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SOUTHWEST GAS CORPORATION

June 15, 2009

Docket Control
Arizona Corporation Commission
1200 West Washington Street
Phoenix, AZ 85007-2996

Subject: **Docket No. G-01551A-07-0504, Decision No. 70665**

Pursuant to Arizona Corporation Commission Decision No. 70665, dated December 24, 2008, Southwest Gas Corporation (Southwest) was requested to perform a feasibility study to evaluate the potential of extending natural gas service to Payson, AZ. Southwest hereby submits an original and thirteen (13) copies of its study.

Respectfully submitted,

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Southwest Gas Corporation

Payson Feasibility Study

Evaluating the Potential for Extending Natural Gas Service to Payson, Arizona

June 15, 2009

Executive Summary

Pursuant to Arizona Corporation Commission (Commission) Decision No. 70665, Southwest Gas Corporation (Southwest or SWG) performed a feasibility study to evaluate the potential of extending natural gas service to Payson, Arizona. Southwest estimates the cost of the project at approximately $97.0 million in the initial year and additional costs of approximately $49.0 million over the following nine years, for a 10-year total cost of approximately $146.0 million. The incremental annual revenue requirement would increase the current delivery cost component from $1.19 per therm to between $4.71 and $12.55 per therm, depending on the number of customers who choose to convert. This would represent an increase in a Payson residential customer's average monthly bill of between 196 and 520 percent. Southwest has therefore concluded that this would not be an economically feasible project, nor would it necessarily be in the best interest of Payson residents or Southwest.

In order to provide natural gas service to Payson, a 62.5 mile long 8-inch high pressure steel pipeline operating at 600 pounds per square inch (psi) would be constructed from a location northwest of Mayer, Arizona traveling in an easterly-southeasterly direction to the north side of Payson (see Appendix A, page 1). Extensive rights-of-way acquisition and land leases would be required from the US Forest Service, Arizona State Land Department, Bureau of Land Management, private land owners and the Arizona Department of Transportation. The acquisition of right-of-way and the construction of the pipeline with its associated appurtenances are estimated to cost approximately $62.7 million.

The studied pipeline would feed natural gas into the existing SemStream propane system. To provide such service, Southwest would also have to acquire the Certificate of Convenience and Necessity currently held by SemStream and SemStream would need to be willing to sell its existing system at a reasonable price. For the purpose of quantifying costs for this study, Southwest conservatively estimates the cost to acquire SemStream's system at $17.0 million.

Assuming the pipeline was connected to the existing propane system, extensive distribution system upgrades would be required to accommodate the delivery of natural gas. Due to the difference in chemical properties, natural gas requires a more robust system with higher flow rate capacities than that of propane. Required system improvements are estimated at approximately $9.0 million during the first year and another approximate $18.1 million over the following nine years. The actual transition from delivering propane to delivering natural gas would pose a significant challenge and is addressed in more detail in the study. Southwest would provide the labor to convert Payson customers' propane appliances to natural gas at an estimated cost of $1.5 million. Customers would be responsible for the cost of parts, which could reach up to $1,500 per household. Only the customers currently connected to the existing distribution system were considered as potential Southwest customers, as it would not be feasible to extend natural gas service to the approximately 2,300 residents served by propane tanks. In addition, the establishment of a district operations center in Payson to serve the community would also be required for Southwest to provide natural gas distribution service; including vehicles and equipment, such an operations center is estimated to cost approximately $3.5 million.

In accordance with the Commission's preference that growth not negatively impact existing utility customers, Southwest did not analyze any alternatives that would impact its existing Arizona customer base.

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Introduction

Payson, Arizona is located in Gila County between the Sierra Ancha and Mazatzal Mountain Ranges. It has a population of approximately 16,700 and an elevation of 4,850 feet. Residents of Payson have had propane service since 1968. SemStream began serving Payson in 2007 and continues to serve approximately 7,800 customers in the Payson area utilizing its Commission-regulated underground distribution system.

During 2007 and 2008, Payson residents experienced significant increases in propane prices. In a June 6, 2008 Staff Report titled "Arizona Semstream Propane", Staff Economist Robert Gray determined that the Mont Belvieu, Texas (Mont Belvieu) pricing hub provides a reasonable price comparison point to SemStream's wholesale propane costs. Mont Belvieu spot market prices reflected that the average monthly price per gallon of propane rose from $.89 to $1.81 between January 2007 and June 2008, an increase of 103 percent. Citing the high cost of propane at the time, Mr. Gray explored alternatives for utility service to Payson, including the possibility of extending natural gas service to Payson.

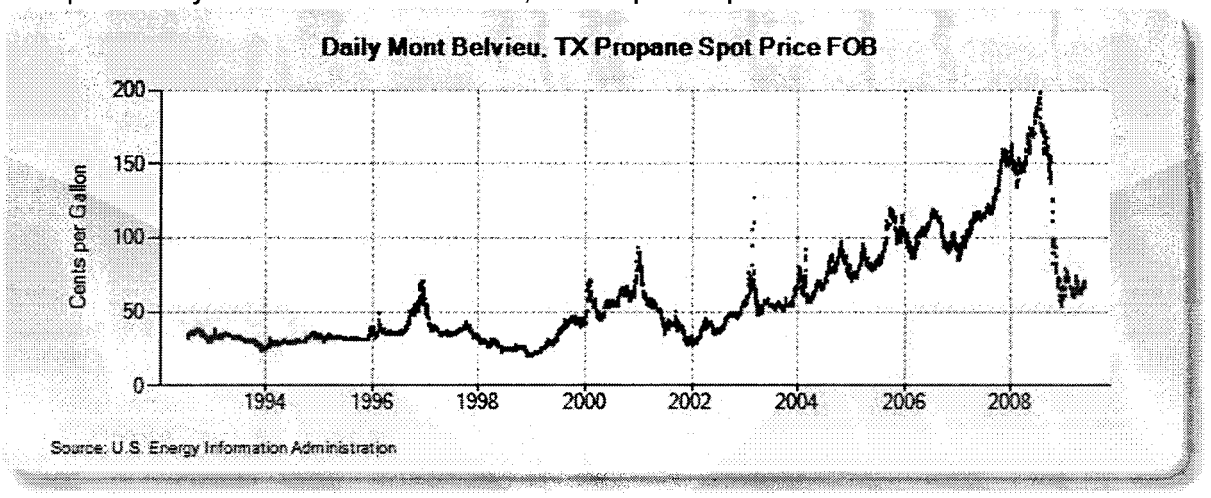
In Southwest's recent rate case, resulting in Decision No. 70665, Commissioner (now Chairman) Mayes referenced Mr. Gray's report and asked Southwest to conduct a cost study to evaluate the potential for extending natural gas service to Payson. Pursuant to this request, Southwest conducted a study to explore the feasibility of extending service to Payson.

Commodity Price Update

Propane and natural gas prices have dropped significantly since June 2008. The average monthly Mont Belvieu price per gallon of propane fell from $1.81 to $.64 between June 2008 and April 2009, a decrease of 65 percent. The average monthly price per dekatherm of natural gas, using the El Paso Natural Gas San Juan Basin price, fell from $10.74 to $2.74 between the same periods, for a decrease of 74 percent.

In June 2008, the average monthly price of a dekatherm equivalent of propane (10.91 gallons) was $9.01 more expensive than that of a dekatherm of natural gas. In April 2009, this difference fell to $4.24. A U.S. Energy Information Administration graph of daily historical Mont Belvieu prices is provided in Graph 1.

Graph 1. Daily Historical Mont. Belvieu, TX Propane Spot Market Prices.



Certificate of Convenience and Necessity

Aside from the economic considerations regarding the potential for extending natural gas service to Payson, Southwest would need to acquire a Certificate of Convenience and Necessity for the Payson area. SemStream currently holds the Certificate of Convenience and Necessity authorizing it to provide gas utility service to Payson. Absent a change in circumstance or some other arrangement, including acquisition of the Payson system from SemStream, any extension of natural gas service to Payson would need to be compatible with the Certificate of Convenience and Necessity currently held by SemStream.

Approach Pipeline

Studied Route

The route Southwest analyzed for extending an approach pipeline to Payson commences approximately 2.5 miles northwest of Mayer, Arizona in Yavapai County. It then follows an existing Arizona Public Service Company (APS) 69 kV electric power line, more or less, in an easterly-southeasterly direction across approximately 40.5 miles of Yavapai County and 22 miles of Gila County to the north end of Payson. Maps and pictures of the proposed approach pipeline route are included in Appendix B. Drawings of the proposed route over topographical maps are included in Appendix C.

Special considerations for selecting this route included:

- Follows an existing APS utility corridor
- Proximity to interstate pipelines with available supply capacity
- Less expensive right-of-way costs due to the remote location of crossed lands
- Avoids protected wilderness areas
- Avoids crossing Indian Reservations/Tribal Lands and the potentially higher right-of-way costs associated with such land
- Minimizes crossing Arizona State Trust Lands (approximately 5.9 miles at the front end of the pipeline) and the potentially higher right-of-way costs associated with such land

Environmental Considerations involving the proposed route include:

- Pipeline would cross the Verde River between mileposts 33 and 34
- Pipeline would parallel and cross Fossil Creek between mileposts 37 and 41, which is undergoing restoration by the U.S. Forest Service, U.S. Fish & Wildlife Service, Arizona Game & Fish Department, Northern Arizona University, and the Bureau of Reclamation following the decommissioning of the APS Irving and Childs power plants
- Pipeline would cross the East Verde River at milepost 59

Distribution Pipe – Type, Size, and Operating Pressure

Southwest performed a hydraulic analysis of 8-inch, 10-inch, and 12-inch X-52 Grade steel pipe in order to determine ideal pipeline diameter and terminal pressure for an approach pipeline to Payson. This analysis was based on a pipeline length of 63 miles, a starting pressure of 600 psig (pounds per square inch gauge) at pipeline take-off, and a projected 20-year future peak winter hourly load of 591 thousand cubic feet per hour (mcfh). As a result, Southwest determined the 8-inch steel pipe would be the most effective option.

The selected 8-inch steel pipeline would be designed to operate at 600 psig and would be tested and rated for a maximum allowable operating pressure (MAOP) of 720 psig. Materials specified would ensure its classification as a high-pressure distribution line due to its ability to operate at a hoop stress under 20 percent of the specified minimum yield strength (SMYS) at the operating pressure of 600 psig. While this pipeline would be

classified as a distribution line, mainline block valves would be installed at the spacing called out for transmission lines due to the pipeline's Class 1 location. Mainline block valves with blowdown assemblies would be installed at takeoff (milepost 0.0), two on either side of the Interstate 17/Dugas interchange (milepost 10.5), and at mileposts 23, 43, and 62.5 (terminus of the pipeline).

Southwest projected a 20-year peak winter hourly load of 591 mcfh for Payson using a per capita peak hourly load of 50 cubic feet per hour (cfh), an existing customer base of 7,823 customers (based on the number of services reported in Semstream's 2007 Annual DOT report for gas distribution systems), and assumed annual growth of 200 customers per year over the next 20 years. This results in an existing peak hourly load of 391 mcfh and a projected future growth load of 200 mcfh by 2029. Southwest considered its service territory of Sierra Vista, Arizona when developing these projections, as Sierra Vista's elevation and coldest heating degree day (HDD) in the last 30 years are similar to those of Payson.

Projected Approach Pipeline Costs

Southwest estimates total costs for extending the proposed 8-inch steel high-pressure approach pipeline to Payson at $61,341,000. A summary of approach pipeline cost estimates for all pipe diameters considered is provided in Table 1. Ten-inch steel pipe is a non-standard size in the industry and, as a result, is more expensive than 12-inch steel pipe.

Table 1. Summary of Approach Pipeline Costs by Pipe Diameter.

Approach Pipeline Costs by Pipe Diameter			
Pipe Size	8-inch	10-inch	12-inch
Installed Cost per Foot	$186.00	$213.00	$208.00
Total Cost	$61,341,000	$70,426,000	$68,641,000

These costs include:

- Supplier tap, meter station, and associated land acquisition
- SWG city gate regulator and check meter station
- Telemetry and SCADA
- Inline inspection: Pig launcher and receiver at take-off and end of line
- SWG large district regulator station (Payson)
- 62.5 miles of steel pipe and labor to construct pipeline and facilities
- Mainline block valves (6) with blowdowns
- Professional engineering design services
- Land survey
- Environmental impact study
- Permits
- Land restoration

Rights-of-Way

Land Ownership

The studied route for the approach pipeline crosses private, state, and federal land. The state lands crossed are managed by two agencies: Arizona Department of Transportation (ADOT) and Arizona State Land Department (ASLD). The federal lands crossed are managed by four agencies: Bureau of Land Management (BLM), Prescott National Forest Service (PNFS), Tonto National Forest Service (TNFS), and Coconino National Forest Service (CNFS). The land ownership interests for this project are shown in Table 2.

Table 2. Land Ownership Interests.

Land Ownership	Miles
BLM	2.6
US Forest Service	50.0
ASLD	5.9
Private	3.1
ADOT	1.0
Total	62.6

Projected Right-of-Way Costs

Southwest estimates 10-year right-of-way costs for the approach pipeline to Payson at $1,558,000. A breakdown of this cost estimate is illustrated in Table 3. Recurring costs will include rents due to BLM, US Forest Service, and ASLD in subsequent 10-year periods.

Table 3. Right-of-Way Cost Estimates.

Right-of-Way Costs				
Land Ownership	One-Time Right-of-Way	Perpetual Right-of-Way	First 10-Year Rent	Total
BLM & US Forest Service	$30,000		$39,000	$69,000
ASLD	6,000		215,000	221,000
Private	48,000	1,220,000		1,268,000
Total	$84,000	$1,220,000	$254,000	$1,558,000

Assumptions and Criteria by Land Ownership Group

BLM and US Forest Service Land: BLM and US Forest Service lands are combined in the cost estimate calculations as application processes, fees, and rent rates are similar for both agencies. Rental rates for 2009 were used with an assumed annual increase of 1.9 percent through 2015. Thereafter, a new rental rate will apply. While rent can be paid annually or in multiple-year terms, a 10-year term was used in order to coincide with ASLD's 10-year term

policy. A right-of-way width of 50 feet was assumed considering the topography of the land and the need to access and patrol the pipeline. A Right-of-Way Agent fee of $5,000 to administer the processing of the application was also included in the cost estimate.

Application and monitoring fees are not included in the cost estimate for BLM and US Forest Service land as these fees would be estimated by the agencies after receipt and review of the applications. The agencies are allowed full cost recovery for processing applications and monitoring the land before, during, and after construction. Therefore, it is likely that a deposit would be required before the applications are processed. All fees and rent payments would be due in full prior to issuance of the final right-of-way documents.

ASLD Land: Rights-of-way acquired from ASLD are usually for a period of 10 years with rent paid in advance. Rates on ASLD lands are based on current market value of the land. When the right-of-way expires, a new application is filed and the land is re-appraised to determine the rent for the next 10-year period. A land value of $65,430 per acre was used in the rent calculation pursuant to discussion with ASLD. A right-of-way width of 25 feet was assumed due to the topography of the land. A Right-of-Way Agent fee of $5,000 to administer the processing of the application was also included in the cost estimate.

Private Land: There are potentially 16 private parcels of land where perpetual right-of-way across for this project would need to be acquired. As a result of researching property values, a cost of $5 per square foot was used to estimate the value of the right-of-way. Southwest assumes that right-of-way would be acquired on all 16 parcels. A right-of-way width of 15 feet was assumed to be sufficient as the pipeline facilities would be located along the exterior boundaries of the project. A Right-of-Way Agent fee of $3,000 per parcel was included in the cost estimate.

Interstate Transportation

Payson is located approximately 63 miles from El Paso's Line 1203 and Transwestern's new Phoenix Lateral. Both of these pipelines provide firm transportation service to the Phoenix market area.

Southwest assumes that interstate transportation service for Payson will be attainable from either the Transwestern or El Paso pipeline without causing any significant impact to the rest of Southwest's customers in Arizona (assuming that a new lateral from an existing interstate pipeline to Payson is not paid for through an interstate transportation agreement). Therefore, assuming Payson is served from El Paso's Line 1203, Southwest estimates the annual interstate capacity cost associated with service to Payson will range between approximately $652,000 and $772,000 over a 10-year period beginning January 1, 2012. These cost estimates are based upon El Paso's current rate case (RP08-426-000).

Distribution System

Review of Existing Distribution System

Southwest performed a limited review of the existing gas distribution system currently serving Payson and surrounding areas. This review was based on SemStream's 2007 Annual DOT report and visual inspections of the service area. Based on Southwest's experience with system acquisitions, Southwest assumes that a pipe replacement program may be warranted. For the purpose of this study, Southwest assumes that approximately 20 percent of the mains and services would require replacement. Depending upon the results of a due diligence study and a distribution integrity management analysis, this replacement activity would likely be planned over a five- to 10-year period. Southwest has not inspected any existing Payson propane distribution piping, however, and potential pipe replacement costs are solely based on Southwest's own historic operational experience.

Pipe Replacements

Southwest assumes the following mains and services would be considered for replacement:

- Main
  - 37 miles of plastic main
- Services
  - 1,565 services (including 535 isolated steel services)

Projected Replacement Costs

The estimated cost of the pipe replacement program is $20,150,000 over the period. A summary of these replacement costs is provided in Table 4.

Table 4. Summary of Projected Distribution System Replacement Costs.

Description	Cost per Foot	Total Footage	Total Cost
Distribution Main	$70.00	195,000	$13,650,000
Plastic Services	50.00	85,000	4,250,000
Steel Services	50.00	45,000	2,250,000
Totals		325,000	$20,150,000

Capacity Upgrades

Southwest assumes that distribution system upgrades would be required, in addition to the integrity management-related replacements mentioned above, to address potential capacity constraints associated with flowing natural gas through the SemStream propane piping network. For the purposes of this study, Southwest estimates that 10 percent of the existing main would need to be replaced at an estimated cost of approximately $7,000,000. These replacements would generally be associated with trunk lines that carry the gas from the district station to the extremities of the system.

