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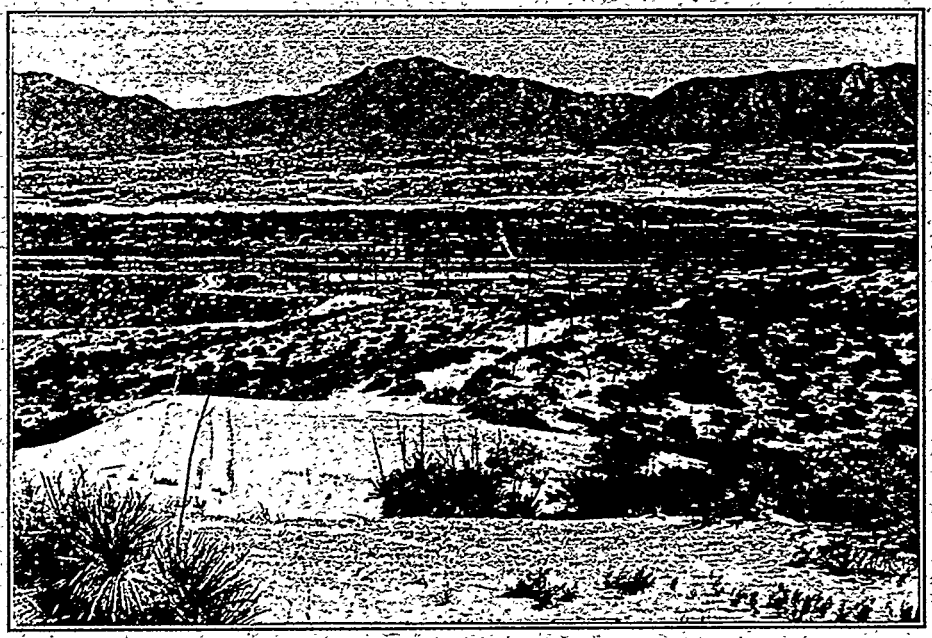
DOE/EA-0611

FINAL ENVIRONMENTAL ASSESSMENT

DIABLO SUBSTATION to the U.S.- MEXICO BORDER 115kV TRANSMISSION LINE PROJECT



U.S. Department of Energy

April 1992

DISCLAIMER

DOE/EA-0611

FINAL ENVIRONMENTAL ASSESSMENT
EL PASO ELECTRIC COMPANY
DIABLO SUBSTATION TO THE U.S.-MEXICO BORDER
115kV TRANSMISSION LINE PROJECT

Lead Agency:	U.S. Department of Energy Office of Fuels Programs
Responsible Official:	Assistant Secretary Office of Fuels Programs
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ABSTRACT

This Environmental Assessment documents the analysis of alternative corridors for development and operation of a proposed 115 kilovolt transmission line using private lands and transporting power to the U.S.-Mexico international border. The project will require (1) an amendment to El Paso Electric Company's existing export authorization to transfer power across this border, and (2) a Presidential Permit for construction of the transmission line. The project would be located in Doña Ana County in southern New Mexico, approximately five miles west of El Paso, Texas. The alternative corridors, specific locations within those corridors, and structure types are identified and analyzed in the environmental studies.

April 1992

Cover: November 1990 photo of northern portion of project area.

EXECUTIVE SUMMARY

El Paso Electric Company (EPE) proposes to construct approximately 2.34 miles of 115 kilovolt (kV) transmission line from the Diablo Substation near Sunland Park, New Mexico (approximately 5 miles west of El Paso, Texas) to the United States-Mexico border. Figure S-1 shows the vicinity of the project. The Mexican utility, Comision Federal de Electricidad (CFE), will then construct a 115kV line from the border into Ciudad Juarez, Chihuahua to serve growth in the area. EPE and CFE have an agreement by which EPE will provide power to CFE to meet the demands for electricity in the Juarez area. The operational life of the project is expected to be approximately 40 years. The project, known as the Diablo to Mexico 115kV Transmission Line Project, would be located in the southern portion of Doña Ana County in southern New Mexico. Construction of the project is scheduled to be completed in the Spring of 1992.

A Presidential Permit authorizes the construction, interconnection, operation, and maintenance of electric transmission facilities across the U.S. international border. An export authorization would allow EPE to transport electricity from the United States to Mexico. EPE has submitted an application for a Presidential Permit to include the proposed action and to amend their existing electricity export authorization. Submittal of this application is in accordance with 10 CFR § 205.300 and 205.320 et seq. The application is submitted to the Department of Energy's (DOE's) Office of Fuels Programs. In accordance with the National Environmental Policy Act (NEPA) of 1969 and implementing regulations issued by the Council on Environmental Quality (40 CFR Parts 1500-1508), DOE is responsible for the completion of environmental studies and preparation of an environmental assessment. The DOE serves as the lead federal agency to assure that the requirements of the federal regulations are satisfied.

EPE is engaged in the generation, transmission, and distribution of electric power in the states of Texas and New Mexico, and the generation and transmission of electric power in the State of Arizona. The existing Diablo Substation is located approximately three miles from EPE's Rio Grande Generation Station within New Mexico's service area.

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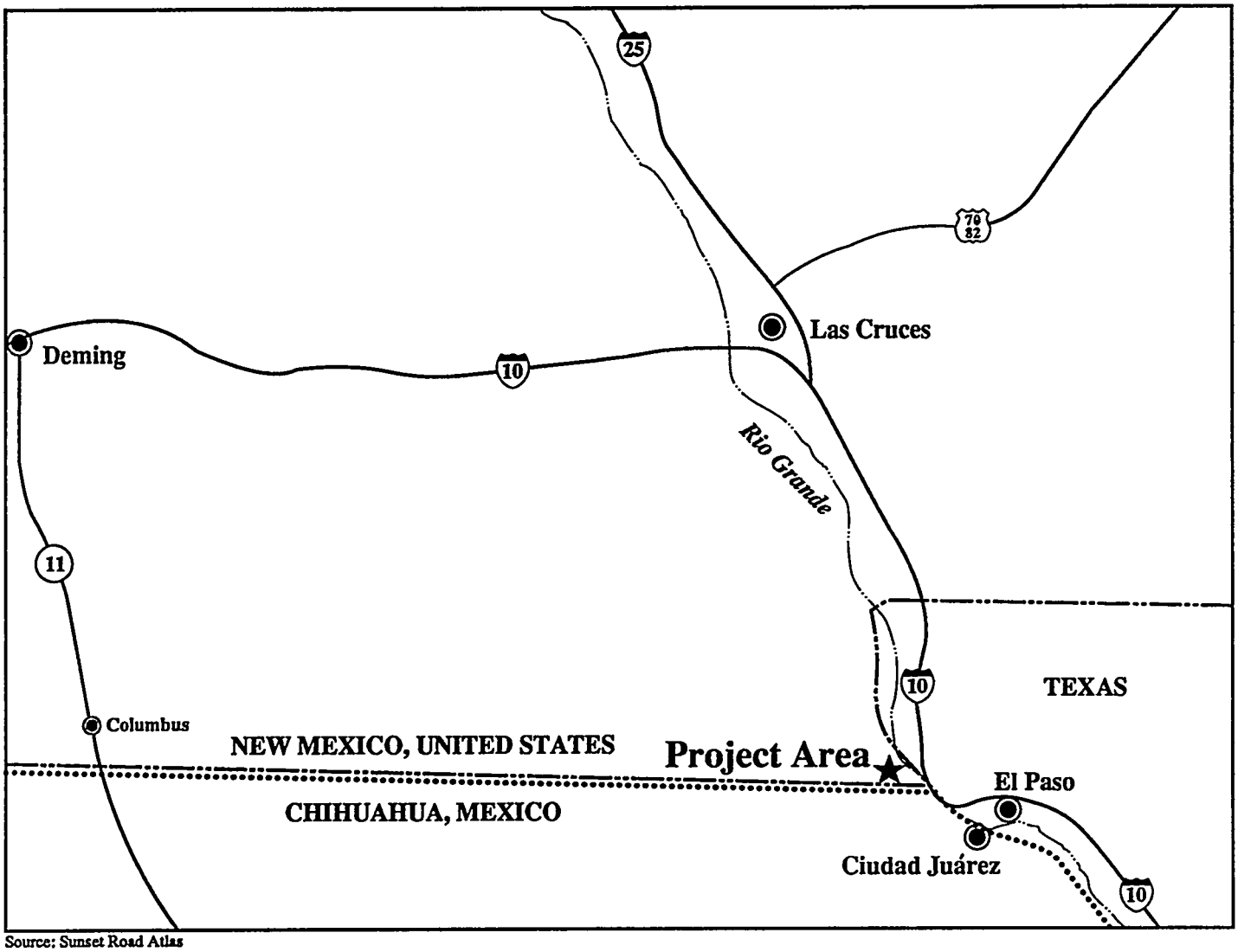
The project is located in Township 29 South, Range 3 East, Sections 11, 12, and 14. Approximately 1.56 miles or 65 percent of this route parallels an existing 345kV transmission line, which was constructed in 1988 and is owned and operated by EPE. The first 1.56 miles of line will be double-circuit single pole structures in anticipation of growth to the west associated with the new Santa Teresa port of entry. The remaining 0.78 mile will be single-circuit H-frame structures. The double-circuit single pole structures will be located where the line would parallel the 345kV line and single-circuit H-frame structures for the remainder of the route to the U.S.-Mexico border.

ENVIRONMENTAL STUDY OVERVIEW

Environmental studies for the proposed Diablo Substation to the U.S.-Mexico border 115kV line began in the Fall of 1990 and were completed in the Spring of 1991. An inventory and analysis of environmental resources were conducted for an approximate 3.25-square-mile study area.

Environmental characteristics evaluated included biological, cultural, earth (geology, soils, water), and visual resources; socioeconomics; and existing and planned land use. As a result of this evaluation, potential environmental impacts were determined. Environmental impacts are defined as modifications to the environment, as it presently exists, that are brought about by an outside action. Impacts can be beneficial or adverse and either short term or long term. Short-term impacts are defined as those changes to the environment that would occur as a result of construction and would most likely be temporary in nature. Long-term impacts are defined as changes made to the environment as a result of construction, and continued operation that would remain after construction.

Study methods included data collection, field reconnaissance, and agency contacts. In addition, personal communications with primary landowners in the study area took place. The study area boundary was delineated based on an approximate half-mile buffer around all outside alternatives. The purpose of this buffer zone was to ensure that any minor shifts in locating the line were evaluated from an environmental perspective and



Source: Sunset Road Atlas

Project Vicinity Map

LEGEND

- ..... International boundary
- —·—·— State boundary
- ——— Highway
- ———·— Rio Grande

Figure S-1

that land use and visual concerns are adequately identified. A 100 percent survey of the proposed route was performed to identify archaeological and historical resources.

Results of the studies show that the greatest environmental concerns associated with the project are primarily related to cultural resources. Minimal adverse impacts to biological, earth (soils, geology, water), air, noise, socioeconomics, land use, or visual resources are anticipated.

To reduce or avoid adverse impacts, EPE has committed to several mitigation measures. Briefly, these measures include the promotion of natural revegetation, avoidance of cultural sites where possible, and the use of construction materials intended to reduce visibility of the line.

General Impacts

In general, impacts are anticipated to be minimal. The project area was previously disturbed as a result of both commercial and recreational use. The majority of the route parallels an existing 345kV line with the intention of confining impacts to a single corridor for approximately 65 percent of the new line's distance. Of the resources evaluated, potential impacts to visual and cultural resources were of most concern given the proximity of the northern portion of the corridor to existing residences and the occurrence of a cultural site along the route. However, views in the area have been impacted previously by the existing 345kV transmission line; therefore, additional visual impacts due to the proposed project will be minimal. Land uses along the route include residential, industrial, and open space. For approximately 0.5 mile along the preferred route where the line parallels the 345kV line, there is residential development adjacent to the 345kV line on the southeast side. Otherwise, existing and proposed land use is primarily industrial as a result of an expanding landfill operation. Because the route location is on the northwest side of the 345kV line in this area, where no specific approved land use plans were identified, land use impacts to the residential development are not anticipated. Biological impacts are expected to be minimal. Four plant species, listed as candidate species for federal protection and one listed by the State of New Mexico, are known or have the potential to occur within the study area. However, none of these species were found during a field reconnaissance in the area in April 1991. Impacts

associated with air-quality, noise, or socioeconomics are anticipated to be temporary and during construction. It is not anticipated that the proposed line would increase electrical and magnetic fields exposure to the nearest resident.

CHAPTER 1

Description of Proposed Action and Alternatives

CHAPTER 1 - DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

PURPOSE AND NEED

Electric utilities have the responsibility of providing safe, reliable and quality electric service to customers within their respective retail service areas. The proposed addition of the Diablo 115kV transmission line to the international border with Mexico will provide the means for EPE to enhance its system reliability and benefit its retail customers by expanding international trade.

Some of the benefits of increased transfers of electricity between the United States and Mexico were identified in the 1990 United States/Mexico Electricity Trade Study (recently published by the DOE and performed by the two countries) and include (1) increased planning, operational, and reliability efficiencies; (2) improved environmental impacts through reduction or delay in construction of new transmission and/or generating facilities; (3) reduced electric rates to consumers in both countries; and (4) support for economic development, especially in border regions of both countries.

Specifically, the proposed project will (1) enhance EPE's system reliability by providing another tieline with Mexico to import electricity to initiate restart procedures in the event of a total loss of power; (2) improve the environmental impacts in the El Paso, Texas/Ciudad Juarez, Mexico border region to the extent that fuel oil-fired generation in Ciudad Juarez is displaced by power supplied by EPE; (3) reduce rates to retail customers by increasing EPE's kilowatt hour sales and revenues from other sources; and (4) further the goal of the United States to foster greater cooperation and trade opportunities with Mexico.

