations depend upon the Federal leases to enable them to graze a sufficient number of animals to establish an economic ranch operation. As a result, all lands suitable for grazing are currently owned or leased.

Grazing capacity is extremely variable. Productivity is correlated to vegetation types, which in turn reflect different climatic and geographic zones. The capacity varies from 1 acre per AUM in meadow and high precipitation areas, to 60 acres per AUM in the hot, dry desert areas. Private lands vary from 4 to 5 AUM's per acre on irrigated pastures to 15 acres per AUM in northern areas and 40 to 60 acres per AUM on privately owned desert lands.

FS lands are the better range lands, with carrying capacities ranging from 2 acres per AUM on meadow and upper elevations to 30 acres per AUM at lower elevations near the forest boundaries. The lands administered by BLM generally include lower elevations, low rainfall, and poor soil areas where carrying capacities range from 10 to 60 acres per AUM. However, small acres of better range do exist on BLM lands in meadows, along streams, and in some higher elevations.

Grazing fees on private lands vary according to ownership and leasing arrangements. According to the Farm Real Estate Market Development, the western states' average rate is $7.56 per AUM. Federal grazing fees (rates) based on current market value are set by law and are subject to increase or decrease. The fees for the 1980 grazing season were **$2.36** on BLM lands and $2.54 on FS lands.

Consequences to Livestock Grazing

Grazing capacity is a product of plant growth translated into forage production and carrying capacity through inventory and analysis. Since each acre of ground may vary greatly in carrying capacity, average figures are used for the route or ownership. Table J-1 assesses impacts to livestock grazing.

Grazing capacity would be totally lost during construction of the project. Recovery of forage, with resulting restoration of grazing capacity, would result at a rate corresponding to geographic location and degree of reseeding or restoration practices employed. Average loss of forage would vary from approximately 2 to 5 AUM's per mile of construction, an average annual loss of $8.50 in grazing fees per mile. The length of this loss would depend on successful establishment of vegetation. Loss could be temporary (for 1 or more years) or total. The northern areas of the routes through Idaho and northern Utah would fall into the more productive locations, and grazing capacity would recover within 3 to 5 years. Along the southern protions of the routes in Utah, Nevada, and California, 5 to 25 years would be required to reestablish forage species, depending upon precipitation quantities and timing.

Noxious weeds have a tendency to dominate disturbed areas where precipitation ranges between 8 to 14 inches annually. If reclamation measures were not vigorously applied, weed species could dominate the area, making it unsuitable for grazing for a decade or more. Several FS areas would also suffer from invasion of thistle species on disturbed areas.

Impact upon livestock grazing might be locally significant because of the linear nature of the project. Rapid construction schedules and proposed construction techniques would minimize disturbance to livestock.

The following impacts to grazing lands could occur:

Disruption of trailing patterns to and from water, should construction occur between grazing areas and water sources.

Creation of hazards in small pastures or near traditional cattle or sheep trails.

Deviation from normal sheep trailing areas or authorized trails.

Imbalance of grazing **use** in intensively managed grazing systems.

Rehabilitation difficulty compounded as a result of pipeline being used as a livestock trail.

Establishment of noxious weed species during construction and land clearing.

Separation of forage from livestock watering areas, especially while pipeline right-of-way is fenced for 3 to 5 years or longer to permit vegetation establishment. This might result in total removal of livestock within a grazing allotment.

Areas separated by right-of-way during construction and rehabilitation might split National Forest grazing allotments so that current management plans would not work. Added to other impacts--i.e., timber sales, Central Utah Project, Moon Lake Electric, etc.,--this might prevent the allotment from being a viable grazing unit and require livestock removal.

Economic loss to ranches might be sufficient to eliminate profit, resulting in the ranch going out of business. For instance, if an entire area **were** grazed by sheep, there would be a loss of 964 AUM's at 5 sheep months per AUM, (4,820 sheep months) or **30 sheep days per month** (144,600 sheep days) would be lost, **times 1.1 lambs per ewe or 159,060 lamb days. Lambs gain approximately 0.75 pound per day, a total of 119,295 pounds of lamb. During 1980, lambs sold for $0.71 per pound, which would equal an annual loss of income to ranchers formers of $84,699.45. (This calculation does not take into account animal product losses such as wool.)**

Table J-1 shows the loss of grazing fee revenues to state, Federal, and private landowners who lease the pastures if the livestock were removed as a result of construction. The ranchers' overhead is about the same whether or not they have the additional animals, but the loss of income may make a low-return operation untenable.