Southwest believes that these capacity upgrades would be necessary to support the switch to natural gas due to the difference in chemical properties between the two gases. The

heating value of liquid petroleum gas (propane) is approximately 2,500 British Thermal Units (BTUs) per cubic foot while the heating value of natural gas is approximately 1,000 BTUs per cubic foot. Due to the significant difference in the heating energy per unit volume of propane gas to natural gas (~2.5 times), a propane gas distribution system can utilize smaller diameter pipe than what would be required of a comparable natural gas system. As a result, capacity upgrades would likely be necessary to ensure that Southwest could provide uninterrupted service. These upgrades could include distribution pipe replacements/upgrades, pressure upratings, and the installation of additional high pressure distribution infrastructure to support outlying areas.

Table 5. Summary of Projected Capacity Upgrade Costs.

Description	Cost per Foot	Total Footage	Total Cost
Distribution Main	$70.00	100,000	$7,000,000

The distribution system replacement cost estimates associated with the integrity management replacement program and capacity upgrades assume comparable replacement activity costs in the Phoenix metropolitan area and do not include any potential burdensome costs that could be imposed by the Town of Payson such as excessive impact fees, permitting, and pavement restoration requirements.

Customer Conversions

Conversion Considerations

The following considerations and assumptions are based on Southwest's knowledge and experience converting propane customers to natural gas. The conversion of any liquid propane appliance to natural gas involves not only replacing the orifices (fixed and pilot), but the replacement of appliance regulators and in some cases, burners as well.

While historically most appliances could be converted from one fuel to another, gas appliances manufactured today are generally designed to be used with a dedicated type of fuel as specified by the manufacturer. For this reason, some appliances are unable to be converted and may have to be replaced.

In most cases, interior house piping size does not present a problem when converting to natural gas. There are, however, times when the diameter of interior gas piping is too small to be used with natural gas and will have to be replaced. Any modifications or additions typically require a test and inspection. The cost of bringing interior house piping up to code for use with natural gas can cost from several hundred to several thousand dollars depending on the extent of the work.

The cost of converting propane appliances to natural gas will typically range from $200 to $500 for conversion parts depending on manufacturer specifications and type of appliance. This brings the average price to convert three appliances (furnace, water heater, oven/range) to $600 to $1500, not including labor. In some cases, it would be less costly to the customer to replace the appliance with a natural gas equivalent rather than convert it.

Projected Customer Conversion Costs

Southwest estimates that an experienced technician can convert several homes per day from propane to natural gas, which includes the installation of the meter set assembly. If Southwest provided the labor, the labor cost for converting the approximately 7,800 customers in the Payson area would be between $1,000,000 and $1,500,000. This cost includes lodging and per diem expenses that would be required for a contingent of employees assigned to this activity. Conversion parts and new appliances are not included in this cost estimate as Southwest will assume, for the purpose of this study, that customers would be responsible for those costs.

Operational Transition

Acquisition Considerations

Southwest estimates that acquiring SemStream's current distribution system would be the most feasible option for serving the Payson customer base with natural gas distribution service. According to the Staff report, SemStream purchased the Payson system for approximately $15,000,000 in 2006. For the purposes of this study, Southwest will conservatively assume that it could purchase the Payson system from SemStream for approximately $17,000,000. The actual price for the Payson system could vary based on factors such as economic conditions, depreciation, current book value, and capital investments made to the system since 2006. Any unwillingness on the behalf of SemStream to sell the Payson system at a reasonable price would be a significant obstacle to extending natural gas service to Payson.

Southwest recognizes that SemStream serves approximately 2,300 additional customers through the unregulated portion of its business. These customers typically live in surrounding areas and obtain service through propane storage tanks. Due to the remote location and low population density of these surrounding areas, Southwest assumes that it would not be feasible to extend new underground natural gas infrastructure to the surrounding areas not already connected to SemStream's underground distribution system. Southwest assumes that these customers would continue to require propane tank service from SemStream (or some other propane service company) and that the existing SemStream operations facilities would be required to provide that service.

System Conversion

Southwest recognizes that acquiring SemStream's distribution system and the transition from flowing propane gas to natural gas would pose difficult and potentially disruptive challenges. Southwest would have to segregate the Payson distribution system and complete the conversion process in phases in order to minimize disruptions in service. Propane and natural gas cannot be simultaneously transported in the same pipeline due to the significantly higher heating value of propane per cubic foot relative to natural gas. All propane appliances within each phase would require conversion or replacement before Southwest could provide natural gas service. The conversion of 7,800 customers is estimated to take between 2,000 and 3,000 person-days to complete. With as many as twenty technicians dedicated to this task, it would take between 100 and 150 workdays to convert all customer appliances. Southwest would likely need to serve each converted segment of the system with compressed natural gas (CNG) injection equipment until the conversion process was completed and service could be provided by the new high-pressure approach pipeline. Costs associated with segmenting the existing system and providing temporary CNG service are not quantified in this study. It is important to understand that this particular aspect of the project would require a comprehensive engineering study to determine logistics, required resources, and associated costs.

Operations Center

Southwest assumes that a new operations center similar in size to its Globe facility would be required to service Payson. Southwest's Globe operations center serves a similar size customer base and is remotely located from Division headquarters, much like Payson would be. The employee base required to serve the Payson area is estimated at approximately 20 employees including several construction and maintenance crews, service technicians, administrative support, and supervision.

Land and Building

Southwest estimates it would require three acres of land to accommodate a Payson operations center and that constructing the center would be preferable to leasing due to the unique needs of a utility operations center. Southwest estimates that it could purchase the land for $800,000 and that it could construct the operations center for $1,304,000, which includes furniture, telecommunications equipment, personal computers, and a security system.

Vehicles and Equipment

Southwest estimates vehicle and equipment costs for Payson at $944,000 initially, and at $150,000 per year thereafter. The vehicles required to support Payson operations would include: construction crew trucks, backhoes and trailers, service trucks, and emergency response vehicles. This estimate also includes a variety of power-operated equipment.

Tools and Supplies

Southwest estimates the initial cost of tools and supplies for the Payson district office at $500,000. This cost includes all warehouse stock of pipe and fittings, tools to equip all of the construction, service, and emergency response vehicles, and other operations related tools.

Operational Expenses

Southwest estimates annual operational expenses associated with Payson at approximately $3,250,000. This estimate includes all operations, maintenance, and capital expenditures associated with standard day-to-day operations. This estimate does not include special costs associated with extending service to Payson, such as distribution system replacements or conversion costs, which are estimated in separate sections of this study.

Cost Estimates Summary

Southwest estimates that extending natural gas service to Payson would cost approximately $96,983,400 in the first year and another $48,963,600 over the following nine years for a 10-year cost of $145,947,000. Cost estimates are in 2009 dollars. A cost estimate summary for year one is provided in Table 6. An additional cost estimate summary for years one through 10 is provided in Appendix A.

Table 6. Cost Estimates Summary for First Year.

COST ESTIMATES SUMMARY (FIRST YEAR)	***AMOUNT***
Purchase of SemStream Distribution System	$17,000,000
Rights-of-Way	1,329,400
High-Pressure Pipeline	61,341,000
Capacity Upgrades	7,000,000
Distribution System Replacements (Year 1/10)	2,015,000
Customer Conversions (Labor)	1,500,000
Operations Center Land and Building	2,104,000
Vehicles and Equipment	944,000
Tools and Supplies	500,000
Operational Expenses	3,250,000
Total	96,983,400

These cost estimates <u>do not</u> include:

- Any unknown obstacles that could alter the identified route of the approach pipeline
- Extending natural gas infrastructure to areas surrounding Payson that are not currently connected to SemStream's underground distribution system
- Customer expenses associated with the conversion of appliances (non-labor) or house piping modifications
- Costs associated with the system conversion from propane gas to natural gas (segmentation of the existing system, providing temporary supplies via CNG, etc.)
- Application and monitoring fees associated with BLM and US Forest Service Lands

Cost Recovery Analysis/Rate Impacts

To analyze the customer impact of extending service to Payson, an incremental annual revenue requirement was developed using the estimated capital costs and expenses required to construct and operate a natural gas transportation system to deliver gas to the existing Payson distribution system. For the purpose of this incremental cost analysis, it is assumed that the existing Payson rates are sufficient to fully recover the cost of providing the current level of distribution service; however, Southwest anticipates certain incremental investments would be necessary to serve Payson and these costs are included in the incremental annual revenue requirement. The analysis also assumes rates required to recover the incremental revenue requirement were implemented immediately upon the initiation of service, and therefore, Southwest has not included any costs related to regulatory processing and approval. The estimated first year incremental revenue requirement is $13,707,920, the details of which are shown in Table 7.

Table 7. Incremental Annual Revenue Requirement.

Capital	
Approach Main and Tap	61,341,000
Right-of-Way	1,304,000
Distribution System Improvements[1]	4,119,000
Propane/NG Conversion[2]	1,500,000
Distribution System Capacity Upgrades[3]	7,000,000
Total Capitalized Cost	$ 75,264,000
Cost of Service Factor[4]	18%
Return, Depreciation and Taxes	$ 13,547,520
Expense	
Operations and Maintenance[5]	$ 135,000
Right-of-way[6]	25,400
Incremental Revenue Requirement	$ 13,707,920

According to Semstream's most recent annual statistical summary filed with the Commission in August 2008, SemStream provided distribution service to approximately 7,800 customers in Payson and delivered approximately 3,640,000 therms annually. The Commission has addressed issues associated with the cost of customer growth and has expressed a preference that the addition of new customers be accomplished in an economical manner that does not negatively impact existing utility customers. Southwest's

[1] $2,015,000 Distribution System Replacements + $2,104,000 District Office
[2] Capitalized labor necessary to perform conversion of homes and appliances
[3] Distribution system upgrades related to conversion
[4] Cost of service factor based on the authorized rate of return, depreciation rates and taxes authorized in Decision No. 70665
[5] Estimated at one percent of total capital
[6] 10-year amortization of $254,000 in prepaid rent

facilities extension policy and tariff is designed to allow for growth only when it can be accomplished economically.

In Southwest's experience, when given the option to change service from propane to natural gas, not all customers will convert. For the purpose of analyzing customer impacts, Southwest has modeled a customer base conversion rate from a high of 80 percent to a low of 30 percent. Customers' decisions are based on various factors, including fuel preference, price differential, and cost to convert or replace appliances. If 80 percent of propane customers were to convert to natural gas, the incremental revenue requirement would be $2,197 per customer per year or $4.71 per therm. However, if only 30 percent of the existing propane customers were to convert to natural gas, the incremental revenue requirement would rise to $5,858 per customer per year or $12.55 per therm. In addition, customers would pay the local distribution and the gas cost rate for each therm consumed. Table 8 includes incremental annual revenue requirement estimates for various customer conversion levels.

Table 8. Incremental Annual Revenue Requirement Estimates for Various Customer Conversion Levels.

Incremental Annual Revenue Requirement		
Proportion of Customers Converted to Natural Gas	Incremental Revenue Requirement per Customer*	Incremental Revenue Requirement per Therm*
80%	$2,197	$4.71
70%	$2,511	$5.38
60%	$2,929	$6.28
50%	$3,515	$7.53
40%	$4,394	$9.41
30%	$5,858	$12.55

* This represents an average of all customer classes and assumes that system-wide consumption would correlate directly with the proportion of customers converted to natural gas.

Impact on Monthly Bill

In its annual statistical summary, Semstream reported they serve 7,200 residential customers who use approximately 2,540,000 therms annually, or approximately 29 therms per month per customer. If the cost of extending gas service to Payson were recovered from customers in volumetric rates, assuming a customer conversion rate of 80 percent to 30 percent and natural gas/propane price parity, a residential customer who uses the class average of 29 therms per month would experience an increase in their monthly bill ranging from $137 to $364. The bill impact could be smaller or greater, depending on any differential between propane and natural gas prices. Table 9 estimates the impact on monthly bills for various customer conversion levels.

Table 9. Impact on Monthly Residential Bills for Various Customer Conversion Levels.

Estimated Impact on Monthly Residential Bill for Various Conversion Levels		
Proportion of Customers Converted to Natural Gas	Average Current Bill*	Average Future Natural Gas Bill*
80%	$70	$207
70%	$70	$226
60%	$70	$252
50%	$70	$288
40%	$70	$343
30%	$70	$434

* This represents an average of all customer classes and assumes that system-wide consumption would correlate directly with the proportion of customers converted to natural gas.

Another consideration is how future distribution rates will be affected by customer conversion levels. Customers who choose not to convert would make no contribution to the fixed costs associated with operating the regulated natural gas distribution system. The existing SemStream rates were established based on its current customer level. With fewer active customers, the existing SemStream rates would not sufficiently cover the fixed costs of providing service. This would introduce additional upward pressure on local distribution rates as the fixed costs of service were spread among fewer remaining customers.

Conclusion

Southwest estimates the costs associated with extending natural gas service to Payson at $97.0 million in the initial year and another $49.0 million over the following nine years for a 10-year cost estimate of $146.0 million. Assuming the cost of extending service to Payson would be borne solely by the existing underground system customers who convert to natural gas, the incremental revenue requirement would increase the cost of delivery component from $1.19 per therm to between $4.71 and $12.55 per therm depending on the proportion of customers converted. This would represent an increase in the monthly bill of a residential customer who uses a class average of 29 therms per month from $70 to between $207 and $434.

Based on the rate and customer bill impacts associated with this project, Southwest concludes that it would not be economically feasible to extend natural gas service to Payson nor provide a desirable option for potential customers.

Review of Potential Obstacles

Aside from the prohibitive costs outlined in this study, several other obstacles exist that could potentially interfere with Southwest's ability to extend natural gas service to Payson. A review of these obstacles includes:

- Acquisition of SemStream's Certificate of Convenience and Necessity
- Unwillingness of SemStream to sell the Payson system at all or at a reasonable price
- Environmental impact of extending 62.5 miles of steel pipeline through mostly undisturbed lands
- Public objections to the construction of the approach pipeline
- Significant out-of-pocket costs for Payson customers related to conversion parts and new natural gas appliances
- Customers would pay a significantly higher price for natural gas distribution service compared to propane service
- Possible lack of conversion interest by Payson customers
- Exclusion of approximately 2,300 SemStream propane tank customers living in surrounding areas due to the low population density of these areas and high costs associated with extending distribution service to these areas

Appendix A

Cost Estimate Details

(In 2009 Dollars)

Payson Feasibility Study - Summary of Total Estimated Costs

Cost Description	Fixed Capital Expenses (Year 1)	Fixed Capital Expenses (Years 2-10)	On-Going Annual Operations Expenses		
			Deferred	O&M	Capital
Purchase of SemStream Distribution System	17,000,000				
Rights of Way	1,304,000			25,400	
Approach High-Pressure Pipeline	61,341,000				
Capacity Upgrades	7,000,000				
Customer Conversions (Labor)	1,500,000				
Distribution System Replacements	2,015,000	18,135,000			
District Office Land and Building	2,104,000				
Vehicles and Equipment	944,000				150,000
Tools and Supplies	500,000				
Operational Expenses			450,000	1,800,000	1,000,000
Totals	$93,708,000	$18,135,000	$450,000	$1,825,400	$1,150,000

First Year Total $96,983,400

First 10-Year Total $145,947,000

Payson Feasibility Study - Approach Pipeline

Estimated Costs by Pipeline Diameter

8-Inch Pipeline	Cost
8-Inch Pipe & Material + Loadings + Overheads per Mile	$167,636
Estimated Contractor Bid Cost per Mile	645,082
Estimated Engineering Cost per Mile	130,000
Construction Inspection 26 Weeks @ $2,448.60/Week (Six 10 Hour Days)	64,000
Estimated Subtotal Cost per Mile	942,718
Total Cost (62.5 Miles)	58,910,000
Fixed Base Cost	2,431,000
Total Cost	**$61,341,000**
10-Inch Pipeline	**Cost**
10-Inch Pipe & Material + Loadings + Overheads per Mile	$312,999
Estimated Contractor Bid Cost per Mile	645,082
Estimated Engineering Cost per Mile	130,000
Construction Inspection 26 Weeks @ $2,488.60/Week (Six 10 Hour Days)	64,000
Estimated Subtotal Cost per Mile	1,088,081
Total Cost (62.5 Miles)	67,995,000
Fixed Base Cost	2,431,000
Total Cost	**$70,426,000**
12-Inch Pipeline	**Cost**
12-Inch Pipe & Material + Loadings + Overheads per Mile	$284,439
Estimated Contractor Bid Cost per Mile	645,082
Estimated Engineering Cost per Mile	130,000
Construction Inspection 26 Weeks @ $2,488.60/Week (Six 10 Hour Days)	64,000
Estimated Subtotal Cost per Mile	1,059,521
Total Cost (62.5 Miles)	66,210,000
Fixed Base Cost	2,431,000
Total Cost	**$68,641,000**