Of particular importance to both parties is the preservation of "black start" capability. This capability is necessary in the event of a catastrophic loss of on-line generation. Either party may deliver to the other party the electric power necessary to restart local generation and resume service to the parties' customers.

Increased Planning, Operational, and Reliability Efficiencies

The function of transmission system planning is to assure that the bulk power supply system is developed in an economic and orderly manner. The application of rational standards of service criteria is undertaken to ensure that electric energy requirements are met with regard to reliability, environmental, and financial constraints. Among other responsibilities, this involves a high degree of coordination with neighboring utility systems.

As early as 1989, CFE informed EPE of its intention to upgrade to the 115kV level its 69kV primary distribution system in Ciudad Juarez, Mexico. Ciudad Juarez is a city with a population of approximately 1,200,000, adjacent to El Paso, Texas on the United States-Mexico border. At that time EPE had two 69kV interconnections with CFE. To remain electrically interconnected to CFE, EPE would need to upgrade or replace these existing interconnections with 115kV facilities. EPE agreed to undertake the upgrade/ replacement of these facilities in order to maintain two interconnections with CFE. The construction of the proposed line would provide benefits by (1) enhancing EPE's local transmission system, unloading the underlying 69kV distribution system and reducing losses on EPE's international system; (2) providing additional voltage support; and (3) providing economical electrical energy to help meet the growth and Ciudad Juarez' electrical requirements.

EPE can realize operational efficiencies from the addition of the proposed line resulting from the opportunity for increased sales to CFE and thereby more efficient utilization of its existing generation and transmission resources. CFE has indicated to EPE that it can achieve similar efficiencies by using electricity purchased from EPE to defer and/or displace future planned transmission and generation facilities. In addition, both EPE and CFE may realize some benefit from the hour-to-hour load diversity between the two systems.

Given EPE's relative isolation from the Western Systems Coordinating Council (WSCC), maintenance of an electrical link to CFE has a direct impact on EPE's overall system reliability. The proposed line will provide a second CFE intertie, completing a loop and thereby enhancing EPE's overall system reliability.

The proposed project will allow EPE to add a delivery point for energy from Mexico to initiate black start operating procedures in the event of a total loss of power and physical separation from the rest of the WSCC. This additional delivery point could be a crucial factor in allowing EPE to recover from a catastrophic loss of generating capacity and may directly affect the ability of a large portion of the western United States to do so as well. In the event of such an occurrence, the energy received from CFE could be instrumental in providing electricity once again to the region.

Improved Environmental Impacts

Power provided to CFE will come from EPE's system resources which include 793 megawatt (MW) of natural gas, 600 MW of nuclear, and 104 MW of coal-based resources. EPE has installed flue gas desulfurization equipment at its coal units; atmospheric emissions from its natural gas units are below regulatory limits; and its nuclear generation inherently has no atmospheric emissions. Therefore, based on an economic dispatch order consistent with voltage maintenance criteria, a limited impact on ambient air quality is expected because of the sales to CFE.

CFE has indicated that power purchased from EPE will help to defer the need to build additional transmission and/or generation facilities in the Ciudad Juarez area. To the extent that purchases from EPE defer such construction or displace generation, otherwise provided from CFE's existing fuel oil fired generation in Ciudad Juarez, such purchases are expected to have a beneficial environmental impact.

Reduced Electric Rates to Consumers of Both Countries

As indicated above, EPE's sales to CFE are expected to provide a benefit to its retail customers by spreading EPE's fixed costs over a larger volume of kilowatt hour sales than would otherwise be expected. Similarly, it is anticipated that purchases from EPE will enable CFE to displace more expensive fuel oil-fired generation and possibly defer construction of additional facilities. This would allow CFE to pass the benefits of such reduced costs on to its customers.

Foster Greater Cooperation and Trade Opportunities

EPE began delivery of firm capacity and associated energy to CFE in May 1991, inaugurating the first firm sales arrangement with CFE since the late 1970s. The proposed line will make it possible for EPE to fulfill its commitment to supply firm power to CFE.

The completion of the proposed project and performance of EPE's obligations under the CFE sales agreement will foster the principles of greater cooperation and expansion of trade opportunities with the Republic of Mexico. In 1990 the United States and Mexico agreed to update the Electricity Trade Study, originally published in 1980, which explored the possibility of increased bilateral transactions for electric commodities. Among other actions, construction and operation of the 115kV transmission line proposed herein was recommended as a means of increasing such bilateral transactions to the mutual benefit of both countries.

It is also anticipated that the local communities in El Paso County, Texas, Doña Ana County, New Mexico; and Ciudad Juarez, Chihuahua, Mexico will benefit from increased trade opportunities fueled by additional supplies of reliable electric power. Specifically, this will occur by expansion of the "in-bond" program. The in-bond program allows foreign (non-Mexican) companies to establish an assembly and/or manufacturing operation in Mexico while using components from the United States in the industrial process.

The in-bond program facilities and related support facilities can be expected to have a beneficial multiplier effect on these communities' economies. Some of these effects are direct; examples include increased property values for local taxing entities and greater retail sales and associated sales tax increases. Some will be more indirect; examples include increased employment opportunity with a concomitant increase in taxable income as well as a higher quality of life for area residents.

The benefits to El Paso County communities are expected to be of a continuing nature, while those for Doña Ana County communities will be new. Since a portion of the proposed line will be of double-circuit construction, one circuit will be dedicated to the proposed line while the other will be reserved for a future line providing electricity to the new international ports-of-entry recently authorized at Santa Teresa and Anapra,

New Mexico, and associated facilities on the United States side of the international boundary. It is not currently anticipated that this additional line will extend across the border.

Conclusion

Under the direction of the current President of the United States, the Administration has created a forum for expansion of the Free Trade Agreement with Mexico. High level meetings have been held between representatives of the respective countries as well as regional public meetings in both nations to discuss the details of removal of existing trade barriers. It should be noted that CFE has committed itself to the EPE power purchase; to defer or cancel the proposed project would impose severe economic and budgetary repercussions affecting the quality of life and industrial output of Mexico.

ALTERNATIVES INCLUDING THE PROPOSED ACTION

EPE and CFE evaluated the feasibility of rebuilding and upgrading an existing 69kV line from the Rio Grande Substation, west of El Paso, to a substation in Ciudad Juarez. This option was not considered feasible because enough growth has occurred near the existing line that there are residences located within the right-of-way and, in some cases, under the line. CFE chose not to use this right-of-way, given the potential impacts to those residents.

Constructing a line from the Diablo Substation to the border appeared to be the better location for the line. Once this location was determined, alternatives were developed primarily based on existing linear corridors or property boundaries. A study area boundary was defined using an approximate half-mile buffer around all of the alternatives. The buffer zone was created to ensure that any minor shifts in line location were evaluated in the environmental studies. Alternatives were added and eliminated during the course of the study when the feasibility or infeasibility of a route became apparent. All alternatives that were identified in the study process are described later in this section.

The alternatives evaluated consist of six routing alternatives, specific locational alternatives associated with the proposed route, structure type alternatives, and the no-action alternative. Routing alternatives are described later in this section.

Specific locational alternatives associated with the proposed route were evaluated relative to which side of the existing 345kV line the proposed project would best be located. Existing residential land uses on the southeast side of the 345kV line suggest that the northwest side is more suitable for locating the proposed line. The farther distance from the residential development would reduce visibility of the new line, particularly where structures will match the locations of the existing 345kV structures. In addition, fewer structures would be required for making the necessary turn to the west along side the 345kV line.

Three **alternative structure types** for a double-circuit 115kV line were evaluated to determine the most suitable type from both an engineering and environmental standpoint. All three structure types are acceptable when considering environmental concerns for the proposed project and, in fact, are expected to result in low impacts. The environmentally preferred structure type is the H-frame. H-frame structures would match the existing 345kV H-frame structures, thereby reducing visual contrast of structures. In addition, the spans between structures would be greater than they would be with the other structure types, thereby reducing the number of structures required overall. The second environmental choice is the single core-ten steel pole structure. Use of this structure would result in a single pole versus double pole structures. However, spans would be shorter than the H-frame. Slightly more contrast would occur with the single pole structures. It is important to note that with this alternative the two circuits are independent of each other. This is an important advantage because it eliminates the need to de-energize both circuits (temporary power outage) while performing maintenance on one circuit. Use of the H-frame structure would require de-energizing both circuits to perform some maintenance. The third alternative is to construct two sets of single-circuit poles that would result in increased structure contrast, reduced span, and a greater number of poles. This alternative would enhance EPE's ability to provide reliable power to customers by reducing the impacts associated with damage to one of the lines (or structures). However, to satisfy both reliability and environmental concerns, EPE prefers the proposed alternative that combines single pole structures where it parallels

the 345kV line and H-frame structures for the new corridor. As stated earlier, impacts associated with all of these structures are expected to be low.

No Action

With the no-action alternative, a 115kV transmission line would not be constructed or operated. If DOE were to deny EPE's request to develop this project, no action would occur in this study area. Any potential impacts related to the project, short term or long term, would not occur. The no-action alternative would not allow EPE to assist CFE in meeting electricity demands in Ciudad Juarez, Chihuahua, Mexico. EPE has entered into a binding firm power sales contract with CFE providing for an initial minimum capacity of 40 megawatts by May 1991 to be upgraded to 150 megawatts. This alternative would not meet electricity demands in Juarez.

Alternative Routes Evaluated

Five alternative routes were evaluated, as shown on the Study Area Map, Appendix D. The five routing alternatives follow an existing 345kV transmission line corridor for the first portion of the route. Use of this existing transmission line corridor confines potential impacts to the established corridor. New right-of-way would need to be obtained for all routes. Alternatives were evaluated based on biological, cultural, visual, and earth resources, and existing and future land use considerations. In addition, an evaluation of potential electrical effects also was conducted. Table 1-1 lists the siting criteria used to evaluate each route.

Alternative A - Proposed Action

The proposed line will exit the Diablo Substation (owned and operated by EPE), located approximately five miles northwest of El Paso, Texas, paralleling an existing 345kV transmission line to the southwest for approximately 1.27 miles and to the west approximately 0.29 mile. From this point, the route diverges from the 345kV line and turns south to the international border, a distance of approximately 0.78 mile. From the

Diablo Substation to the point where the line diverges from the 345kV line, the preferred location for the line is on the northwest and north side of the 345kV line, farther away from existing residential land uses. The southwest side of the existing 345kV line cannot be used because only 50 feet of right-of-way are available. More than 50 feet are required in order to meet electrical safety codes and minimum distances from other transmission lines.

The 115kV structures will be double-circuit, single steel pole structure where the line parallels the 345kV line (1.56 miles) and single-circuit H-frame structures for the remaining portion (0.78 mile). Figures 1-1 and 1-2 illustrate these structures. The single pole structures will be approximately 61 to 88 feet above ground with an average of 310-foot spans. The H-frame structures are an average of 47.5 to 61 feet above ground with an average of 525-foot spans. The turning structures would consist of two poles, one pole per circuit (adjacent to the 345kV angle structure), supported by guy wires attached at the height of the conductors. Conductor distance from the ground will be 45 feet. In comparison, the existing 345kV line consists of wooden H-frame structures, approximately 74 feet high with 800-foot spans. Figure 1-3 shows the relationship of the 345kV line to the proposed 115kV line. Conductor distance from the ground is 55 feet. The turning structure consists of three poles with guy wires. Wherever possible, the 115kV structures will be located adjacent to the 345kV structures to reduce visibility. To some extent, terrain will dictate placement of the poles.

Alternative B

Alternative B follows the same proposed corridor of Alternative A with the exception of 0.41 mile. The divergence point is at the turning point for the 345kV line, where Alternative A and the 345kV line continue to the west. Alternative B continues in a southwesterly direction to a mid-section point. From this point the route follows Alternative A again continuing south to the U.S.-Mexico international border. This alternative was not preferable because it passes through four patent restricted areas containing known cultural resources. Alternative B is the most sensitive of the routing alternatives studied in detail considering cultural resources.