TABLE J-1 (Revised)

COMPARISON OF LOSS OF GRAZING USE FROM PIPELINE CONSTRUCTION ON THE PROPOSED ACTION, ALTERNATIVES, AND VARIATIONS

ROUTE	LAND STATUS												TOTAL		
	[a]Private			[b]State			FS			BLM			Acres	AUM	$
	[c]Acres	[d]AUM	[e]$	Acres	AUM	$	Acres	AUM	$	Acres	AUM	$			
Proposed Action	2,460	492	3,719	11	1	7	642	214	543	3,090	257	607	6,203	964	4,896
Northern Systems	1,330	305	2,324	36	5	38	--	--	--	2,650	265	673	4,016	575	3,035
Sanpete Valley	1,917	383	2,895	194	38	287	642	214	543	3,333	222	524	6,086	857	4,249
Central Nevada	2,753	550	4,158	194	38	287	666	222	564	5,514	367	866	9,127	1,519	5,875
Sevier-Escalante Desert	1,674	335	2,683	339	67	506	642	214	543	3,454	230	542	6,109	846	4,274
West Salt Lake	3,000	330	2,494	200	15	113	120	24	61	4,605	230	544	3,454	599	3,212
Provo Canyon	3,705	741	5,601	218	43	325	169	56	142	3,151	210	495	7,243	1,050	6,563
Thistle Creek	290	58	438	12	2	15	24	8	20	--	--	--	326	68	473
East Las Vegas	230	46	347	--	--	--	--	--	--	472	31	73	702	77	420
Fort Mojave	12	--	--	--	--	--	--	--	--	108	5	12	120	5	12
Mill Creek	36	7	52	--	--	--	120	40	101	--	--	--	156	47	153
Daniels Canyon II	--	--	--	--	--	--	35	28	72	--	--	--	85	28	72
Moapa	--	--	--	--	--	--	--	--	--	352	18	42	352	18	42
West Kamas Valley	170	22	166	--	--	--	--	--	--	--	--	--	170	22	166

[a]Private range land was computed as the difference of total private land less croplands.
[b]State lands do not include croplands.
[c]Value is computed as fees charged times AUM's; BLM=$2.36; FS=$2.54; private=$7.56. (dollars/year)
[d]AUM's is defined as the amount of forage necessary to sustain one animal unit for 1 month.
[e]Acres reflect land area within the 100-foot wide right-of-way suitable for grazing.

Appendix K

Forest Products

The following two tables summarize commercial timber and miscellaneous forest products in National Forests which would be affected by the RMPP or its alternatives. The information should provide an adequate basis for evaluating impact to these resources.

The volumes of pinyon-juniper fuel wood in National Forests vary from 5 to 7 cords per acre west of Delta, Utah. Near Sacramento Pass and near Ely, Nevada, the volume is 9 to 10 cords per acre; in the valley bottoms, it drops to 3 cords per acre. Therefore, a good average would be 5 cords per acre.

Fees for fuel wood are $2 per cord **would** a personal permit, $6 **would** a commercial permit, and $25 for retail sale. Retail values in Las Vegas and Salt Lake City are $90 to $100 per cord. Retail values in Denver are $125 per cord.