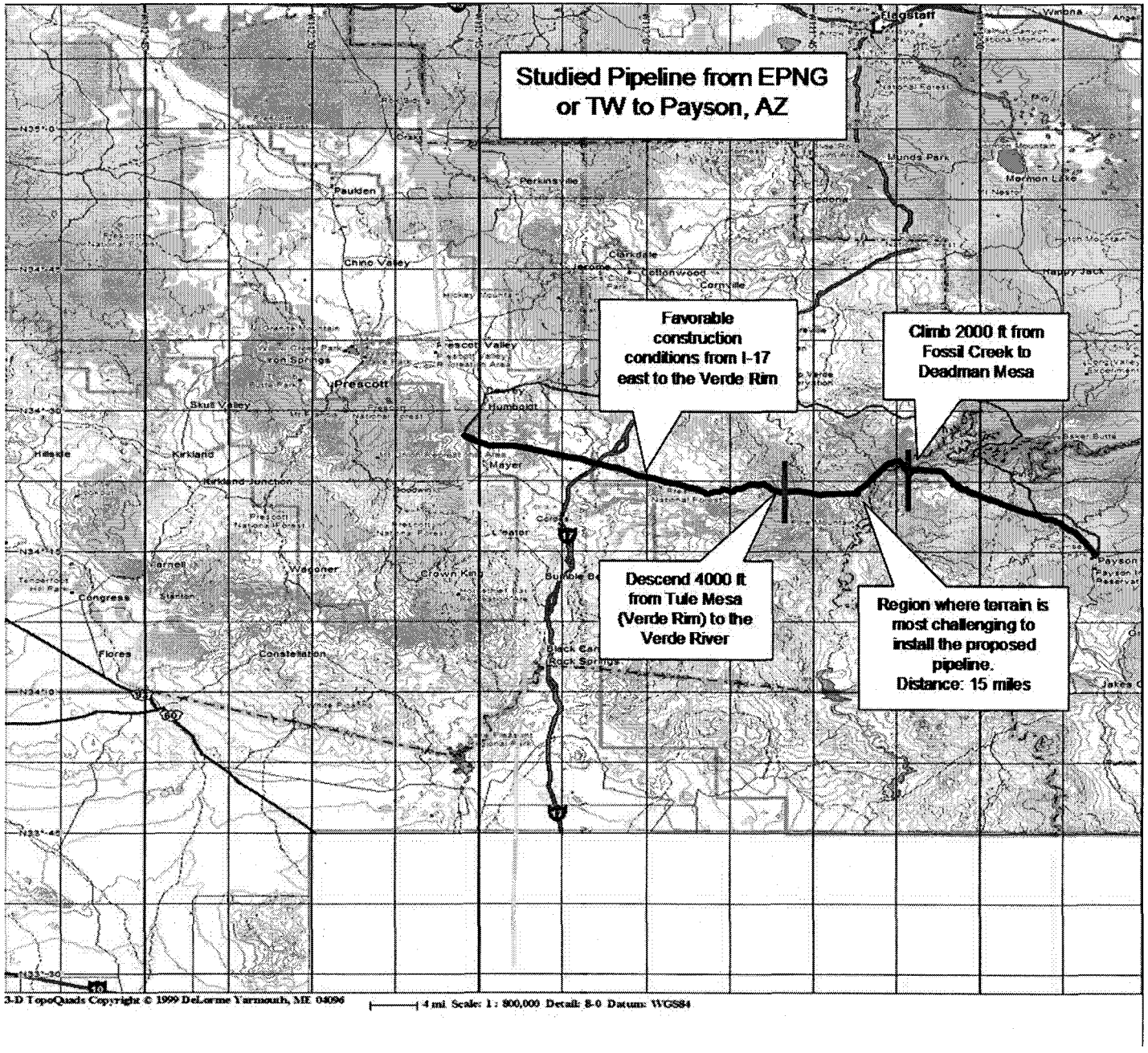
Payson Feasibility Study - Approach Pipeline Estimated Engineering & Administrative Cost per Mile	
Description	**Cost**
Engineering - SWG	$1,000
Engineering - Outsource Design	16,000
Survey - Design	2,500
Engineering Drawings - AutoCAD Plan & Profile	5,000
Environmental Impact Survey - Plan of Development	2,500
Biological Study	1,000
Cultural Survey and Monitoring	1,000
Easement	
Permits - Federal, State and County, SWPPP	1,000
SWPPP Monitoring	1,000
Permits - National Forest & State Land Remediation	
Land Remediation	12,000
Survey - Clearing & Grading	3,000
Survey - Construction	1,000
Survey - Welds & Asbuilt	1,000
X-Ray Welds	30,000
Administrative Overhead	35,000
AFUDC	8,000
Construction Overhead	9,000
Subtotal	**$130,000**

Payson Feasibility Study - Approach Pipeline Estimated Fixed Property Base Costs		
Mile Post Number	**Description**	**Cost**
0.0	Initial Supplier Tap Facility Cost	$500,000
0.0	City Gate Meter & Regulation Station	542,000
0.0	Valve - Mainline Block w/ Blowdown	40,000
0.0	PIG Launcher	25,000
0.0	Enclosure - Slump Block	25,000
0.0	Odorizer	35,000
10.5	Bore I-17 Crossing - Dugas Interchange (1,000 ft @ $400/ft)	400,000
10.5	ADOT I-17 Freeway R/W Isolation Valves with Blowdowns (Below Ground)	20,000
22.0	Valve - Mainline Block w/ Blowdown & Enclosure (Above Ground)	50,000
33.5	Verde River Crossing	300,000
42.0	Valve - Mainline Block w/ Blowdown & Enclosure (Above Ground)	50,000
59.0	East Verde River Crossing	300,000
62.5	Town Station - Dist. Regulator	51,000
62.5	Valve - Mainline Block w/ Blowdown	40,000
62.5	PIG Receiver	28,000
62.0	Enclosure - Slump Block	25,000
	Subtotal	**$2,431,000**

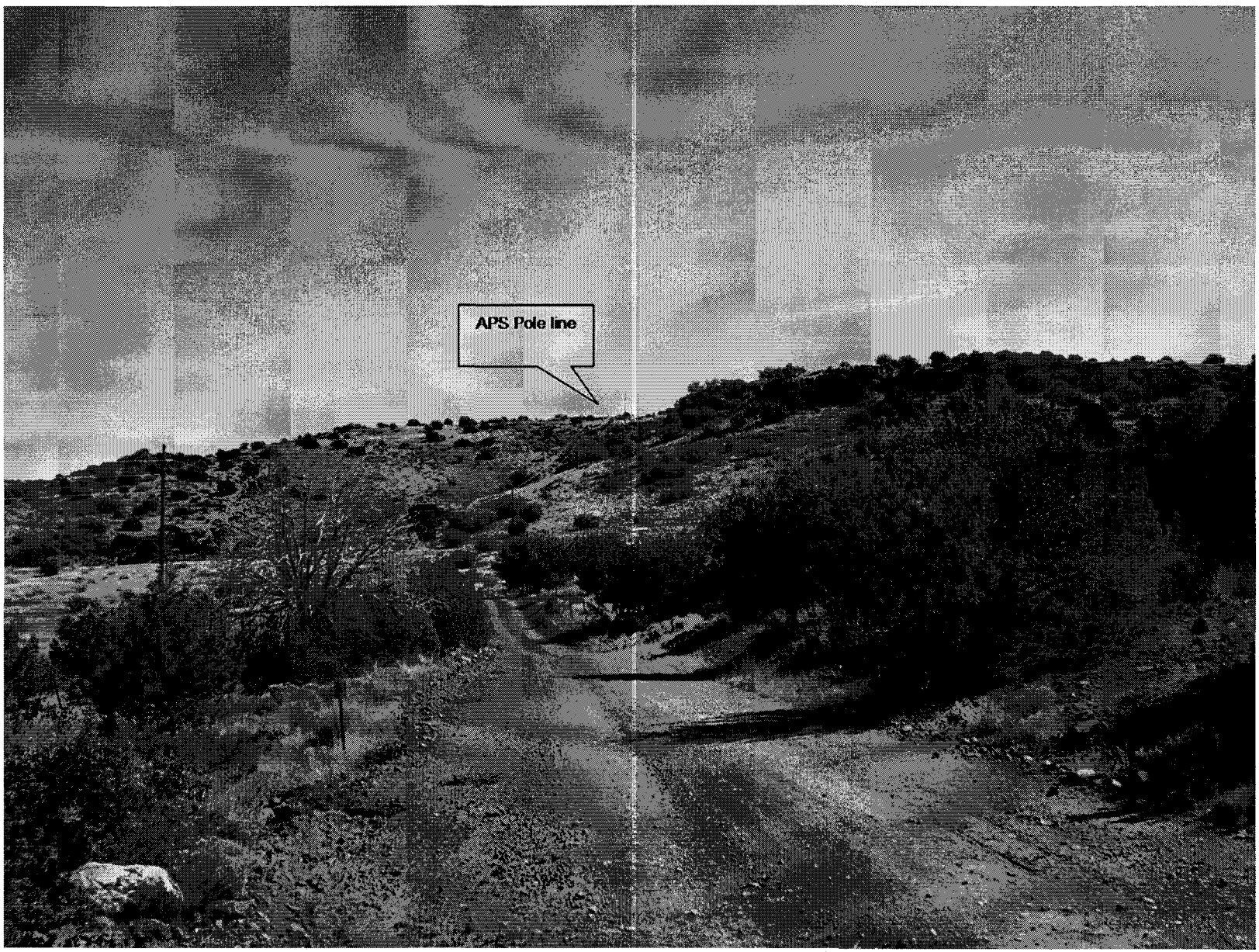
Payson Feasibility Study - Operations Center Estimated Land and Building Costs	
Description	**Cost**
Architectural	$50,000
Engineering	20,000
Civil	30,000
Permitting	25,000
Surveying	10,000
Layout	1,500
Water Mains	60,000
Sewer	50,000
Dry Utilities	80,000
Grading/Paving	100,000
Curbs, Gutters, Sidewalk	50,000
Site Utilities	45,000
Stripping	2,000
Fencing (Chain Link)	25,000
Landscaping	10,000
Concrete	88,000
Masonry	15,000
Structural Steel	60,000
Rough Carpentry	5,000
Casework	8,000
Waterproofing	2,000
Insulation	5,000
Roofing	30,000
Skylights	3,000
Hollow Metal Doors	8,000
Overhead Doors	3,000
Aluminum Framed Storefronts	9,500
Framing, Drywall, Paint	35,000
CeramicTile	4,000
Carpet and VCT	9,000
Signs	1,500
Partitions	2,500
Toilet Accessories	1,000
HVAC	100,000
Plumbing	25,000
Fire Suppression	15,000
Electrical	120,000
Security Camera system	20,000
Card access system	18,000
GC's+OH	55,000
Fee	25,000
Furniture (Installed)	35,000
Misc. Furnishings	3,000
Telecommunication/ PC support	40,000
Land (Purchase of 3 Acres)	800,000
Total Cost	**$2,104,000**

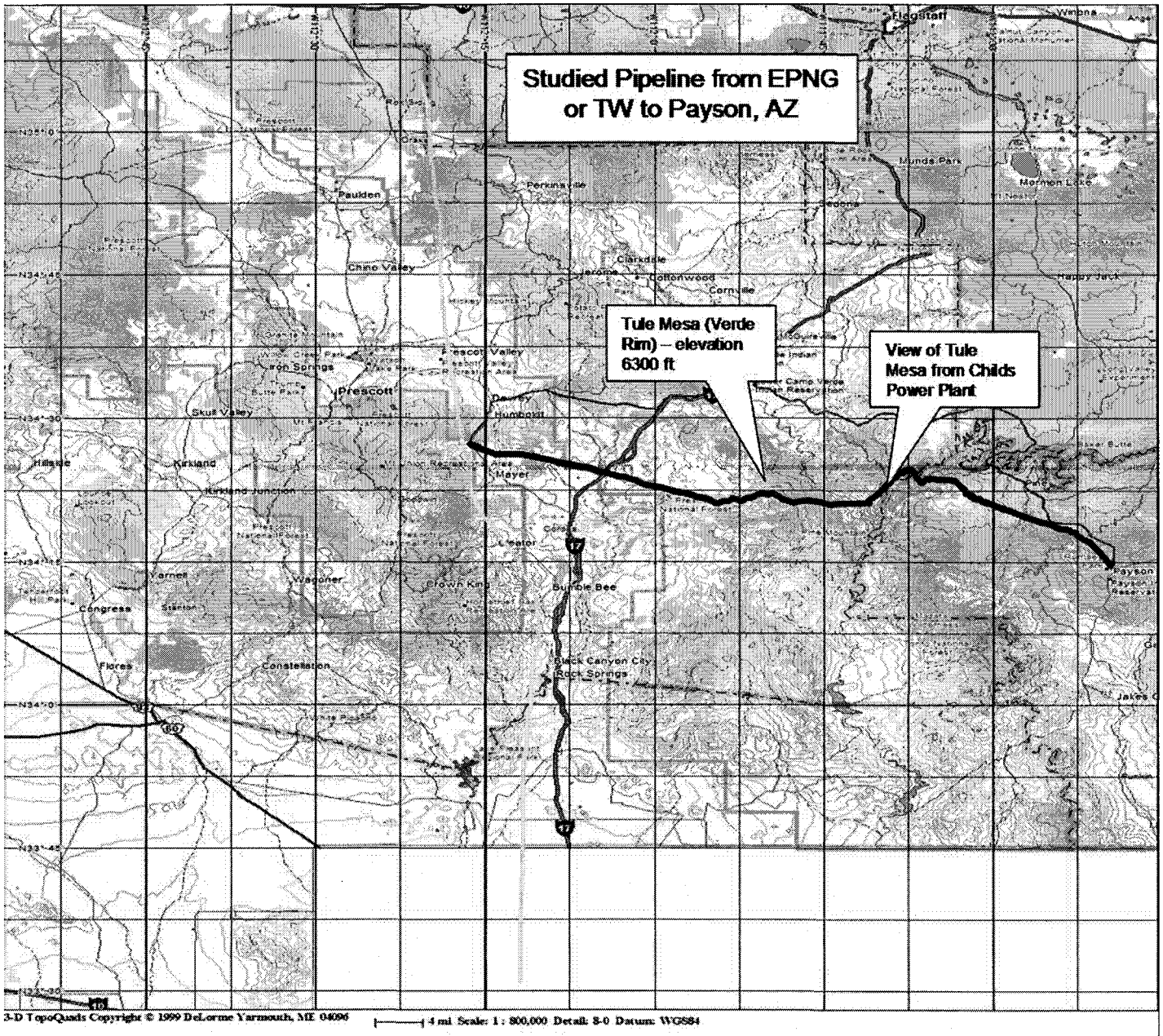
Appendix B

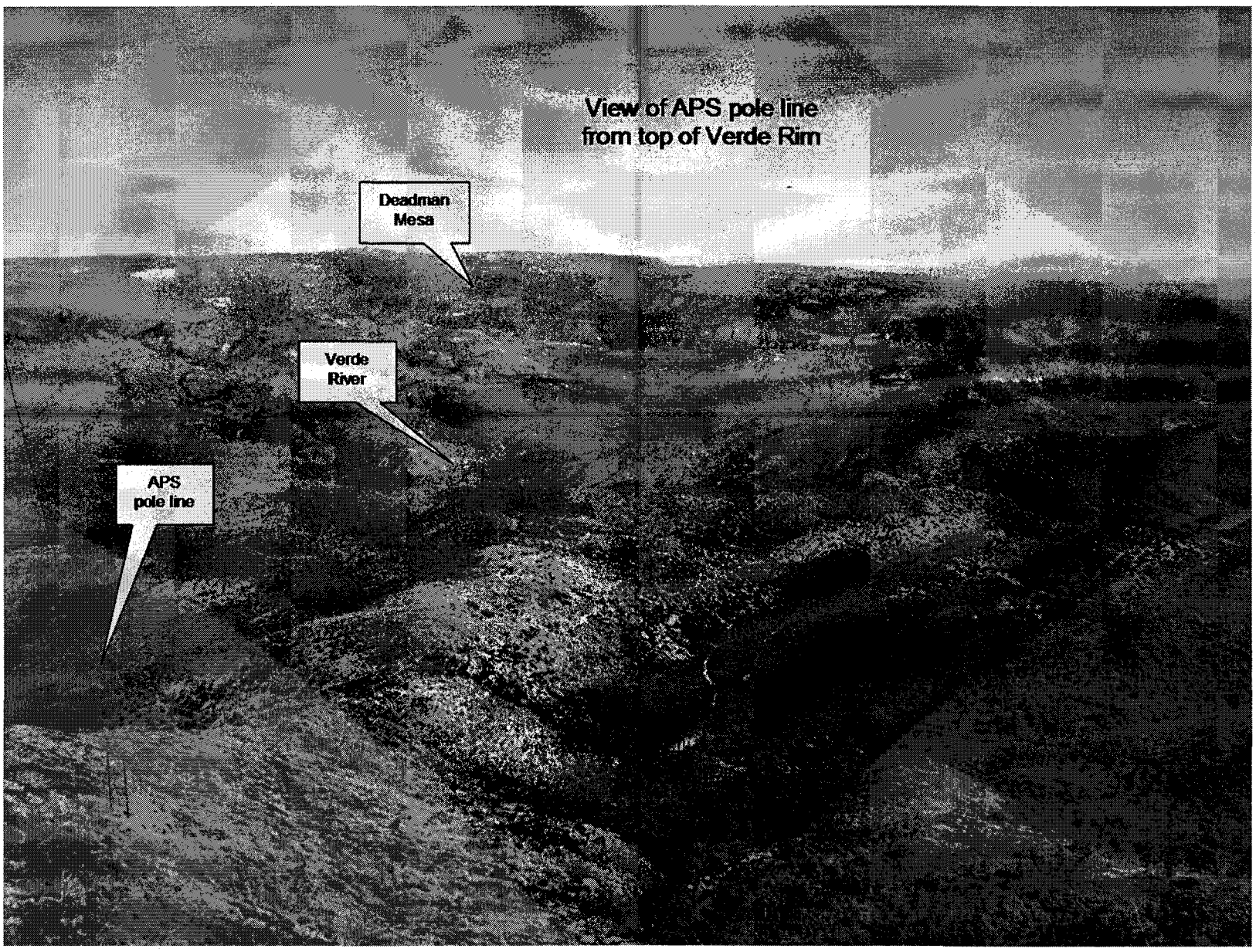
Pictures and Maps of Approach Pipeline Route