TABLE 1-1
ENVIRONMENTAL SITING CRITERIA
DIABLO SUBSTATION TO U.S. MEXICO BORDER
115KV TRANSMISSION LINE

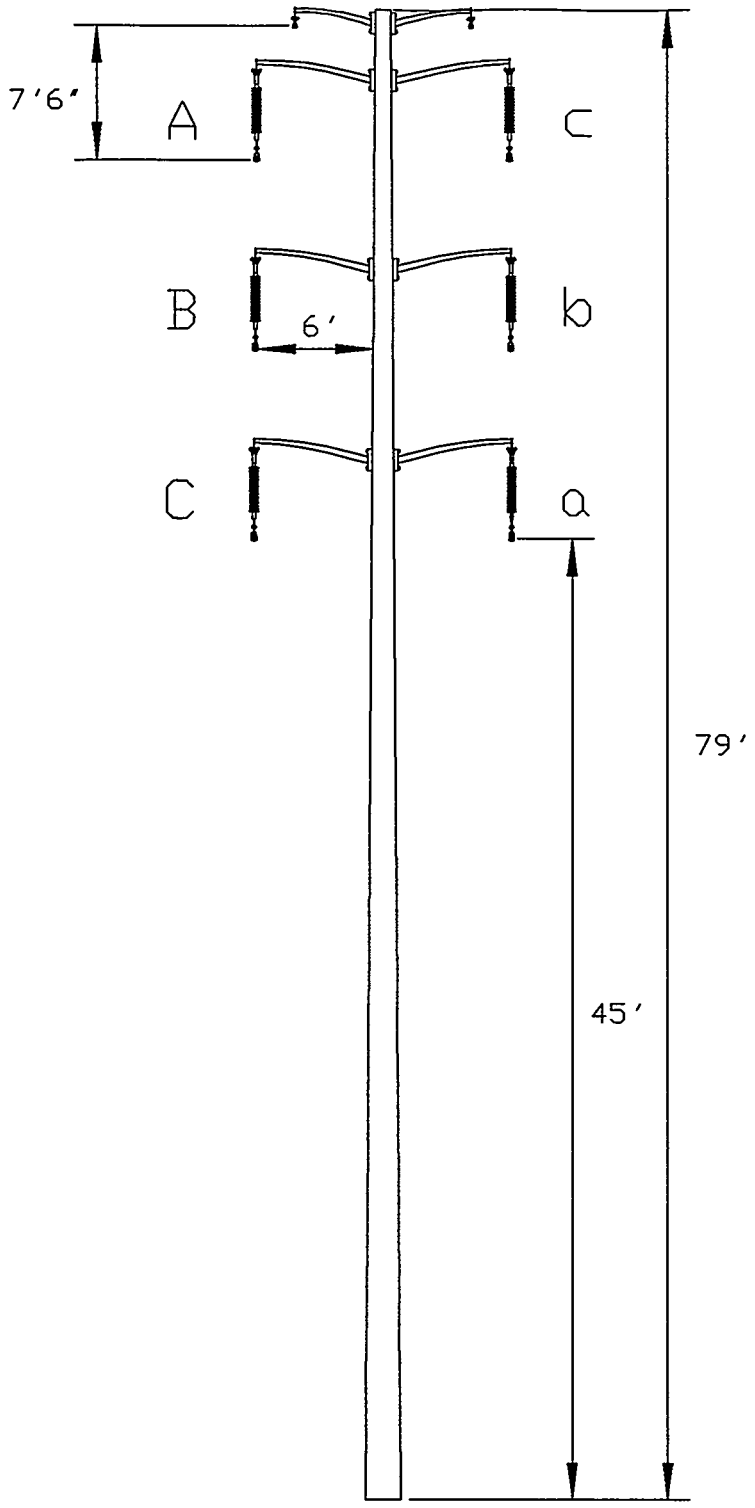
Opportunity Areas	Criteria Applications - Routes Affected
Existing overhead lines	A, B, C, D, E
Existing and proposed highways and major arterials	none
Canals	none
Railroads	E
Major property boundaries and field boundaries	C, D
Open space	A, B
Existing and proposed industrial development	A, B, C, D, E
Undeveloped areas (no future development proposals)	A, B, C, D, E
Availability of vegetative or topographic screening	A, B, C, D, E
Constraint Areas	
Existing and future residential, commercial, industrial, and institutional developments	C*, D*, E* (landfill and unavailable railroad ROW)
Established and planned recreation areas, parks, and preserves	none
Designated scenic roads	none
Airports	none

* Routes eliminated for this reason (possibly combined with other reasons shown on this chart).

Table 1-1 (continued)
Environmental Siting Criteria

Constraint Areas (continued)	Criteria Applications - Routes Affected
Developments with underground utilities	none
Cultivated agricultural fields	none
Existing views of mountains, mesas, and undisturbed areas visible from residences and other key observation points	none
High visual quality	none
Foreground views from residences, parks, and other visually incompatible areas	A, B, C, D, E* (adjacent to existing 345kV line)
Federally classified "critical habitats" or habitats of threatened or endangered species	none
Habitats of state-listed protected, threatened or unique species, other rare or undisturbed habitats	A, B, C, D, E
Sensitive vegetation (e.g., riparian)	none
Existing or proposed National or State Register archaeological or historical properties	none
Known historic or prehistoric site areas	A (several small sites known to be present and effects could be mitigated) B* (BLM patent-restricted areas)

* Routes eliminated for this reason (possibly combined with other reasons shown on this chart).



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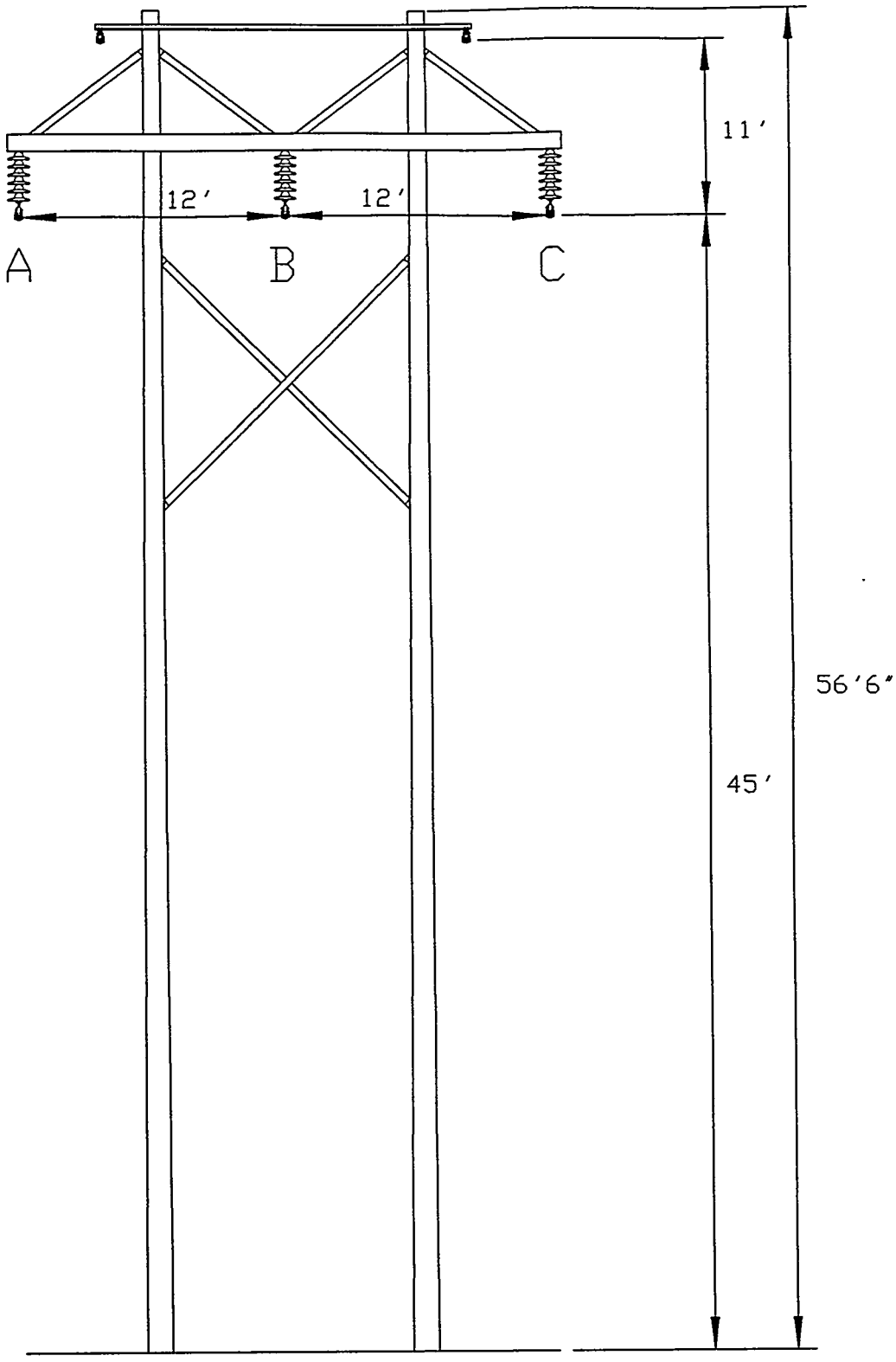
DIABLO – CFE TANGENT STRUCTURE FOR 115KV DOUBLE CIRCUIT SINGLE POLE LINE				HIGH VOLTAGE ENGINEERING The Electric Company EL PASO ELECTRIC P.O. BOX 982 EL PASO, TX 79960	1 OF 1
DRAWN*	H S DUTCHOVER	WORK ORDER NO.*	90-7-6-46820		
DESIGNED*	S OLIVAS	SCALE*	NTS		
APPROVED*	D JENSEN	DATE* 8-1-91	LAST REVISED* 10-28-91		

Typical 115kV Double-Circuit Single Pole Structure

Figure 1-1



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Date: 8/2/1991
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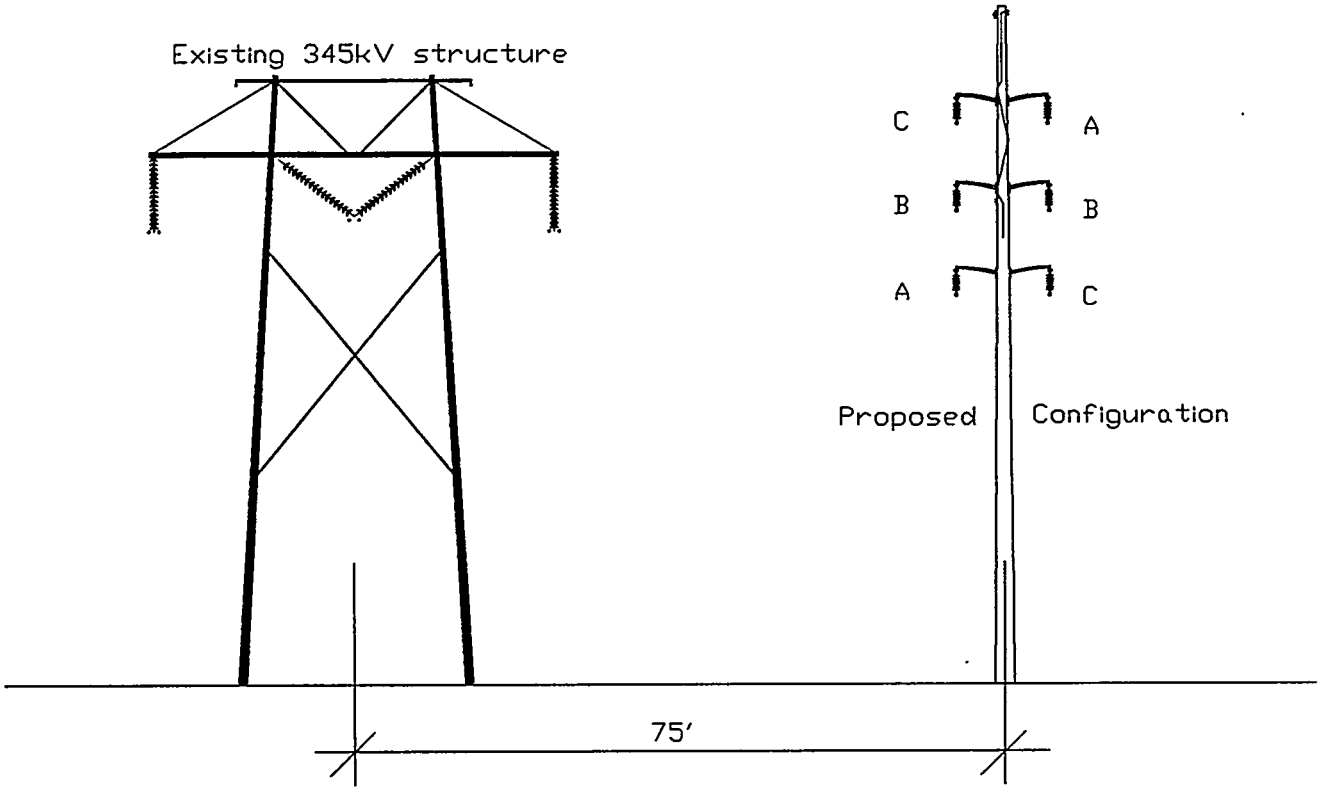
DIABLO – CFE TANGENT STRUCTURE FOR SINGLE CIRCUIT H–FRAME LINE				HIGH VOLTAGE ENGINEERING The Electric Company EL PASO ELECTRIC P.O. BOX 982 EL PASO, TX 79960	1 OF 1
DRAWN:	H S DUTCHOVER	WORK ORDER NO.:	90-7-6-46820		
DESIGNED:	S OLIVAS	SCALE:	NTS		
APPROVED:	D JENSEN	DATE: 8-1-91	LAST REVISED: 10-28-91		

Typical Single-Circuit 115kV H-Frame Structure

Figure 1-2



Source: El Paso Electric Company, 1991

Typical Corridor Arrangement with Proposed 115kV Configuration and 345kV Line

Figure 1-3

Alternative Routes Eliminated

Alternative C

This alternative also parallels the existing 345kV line out of Diablo Substation but only to the intersection with the section line of Sections 11 and 12. At this point the route diverges from the 345kV line, follows the section line to the U.S.-Mexico border, and then continues to the east for one mile along the border. This alternative was originally considered because it was believed to be a boundary between two adjacent landowners. In addition, it terminated at a point a little closer to Juarez. Therefore, EPE and CFE established a possible interconnection point at this location. Discussions with the private landowners involved revealed an impending sale/transfer of this land that would move the boundary 0.5 mile to the west and allow for expansion of the existing landfill.

Alternative C is not considered a viable alternative because it passes through a planned landfill expansion area. Nu-Mex Landfill, Inc. currently maintains facilities to the east of this proposed route and intends to expand the landfill to the west.

Alternative D

Alternative D parallels Alternative C following the 345kV line to the section line and continuing south to the border. This alternative terminates at the border and offers an additional termination point and less line construction over difficult terrain.

This alternative is not considered viable because it also passes through the planned landfill expansion area.

Alternative E

Alternative E parallels the existing 345kV line to its intersection with the railroad. At this point it continues along the railroad right-of-way for a distance of approximately one mile to a section line. The route then continues south across the railroad tracks to

the U.S.-Mexico border. This alternative terminates in the same location as Alternative C. The historic railroad grades along a substantial portion of this route would potentially be impacted by this alternative.