TABLE K-1

NATIONAL FOREST RESOURCES DISTURBED BY CONSTRUCTION OF RMPP AND ALTERNATIVES

(100-foot Wide Construction Right-of-way)

Route	Commerical Timber		Miscellaneous Forest Products[b]	
	Volume (Mbf)[a]	Value($)	Volume[b]	Value($)
Proposed Action	1,016	16,115	2,410 CDS 300 CT 130 P	6,648
Central Nevada Alternative	---	---	375 CDS	714
West Salt Lake Alternative	42	875	---	---
Mill Creek Variation	1,167	25,685	98 CDS	254

[a]Mbf=Thousand board feet
[b]CDS=Cords of fuelwood;
CT=Christmas trees;
P=Posts

TABLE K-2

NATIONAL FOREST RESOURCES DISTURBED ANNUALLY BY OPERATION OF RMPP AND ALTERNATIVES

(50-foot Wide Permanent Right-of-way)

Route	Commercial Timber		Miscellaneous Forest Products[b]	
	Volume (Mbf)[a]	Value($)	Volume[b]	Value($)
Proposed Action	106.1	2,211	95 CDS	233
Central Nevada Alternative	---	---	7 CDS	14
West Salt Lake Alternative	0.7	15	---	---
Mill Creek Variation	89.0	1,267	4 CDS	11

[a]Mbf=Thousand board feet
[b]CDS=Cords of fuelwood;
CT=Christmas trees;
P=Posts

Appendix L

Significant Cultural Resources: Properties and Districts

TABLE L-1

SIGNIFICANT CULTURAL RESOURCES: PROPERTIES AND DISTRICTS LISTED ON THE NATIONAL REGISTER OF HISTORIC PLACES

County	Property or District	Nearest MP
Proposed Action		
Summit	Howe Flume Historic District	100
Summit	Kimball Stage Stop	105
Juab	Nephi Mounds	196
Millard	Pharo Village	230
Beaver	Wildhorse Canyon Obsidian Quarry	300
Washington	Mountain Meadows Historic Site	379
Clark	Black Dog Mesa	461
Clark	Gypsum Cave	490
Clark	Las Vegas Historic District	500
Clark	Las Vegas Wash Archaeological District	500
Rich	Mormon Trail*	51
San Bernardino	Piute Pass Archaeological District	597
San Bernardino	Tule Springs Archaeological Site	600
Alternative A, Northern Systems Alternative		
San Joaquin	San Luis Gonzaga Archaeological District	25 (Brentwood-Panoche Junction Pipeline)
Lincoln	Oregon Trail*	6 (Kemmerer Loop)
Bear Lake	Oregon Trail*	35 (Pegram Loop)
Bear Lake	Oregon Trail*	66-85 (Soda Springs Loop)
Alternative B, Sanpete Valley Alternative		
Summit	Howe Flume Historic District	100
Summit	IKimball Stage Stop	105
Sanpete	Wasatch Academy	17
Sevier	Aspen--Cloud Rockshelters	60
Sevier	Jenson, Jens Larson Lime Kiln	80
Sevier	Parker, Joseph William, Farm	90
Washington	Mountain Meadows Historic Site	379
Clark	Black Dog Mesa	461
Clark	Gypsum Cave	490
Clark	Las Vegas Historic District	500

TABLE L-1—Continued

County	Property or District	Nearest MP
Clark	Las Vegas Wash Archaeological District	500
San Bernardino	Piute Pass Archaeological District	597
San Bernardino	Tule Springs Archaeological Site	600
Alternative C, Central Nevada Alternative		
Summit	Howe Flume Historic District	100
Summit	Kimball Stage Stop	105
Juab	Nephi Mounds	0
Millard	Topaz War Relocation Center Site	59
Millard	Gunnison Massacre Site	61
Millard	Archaeological Site 42MD300	75
White Pine	Lehman Orchard and Aqueduct	142
White Pine	Rhodes Cabin (No. 19)	142
White Pine	Ward Charcoal Ovens	200
Nye	Tonopah Historic District	357
Inyo	Pawona Witu	465
Inyo	Manzanar War Relocation Center	505
Inyo	Coso Hot Springs	560
Inyo	Big and Little Petroglyph Canyons	570
San Bernardino	Steam Well Petroglyph Archaeological District	610
Alternative D, Sevier-Escalante Desert Alternative		
Summit	Howe Flume Historic District	100
Summit	Kimball Stage Stop	105
Juab	Nephi Mounds	0
Millard	Fort Deseret	60
Millard	Gunnison Massacre Site	60
Washington	Mountain Meadows Historic Site	379
Clark	Black Dog Mesa	461
Clark	Gypsum Cave	490
Clark	Las Vegas Historic District	500
Clark	Las Vegas Wash Archaeological District	500
San Bernardino	Piute Pass Archaeological District	597
San Bernardino	Tule Springs Archaeological Site	600
Alternative E, West Salt Lake Alternative		
Box Elder	Hogup Cave	150
Tooele	Gapa Launch Site and Blockhouse	225
Tooele	Iosepa-Settlement Cemetary	270
Beaver	Wildhorse Canyon Obsidian Quarry	300
Washington	Mountain Meadows Historic Site	379
Clark	Black Dog Mesa	461
Clark	Gypsum Cave	490
Clark	Las Vegas Historic District	500
Clark	Las Vegas Wash Archaeological District	500
San Bernardino	Piute Pass Archaeological District	597
San Bernardino	Tule Springs Archaeological Site	600