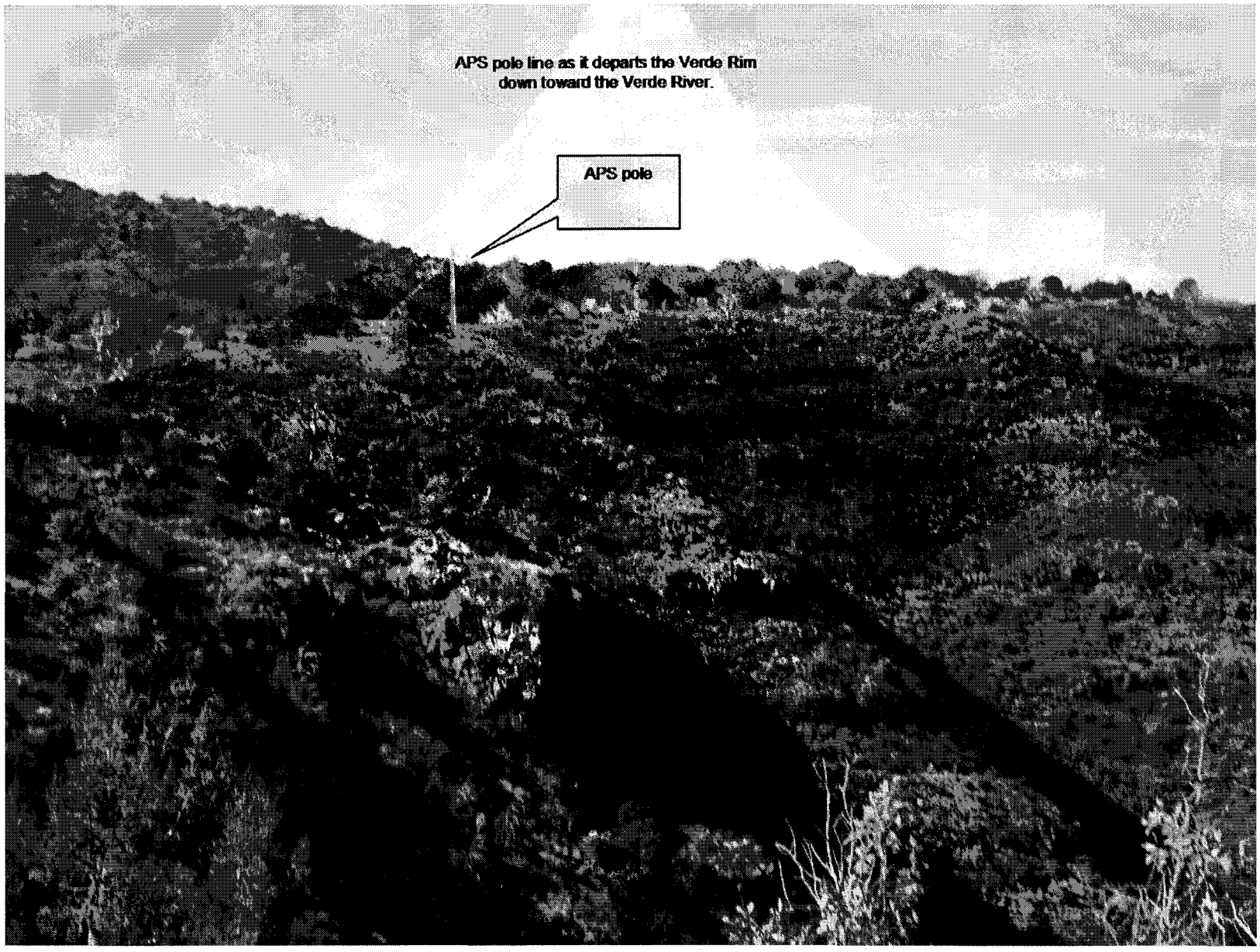

Studied Pipeline from EPNG or TW to Payson, AZ
Favorable construction conditions from I-17 east to the Verde Rim
Climb 2000 ft from Fossil Creek to Deadman Mesa
Descend 4000 ft from Tule Mesa (Verde Rim) to the Verde River
Region where terrain is most challenging to install the proposed pipeline. Distance: 15 miles
Flagstaff
Prescott
Paulden
Chino Valley
Cottonwood
Clarkdale
Jerome
Mayer
Humboldt
Kirkland
Skull Valley
Congress
Wagoner
Crown King
Constellation
Flores
Payson
Mormon Lake
Lunds Park
Happy Jack
Perkinsville
Prescott Valley
Kirkland Junction
Rock Springs
Black Canyon
Lonesome
Varnes
Hillside
Tonto National Forest
Prescott National Forest
Coconino National Forest
Coconino National Forest
Tonto National Forest
Tonto National Forest
Prescott National Forest
Coconino National Forest
Coconino National Forest
Tonto National Forest
Tonto National Forest
Tonto

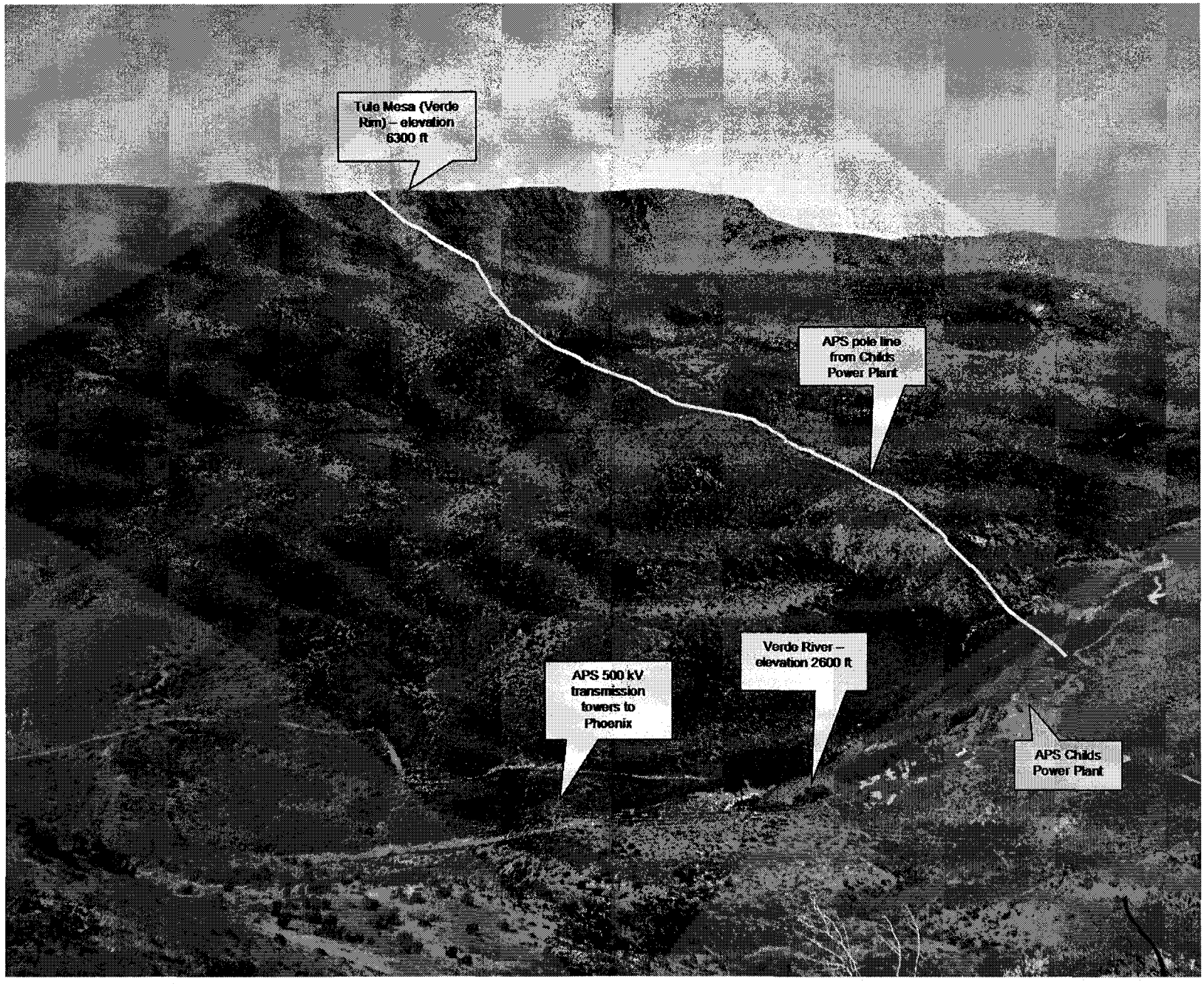
View looking west at the /I-17 Dugas Rd Interchange
Pole line crosses I-17 and continues west
I-17 Fwy
APS Pole line


APS Pole line

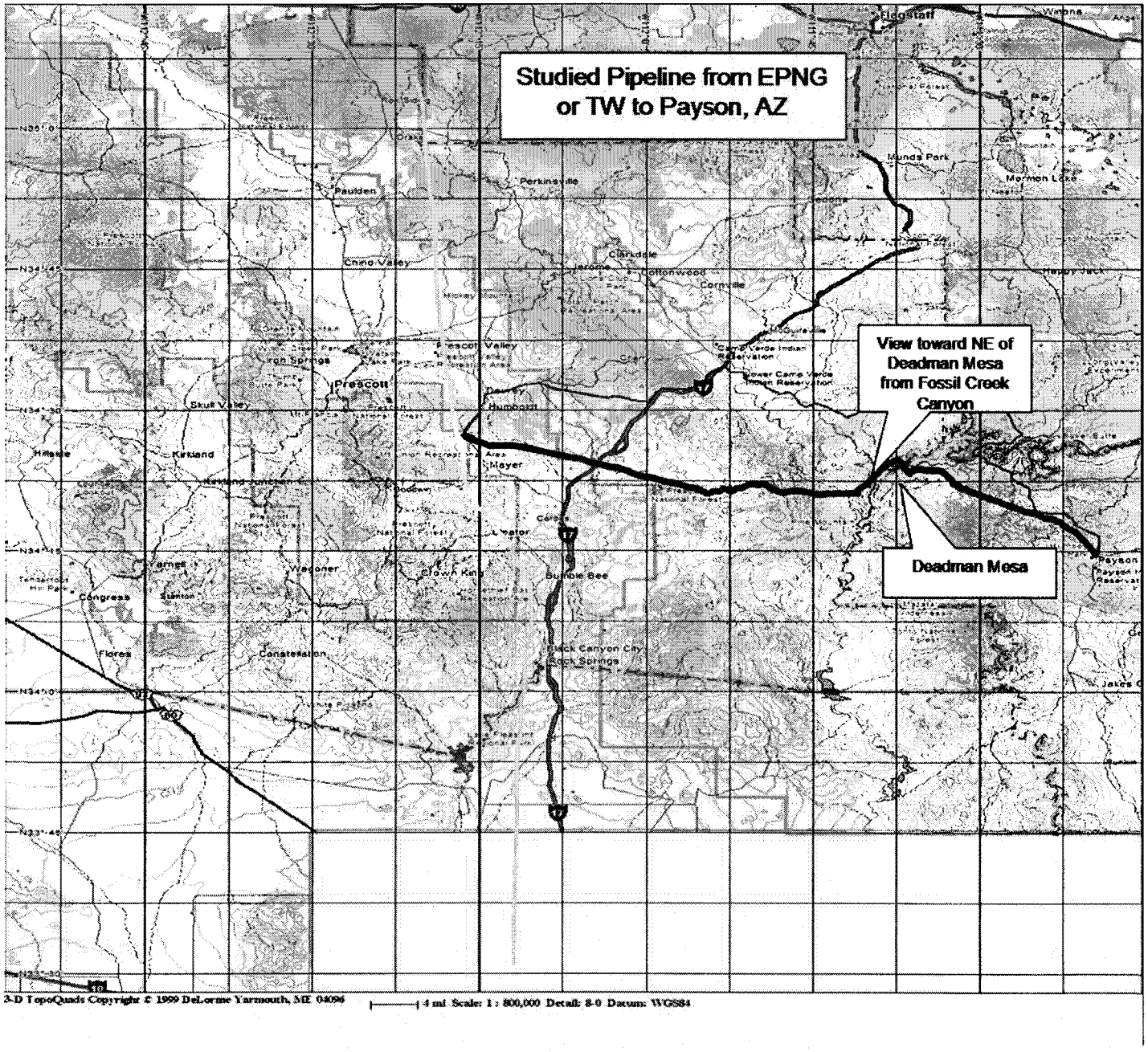

Studied Pipeline from EPNG or TW to Payson, AZ
Tule Mesa (Verde Rim) – elevation 6300 ft
View of Tule Mesa from Childs Power Plant
Flagstaff
Munds Park
Mormon Lake
Paulden
Perkinsville
Chino Valley
Clarkdale
Jerome
Cottonwood
Cornville
Prescott Valley
Prescott
Iron Springs
Skull Valley
Dewey
Humboldt
Hillside
Kirkland
Kirkland Junction
Mayer
Cordes
Cleator
Bumble Bee
Crown King
Wagoner
Yarnell
Congress
Flores
Constellation
Black Canyon City
Rock Springs
Payson
Jakes
3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096
4 mi Scale: 1 : 800,000 Detail: 8-0 Datum: WGS84

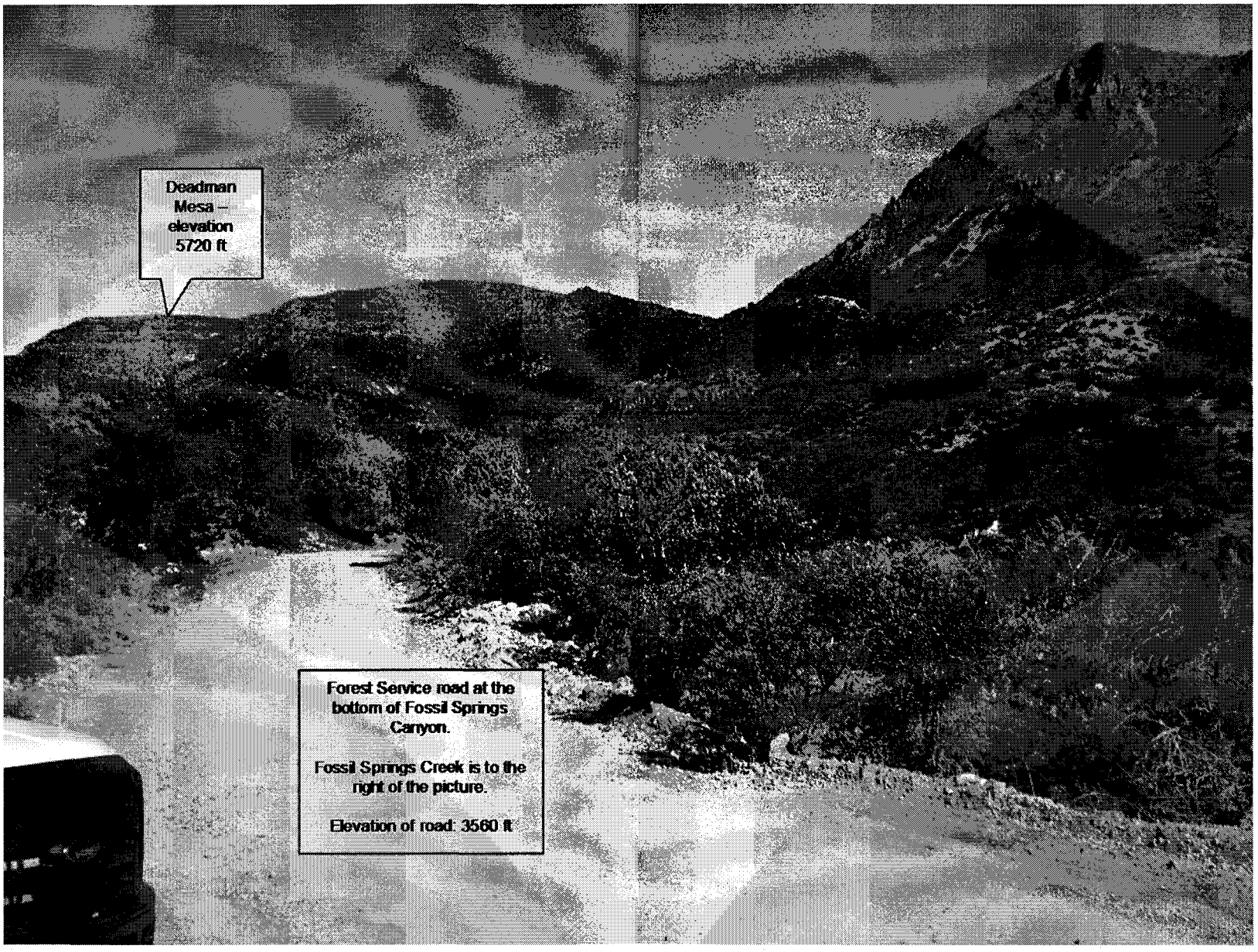

View of APS pole line
from top of Verde Rim
Deadman
Mesa
Verde
River
APS
pole line