Alternative E is not considered viable because the right-of-way is not available from Southern Pacific Railroad and the existing landfill extends to the edge of the railroad right-of-way on the southwest side. As a result of the landfill's location, the ground is anticipated to be unstable for locating a transmission line. In addition, Alternative E ranks highest in visual sensitivity to residential viewers.

Construction Methods

Construction of the proposed line will consist of the following procedures:

- **Access** - Construction-related vehicles will use existing roads and trails where available. Any additional road construction would be performed within the right-of-way.

- **Hole Digging** - An auger truck will be used to dig holes approximately 3 feet in diameter and 12 feet deep for embedment of poles. Anchor hole depths will be about 10 feet.

- **Double Circuit, Steel Pole Assembly and Erection** - Steel poles will be hauled to the site and assembled on the ground. Laydown areas will be about 100 feet by 10 feet, and located within the right-of-way. Seventy-two inch steel davit arms with polymer suspension insulators will be attached directly to the poles prior to erection.

- **Single Circuit, Wood H-Frame Structure Assembly and Erection** - Wood poles and timbers will be hauled to the site and structures assembled on the ground. Laydown areas will be about 80 feet by 20 feet, and located within the right-of-way. Polymer suspension insulators will be attached to the structure timbers following erection.

- **Construction Site** - There will be one construction yard, located on the Strauss Ranch, for accepting material deliveries and providing pre-construction storage.

- **Cleanup** - Construction sites, material laydown areas, and access roads will be kept clear of waste material throughout the engineering, material procurement, and construction phases. Upon completion of construction, affected areas will be cleaned and restored to as near their original condition as possible.

- **Time Frame** - Construction of the new line is expected to take two to three months.

CHAPTER 2

Affected Environment

CHAPTER 2 - AFFECTED ENVIRONMENT

This chapter provides a study area overview of the existing natural, human, and cultural resources including:

- Natural Environment
  - Earth Resources (geology, soils, water)
  - Biological Resources (vegetation, wildlife, and special status species)
- Human Environment
  - Land Use
  - Visual Characteristics
  - Socioeconomics
  - Noise
- Cultural Environment

EARTH RESOURCES

Geology and Soils

The project area is located in the Rio Grande Rift of the Basin and Range physiographic province. The Basin and Range is typified by broad, gently sloping alluvial basins separated by steep, subparallel, discontinuous mountain ranges. The Rio Grande Rift Valley is a narrow block of the earth's crust that has been formed by downdropping along parallel faults due to large scale crustal extension. The valley in the project area is bounded to the east by the Franklin Mountains in Texas and to the west by the East Potrillo and West Potrillo mountains. The Potrillo Mountains are a broad volcanic field including numerous volcanic cones and lava flows. The Franklin Mountains consist primarily of limestone, dolomite, shale, sandstone, conglomerates, granite, and rhyolite (Dane and Bachman 1965). Some of the sedimentary rock units in the region include marine fossils such as mollusks, brachiopods, graptolites, linguloids, trilobites, and sponges (Flower 1972; Kennedy and others 1988).

The project area is in a portion of New Mexico designated as a Known Geothermal Resource Field. Although lead, fluorite, barite, and silver are found in the Franklin

Mountains and lead, copper, and silver are found in the Potrillo Mountains, only sand and gravel deposits are known mineral resources in the project area (North and McLemore 1986; Summers 1979). Drainage of the area is by numerous intermittent washes into the Rio Grande.

The soils in the project area have been mapped by the Soil Conservation Service (SCS) (SCS 1980) and consist primarily of deep, somewhat excessively drained soils that formed in alluvium modified by wind on fans, terraces, and ridges along the margins of the Rio Grande Valley. The soils are typically loamy sands with some areas of loamy fine sands and gravelly to very gravelly sandy loams. These soils are generally calcareous. All of the soil series mapped in the area have a high or very high wind erosion hazard. This is due to the high sand content of most of the soils. The hazard of water erosion varies from slight to moderate.

Water Resources

Drainage in the study area is generally to the north and northeast with numerous washes into the Rio Grande. The area is arid. The average annual precipitation ranges from seven to nine inches. Fall, winter, and spring are the dry seasons; summer is the rainy season when moisture-laden air from the Gulf of Mexico enters southern New Mexico. Brief and heavy showers are typical of these summer storms. Dust storms are frequent in the spring when the winds are strong and soils are dry. Snowfall is generally light in the area, ranging from 2.5 to 5 inches (SCS 1980).

The Diablo Substation is approximately 1,600 feet away from the Rio Grande. The substation is at an elevation of approximately 3,800 feet (msl), while the 100-year flood water surface elevation of the Rio Grande in the vicinity of the project is at an elevation of 3,730 (msl) in the area (U.S. Federal Emergency Management Agency 1978). Therefore, neither the Diablo Substation nor Alternative B is located within the 100-year floodplain of the Rio Grande.

BIOLOGICAL RESOURCES

Vegetation

The project area is characterized by Chihuahuan desertscrub and semi-desert grassland. Species commonly found in these two community types are similar and occasionally occur as discrete units. Chihuahuan desertscrub is often dominated by creosotebush (Larrea tridentata), with some scrubby mesquite (Prosopsis grandulosa) and whitethorn acacia (Acacia constricta) present. Mesquite, four-winged saltbush (Atriplex canescens), and soaptree yucca (Yucca elata) characterize semi-arid grasslands. Primary grasses in this type include tobosa (Hilaria mutica), black grama (Bouteloua eriopoda), alkali sacaton (Sporobolus airoides), and sand dropseed (S. cryptandrus). Other plants found in these community types are listed in Tables Bio-1 and Bio-2 in Appendix A. The plants are generally low in height and widely spaced.

The proposed route and Alternative B cross both types of communities. The vegetation from the Diablo Substation southwest to the railroad tracks is highly disturbed, being characterized by creosotebush and curly dock (Rumex crispis), an alien species indicative of disturbed areas. The area from Diablo Substation to the railroad tracks is highly disturbed with numerous roads and trails crossing through it. After crossing the railroad tracks, as these routes continue to parallel the existing 345kV line on the northwest side, they cross creosotebush communities and a sand dune. The sand dunes in the area are characterized by low-growing shrubs and grasses, with some mesquite and creosotebush. The downward slope of the sand dune is stabilized by creosote, an occasional scrubby mesquite, and ephedra (Ephedra spp.). Ocotillo (Fouqueria splendens) and dalea (Dalea formosa) are locally present, in addition to creosote at the top of the sand dune. Prior to private ownership, this area was a popular spot for recreational vehicle use.

There is little or no slope from this point to the border. This area is characterized by sandy soils supporting semi-desert grassland communities. Hummocks of either mesquite or soaptree yucca/four-winged saltbush are found throughout, with open sandy areas in between. Alkali sacaton, tobosa, peppergrass (Lepidium spp.), and verbena, in addition to other grasses, are found within these sandy areas or intermingled in the hummocks. The hummocks are higher and more deeply divided at the north end. Cactus, although

generally occurring within the community types identified here, were notably absent from the area.

Wildlife

Four lizards, two mourning doves, and two desert cottontails were observed during a site visit (April 10, 1991). Approximately 6 species of amphibians, 45 species of reptiles, 46 mammalian species, and 53 avian species, 26 of which are permanent residents, have the potential to occur along or near the proposed route. Appendix A, Tables Bio-3 through Bio-5, contain a list of these species. The potential occurrence of these species has been determined based on their known habitat requirements and distributions.

Raptors in the area are those associated with Chihuahuan grassland and desertscrub communities including northern harrier, Swainson's hawk, red-tailed hawk, ferruginous hawk, rough-legged hawk, golden eagle, American kestrel, and prairie falcon (Johnsgard 1990). Most of these species are widely distributed within diverse habitats. They utilize the area primarily in winter and forage on small mammals and lagomorphs. Several owl species, including burrowing owl, great horned owl, and short-eared owl, potentially forage in the area, although nesting sites appear limited.

Special Status Species

Agency personnel from the U.S. Fish and Wildlife Service (USFWS), the Bureau of Land Management (BLM), the New Mexico Department of Game and Fish, and the State of New Mexico - Energy, Minerals, and Natural Resources Department were asked to provide information on special status species known or likely to occur in the project area. Specific survey information was not available; however, based on existing distribution and known habitat requirements, five plant species of concern were identified (USFWS, Letter, May 10, 1991; State of New Mexico, Letter, April 15, 1991).

Applicable code definitions associated with this project are as follows.

Federal

Category 1 Candidate Species (C1): Status review taxa for which the USFWS currently has on file substantial information on biological vulnerability and threat(s) to support the appropriateness of proposing to list the taxa as an endangered or threatened species.

Category 2 Candidate Species (C2): Status review species for which information now in possession of the USFWS indicate that proposing to list the taxa as an endangered or threatened species is possibly appropriate but for which substantial data on biological vulnerability or threat(s) are not currently known or on file to support proposed rules.

State

Endangered: A plant species must meet one of the following criteria:

- The taxon is listed as threatened or endangered under the provisions of the Federal Endangered Species Act (16 U.S.C. sections 1531 et seq.) or is considered proposed under the tenets of the act.

- The taxon is rare across its entire range and of such limited distribution and population size that unregulated collection could adversely impact it and jeopardize its survival in New Mexico.

- The taxon may be widespread in its distribution and may occur in adjacent states or Mexico, but its numbers are being significantly reduced to such a degree that within the foreseeable future the survival of this species in New Mexico is jeopardized.

Plants

Sand Prickly Pear (Opuntia arenaria), Family: Cactaceae, is known to occur in Doña Ana County, New Mexico. It is found on or among sandy dunes, or on sandy floodplains in arroyos at 3,600-foot elevation. Although no individuals were found on or near the

proposed route, there is the potential for it to occur within the area given the habitat requirements. It is a candidate species for federal protection, listed as a C2 species (Federal Register, 50 CFR Part 17, February 21, 1990), as well as listed as state endangered (New Mexico Native Plants Protection Advisory Committee 1984).

Two additional species that are federally listed (C2) and state endangered are night-blooming cereus (Cereus greggii) and five-leaf scurfpea (Pediomelum pentaphyllum). Scheer's pincushion cactus (Coryphantha scheeri) is a federally listed (C1) species and state endangered known from Doña Ana County. The dune unicorn plant (Proboscidea sabulosa) is a state-listed endangered species. Although there were no specific locations of any of these species found within the study area, they are known to occur in sandy areas of southern New Mexico (Energy, Minerals, and Natural Resources Department, personal communication April 15, 1991). No cacti were encountered on the one day field survey (Dames & Moore, April 10, 1991).

Wildlife

No threatened or endangered wildlife species are known to exist within the project area. According to the USFWS, the black-footed ferret may be found in the area (USFWS, Letter, May 10, 1991). The New Mexico Game and Fish Department has determined that the black-footed ferret is extinct in the State of New Mexico. Additionally, there are no historic or recent records of black-tailed prairie dogs in the area, which are necessary to support black-footed ferrets (Hubbard and Schmitt 1984).

LAND USE

Existing Land Use

The study area for the proposed project is principally located adjacent to the city of Sunland Park in Doña Ana County, New Mexico. Sunland Park is located five miles northwest of El Paso, Texas on the Rio Grande River. The primary transportation corridors that traverse the study area include State Route 273 and the Southern Pacific Railroad. In addition, there are secondary roads associated with residential subdivisions

and the landfill operation located in the study area. The only major utility facilities include the Diablo Substation located in the northern section of the study area and the existing 345kV transmission line that proceeds southwest from the substation crossing the Southern Pacific Railroad, entering Section 11 and then turning in a westerly direction towards Deming, New Mexico.

Existing land uses in the study area include residential, commercial, industrial, public, agriculture, and open space/vacant lands as illustrated in Figure 2-1. The dominant land use is open space/vacant lands found throughout the study area. The Nu-Mex Landfill located south of the Southern Pacific Railroad and in the central portion of the study area is the only industrial land use located within the project area. Residential subdivisions of Sunland Park found in the study area include Riverside, Sunland Park, and Meadow Vista. Commercial establishments are limited to a restaurant and grocery stores associated with the above-mentioned subdivisions. Public land uses include two schools, the fire department, and a wastewater treatment plant. The remaining land use is an agricultural ranch, located in the southeast corner of the study area.

Future Land Use

The two primary development trends associated with future land use in the study area include residential and industrial developments. Residential development is anticipated to continue to expand south from State Highway 273 to the Southern Pacific Railroad. Additional development is occurring at the Riverside Subdivision north of State Highway 273. Residential development in Sunland Park and Santa Teresa is expected to continue to expand at an increasing rate with the anticipation of the new ports of entry located at the U.S.-Mexico border at Sunland Park and Santa Teresa. The current U.S.-Mexico free trade agreement will play a major role in future development within the region. The industrial land development anticipated is the expansion of the Nu-Mex Landfill facilities. In the Spring of 1991 Nu-Mex Landfill, Inc. acquired approximately 500 acres of land located in the western portion of the study area in Sections 11 and 14. The land was purchased from Charles Crowder, principal developer of the Santa Teresa area and new port-of-entry located 2.5 miles to the west of the project area. The expanded landfill

will incorporate a secondary landfill and sludge fill area. Figure 2-2 illustrates anticipated future land uses.

Two new transportation corridors are planned in response to the expected increased transportation needs from the new ports of entry. The future road to Columbus, New Mexico (50 miles west of the project area) will proceed in a southwest direction from Interstate 10, crossing State Highway 273, entering the study area, paralleling the existing 345kV transmission line, and eventually turning west to the Santa Teresa port-of-entry. A secondary transportation route is proposed in an east/west direction across the study area. However, no definite corridors have been defined or approved as of this date.