TABLE L-1—Continued

County	Property or District	Nearest MP
Alternative F, Provo Canyon Alternative		
Summit	Howe Flume Historic District	100
Summit	Kimball Stage Stop	105
Utah	Olmsted Station Powerhouse	30
Utah	Nunn Power Plant	33
Utah	Old Goshen	80
Millard	Pharo Village	230
Beaver	Wildhorse Canyon Obsidian Quarry	300
Washington	Mountain Meadows Historic Site	379
Clark	Black Dog Mesa	461
Clark	Gypsum Cave	490
Clark	Las Vegas Historic District	500
Clark	Las Vegas Wash Archaeological District	500
San Bernardino	Piute Pass Archaeological District	597
San Bernardino	Tule Springs Archaeological Site	600
Variation 3, East Las Vegas Variation		
Clark	Big Spring	12
Variation 4, Fort Mojave Variation		
Clark	Dead Mountains Archaeological District	5

*National Historic Trail Register

Appendix M

Forest Service Positions on Soils/Geology Problems on National Forests

Exerpt from Forest Service November 18, 1980, comments on the RMPP Preliminary DEIS.

The following discussion is quoted from the FS November 18, 1980, comments on the preliminary DEIS. It represents the FS position on potential soil problems and impacts on the Uinta National Forest, and is included at the request of the FS in its review of the DEIS.

<u>Soils problems identified in the Sheep Creek and White River Drainages</u>

The unit plan for the Hobble-Diamond Management Unit identified a management concern dealing with the degraded watershed in the Sheep Creek and White River drainages. In these units, based on in-Service soil surveys, current rates of soil loss through wind and water erosion exceed the rates of soil formation. Consequently, our management direction for these two drainages is that the net effect on soil loss of any project must result in a decrease of soil loss. That is, if a project will cause an increase in soil loss it must be accompanied by a companion project which will benefit the watershed and cause a decrease in soil to the degree or greater than the first project increased it. Due to the degree of disturbance, which will result from the pipeline construction, the short range and long range soil losses will be considerable. For this reason, the current Uinta Forest policy states that the Sheep Creek and White River drainages will not be used for utility corridors.

The pipeline passes through the most fragile soil and geologic conditions found on the Uinta National Forest when it crosses Strawberry Ridge and enters soils derived from the Green River Formation. The soil survey was completed in this area in 1979, and another special soil study performed the same year on the area that the pipeline will traverse. Disturbed soil erosion rates range from 0.1 to 1.1 inches per year. The Sheep Creek drainage is presently in a soil degrading condition, that is, the net soil formation is negative. This is particularly importnat in that very infertile subsoils are being exposed and the vegetative cover is being permanently lost. Fertile top soils are limited in the Sheep Creek drainage, and whenever these have been significantly disturbed and mixed with the subsoils revegetation has not occurred. In some areas, toxic subsoils have been exposed and when this has happened, raw soil slopes have formed and these show no signs of revegetating.