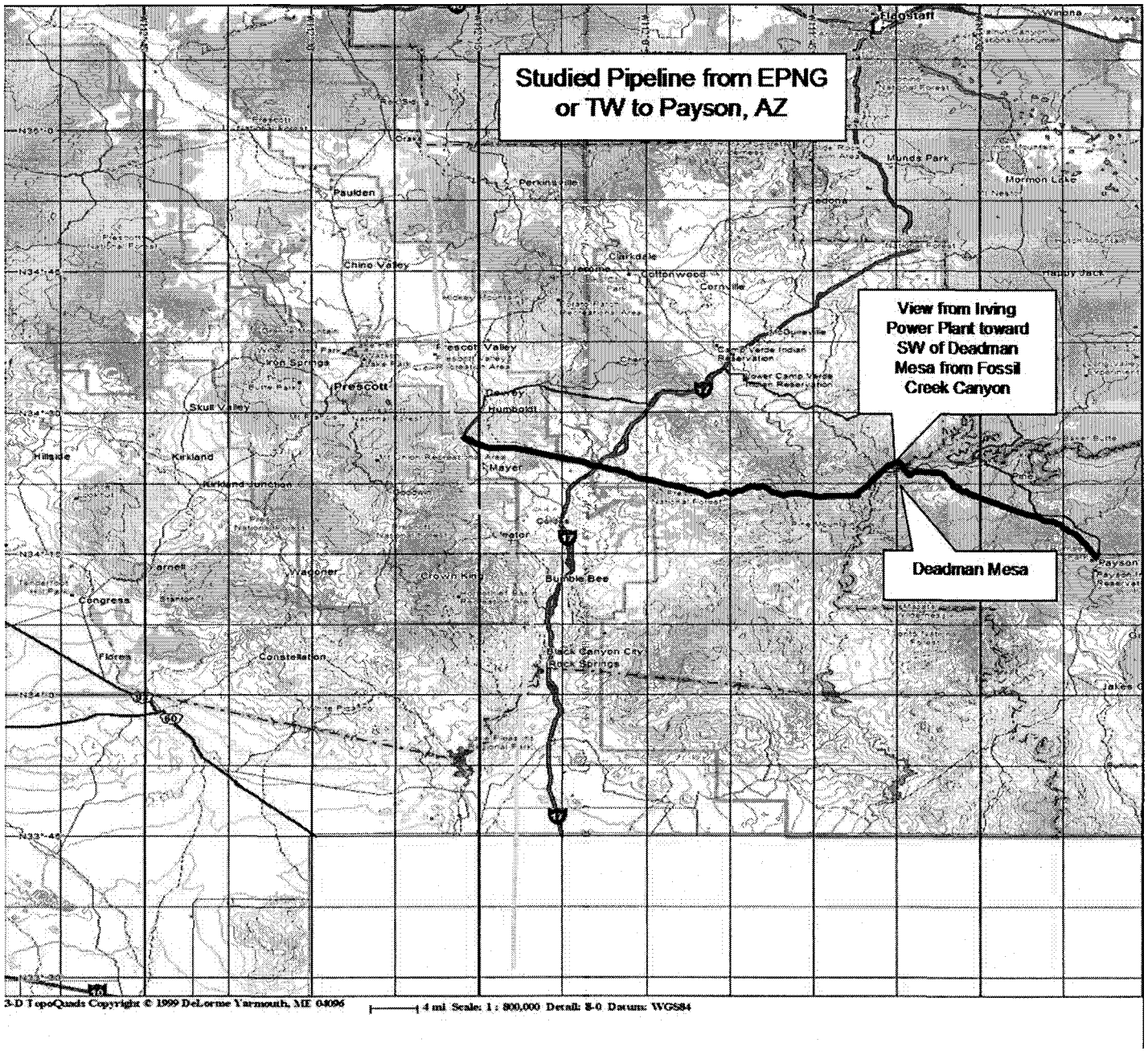

APS pole line as it departs the Verde Rim
down toward the Verde River.
APS pole

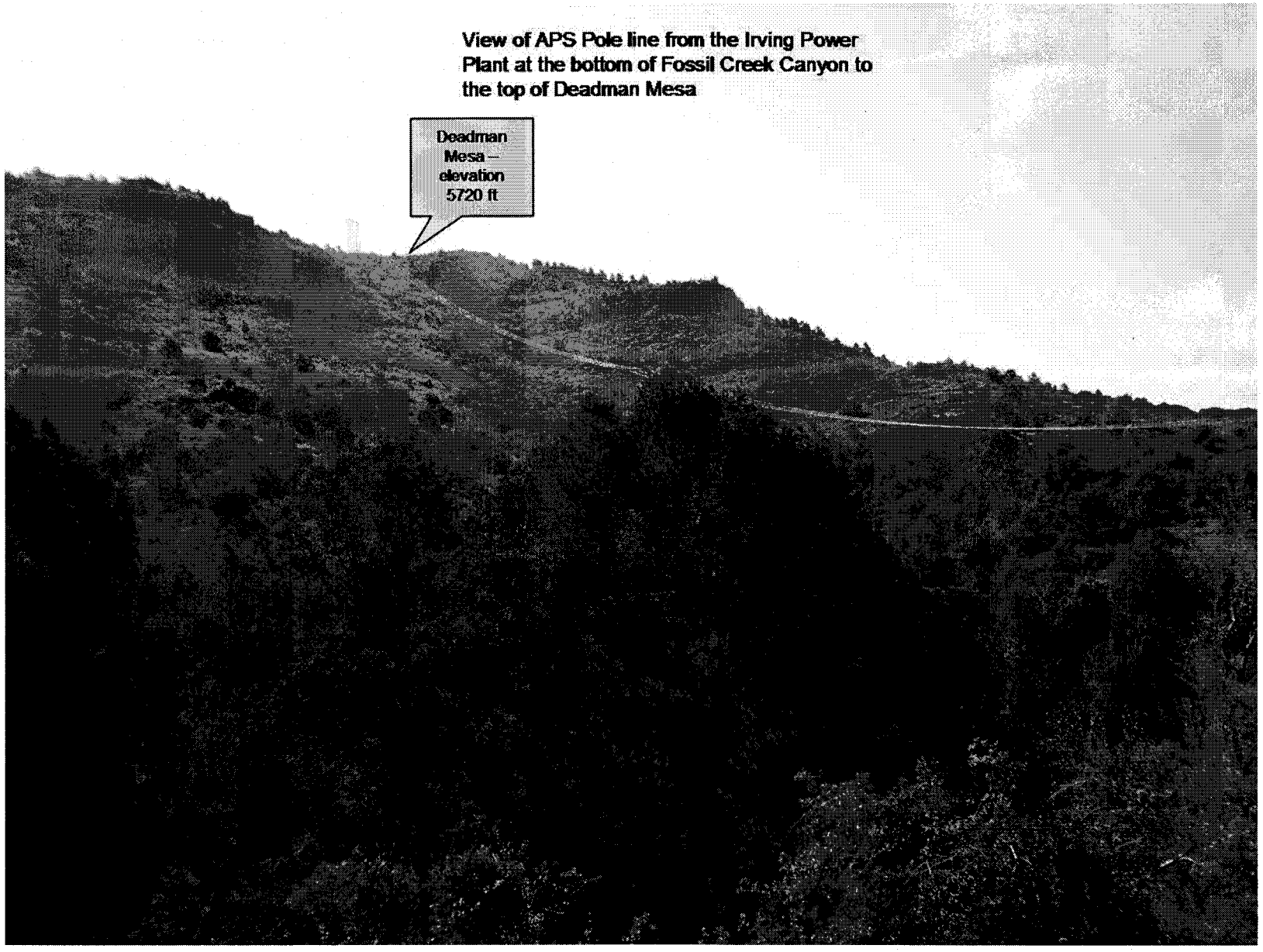

Tule Mesa (Verde Rim) – elevation 6300 ft
APS pole line from Childs Power Plant
Verde River – elevation 2600 ft
APS 500 kV transmission towers to Phoenix
APS Childs Power Plant

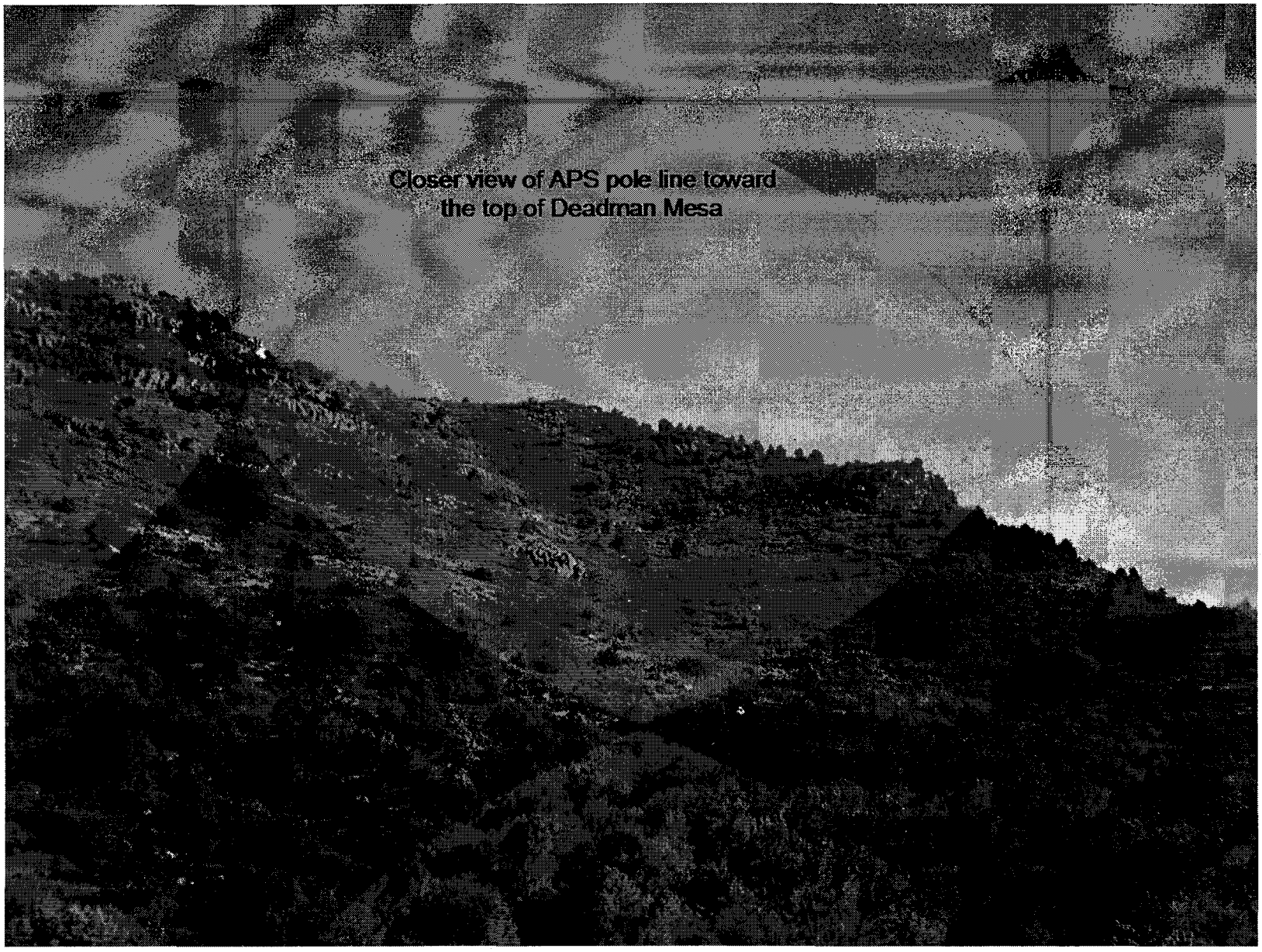
APS 500 kV
line coming
up from
Verde River

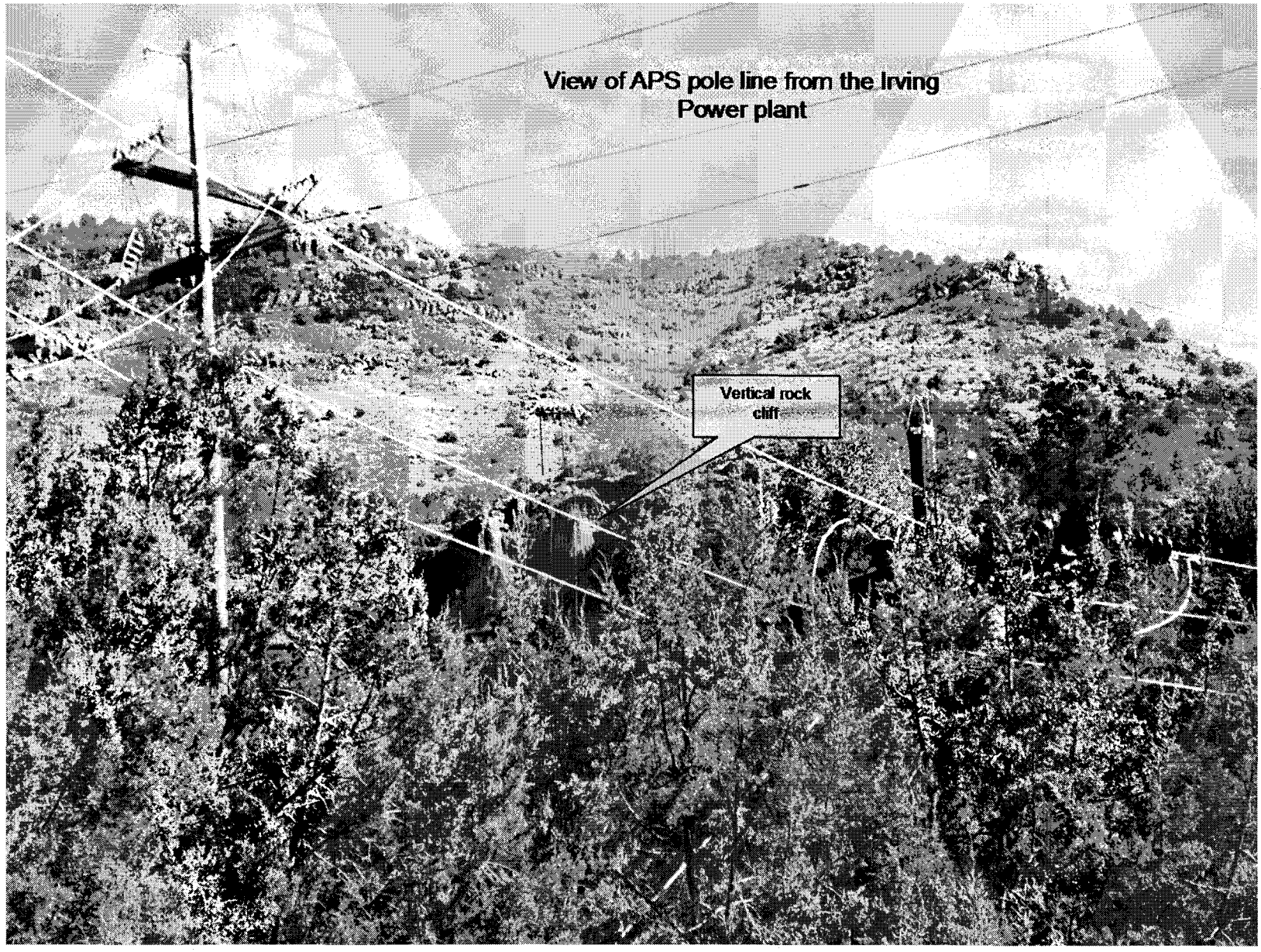

Studied Pipeline from EPNG or TW to Payson, AZ
View toward NE of Deadman Mesa from Fossil Creek Canyon
Deadman Mesa
Flagstaff
Winona
Munds Park
Mormon Lake
Perkinsville
Paulden
Chino Valley
Clarkdale
Jerome
Cottonwood
Cornville
Camp Verde Indian Reservation
Lower Camp Verde Indian Reservation
Prescott Valley
Prescott
Iron Springs
Skull Valley
Humboldt
Kirkland
Hillside
Mayer
Cordes
Lakeview
Crown King
Bumble Bee
Congress
Wagoner
Sunset
Flores
Constellation
Black Canyon City
Rock Springs
Payson
Happy Jack
3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096
4 mi Scale: 1 : 800,000 Detail: 8-0 Datum: WGS84


Deadman Mesa – elevation 5720 ft
Forest Service road at the bottom of Fossil Springs Canyon.
Fossil Springs Creek is to the right of the picture.
Elevation of road: 3560 ft

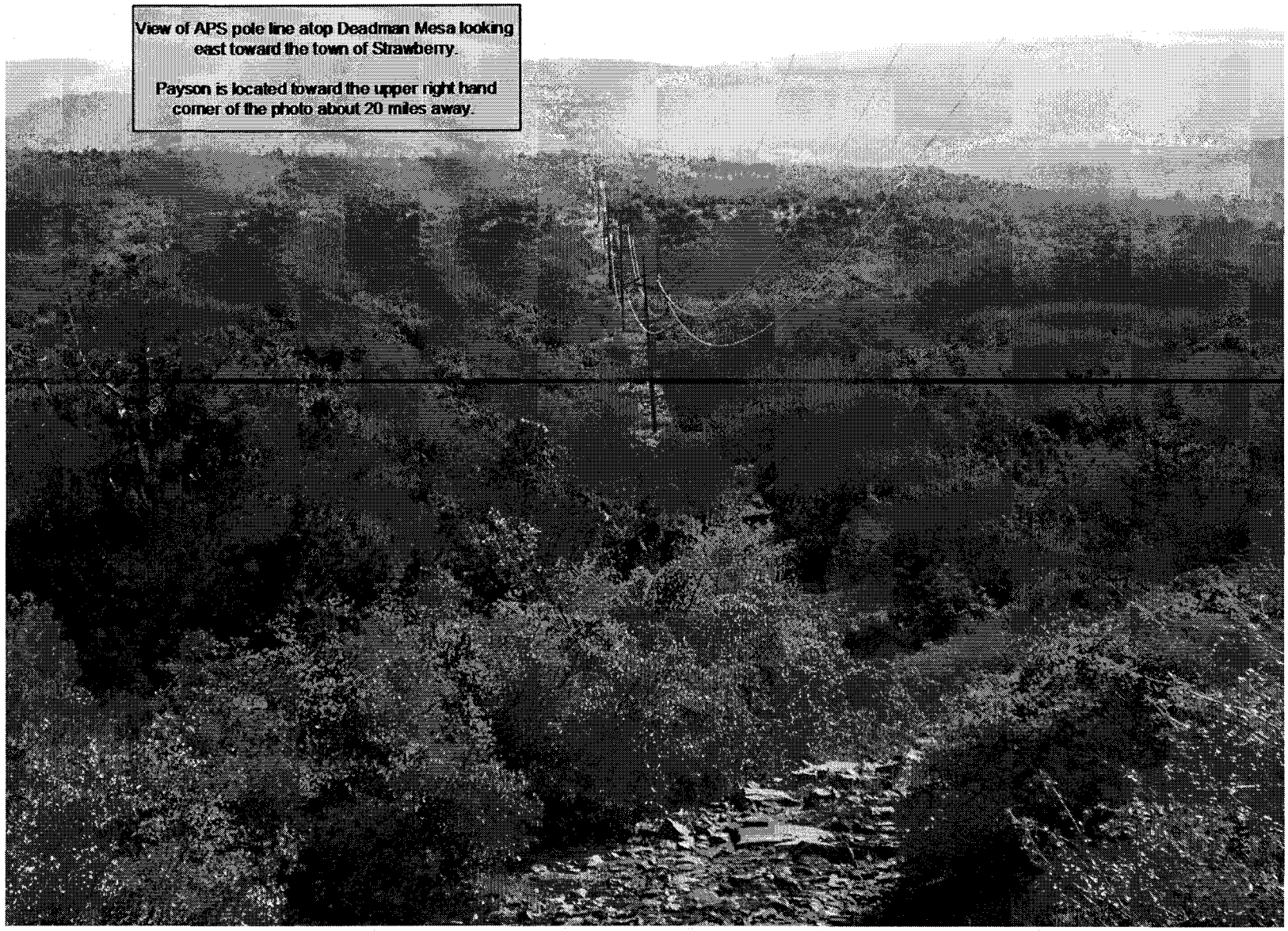

Studied Pipeline from EPNG or TW to Payson, AZ
View from Irving Power Plant toward SW of Deadman Mesa from Fossil Creek Canyon
Deadman Mesa
Flagstaff
Munds Park
Mormon Lake
Paulden
Chino Valley
Prescott
Prescott Valley
Skull Valley
Kirkland
Hillside
Congress
Wagoner
Yarnell
Bumble Bee
Payson
3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096
4 mi Scale: 1 : 800,000 Detail: 8-0 Datum: WGS84