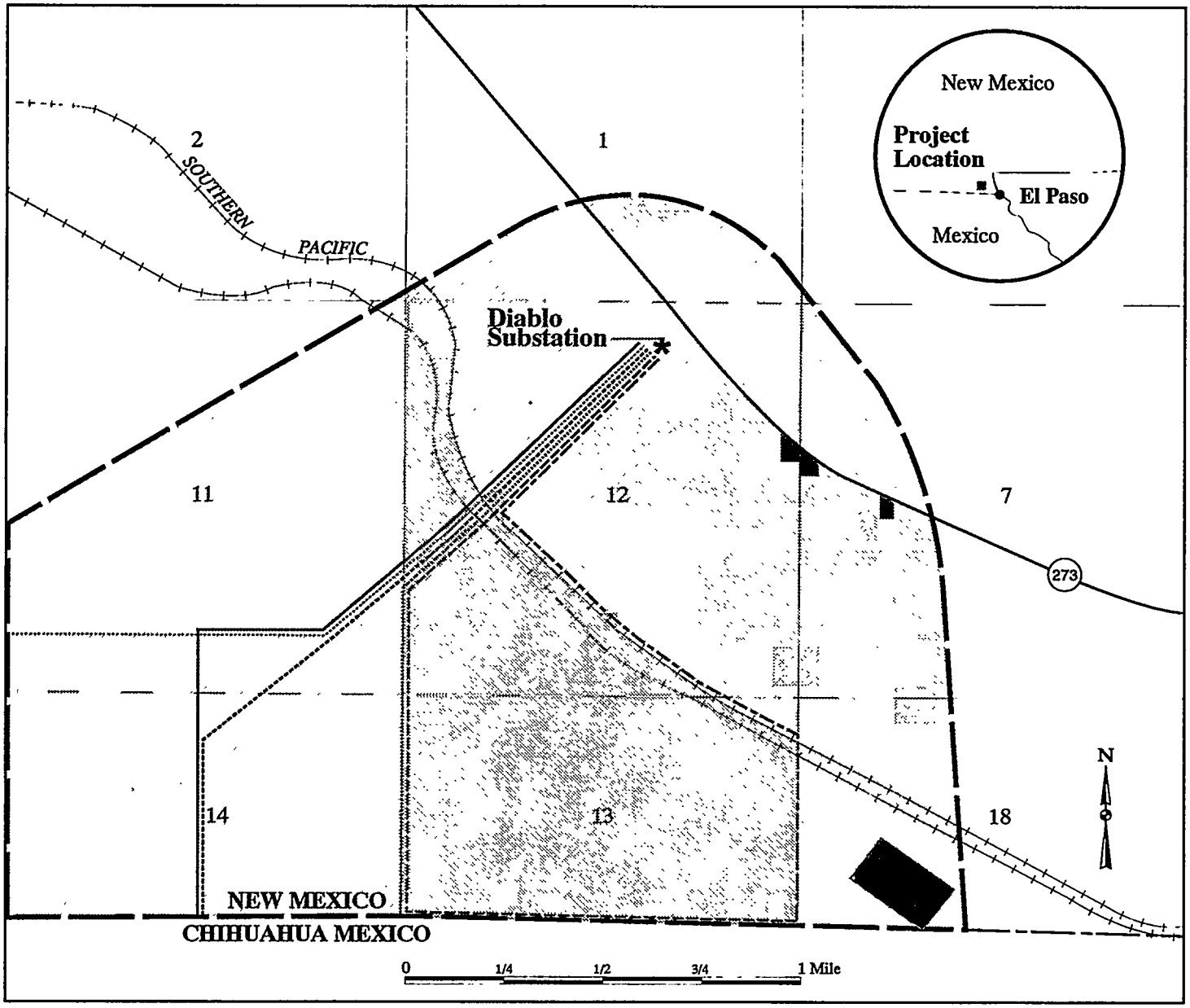
VISUAL RESOURCES

A visual resources study was conducted to address the importance of the inherent scenic values of the landscape, the public values of viewing the landscape, and the public's sensitivity to visual intrusions that could result from the proposed transmission line. The existing visual characteristics of the study area were inventoried for this environmental assessment by reviewing the landscape setting, scenic quality, the viewing conditions, viewer sensitivity, and the physical contrast (of the proposed transmission line with existing features). Together these data form the basis for determining visual impacts.

Landscape Setting

The study area lies between the Franklin and Juarez mountains in the Rio Grande Valley. The valley is dissected by the Rio Grande River with numerous drainages descending to the river. Landforms in the study area consist of rolling hills with dispersed arroyos. The arroyos were formed by drainages dissecting the alluvial deposit landforms. Vegetation consists of yucca, sage, and greasewood interspersed with grasslands. The vegetation pattern is nonuniform in appearance with moderate density, and mute grey/green tones. The study area has numerous areas of disturbance associated with the landfill operation. These disturbed land surfaces break up the uniform vegetation pattern dominating the visual appearance of the landscape setting.

Figure 2-1



SOURCE: City of Sunland Park, Dona Ana County, Nu-Mex Landfill

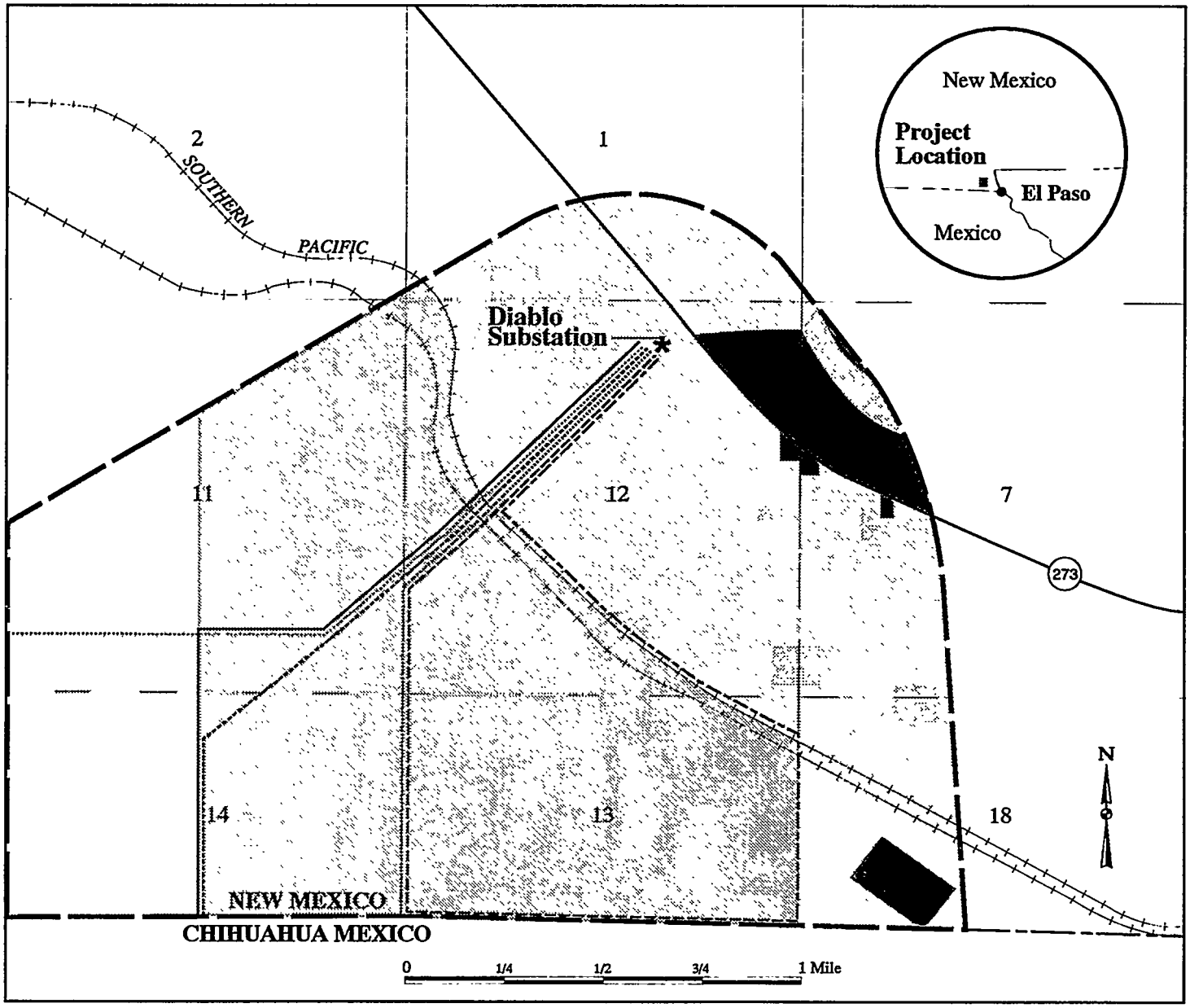
LEGEND

- Residential
- Commercial
- Industrial
- Public
- Agriculture
- Open Space/Vacant

- Alternative A (preferred route)
- Alternative B
- Alternative C
- Alternative D
- Alternative E
- Existing 345kV
- Study Area Boundary

EXISTING LAND USE
Diablo Substation to U.S. - Mexico Border
115kV Transmission Line Project

Figure 2-2



SOURCE: City of Sunland Park, Dona Ana County, Congie Engineering (Santa Teresa), Nu-Mex Landfill

LEGEND

- Residential
- Commercial
- Industrial
- Public
- Agriculture
- Open Space/Vacant
- Alternative A (preferred route)
- Alternative B
- Alternative C
- Alternative D
- Alternative E
- Existing 345kV
- Study Area Boundary

FUTURE LAND USE
Diablo Substation to U.S. - Mexico Border
115kV Transmission Line Project

Houses in the residential subdivisions located in the study area are diverse in appearance. Roads are unpaved in the residential neighborhoods. The two relatively new schools have modern architectural design. Industrial uses include the railroad track located southwest of the residential subdivision and the existing landfill and 345kV line. The landscape setting for the study area as a whole provides minimal visual interest, due to the large areas of disturbed land found throughout the rolling landscape, coupled with the residential subdivisions and 345kV line.

Viewing Conditions/Viewer Sensitivity

Viewpoints were inventoried for residences, public facilities, and major transportation corridors within the study area. Residences located in Sunland Park and Meadow Vista subdivisions would have the greatest visibility of the proposed project due to the close proximity of the residences to the proposed line. Other primary viewers include views from two schools and New Mexico State Highway 273 within the study area. Secondary views from Interstate 10 were inventoried and documented. The residential and school viewpoints were rated as the highest sensitivity level due to the long duration of view the viewers would have of the proposed project.

Characteristics reviewed in inventorying viewing conditions and viewer sensitivity include:

- **Viewing Conditions/View Point** - The specific location or points from which potential viewers may see the project.

- **Viewer Sensitivity** - A rating of low, moderate, or high selected on the basis of the number and frequency of viewers, the duration of the view, and the relative importance of the view to the viewer.

- **Proximity** - A measure of distance from a viewing point
  - foreground -- 0 to $\frac{1}{4}$ mile
  - middleground -- $\frac{1}{4}$ to 2 miles
  - background -- 2 to 5 miles (and beyond)

- **Visibility** - A description of how the proposed project is viewed in the landscape setting.

SOCIOECONOMICS

EPE's proposed project would be located in the south-central portion of Doña Ana County in southern New Mexico in the vicinity of Sunland Park. El Paso, Texas is approximately five miles to the east and Santa Teresa within five miles to the west. Las Cruces, the location of the county seat, is 40 miles north of the proposed project. As part of this socioeconomic analysis, population projections obtained from Doña Ana County were reviewed. Doña Ana County is currently in the process of updating its socioeconomic data, including forecasts. Growth associated with the new ports-of-entry will substantially affect southern New Mexico due to the anticipated increase in industrial operations along the border. Population profiles for the county as well as for nearby communities are presented in Table 2-1 and Table 2-2.

TABLE 2-1
DOÑA ANA COUNTY POPULATION
PAST AND PROJECTED

1980	1990	2000	2010	2020
96,340	135,510	184,179	226,175	260,929

Source: Doña Ana County Planning Department

TABLE 2-2
POPULATION GROWTH IN NEARBY COMMUNITIES

	1970	1980	1990
Doña Ana County	69,773	96,340	135,510
City of Las Cruces	37,857	45,086	62,126
Santa Teresa	-	157	1,109
Sunland Park	-	5,163	8,179

Source: Doña Ana County Planning Department

Doña Ana County is the largest agricultural area in New Mexico. Agricultural products include dairy, chile, pecans, cotton, hay, grain sorghum, and a variety of vegetables. As a result of the new ports-of-entry near the study area, economic development is expected to expand in industries developing along the border.

The City of Sunland Park was incorporated in 1983 and consists of five major subdivisions: Anapra, Meadow Vista, Sunland Park, Riverside, and Los Ranchos del Rio. The original, major employer of the community is the Sunland Park Racetrack for horse racing. In the last seven years, the city increased in population by 38 percent and is continuing to grow. A planned port-of-entry is located in the southeastern portion of the city. By the year 2009, the population is expected to be 18,400. To accommodate the current growth, many basic city services have been provided including paving streets and adding gutters; installing an $8 million wastewater treatment facility (using federal and state funding); and continued planning for land use, water, wastewater, and drainage.

Sunland Park's tax base is derived primarily from the horse racing facility, EPE's power generation facility, and the Nu-Mex Landfill (for commercial waste disposal). The city's population is characterized as predominantly low income.

Santa Teresa is a developing community that encompasses approximately 28,500 acres with 9 miles bordering Mexico. It is situated around a new port-of-entry with plans for growth focused on this exchange. The population in 1990 was 1,109. Development plans include twin-plant industries and residential, commercial, and recreational facilities. By 1992, it is estimated that 1,500 new jobs will be created in the Santa Teresa area.