The Sheep Creek drainage also has geologic hazards which are of concern. Several large, active landslides are found in the area and these pose serious problems for pipelines. The Green River shale formation has laminar bedded structure with the beds ranging in thickness from less than a centimeter to several meters in thickness. Occasionally these beds slide over one another triggering land slippage when no artificial forces have been applied. An example of this is in the road from Sheep Creek to Rays Valley where a large, active landslide is found. Cutting of the laminer shale beds by excavation is expected to increase the probability of soil and geologic mass movement many times over the natural state.

Construction of the pipeline through any part of the Green River shale Formation is expected to result in the following conditions. These conditions are based on the companies stated standards of a 100-foot cleared construction zone with a maintained 50-foot right-of-way. (1) Areas of the cleared and disturbed zone will not revegetate over the site. The exposure of infertile subsoils and the shallow depth to bedrock will inhibit all revegetation efforts. Mulching, fertilizing, and most conventional revegetation techniques will have very little success in this country. (2) Erosion rates will range from 0.5 to 1.1 inches per year in the cleared zone. This will result in soil loss of 815 to 1793 cubic yards of soil per mile of pipeline. This loss will continue of an extended period of time and will contribute a considerable amount of sediment to Sheep Creek. At present, this area receives considerable use by ORV's.

On the Spanish Fork District, our major problems occur on the Mountain Fuel Supply Company pipeline on the Nebo Unit. We anticipate that ORV use will occur on the proposed pipeline destroying any revegetation. This would present a significant, continuing problem for Forest Service management. (3) Construction of the pipeline will likely result in new soil and geologic mass movement. This will pose a threat to the pipeline as well as adjacent resources.

FOREST SERVICE POSITIONS

Reconnaissance Geologic Evaluation of a Proposed Utility Corridor in the Dairy Fork, Lake Fork and Little Clear Creek Drainages Manti-LaSal National Forest.

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Fishlake National Forest
170 North Main
Richfield, Utah 84701

1950 (Rocky Mountain
Pipeline Project

April 15, 1981

Janis Bowles
% Department of Interior
Bureau of Land Management (140)
18th & C Street NW
Washington, D.C. 20240

Dear Janis:

The Manti-LaSal National Forest has recently prepared a geological report which describes the topographic and geologic conditions from mileposts 159 to 169 of the Proposed Action - Rocky Mountain Pipeline Project. The report specifically addresses conditions along the pipeline corridor crossing the Manti-LaSal National Forest. This report is enclosed for your review and information.

As discussed in the geologic report and illustrated by the attached map and profiles (Plates 1, 2, and 3), several topographic and geologic features might combine to create engineering problems along portions of Segment 25.

According to the Manti-LaSal National Forest geologists, the northern segment of the referenced corridor is located in an area that is highly susceptible to natural surface instability. Construction of facilities along this route would create significant potential for damage to surface resources due to slope failure, erosion, and acceleration of the existing natural instability. Potential would also exist for damage to facilities installed within this portion of the corridor, due to construction induced failures.

The Forest geologists have also stated that, although the southwestern portion of the referenced corridor segment does not appear to be as prone to instability and slope failure, there would still be potential for damage to surface resources and facilities by induced failures. In addition, construction of the proposed pipeline across the steep topography (side slopes and direct slopes up to 100 percent) on this portion of the corridor segment would create extensive surface disturbance with or without any resultant slope failures.

Due to the geologic and topographic problems observed, the Manti-LaSal National Forest Supervisor has stated that the proposed pipeline corridor, within the Dairy Fork-Lake Fork-Little Clear Creek drainages would be unacceptable for construction of the types of surface facilities proposed or anticipated. The Forest Supervisor recommends the Thistle Canyon alternative or other alternatives as discussed in the geologic report.

Reference to the geologic report and findings should be included in the appropriate Draft EIS sections.