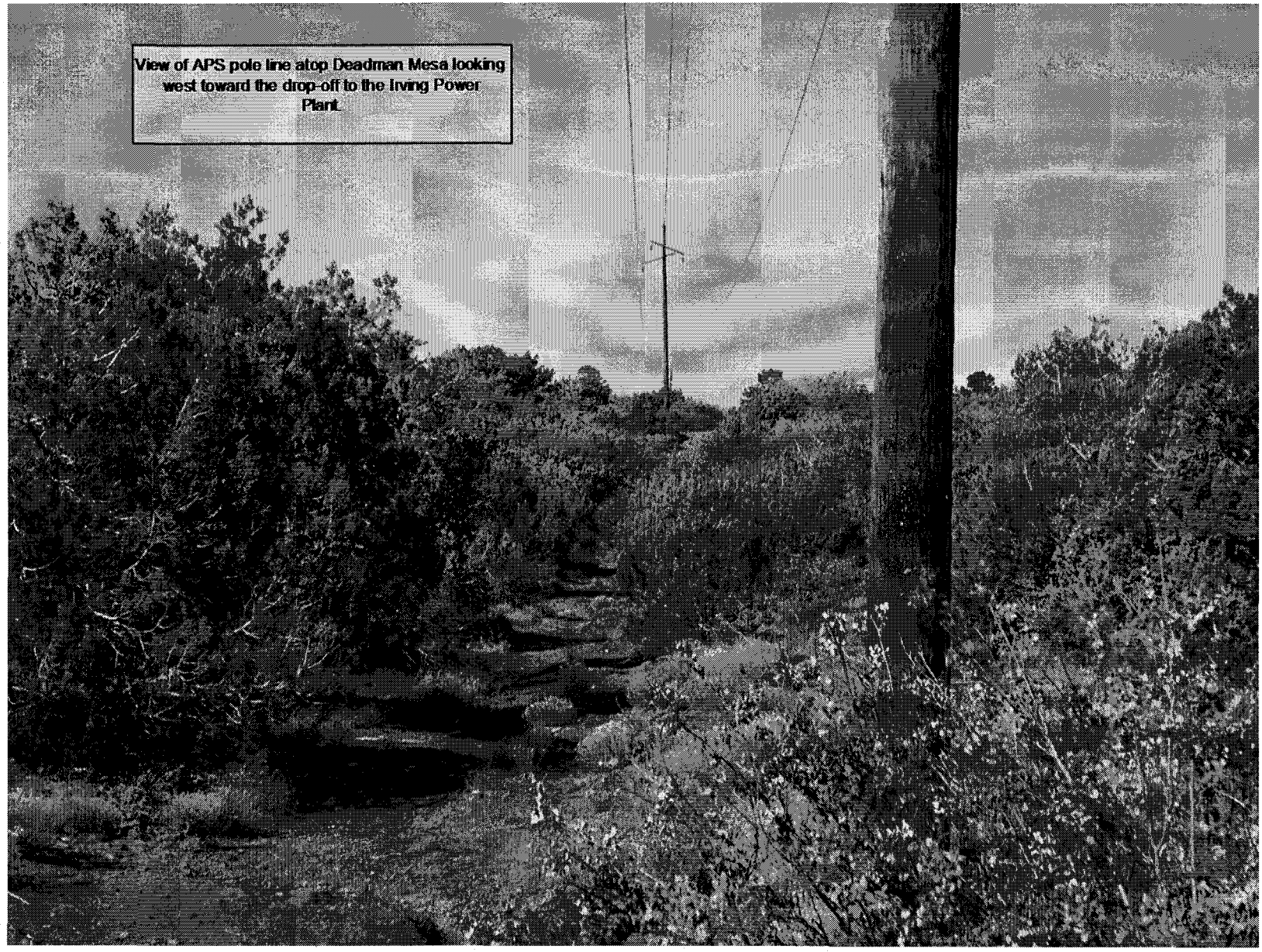

View of APS Pole line from the Irving Power Plant at the bottom of Fossil Creek Canyon to the top of Deadman Mesa
Deadman Mesa – elevation 5720 ft


Closer view of APS pole line toward
the top of Deadman Mesa


View of APS pole line from the Irving Power plant
Vertical rock cliff

APS Irving Power
Plant at the bottom
of Fossil Springs
Canyon – elevation
3800 ft


View of APS pole line atop Deadman Mesa looking east toward the town of Strawberry.
Payson is located toward the upper right hand corner of the photo about 20 miles away.


View of APS pole line atop Deadman Mesa looking west toward the drop-off to the Irving Power Plant.

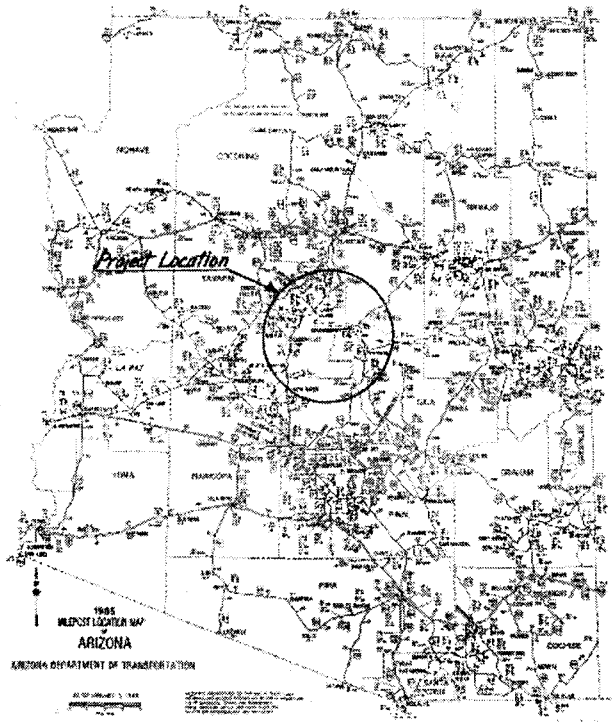
Appendix C

Drawings of Approach Pipeline Route over Topographical Maps

SOUTHWEST GAS CORPORATION

PAYSON FEASIBILITY STUDY

DEPARTMENT OF TRANSPORTATION MAP



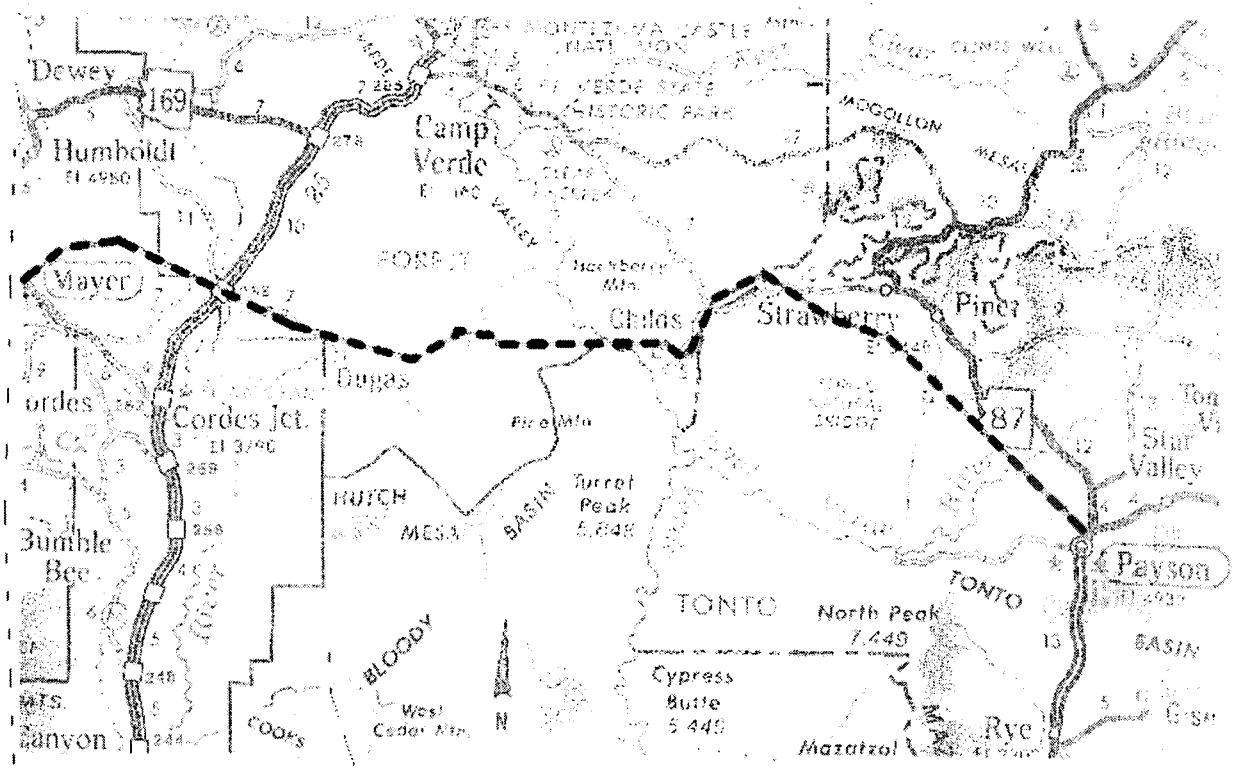
STATE MILEPOST MAP

PAGE 1

SOUTHWEST GAS CORPORATION

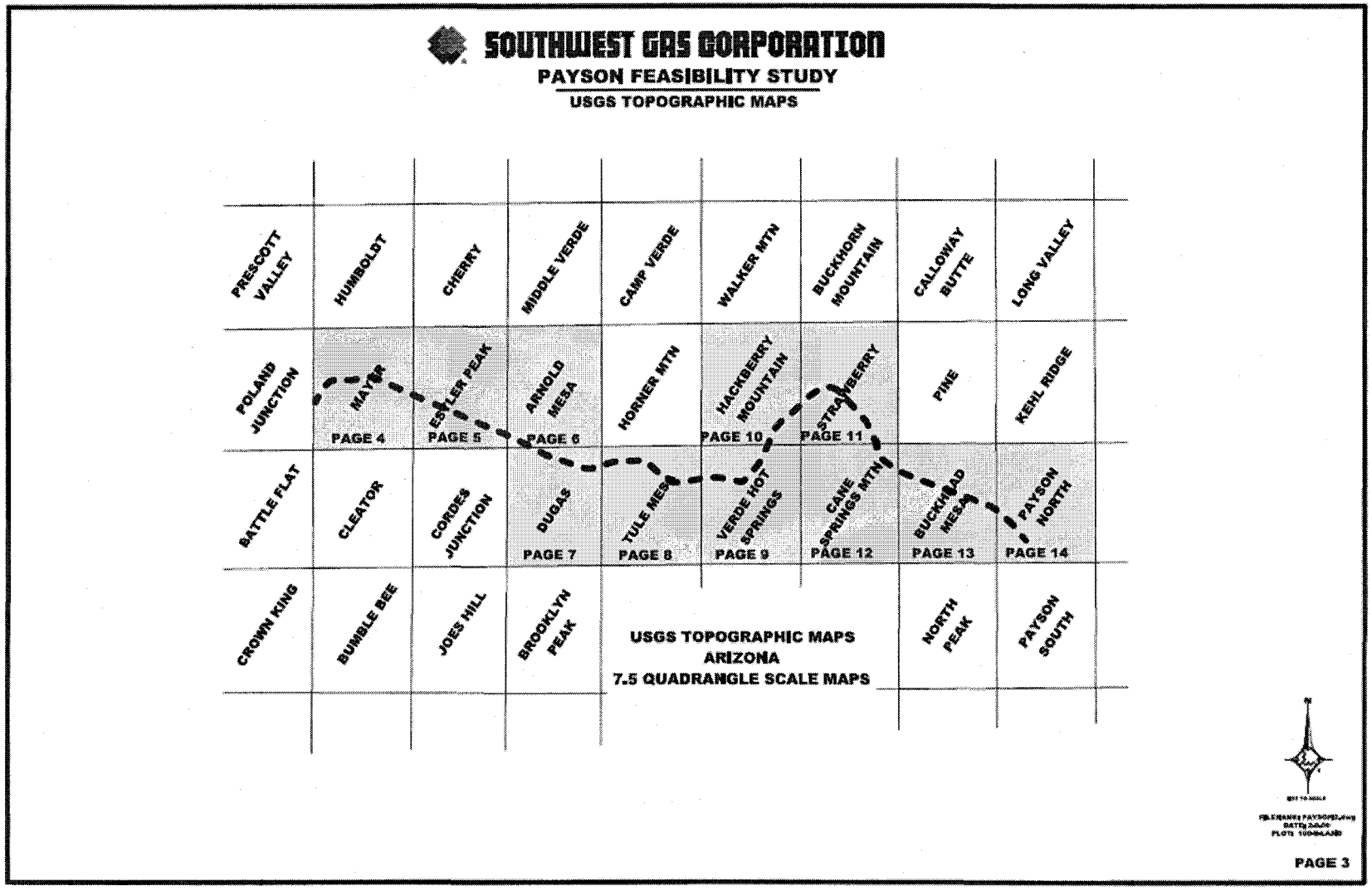
PAYSON FEASIBILITY STUDY

2009



STATE MILEPOST MAP

PAGE 2

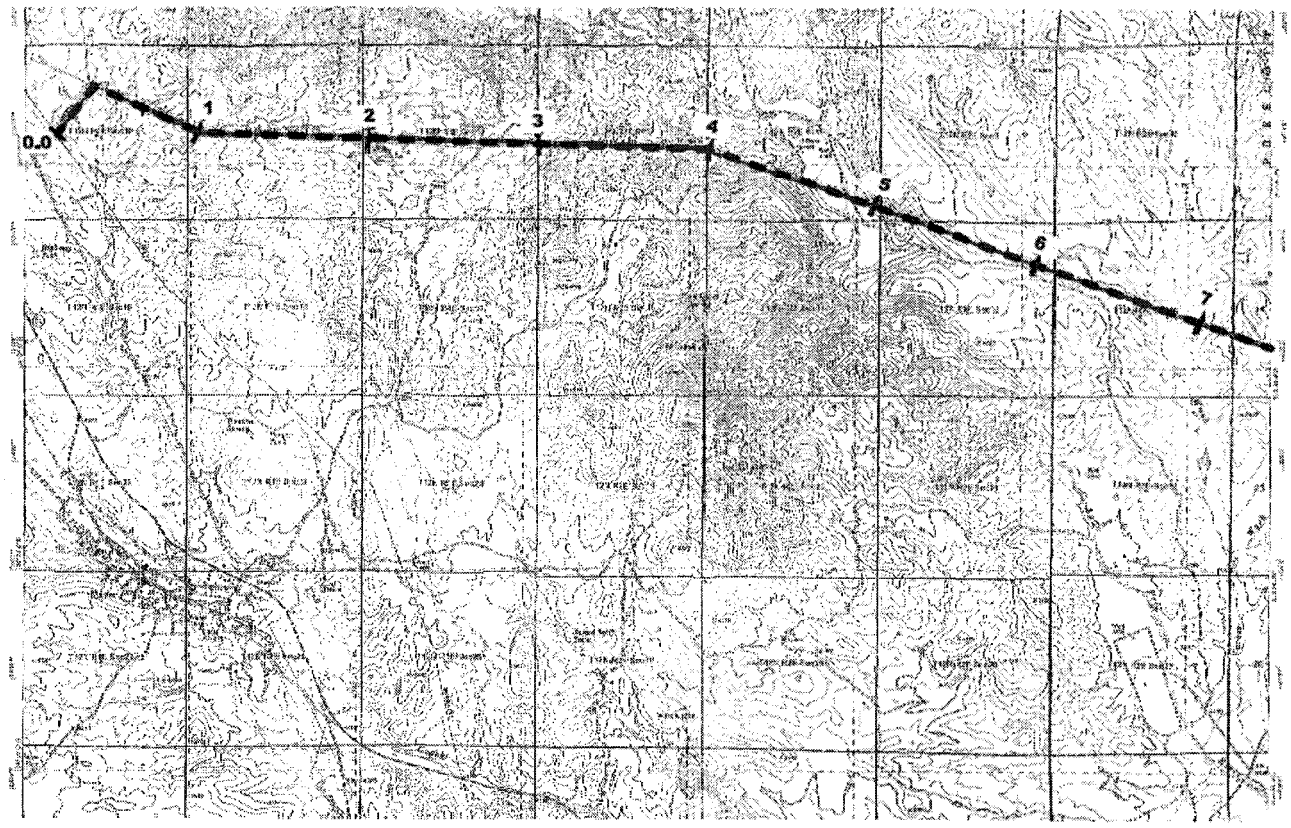

SOUTHWEST GAS CORPORATION
PAYSON FEASIBILITY STUDY
USGS TOPOGRAPHIC MAPS
PRESCOTT VALLEY
HUMBOLDT
CHERRY
MIDDLE VERDE
CAMP VERDE
WALKER MTN
BUCKHORN MOUNTAIN
CALLOWAY BUTTE
LONG VALLEY
POLAND JUNCTION
MAYER
PAGE 4
ESTLER PEAK
PAGE 5
ARNOLD MESA
PAGE 6
HORNER MTN
HACKBERRY MOUNTAIN
PAGE 10
STRAWBERRY
PAGE 11
PINE
KEHL RIDGE
BATTLE FLAT
CLEATOR
CORDES JUNCTION
DUGAS
PAGE 7
TULE MESA
PAGE 8
VERDE HOT SPRINGS
PAGE 9
CANE SPRINGS MTN
PAGE 12
BUCKHEAD MESA
PAGE 13
PAYSON NORTH
PAGE 14
CROWN KING
BUMBLE BEE
JOES HILL
BROOKLYN PEAK
USGS TOPOGRAPHIC MAPS
ARIZONA
7.5 QUADRANGLE SCALE MAPS
NORTH PEAK
PAYSON SOUTH
PAGE 3