CULTURAL RESOURCES

Cultural resources are historic and traditional cultural properties that reflect our heritage. Federal regulators charged with implementing the Nation's historic preservation program have defined these resources as prehistoric or historic sites, buildings, structures, districts, or objects included in, or eligible for inclusion in, the National Register of Historic Places (National Register), as well as artifacts, records, and remains related to such properties (National Historic Preservation Act §301[5]). Traditional cultural properties are those that may be eligible for inclusion in the National Register

because of their association with the cultural practices or beliefs of a living community, that are rooted in that community's history, and are important in maintaining the cultural identity of the community (National Register Bulletin 30).

The National Environmental Policy Act (§101[b][4]) establishes a federal policy of preserving not only the natural aspects, but also the historic and cultural aspects of our national heritage when undertakings regulated by federal agencies are planned. Implementing regulations (40 CFR Part 1502.16[g]) issued by the Council on Environmental Quality require that the consequences of federal undertakings on historic and cultural resources be analyzed. Consultation between DOE and the New Mexico State Historic Preservation Office (SHPO) has been initiated with reference to the selected alternative and efforts to identify traditional cultural properties also are being undertaken.

There are no places or objects listed on, or officially proposed for listing on, the State or National Registers known to be on the preferred transmission line route. In March of 1991, however, Batcho & Kauffman Associates conducted an archaeological survey of Alternative A (Stuart 1991). They encountered three, roughly parallel, historic railroad grades, five prehistoric archaeological sites, and nine isolated manifestations. The railroad grades include the following: the El Paso SW railroad grade, which has been abandoned and is used as a road today; the Southern Pacific railroad grade which is still in use today; and one alignment that is an abandoned grade. All five of the prehistoric sites appear to be the remains of short-term campsites. The isolated manifestations range from single artifacts to scatters of several artifacts and include chipped lithics, ground stone, ceramics, and one sun-colored amethyst glass fragment near the railroad grades.

Four of the five prehistoric campsites noted above (Sites BK310, 311, 313 and 314) have been determined eligible for National Register listing for their information content (criterion "d"); and Site BK312 has been determined potentially eligible under criterion "d" in consultation between DOE and the New Mexico SHPO These sites all are described as short-term campsites probably used for the procurement and processing of wild plant and animal resources. These are quite similar sites, at least four of which appear to be Formative in age. All contain chipped lithics, ground stone and burned caliche; and four also exhibit brownware ceramics. They vary in size from only 600 square meters to close to 30,000 square meters. Of the four dated sites, three are attributable simply to the

Jornada Mogollon (ca. AD 200-1450) and one may be attributed to the El Paso Phase of the Jornada Mogollon (ca. AD 1200-1450).

Three 40-acre parcels designated as "patent restricted" are located just to the south and east of the proposed route in Sections 11 and 14, Township 29 South, Range 3 East and are crossed by Alternative B. These were recorded during an archaeological survey for the Navajo-Hopi Land Exchange project. This survey adopted a "non-site" approach to archaeological landscapes (Camilli and others 1988), and these parcels were transferred to private ownership, but with patent restrictions that state that effects to significant cultural resources within them must be mitigated prior to their use. When a "non-site" approach is adopted, artifacts and other archaeological manifestations are mapped as they are found and recorded, but site boundaries are not delineated. The 40-acre parcels contain areas that exhibit relatively high quantities of surface artifacts and features that ordinarily would have been defined as archaeological sites. While it is close, Alternative A does not actually transect any of these parcels.

CHAPTER 3

Environmental Consequences

CHAPTER 3 - ENVIRONMENTAL CONSEQUENCES

This chapter contains information regarding the potential impacts of the proposed action and Alternative B. Impacts to natural, human, and cultural resources were considered. These environmental impacts are defined as modifications to the existing environment that are brought about by construction, operation, maintenance or abandonment of the transmission line. Impacts can be beneficial or adverse and either short term or long term. Short-term impacts are defined as temporary and typically occurring as a result of construction. Long-term impacts are defined as typically remaining after construction is completed and resulting from continued operation, maintenance, and decommissioning of the project. Direct impacts are those that are clearly attributable to construction and operation of the project, and indirect impacts are reasonably foreseeable consequences of the project, usually occurring much later in time.

EPE has committed to several mitigation measures to reduce or avoid adverse potential impacts. Mitigation measures and residual impacts (potential impacts remaining after mitigation is applied) are described in the discussion of impacts for the individual resources, where appropriate.

Environmental consequences from the proposed power line are the residual impacts remaining after mitigating measures have been applied to initial (unmitigated) impacts. The process of determining environmental consequences involved assessing impacts based on a comparison of the proposed project and the pre-project environment, and mitigation measures that would effectively reduce or eliminate impacts. The impact assessment and mitigation plan is briefly described below.

IMPACT ASSESSMENT AND MITIGATION PLAN

The initial step in the impact assessment and mitigation plan was to define the proposed action, which collectively involved three interrelated components: (1) the project description, (2) access requirements, and (3) mitigation committed to by EPE.

The first component described EPE's proposed project design features, construction techniques, and operational characteristics as described in Chapter 1. The second component consisted of assessing where and to what level of access would be required to construct and maintain the proposed project facilities. The third component was mitigation. Mitigation consists of measures or techniques to which EPE made a commitment to as part of its proposed project plan. This mitigation was assumed in assessing impacts resulting from the proposed action. Mitigation measures are listed in Table 3-1.

The proposed action was thus defined as including the project description and mitigation. The next set of data used in the impact assessment/mitigation planning process was the inventory of the no-action or pre-project environmental setting as described in Chapter 2. Collectively, these data define soils, land uses, visual, biological, cultural, and socioeconomic environments potentially affected by the proposed action.

Types of impacts were first identified by considering what effects project activities could have on the pre-project environment of each alternative route. Following identification of types of impacts, potential impact levels were assessed. Mitigation was employed where effective or warranted in reducing or eliminating specific impacts. In some cases where impacts were low or minimal, or mitigation would not be effective, no mitigation is anticipated to be necessary.

DESCRIPTION OF IMPACTS

The following section on environmental consequences describes impacts that could be expected for each resource as described in Chapter 2. For the purposes of this document, environmental impact has been defined as a modification expected to occur in the status of the environment as it exists presently, or in the future, from the proposed action. The following sections emphasize impact types by resource. Impacts were generally defined as high, moderate, low, or not identifiable as described below.

TABLE 3-1
MITIGATION MEASURES

- Design and construct transmission line to prevent electrocution of raptors including adequate separation of energized hardware or insulation of wires where sufficient separation can be attained. Avoid steel crossarm braces.
- Use non-specular conductors and core-ten steel poles for the entire distance of the line to reduce reflectivity of the structures.
- Use local workers for construction of the line.
- Avoid four of the prehistoric campsites on the proposed route. If the fifth site (prehistoric camp site at the angle structure location) is determined to be eligible for the National Register, EPE would ensure that preparation of a research design and subsequent data recovery, analysis, and report preparation occurs. A qualified archaeologist will be present during construction to ensure that cultural resources determined to be eligible for National Register listing are avoided and thus protected in place. Avoidance measures would include re-routing access/maintenance roads around site boundaries, locating pole structures outside of site areas, and hand-carrying cables over sites. DOE will undertake Native American and other contacts to determine whether traditional cultural properties may be present and of concern to local communities.
- Limit areas of disturbance to right-of-way corridor.
- Compact soils in disturbed areas to 90 percent of original density to reduce soil erosion and encourage natural revegetation.
- Where the soils in the area are gravelly, to reduce wind erosion hazards, replace gravel on the surface of areas disturbed.

High Impact - A high level of impact would result if the construction, operation, maintenance or abandonment of the proposed project would potentially cause a significant or substantial adverse change or stress to an environmental resource(s).

Moderate Impact - A moderate impact would result if the construction, operation, maintenance or abandonment of the proposed project would potentially cause some adverse change or stress (ranging between significant and insignificant) to an environmental resource(s).

Low Impact - A low impact would result if the construction, operation, maintenance or abandonment of the proposed project would potentially cause an insignificant or small adverse change or stress to an environmental resource(s).

No Identifiable Impact - No identifiable impact would be indicated where no measurable impact would occur to the specific resource(s) under investigation.

In some cases where impacts were low, or mitigation would not be effective, no mitigation was recommended. Where mitigation was warranted and would be effective, mitigation recommendations were made by the resource specialists to reduce or eliminate specific impacts.

EARTH RESOURCES

Geology and Soils

The proposed route and Alternative B cross soils with very high wind erosion hazards that have been previously disturbed. These soils when disturbed by construction activities (including removal of vegetation) are susceptible to increases in wind erosion. The erosion hazard potential of a soil is the result of several factors including slope, climate, vegetation, and the physical/chemical characteristics of the soil. The SCS classifies soils with erosion hazards of slight, moderate, high, very high, and severe. With adherence to mitigative measures for soil erosion as shown in Table 3-1, an increase in soil loss by wind is expected to be short term and minimal. The proposed mitigation measures include compaction of soil to 90 percent of original density (leaving a minimal amount of loose soil to encourage natural revegetation), replacement of gravel on the surface of originally gravelly soils areas (to reduce wind erosion), and limits to the areal disturbance of construction.

The revegetation guidelines should consist of native plants and be based on BLM or SCS recommendations. If necessary, revegetation also should be planned seasonally due to the aridity of the area. With adherence to the mitigation guidelines, significant increases in wind erosion should be limited to short term following construction, on the order of one to three years depending on the success of the revegetation program.

EPE would use the existing construction road for the 1.56 miles of proposed line parallel to the existing 345kV line. In this area, the only grading that would occur would be immediately adjacent to some of the structures where small sand dunes would need to be partially leveled to allow for the assembly of the structures. For the area of the proposed line that departs from the existing line, approximately 0.78 mile in length, a new construction road would be required that would be a maximum of 0.75 mile in length and approximately 14 feet wide. Fill would not be required for construction of the proposed facilities.

Water Resources

The proposed route and Alternative B cross several intermittent washes that drain the area to the Rio Grande. No significant waterways are crossed by either route. These routes are not located in a floodplain and no federally designated wetlands would be impacted.

Precipitation is the principal source of water runoff in the project area and is absorbed by soils at the site. The project would not impact water runoff.

Because the Diablo Substation is at an elevation of 3,800 feet (msl) while the Rio Grande is at an elevation of 3,730 feet (msl) and below that of the substation, and approximately 1,600 feet horizontally from the substation (a sufficient distance away), flooding is not expected to affect the project. Both routes cross numerous, intermittent washes. Neither of the routes cross the Rio Grande or any other significant waterways.

BIOLOGICAL RESOURCES

The impacts of the proposed action to biological resources in the area would primarily occur during construction of the transmission line. Construction activities from the initial hole digging by auger trucks and the laydown areas for poles would likely disturb vegetation growing in those locations. However, the use of existing roads for access for the majority of the route would result in low potential impacts to existing vegetation.

Vegetation

The proposed action would cause the loss of vegetation in some of the lesser disturbed areas, particularly the section running north and south, just west of the quarter section line. The vegetation, as described in Chapter 2, consists primarily of soaptree yucca, four-winged saltbush, and mesquite hummocks divided by open sandy areas. Although a major source of disturbance could potentially be the construction of new access roads, there is an existing road system that would reduce the need for extensive new construction. The roads are currently used by the landowner and his employees, as well as by EPE employees.

Roads used for maintenance of the existing 345kV line will be used where the proposed line will parallel the existing line. South of the Diablo Substation, the vegetation is primarily creosotebush, with the area being substantially disturbed northeast of the railroad tracks. Vegetation along the southeastern slope of the sand dunes area is important for stabilization, but should not be greatly impacted, except where towers are placed.

The impacts to the vegetation along the proposed route or Alternative B will be short term and retrievable, except in those areas where the towers are placed. Revegetation, where appropriate, would reduce potential impacts to vegetation.

Wildlife

Disturbance of wildlife along the proposed route or Alternative B would occur primarily during the actual construction of the line, with minimal irreversible loss of habitat. There would likely be direct mortality to small mammals, amphibians, and reptiles as a result of encounters with increased vehicular traffic during construction. Some loss of burrows and nests would be expected. It is likely that some bird species that use the riparian area along the Rio Grande or the Rio Conchos may migrate over this area, although no specific concerns have been identified. Residual impacts, those remaining following completion of the project, would be minimal. More mobile species that may be temporarily displaced during construction would likely return to the area following completion of construction activities.

The transmission line would be designed and constructed to prevent the electrocution of raptors. Design would include adequate separation of energized hardware or insulation of wires where sufficient separation can be attained. Steel crossarm braces would be avoided. To minimize the possibility of raptor electrocutions, phase to phase spacing must be a minimum of 60 inches. Both the single pole double-circuit tubular steel structures and the wood pole H-frame structures that will be used for this project have phase to phase spacing of 12 feet or 144 inches which more than doubles the minimum required phase spacing (see Figures 1-1 and 1-2 following page 1-8). A potential positive impact of the proposed project would be to increase perching and/or nesting sites for raptors. In areas characterized by large expanses of homogeneous habitats, such as within the study area, power lines may provide the diversity necessary to increase nesting opportunities and enhance foraging for raptors.

Special Status Species

Plants

There are five special status species with the potential to occur in the study area. Scheer's pincushion cactus is a federal candidate C1 species; sand prickly pear, night-blooming cereus, and five-leaf scurfpea are federal candidate C2 species; and the dune unicorn plant is a state-listed endangered species. Sand prickly pear has the most potential to occur. Exhaustive surveys for each of these species have not been undertaken. However, no known locations were identified by the various agencies and none were observed during a field visit by a Dames & Moore biologist in April 1991.

Wildlife

Although some concern was expressed over the possible existence of black-footed ferrets, the evidence from historic data and the absence of large prairie dog towns make it highly improbable for this species to be present.