Theron Garth Heaton

THERON GARTH HEATON
Forest Service Liaison
Rocky Mountain Pipeline Project

Enclosure

Reconnaissance Geologic Evaluation of a Proposed Utility Corridor in the Dairy Fork, Lake Fork and Little Clear Creek Drainages Manti-LaSal National Forest

Prepared by:

Dwain E. McGarry

and

Carter E. Reed

Manti-LaSal National Forest

March 2, 1981

I. INTRODUCTION

Pacific Gas Transmission Corporation has proposed construction of a major natural gas pipeline (Rocky Mountain Pipeline Project) from gas fields in northeastern Utah - southwestern Wyoming to several locations in California. A segment of the proposed pipeline approximately 10 miles in length crosses the northwestern portion of the Manti-LaSal National Forest, Price Ranger District (see Plate 1). Access roads and other service facilities will also have to be constructed in conjunction with the proposed pipeline. It is also probable that a future power transmission line and associated facilities will utilize this same corridor. This report is a preliminary geologic evaluation of the proposed utility corridor.

The authors, Carter E. Reed, Supervisor's Office Geologist, and Dwain E. McGarry, a Price Ranger District Geologist, were directed to prepare this evaluation on February 23, 1981. A field investigation and aerial reconnaissance were conducted February 24 and February 25, 1981. Weather and road conditions prevented surface access to all but a small portion of the project area. The entire corridor and surrounding areas (within the Manti-LaSal National Forest) were viewed from the air.

Most of the geologic information in this report is based on a review and compilation of published and unpublished geologic data (see list of references in Section IV).

Previously mapped geologic data was verified and/or refined by photogeologic interpretation of the aerial photographs along the proposed corridor. The limited field investigations served only to provide the authors with some familiarity with the area and to verify some previous photo interpretations.

II. GEOLOGY AND TOPOGRAPHY

A. Description of Local Geology

1. Location and Topography

The project area is located in the northwest corner of the Wasatch Plateau, an area characterized by rugged topography. Lake Fork, Dairy Fork and Little Clear Creek are the primary drainage systems in the area. Deeply-incised intermittent or perennial major streams and tributaries have dissected the terrain to create a steep and divergent drainage pattern.

Elevations in the vicinity of the proposed corridor range from 6,000 to 9,000 feet above sea level.

As indicated on the Rocky Mountain Pipeline Project maps (December, 1980), the proposed pipeline will cross the northwest portion of the Price Ranger District along the Dairy Fork, Lake Fork and Little Clear Creek drainages.

The utility corridor under consideration is a broad zone within these main drainages. The project map (1:250,000) does not permit precise identification of the pipeline route; however, the general utility corridor will traverse a wide range of topographic features.

2. Stratigraphy

The project area is underlain primarily by sedimentary rocks of Cretaceous to Tertiary age with minor occurrences of undifferentiated Jurassic strata, Tertiary pyroclastics and various unconsolidated Quaternary deposits. The principal formation exposed in the vicinity of the proposed corridor consist of Cretaceous and Tertiary marine, florial and lacustrine sedimentary rocks. Figure 1 (from Doelling, 1972) presents the general stratigraphy of the area.

3. Structural and Surficial Geology

The relatively simple structure typical of much of the Wasatch Plateau has been complicated in this area by normal faulting and folding. The strata exposed on the higher elevation areas are relatively flat-lying, dipping slightly (less that 10°) to the north, east and west. Along the northeastern part of the Plateau, the beds of the Green River, Flagstaff and North Horn Formations dip more steeply (approximately 10-30°), but uniformly to the north and northeast controlled by a structural feature that has been referred to as the Soldier Monocline (Spieker, 1949). In general, the strata in the western part of the project area conforms to the regional northward dipping trends. However, normal faulting has locally affected some areas causing various changes in altitude. Some beds are nearly vertical while others may dip relatively steeply to the east or west. Plate 1 illustrates the observed structural features of the area.

A major structure, the Strawberry Fault, roughly parallels the proposed pipeline route (Spieker, 1949). Two near parallel SW-NE trending lineations that probably correlate with the Strawberry Fault zone, were identified on the aerial photos. Displacement on these faults has created a graben where a block of the Green River Formation has dropped relative to the North Horn and Flagstaff Formations on either side. This structural feature outlines the Dairy Fork drainage. Normal faulting has occurred in other parts of the project area, but these structures appear less prominent and have had less apparent effect on the adjacent strata.