CITY GATE CUSTODY METER
FEEDER REGULATION
BLOCK MAINLINE VALVE W/ BLOWDOWN
PIG LAUNCHER
BLOCK ENCLOSURE MP 0.0

SOUTHWEST GAS CORPORATION

PAYSON FEASIBILITY STUDY

Mayer, AZ



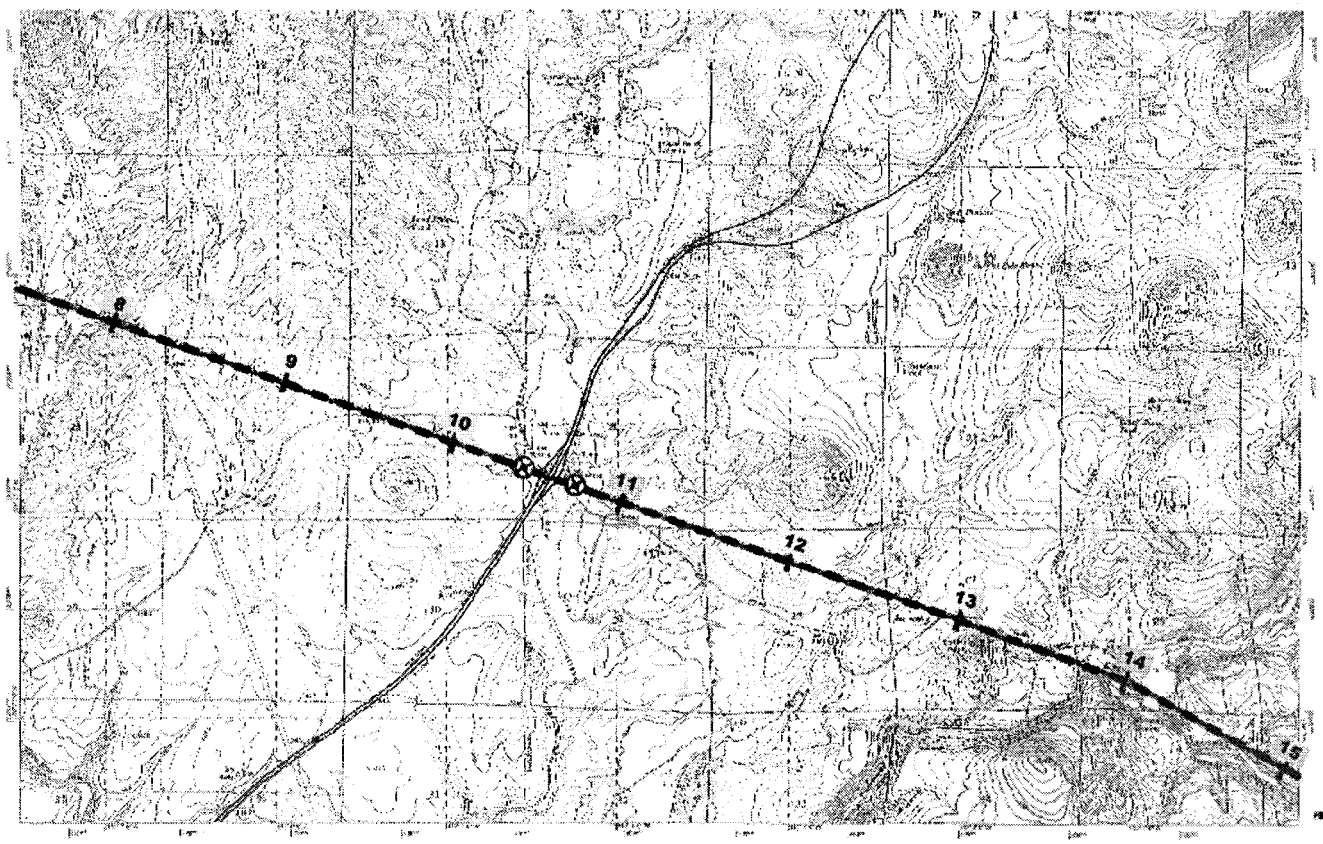
PAGE 4

ADOT I-17 FREEWAY CROSSING
ISOLATION
MAINLINE VALVES ON EACH SIDE
OF RIGHT OF WAY MP 10.5

SOUTHWEST GAS CORPORATION

PAYSON FEASIBILITY STUDY

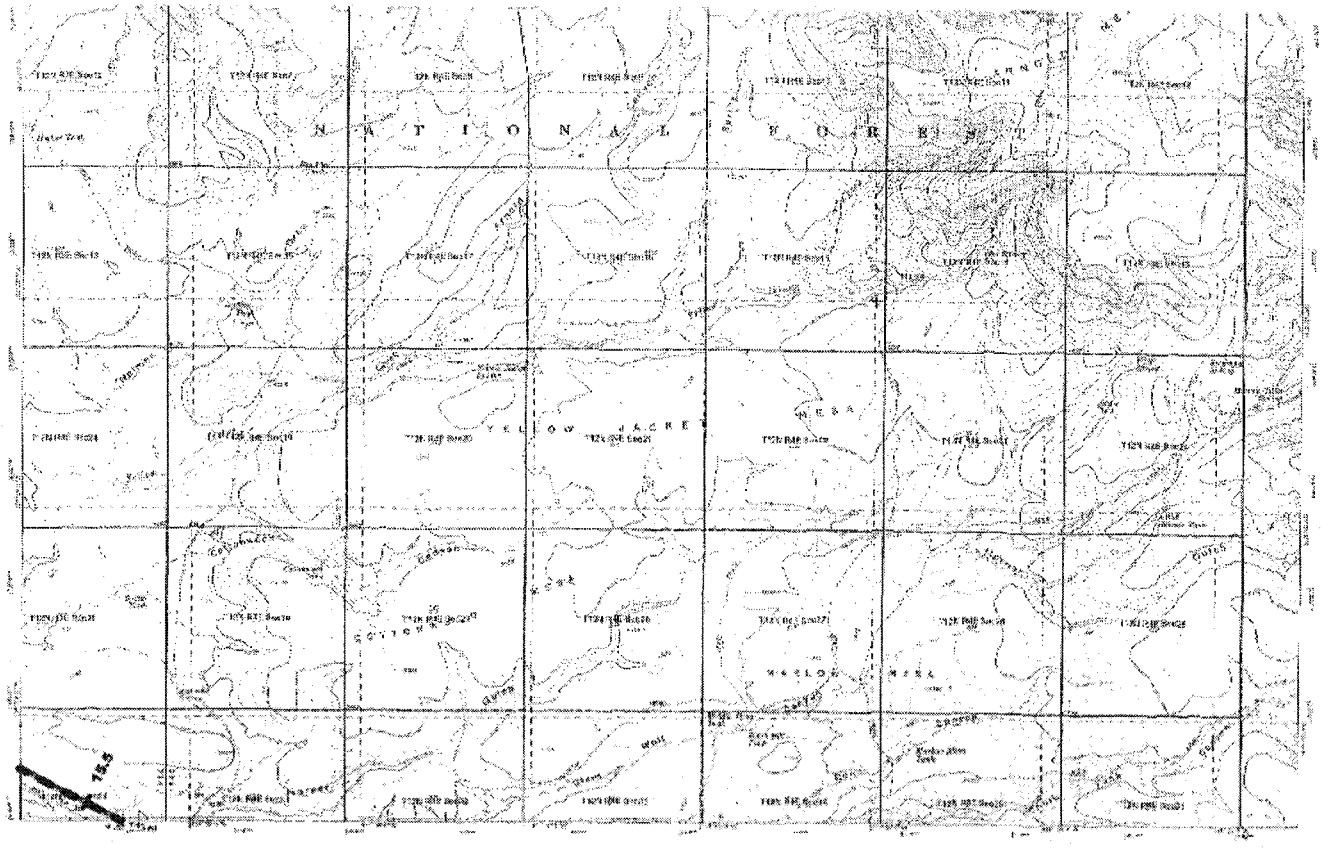
Estler Peak, AZ



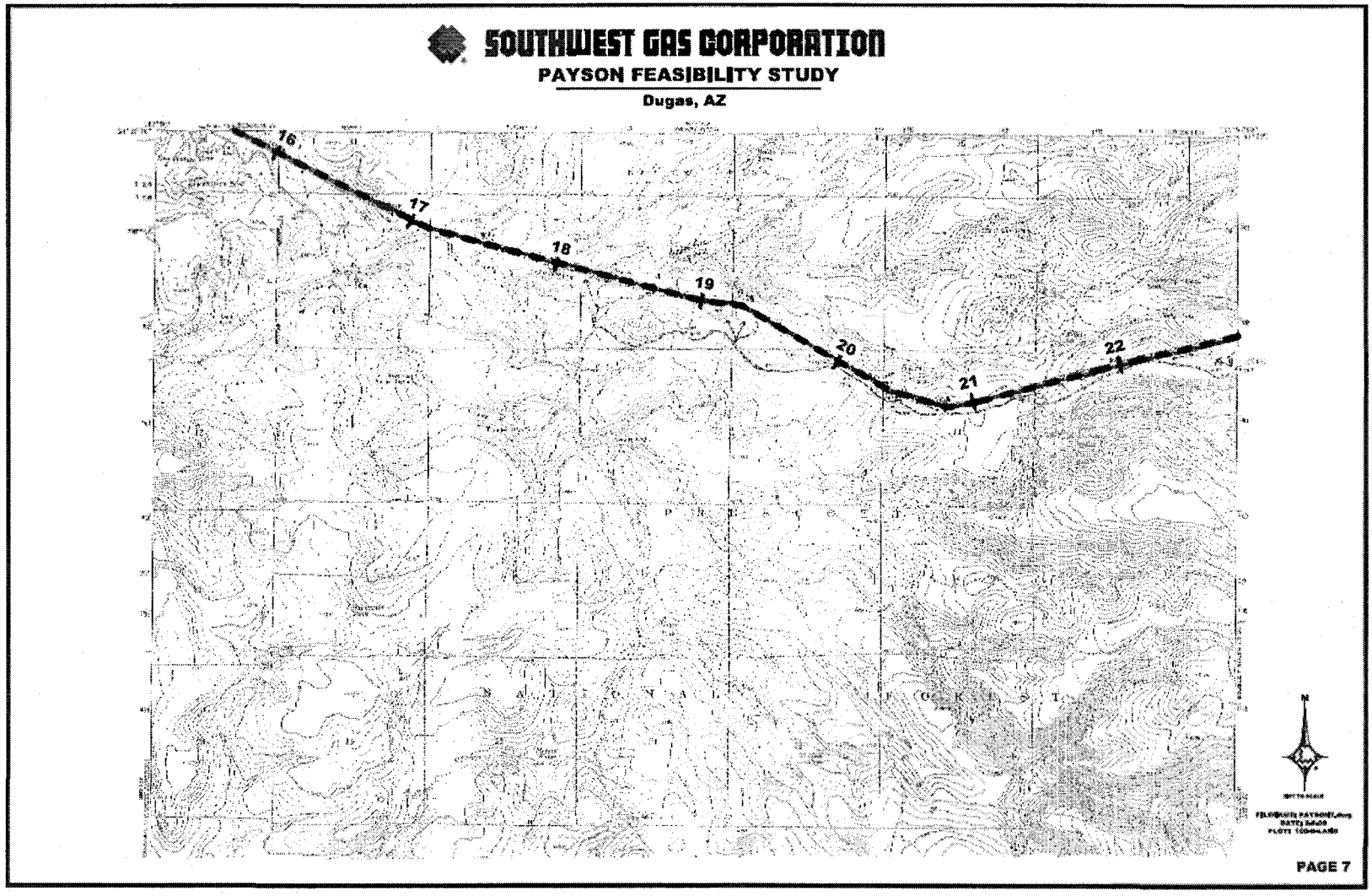
SOUTHWEST GAS CORPORATION

PAYSON FEASIBILITY STUDY

Arnold Mesa, AZ



PAGE 6

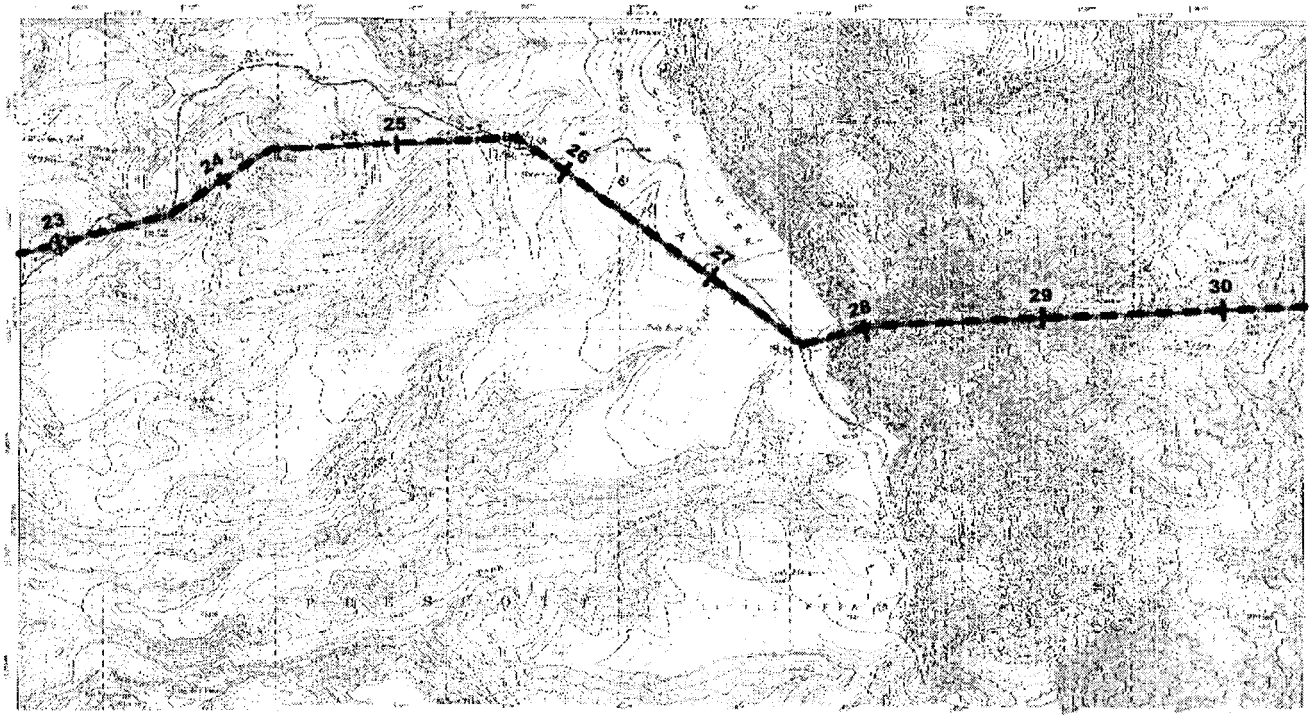

SOUTHWEST GAS CORPORATION
PAYSON FEASIBILITY STUDY
Dugas, AZ
16
17
18
19
20
21
22
N
PAGE 7

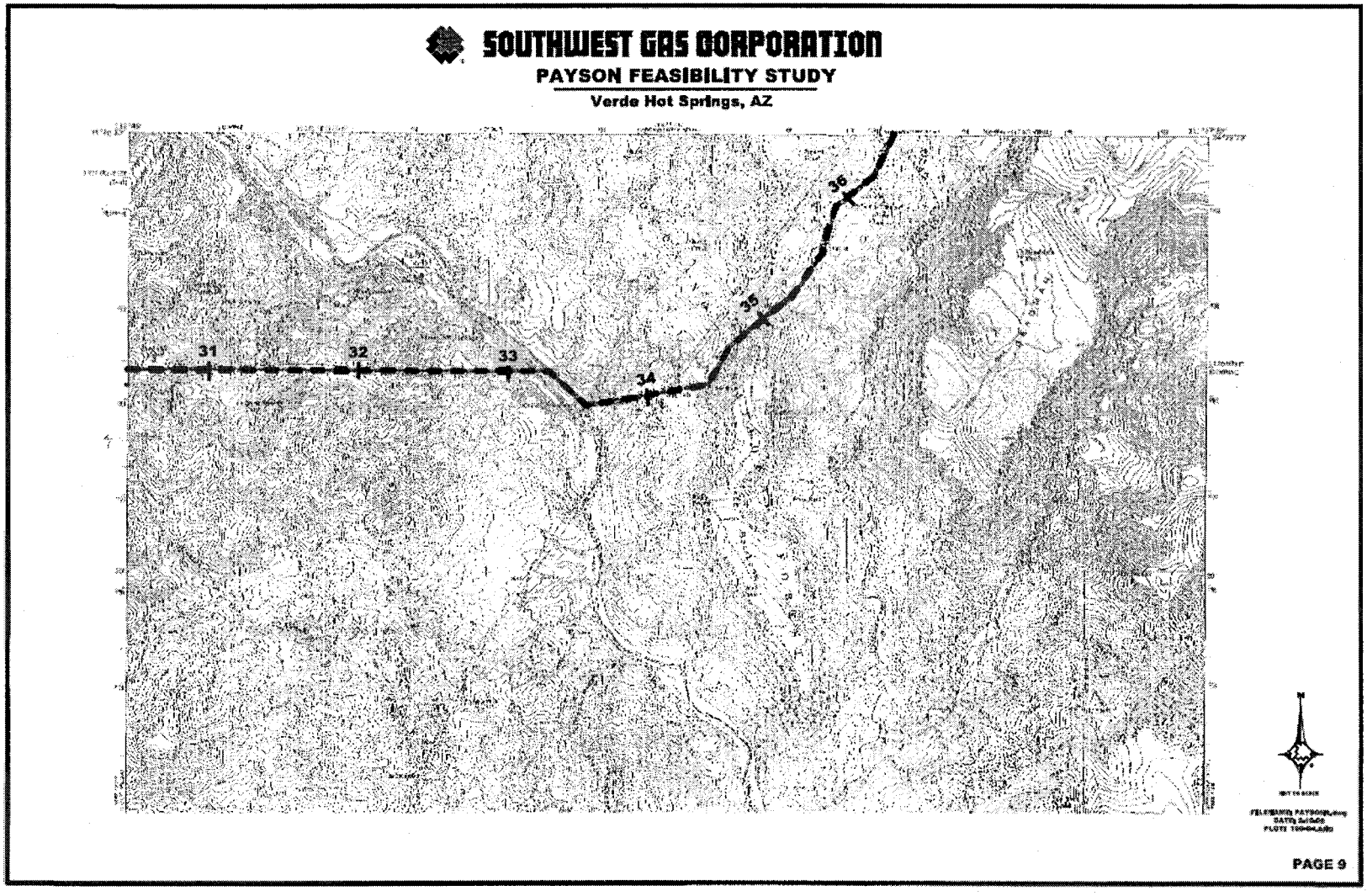
BLOCK MAINLINE VALVE
W/ BLOWDOWN
BLOCK ENCLOSURE MP 23.0

SOUTHWEST GAS CORPORATION

PAYSON FEASIBILITY STUDY

Tule Mesa, AZ