The impacts to biological resources would be similar for the proposed alternative and Alternative B. They both parallel the existing 345kV line from Diablo Substation to the

southwest, traversing highly disturbed areas and sand dunes. The north-south section is also identical, crossing an area characterized by scrubby mesquite, soaptree yucca, and four-winged saltbush hummocks. Alternative B would impact slightly less habitat along the center portion; however, road access to that area is not as developed as for the proposed alternative, which continues to parallel the existing 345kV line before turning south.

Neither of the alternatives would adversely impact known populations of special status plants or habitat for sensitive wildlife species.

LAND USE

Impacts to land uses typically result from direct physical interference with existing and future land uses. Resource sensitivity, or the functional, social and economic aspects of specific land use types, was considered in determining the level of impact. In addition, impact duration was considered, i.e., short-term, construction-related effects versus long-term operations effects.

Adverse impacts to land uses are defined as wherever construction, operation and/or maintenance of the proposed project would:

- displace, alter, or otherwise physically affect any existing, developing, or planned residential, commercial or industrial use or activity

- displace, alter, or otherwise physically affect any existing agricultural use or activity

- alter or otherwise physically affect any established, designated or planned recreational, preservation, educational, or scientific facility, use area or activity

For a particular land use feature or area of affected resource, only the impact occurring within the 100-foot right-of-way was assessed.

Land use impacts are expected to be minimal for the proposed route. The location of the proposed line on the western side of the existing 345kV line avoids impacts to the existing residential development in that vicinity. For the remainder of the preferred alternative, EPE anticipates obtaining a right-of-way from Nu-Mex Landfill, Inc. and from Charles Crowder thereby eliminating these potential land use conflicts. A road used by vehicles transporting trash to the landfill follows a portion of this route and may need to be realigned where it intersects with the new line. Potential future land use impacts are not anticipated with the proposed route, given the proximity of the line to the existing 345kV line, therefore making use of an established utility corridor. In addition, no specific plans were identified for this area.

There is a potential for impacts to future land use with Alternative B. It is anticipated that Alternative B would not impact current landfill operations, although plans to expand the landfill could eventually conflict with this alternative.

VISUAL RESOURCES

Determination of potential visual impacts was based on assessing the following:

- the quality of the scenic resource
- the viewing conditions, specifically viewer sensitivity to construction of a 115kV transmission line adjacent to an existing 345kV line where it is near residences
- the degree of visibility the project would have from each sensitive viewpoint
- the physical and structural contrast of the proposed project (the inherent ability of the existing landscape to absorb visual change, and the subsequent potential impacts on scenic quality and the viewer)

Visual impacts to the scenic quality of the landscape setting and the viewer are expected to be low for the proposed route or Alternative B. Scenic quality is minimal due to the lack of landscape and vegetation diversity, coupled with the existing residential development and the disturbed landscape of the landfill that occurs in the project area. The

potential physical contrast resulting from the proposed route or Alternative B is low and should not diminish the scenic quality of the landscape setting. Different structure types were considered from both an environmental and engineering standpoint to determine which structure was most desirable. From this analysis, it was determined that all of the structure alternatives would have a low impact on the viewer including the proposed single steel pole and H-frame structures. Visual impacts to the residential viewer also are anticipated to be low. Through the visual analysis it was determined that by placing the proposed line on the western side of the existing transmission line visual impacts to viewers would be minimized.

Scenic Quality

Visual impacts to the scenic quality of the landscape setting in the study area are expected to be low. As previously described, the scenic quality of the landscape setting is nondistinct because of lack of diversity in landform, vegetation, and color, coupled with the large areas of disturbance associated with the landfill operation. The low physical contrast from the proposed project would not diminish the scenic quality of the existing landscape setting; therefore, impacts are expected to be minimal.

Viewers

The primary viewers of the proposed transmission line are the residents in the Sunland Park and Meadow Vista subdivisions. The proposed route and Alternative B parallel the existing 345kV transmission line. Subsequently, the residential viewers would have foreground views (0 to .25 mile) of the proposed 115kV transmission line. However, impacts to the residential viewers are expected to be low given the proposed line would be adjacent to the existing 345kV transmission line and on the opposite side, away from the residents. Secondary viewers that were given consideration in the inventory were the State Highway 273 and Riverside Subdivision viewers. The visible portion of the existing 345kV transmission line, with or without the proposed route and Alternative B, occurs primarily in the middleground views (.25 to 2 miles). The impact to the viewer in this situation is low due to the rolling landscape in which the line(s) in the corridor are only visible for a short duration of time to the viewer. Distant or background views (2 to 5

miles) from Interstate 10 were inventoried, although it was determined that the distant views were dominated by the landfill operations, with minimal or no views of the existing 345kV transmission line.

Visual impacts to the residential foreground viewers in the study area are anticipated to be low. An evaluation of the location, physical contrast, and committed mitigation measures were analyzed to determine which proposed 115kV double-circuit transmission line structure alternative would have the least amount of visual impact on the viewer.

The location analysis looked at placement of the proposed project on either side of the 345kV line. It was determined that the northwest side would have the least amount of visual impact because the existing 345kV line would be located between the existing residences and the proposed project. In addition, the proposed project would be partially obscured by the rolling hills. The southeast side would place the line directly adjacent to the residences resulting in greater visibility to the residences.

Structure contrast was evaluated to determine which structure type would have the lowest contrast with the existing 345kV structures, thereby reducing visual impacts. The following structure alternatives were evaluated:

- two single-circuit poles - 61 feet in height
- single double-circuit pole - 79 feet in height
- H-frame double-circuit - 65.5 feet in height

Although it is expected that all of the above structures would have a low or minimal impact to visual resources, an analysis and comparison were conducted. To determine the structure contrast of these alternatives, the following factors were analyzed with respect to the existing 345kV H-frame transmission line:

- the span of the structures
- the height of the structures
- the number of structures

The existing 345kV transmission line has 74.5-foot H-frame structures with average spans of 800 feet. Through the structure contrast analysis it was determined that the 65.5-foot

H-frame double-circuit transmission line with average spans of 400 feet would have the least amount of impact on the viewer due to a fewer number of structures, and the similar form of structure to the existing transmission line. In addition, where the line does not parallel the existing 345kV line, the H-frame structure would be preferred because it would result in fewer structures as a result of longer spans, and therefore subsequent lower contrast with the landscape setting. As proposed, the portion of the line paralleling the 345kV line would be single pole double-circuit and the remaining portion as H-frame single circuit. As mentioned earlier, this proposed combination is expected to have a low impact. However, all structures are expected to have a low impact on visual resources.

Committed mitigation for all of the structure alternatives includes non-specular conductors and core-ten steel poles. Core-ten steel becomes a dark rust or brown color with weathering. The committed mitigation would reduce reflectivity of the proposed structures, with the darker colors associated with non-specular conductors and core-ten steel poles.

SOCIOECONOMICS

Social and economic effects that could potentially occur as a direct or indirect result of the proposed route or Alternative B are discussed in this section. Impacts of either alternative would be similar. The analysis details both beneficial and adverse social and economic impacts on nearby communities, surrounding property owners, and on public entities potentially affected by the construction of a 115kV line. Short-term impacts are defined as those occurring during the construction period, and long-term impacts are those that occur following project completion. This analysis also identifies possible mitigation measures.

Short-term impacts are those occurring during the construction phase of the project, which is expected to last approximately 20 working days. No long-term effects are anticipated. Short-term effects could be from construction employment and impacts on social and economic conditions within the community as a result of the construction-related activities.

The expected construction workforce would be hired by the contractor selected by EPE. Although the precise number of construction workers to be assigned to this project is not known presently, the size of the crew is not expected to be substantial (probably less than 50 people). It also would be conjecture to indicate from where the contractor would be hired, but it would be safe to assume that the project would be awarded to a firm from a nearby community. While there may or may not be construction contractors in the nearby communities of Sunland Park or Santa Teresa, some of the workers, specifically unskilled laborers, could be hired locally.

Sunland Park could potentially receive limited, short-term economic benefit from income or revenues generated from purchases by the construction workers. If, however, the contractor's employees lived within commuting distance of the work site(s), the economic impacts from these workers would be minimized in the nearby communities. In any event, economic benefit from the construction workers would be small due to the limited number of individuals involved. Nearby public and community facilities and services would potentially be affected by construction-related activities, but the impact and extent of effects is expected to be minor.

Most of the construction activities would be located adjacent to the utility's existing right-of-way. Access to the construction sites, as well as to the pole erection points, would be via existing roads and trails to the extent possible. The increase in traffic related to construction is expected to be negligible and should not adversely affect local traffic, including access to homes or businesses. Airborne dust raised by traffic on dirt roads will be increased during construction. Currently the roads are watered by the owners of the Nu-Mex landfill. This greatly reduces the amount of dust generated by the heavy truck traffic to the landfill. EPE will participate with the landfill operation in this dust abatement effort during the construction period. EPE would require the contractor to clean and restore construction sites, material laydown areas, and access roads to near pre-construction conditions.

Construction guidelines and mitigation measures previously described should minimize or eliminate short-term adverse impacts to both the social and economic fabrics of the local community.

CULTURAL RESOURCES

As noted, Class I records searches and Class III inventory surveys have been undertaken only for the proposed route. Some previous research has, however, been undertaken in the general project area and, as described, Alternative B actually crosses through stretches previously surveyed by Camilli and others (1988). Also, previous research suggests that the mesa top, crossed by Alternative B, was a particularly good area for prehistoric foraging and that therefore it is more likely to contain sensitive sites than the lower eastward slope of the mesa. Historic railroad grades are present at the base of the mesa, but these are not identified as significant resources by (Stuart 1991).

Stuart (1991) concludes that the five prehistoric campsites associated with the proposed route all are potentially eligible for National Register listing because of their information content (criterion "d") and thus may be significant resources. EPE would be able to avoid impact to four of the sites; but one site, which may be an extension of a previously recorded site, may be affected to some degree by construction. If this site is determined to be eligible for the National Register and avoidance is not feasible, treatment to mitigate these adverse effects would involve the preparation of a research design and subsequent data recovery, analysis, and report preparation. Even if the site is not considered to be eligible, it would be protected to the extent possible.

ELECTRICAL EFFECTS

The potential electrical effects of this proposed alternating current transmission line can be categorized as corona effects, electrical field effects, and magnetic field effects. The levels of corona and field effects discussed in this document are calculated (not measured) values, based on a computer program developed at the Bonneville Power Administration. Key variables include voltage, conductor size, and geometric configuration.

For the purposes of this analysis, 345,000 and 115,000 phase-to-phase voltages have been used for the 345kV and 115kV lines, respectively. A maximum load of 400 MW has been assumed for the 345kV line, 200 MW for the proposed line to Mexico, and 150 MW for the future line to serve the ports-of-entry. This represents worst case conditions with the

existing, proposed, and future lines. The conductor used for all circuits was 954 kcmil (thousand circular mills) ACSR (Aluminum Core Steel Reinforced).

Corona Effects

Corona is the partial electrical breakdown of air into charged molecules. Corona results in audible noise and electromagnetic interference.

Audible Noise

During operation, audible noise would emanate from the proposed line as a result of corona activity. Corona-generated noise is most noticeable during foul weather. During fair, dry weather, audible noise from transmission lines is generally imperceptible.

Transmission noise is measured in units of decibels on the A-weighing (dBA) sound-level scale. The L50 level denotes the sound level exceeded 50 percent of the time and represents the median sound level. The L5 level is equaled or exceeded 5 percent of the time and represents the typical maximum sound level.

In this analysis, predicted L5 noise levels during fair weather at the edge of right-of-way are 28 dBA or less for all of the proposed alternative configurations except for number 7. L5 noise level for configuration 7 is 43.1 dBA at the east edge of the right-of-way and 36.5 dBA at the nearest residence. Levels of this magnitude are well below any environmental noise standards or guidelines, and would be barely distinguishable from ambient levels in most cases. It should be noted that the addition of the two 115kV circuits actually reduces noise levels that are present with the existing 345kV circuit alone. This is due to the vector addition of the fields created by each individual circuit.

Electromagnetic Field Effects

Corona on transmission line conductors can generate electromagnetic noise in all frequency bands. Radio signals are of primary concern because this noise can cause radio interference (RI).

Radio reception in the amplitude-modulated (AM) broadcast band is often affected by corona noise. By contrast, frequency-modulated (FM) radio reception is rarely affected. Only residences very near transmission lines are typically affected by RI.

The quality rating of radio reception is not universally defined. However, a committee from the Institute of Electric and Electronic Engineers (IEEE) has analyzed and quantified quality-of-reception as a function of the quasi-peak, signal-to-noise ratio of an AM radio signal to the noise generated by a transmission line. Figure 3-1 is a graphic representation of the curve established by the committee and corresponding categories of reception quality. A rating of "entirely satisfactory", for example, is achieved at a signal-to-noise ratio of about 28 dB.

Table 3-2 compares measured signal strengths (in dB) of American-based AM radio broadcasting stations in the El Paso area and predicted noise caused by the existing 345kV line and alternative configurations studied in this analysis. For comparison purposes and to assume worst case conditions, noise levels are for the easterly edge of the combined facility right-of-way. All signals have a ratio (calculated by subtracting line noise from signal strength) of 24dB or greater except for the Belen station and one of the Las Cruces stations. Such a signal-to-noise ratio results in a listener satisfaction rating of "very good", as indicated Figure 3-1. It should be noted that the RI levels of all the proposed configurations are actually slightly lower than levels that presently exist on the 345kV circuit and that noise levels at the nearest residence are considerably lower than at the edge of right-of-way.