FOREST SERVICE POSITIONS

System	Series	Stratigraphic Unit		Thickness (feet)	Description
TERTIARY	Eocene	Green River Formation		—	Chiefly greenish lacustrine shale and siltstone.
TERTIARY		Wasatch Group	Colton Formation	300-1,500	Varicolored shale with sandstone and limestone lenses, thickest to the north.
TERTIARY	Paleocene	Wasatch Group	Flagstaff Limestone	200-1,500	Dark yellow-gray to cream limestone, evenly bedded with minor amounts of sandstone, shale and volcanic ash, ledge former.
CRETACEOUS	?	Wasatch Group	North Horn Formation (Lower Wasatch)	500-2,500	Variegated shales with subordinate sandstone, conglomerate and freshwater limestone, thickens to north, slope former.
CRETACEOUS	Maestrichthian	Mesaverde Group	Price River Formation	600-1,000	Gray to white gritty sandstone interbedded with subordinate shale and conglomerate, ledge and slope former.
CRETACEOUS	Campanian	Mesaverde Group	Castlegate Sandstone	150- 500	White to gray, coarse-grained often conglomeratic sandstone, cliff former, weathers to shades of brown.
CRETACEOUS	Campanian	Mesaverde Group	Blackhawk Formation *MAJOR COAL SEAMS*	700-1,000	Yellow to gray, fine- to medium-grained sandstone, interbedded with subordinate gray and carbonaceous shale, several thick *coal* seams.
CRETACEOUS	Campanian	Mesaverde Group	Star Point Sandstone	90-1,000	Yellow-gray massive cliff-forming sandstone, often in several tongues separated by Masuk Shale, thickens westward.
CRETACEOUS	Santonian	Mancos Shale	Masuk Shale	300-1,300	Yellow to blue-gray sandy shale, slope former, thick in north and central plateau area, thins southward.
CRETACEOUS	Santonian	Mancos Shale	Emery Sandstone *COAL (?)*	50- 800	Yellow-gray friable sandstone tongue or tongues, cliff former, may contain *coal* (?) in south part of plateau if mapping is correct, thickens to west and south. *Coal* may be present in subsurface to west.
CRETACEOUS	Coniacian	Mancos Shale	Blue Gate Member	1,500-2,400	Pale blue-gray, nodular and irregularly bedded marine mudstone and siltstone with several arenaceous beds, weathers into low rolling hills and badlands, thickens northerly.
CRETACEOUS	Turonian	Mancos Shale	Ferron Sandstone Member *MAJOR COAL SEAMS*	50- 950	Alternating yellow-gray sandstone, sandy shale and gray shale with important *coal* beds of Emery coal field, resistant cliff former, thickens to the south.
CRETACEOUS	Cenomanian	Mancos Shale	Tununk Shale Member	400- 650	Blue-gray to black sandy marine slope forming mudstone.
CRETACEOUS	Albian	Dakota Sandstone *MINOR COAL*		0- 60	Variable assemblages of yellow-gray sandstone, conglomerate shale and *coal*. Beds lenticular and discontinuous.

~~Figure 5~~. Generalized section of rock formations, Wasatch Plateau coal field.

Figure 1 (after Doelling 1972)

An examination of the area's aerial photography indicates that the Green River Formation, within the Dairy Fork graben, is prone to surficial instability. Visible slumps of various sizes are common throughout this area, particularly in the upper reaches of the drainage. Less notable areas of instability with some isolated slumps, can also be observed in the Lake Fork drainage which is some distance from the proposed utility corridor. The southwestern portion of the corridor, in the Little Clear Creek drainage appears to traverse steep, but stable terrain.

B. Topographic and Geologic Conditions Along the Proposed Pipeline Route

The proposed pipeline location was transferred onto four U.S.G.S. 7½ minute quadrangle, topographic maps (scale 1:24,000) from map #3 (Price area) of a compilation of maps showing proposed and alternative pipeline routes prepared by Janis Bowles--Bureau of Land Management. This document is entitled the Rocky Mountain Pipeline Project, Edition #4 dated December 20, 1980. The scale of the reference maps (1:250,000) is so large that the actual proposed pipeline route cannot be precisely located. For the purpose of this report, it is assumed that the proposed route is along the east slope or walls of Little Clear Creek, West Lake Fork and Dairy Fork Canyons as drawn on the referenced map (see Plate #1).