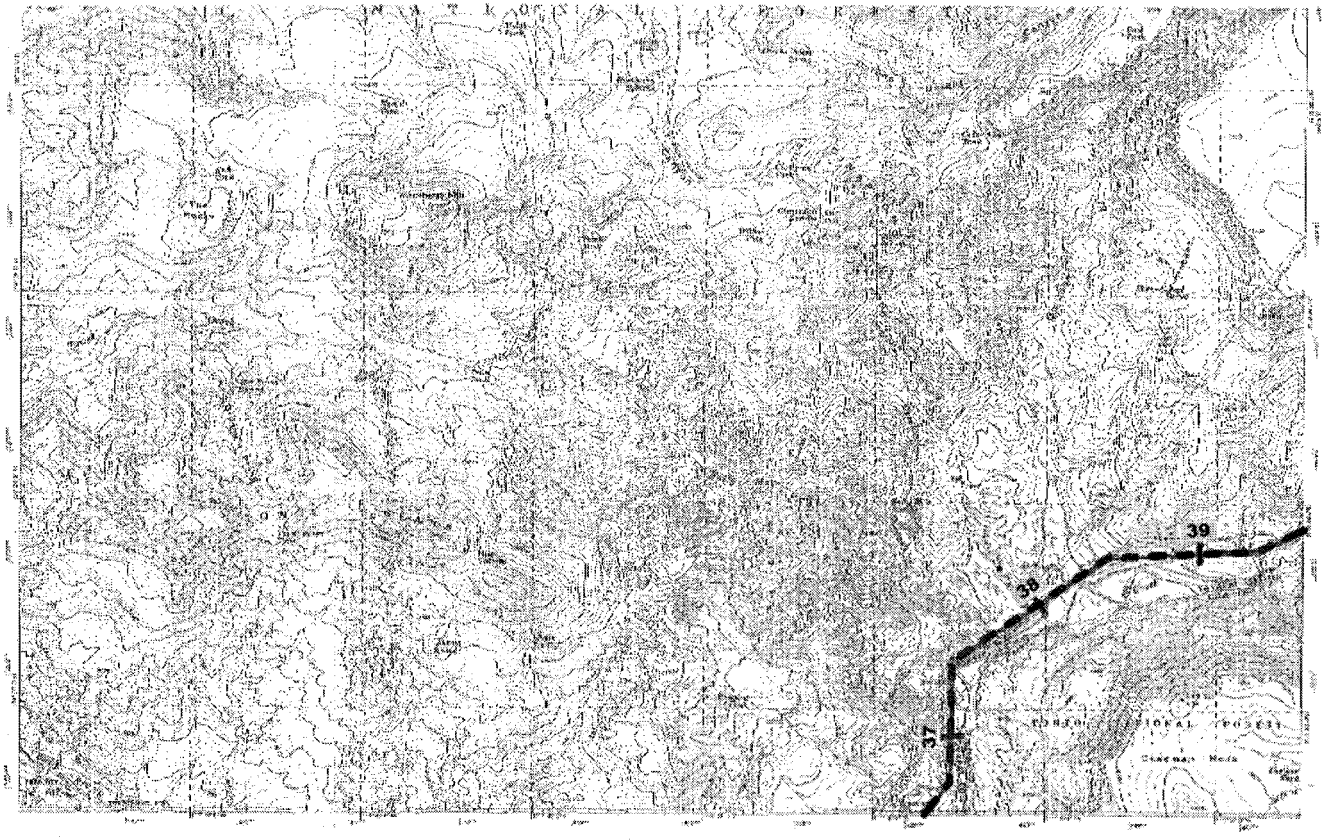



SOUTHWEST GAS CORPORATION
PAYSON FEASIBILITY STUDY
Verde Hot Springs, AZ
31
32
33
34
35
36
PAGE 9

SOUTHWEST GAS CORPORATION

PAYSON FEASIBILITY STUDY

Hackberry Mountain, AZ

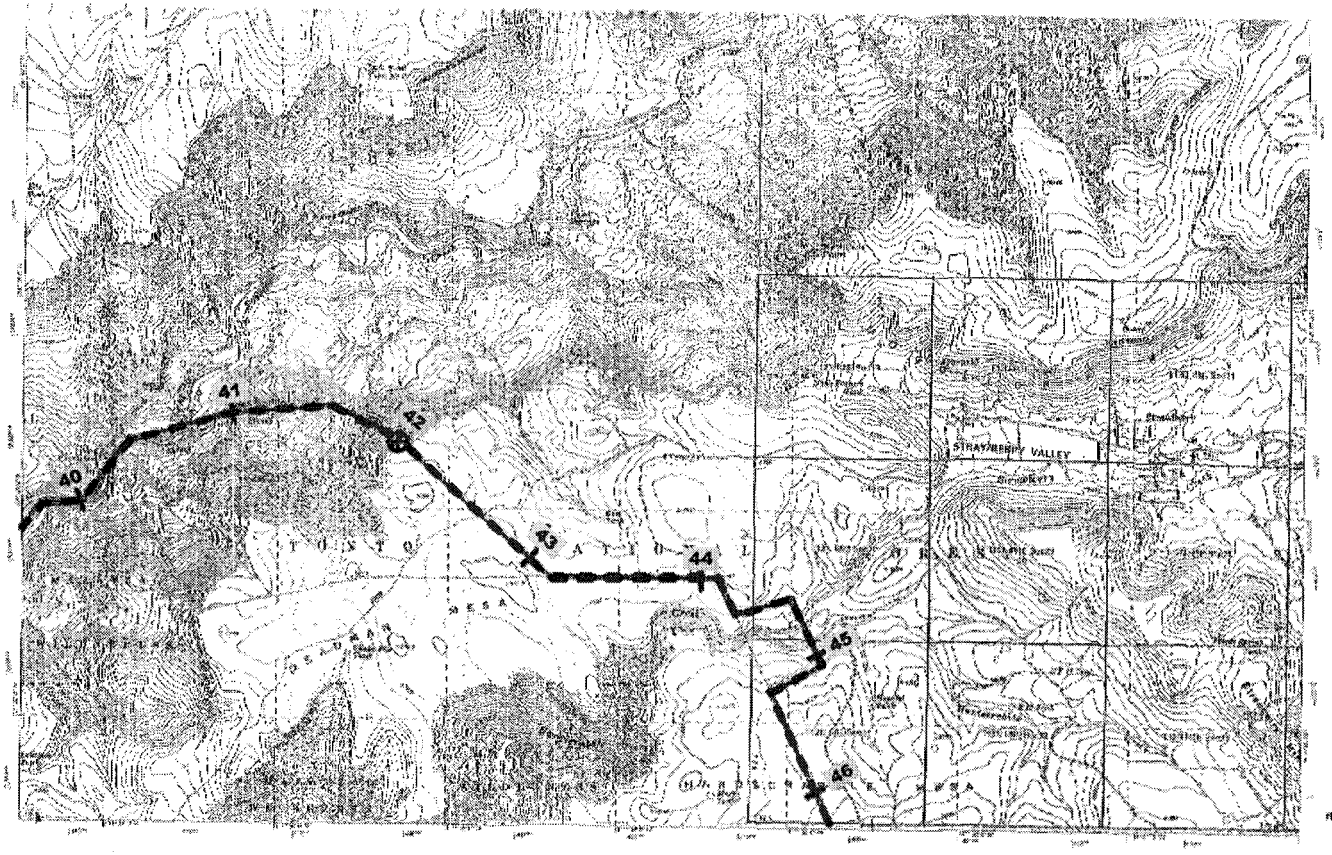


BLOCK MAINLINE VALVE
W/BLOWDOWN
BLOCK ENCLOSURE MP 42.0

SOUTHWEST GAS CORPORATION

PAYSON FEASIBILITY STUDY

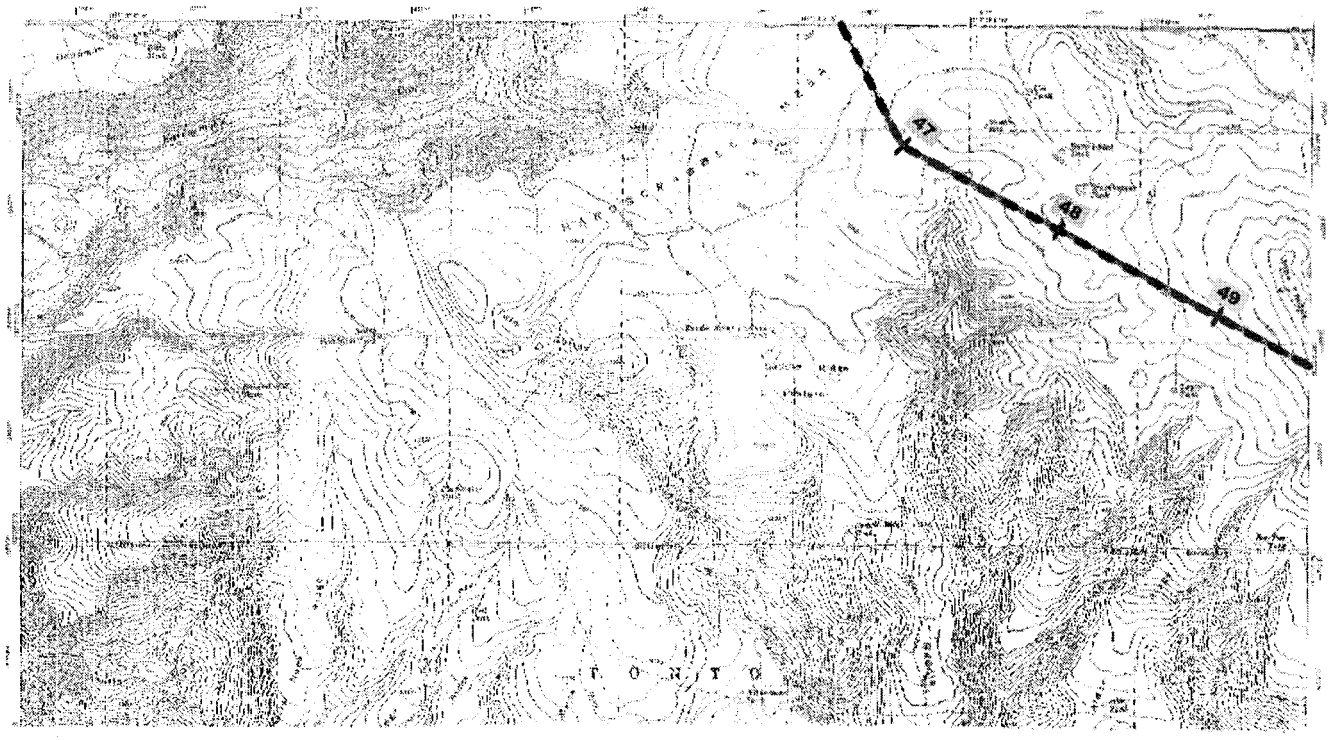
Strawberry, AZ

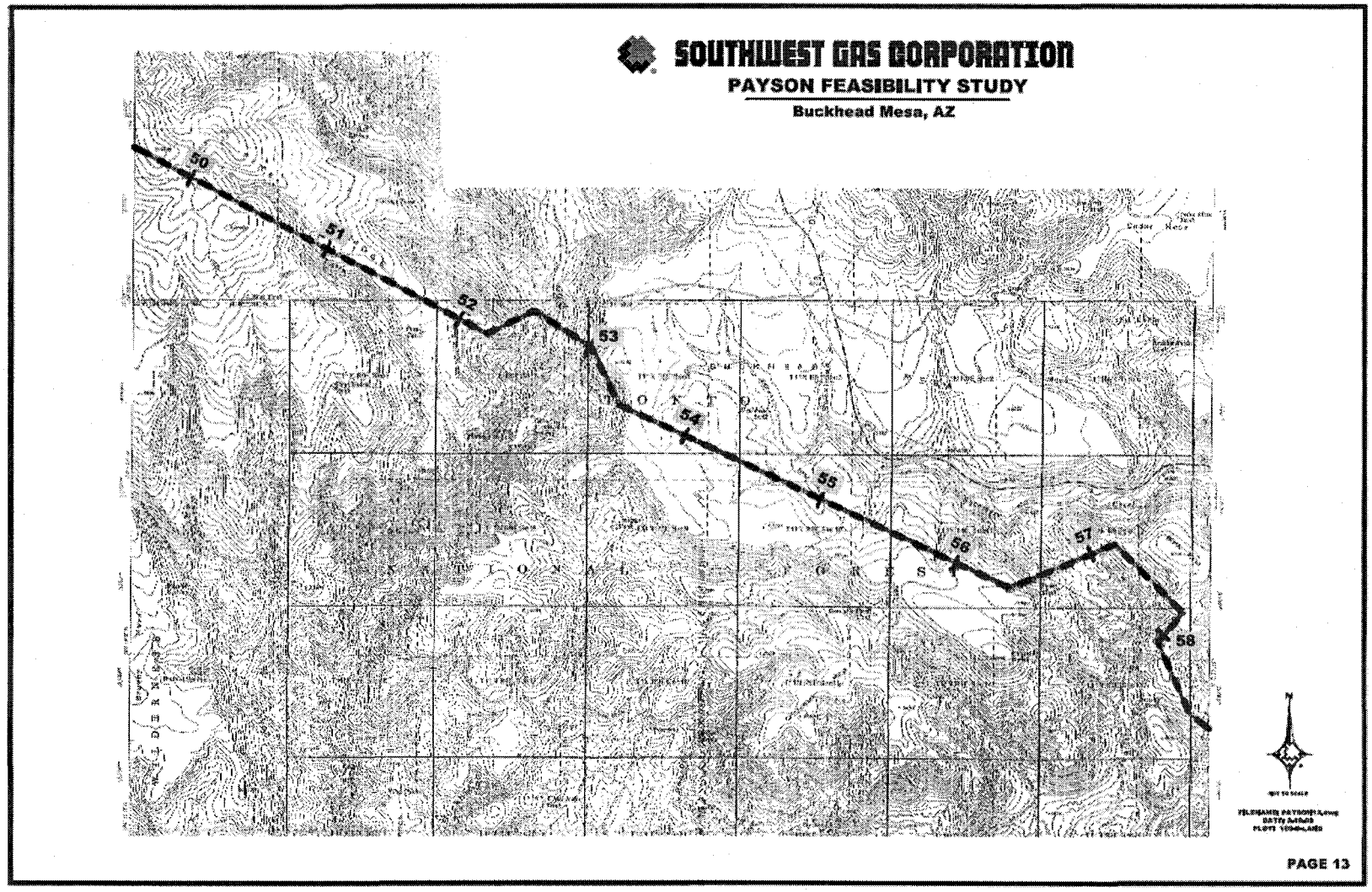


SOUTHWEST GAS CORPORATION

PAYSON FEASIBILITY STUDY

Cane Springs Mountain, AZ




SOUTHWEST GAS CORPORATION
PAYSON FEASIBILITY STUDY
Buckhead Mesa, AZ
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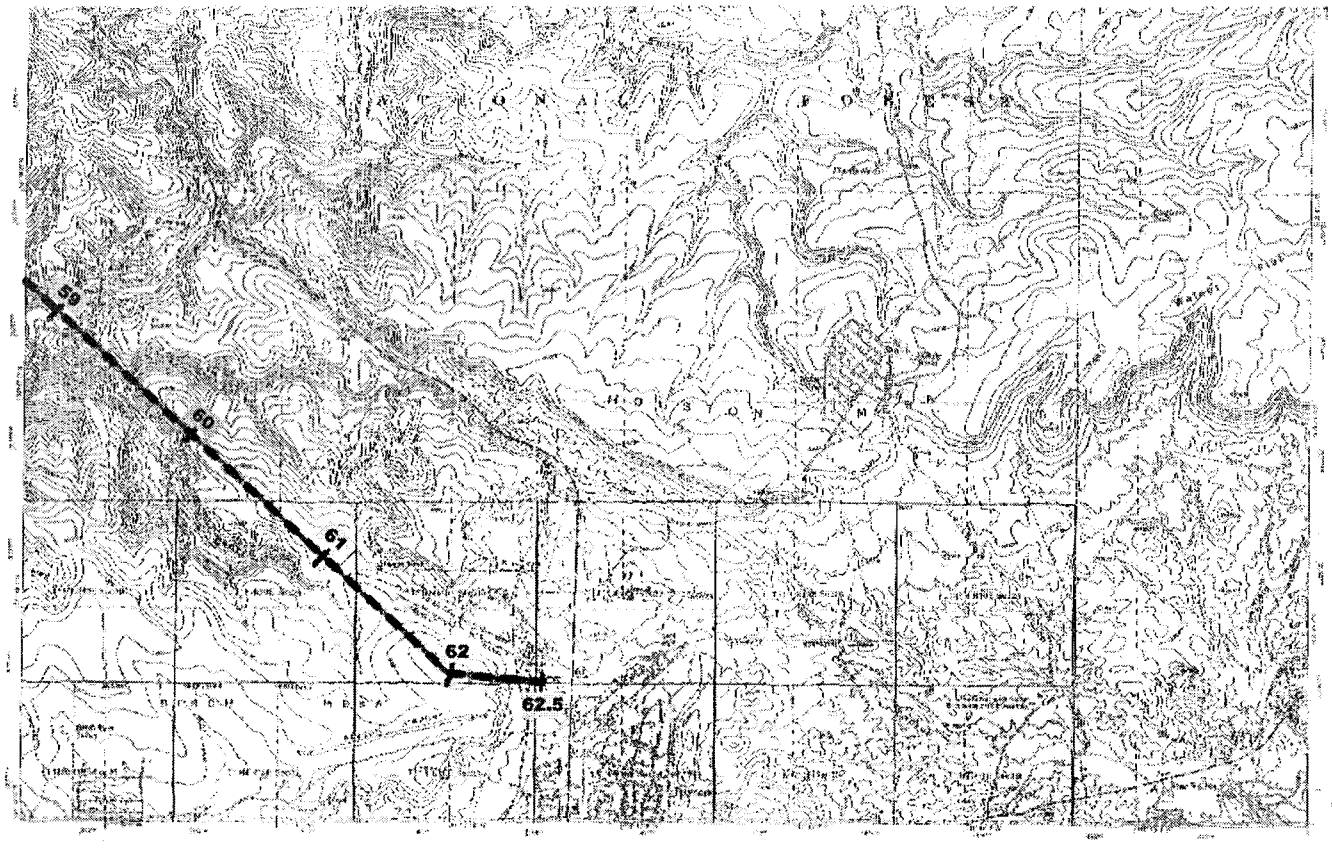
TOWN STATION DIST. REGULATION
BLOCK MAINLINE VALVE W/ BLOWDOWN
PIG RECEIVER - BLOCK ENCLOSURE MP 62.5

SOUTHWEST GAS CORPORATION

PAYSON FEASIBILITY STUDY

Payson North, AZ