1. Topography

Profile sections were drawn directly along the assumed pipeline route and at various locations perpendicular to this route to illustrate the topography along the corridor. A 2:1 vertical exaggeration was used for illustration purposes (see Plates 1, 2, 3).

The pipeline route encounters side slopes along the canyons that may range from approximately 0 to 100 percent, and direct slopes as it crosses side or tributary drainages, of 0 to 50 percent. The steepest slopes and most rugged topography is encountered near Smith's Reservoir, approximately midway along the line across the Manti-LaSal National Forest.

2. Geology

The proposed pipeline route crosses several formation contacts (Price River, Mancos Shale-Emery Sandstone, Jurassic Undifferentiated Formations) at its southwestern end. Each formation and formation member will differ lithologically and have different physical and engineering properties.

The line enters the Strawberry Fault Zone approximately one mile northeast of Smith's Reservoir. The rock beds south of the fault zone dip steeply to the southeast, generally exceeding 30 degrees. This is a desirable situation for ground stability because the rocks dip away from the pipeline in the opposite direction from the ground slope. The fault zone is reflected by a pronounced change in the attitude of the rock beds and rock types. In this more northern section of the line (approximately 4 miles in length), the Green River Formation outcrops, dipping steeply (approximately 10-30°) in a northerly direction. Common slumping was observed from the air and on the aerial photographs indicating that this area is relatively unstable. The formations within the fault zone seem to have dropped relative to the rest of the map area. Instability of this area could be the result of saturation of the ground from groundwater flowing from the fault zone into the Green River strata along bedding planes and fractures. The Green River Formation in this area is typically unstable when water saturated.

Dr. Andrew E. Godfrey of Vanderbilt University of Nashville, Tennessee, mapped the area in question in 1972 for his report entitled: A Field Reconnaissance of Mantle Instability on the Manti-LaSal National Forest and an Adjacent Portion of the Fishlake National Forest, dated February, 1972. Godfrey mapped most of the area within the fault zone as "Zone 1" which represents his zone of least stability of four zones or stability categories; "Zone 4" being the most stable. "Zone 1" represents areas of instability prone to failure due to natural causes. The bulk of the remaining area of this survey was mapped as "Zone 2" representing areas of instability prone to failures due to external stimuli such as human activities (i.e. pipeline construction). A small portion of the survey area along the southern portion of the pipeline route and east of the fault zone was mapped as "Zone 3" representing moderately stable conditions.

III. CONCLUSIONS AND RECOMMENDATIONS

Several potential problems become apparent upon examination of the geologic and topographic conditions along the proposed utility corridor. Construction of the northern segment of the corridor through the Dairy Fork graben, would be almost entirely within unstable surficial materials. It is likely that construction activities in this area would precipitate significant slope failures both during and after construction. There is significant potential for surface resource damage, and damage to the proposed pipeline or other facilities, along this section of the proposed corridor. The southwestern portion of the corridor, in the Little Clear Creek drainage, does not appear to be as susceptible to natural instability as that portion of the corridor in the Dairy Fork drainage. Construction activities in this area will create extensive surface disturbance because of the steep topography, both parallel and transverse to the corridor. In addition, it is possible that instability and slope failures will be induced by construction along this segment of the corridor.

Based upon the authors' observations and conclusions, we recommend consideration of alternative corridors for construction of the Rocky Mountain Pipeline Project and associated or future facilities. It is not within the scope of this report to present alternative corridors; however, two possible alternatives for further consideration are apparent. A possible corridor could exist along U.S. Highway 50&6 through the Red Narrows and U.S. Highway 89 in the Sanpete Valley. Another corridor may be available along one of several major ridges across the upper surface of the Wasatch Plateau. Additional alternatives may also be identified by further study.

IV. LIST OF REFERENCES

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NOTE: Plates 1, 2, and 3 referenced in this letter are available for viewing at the BLM EIS office in Denver and the FERC office in Washington, D.C.

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