The possible relationship between human health effects and electromagnetic fields (EMF) at 60 hertz is currently a source of considerable controversy. Electric utilities, the electronics industry, state governments and the federal government have spent and are currently spending millions of dollars annually funding research concerning 60 hertz EMF. To date, scientific evidence has not determined that 60 hertz EMF is detrimental

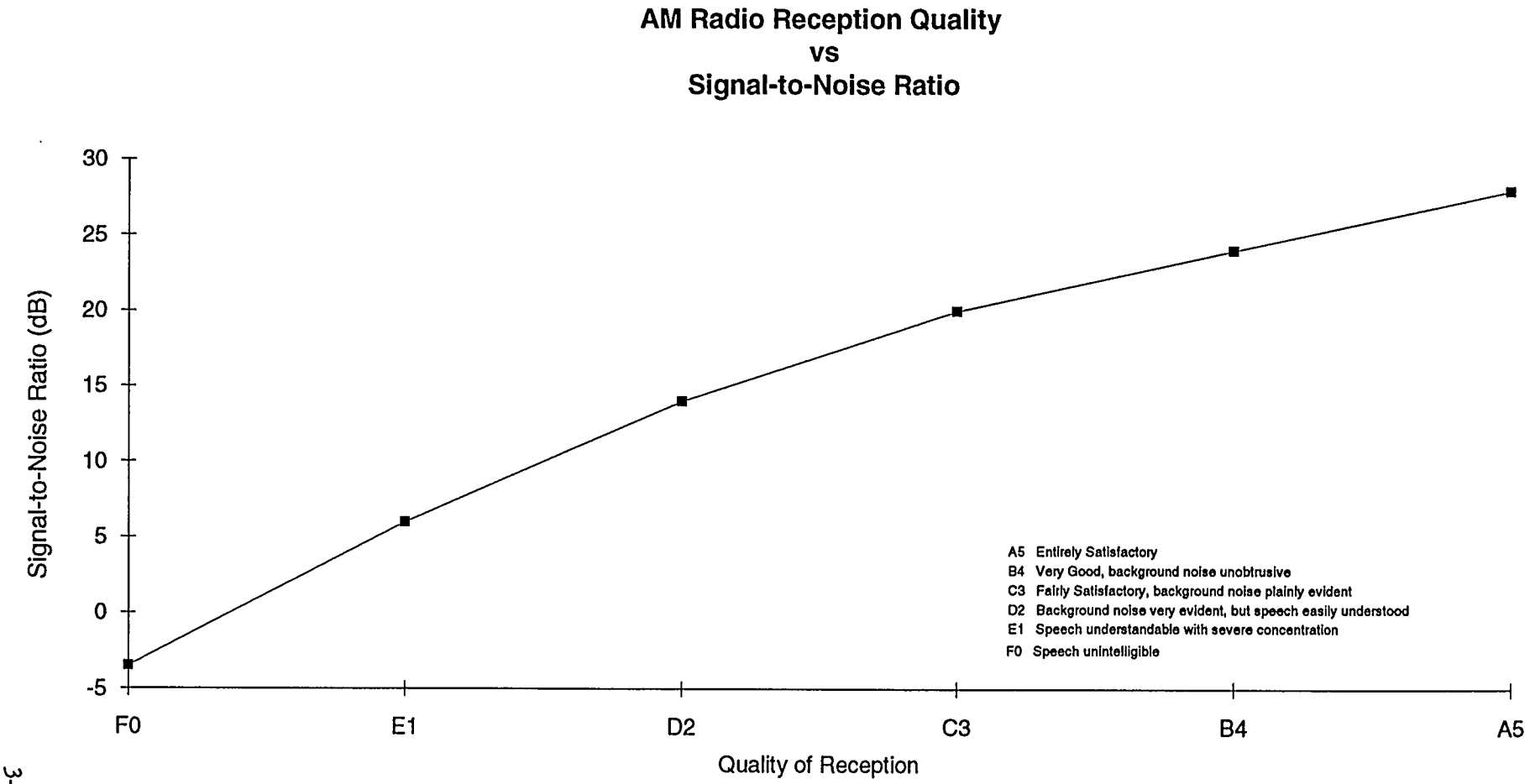

AM Radio Reception Quality
vs
Signal-to-Noise Ratio
Signal-to-Noise Ratio (dB)
30
25
20
15
10
5
0
-5
F0
E1
D2
C3
B4
A5
Quality of Reception
A5 Entirely Satisfactory
B4 Very Good, background noise unobtrusive
C3 Fairly Satisfactory, background noise plainly evident
D2 Background noise very evident, but speech easily understood
E1 Speech understandable with severe concentration
F0 Speech unintelligible

Figure 3-1

RADIO FREQUENCY COMPARISON

at easterly edge of RoW

(Strengths in dB)

Freq. (mHz)	Call Letters	Location	Signal Strength	Existing Noise / Ratio	# 3 Noise / Ratio	# 6 Noise / Ratio	# 7 Noise / Ratio	# 8 Noise / Ratio	# 10 Noise / Ratio	# 10A Noise / Ratio
				Configurations						
0.570	KGRT	Las Cruces, NM	78.5	53.2 / 25.3	53.0 / 25.5	53.0 / 25.5	69.2 / 09.3	53.0 / 25.5	53.1 / 25.4	53.2 / 25.3
0.750	KAMA	El Paso, Tx	90.0	53.2 / 36.8	53.0 / 37.0	53.0 / 37.0	69.2 / 20.8	53.0 / 37.0	53.1 / 36.9	53.2 / 36.8
0.860	KARS	Belen, NM	71.0	49.1 / 21.9	48.9 / 22.1	49.0 / 22.0	65.2 / 05.8	49.0 / 22.0	49.0 / 22.0	49.1 / 21.9
0.920	KDXX	El Paso, Tx	73.5	49.1 / 24.4	48.9 / 24.6	49.0 / 24.5	65.2 / 08.3	49.0 / 24.5	49.0 / 24.5	47.3 / 26.2
1.115	KEZB	El Paso, Tx	76.5	47.3 / 29.2	47.1 / 29.4	46.9 / 29.6	63.4 / 13.1	47.2 / 29.3	47.3 / 29.2	44.8 / 31.7
1.340	KALY	El Paso, Tx	73.0	44.9 / 28.1	44.8 / 28.2	45.2 / 27.8	61.0 / 12.0	44.7 / 28.3	44.8 / 28.2	44.8 / 28.2
1.380	KTSM	El Paso, Tx	81.0	44.9 / 36.1	44.8 / 36.2	45.2 / 35.8	61.0 / 20.0	44.7 / 36.3	44.8 / 36.2	44.8 / 36.2
1.450	KOBE	Las Cruces, NM	63.0	44.9 / 18.1	44.8 / 18.2	45.2 / 17.8	61.0 / 02.0	44.7 / 18.3	44.8 / 18.2	44.8 / 18.2
1.590	KELP	El Paso, Tx	83.5	42.7 / 40.8	42.7 / 40.8	43.0 / 40.5	60.2 / 23.3	42.6 / 40.9	42.6 / 40.9	42.7 / 40.8

Table 3-2

to health. Some epidemiological studies have shown that tissue at the cellular level is affected but the mechanism for such effects if not known and the level of harm associated has not been established. Because of the uncertainty surrounding this issue, some states have legislated electric and magnetic field strength limits at the edge of transmission rights-of-way.

ELECTRIC FIELD STRENGTHS

State	kV/M	Measurement Location
Montana	1	edge of right-of-way in residential area
Minnesota	8	in right-of-way
New Jersey	3	edge of right-of-way
North Dakota	9	edge of right-of-way
Oregon	9	edge of right-of-way
Florida	10	edge of right-of-way 500kV lines
	8	edge of right-of-way 230kV lines
	2	edge of right-of-way all other lines

MAGNETIC FIELD STRENGTHS

Florida

mG (at edge of right-of-way)	Voltage Class
200	500kV single circuit
250	500kV double circuit
150	230kV

EPE used a computer program developed by Bonneville Power Administration to predict the field strengths at edge of right-of-way and just outside the nearest residence to evaluate the EMF performance of 11 possible configurations for the proposed transmission line (Figure 3-2). All of the configurations provided EMF strengths that are within acceptable ranges of field strengths at edge of right-of-way as determined by states which have adopted limits. Configurations 1, 2, 4, 5, and 9 were eliminated from consideration due to visual impacts. The predicted field strengths of configurations 3, 6, 7, 8, 10, 10A, and the existing facilities are given in Table 3-3.

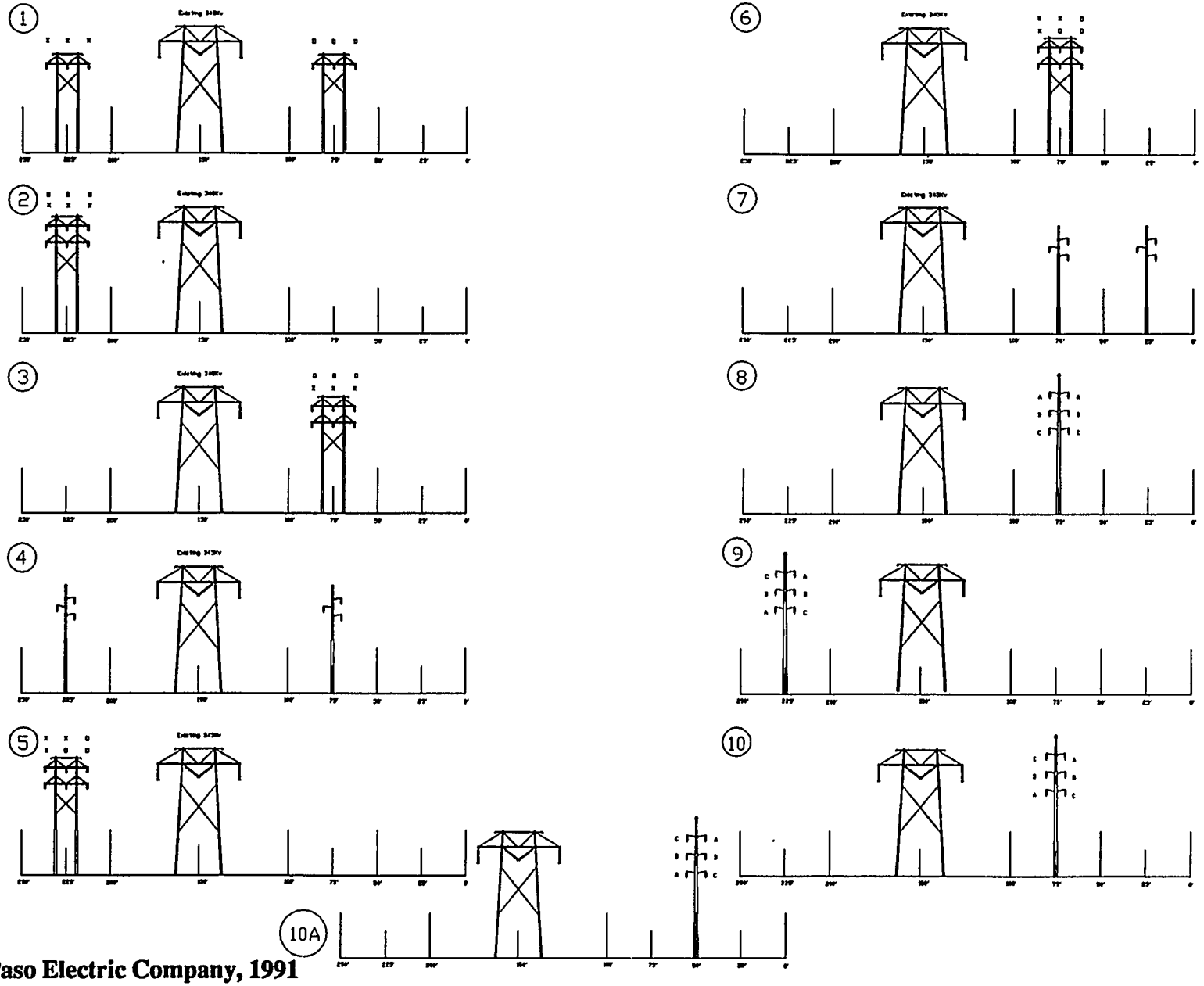
Three tables showing (1) electric field at the center of various rooms in a typical home in 1974, (2) typical electric field strengths at one foot from 115 volt home appliances, and

(3) magnetic field strengths at one foot from home appliances are shown in Table 3-4 (WHO 1984, 1987). Comparing the field strengths of the proposed configuration (#10) just outside the nearest residence with the values given in Table 3-3 reveals that (1) electric fields at the center of typical rooms would be less than those generated by the transmission facilities near the residence; (2) electric field strength experienced near electrical appliances in the home would be comparable to that generated by the transmission facilities near the residence; and (3) magnetic fields near household appliances are generally greater than those generated by the transmission facilities near the residence. With the chosen configuration, current levels of EMF will remain the same or be less. Human exposure will occur only on infrequent occasions when individuals cross under this line or use the associated access roads.

All computer studies were performed using maximum line loading conditions. Therefore, the predicted field strengths given for the proposed transmission facilities represent worst case conditions.

Electric and magnetic fields associated with transmission facilities induce charges in metal structures located in close proximity to the facilities. Those charges are, at the least, uncomfortable and, at the worst, dangerous. Of most concern are long metal facilities, such as fences, that parallel the transmission lines. It is possible for such structures to acquire enough charge, through induction, to be dangerous. As a mitigative measure, all metal structures within 100 feet of the transmission centerline will be grounded using a driven ground rod and connected with copper wire. Grounds will be applied at a minimum of every 700 feet for parallel fences, and on each side of the right-of-way for crossings. In the 2.34-mile length of this project there are no parallel fences. The adjacent transmission lines represent the greatest hazard. When maintenance is performed on these lines, grounds will be required within one span of the location on both sides of the maintenance work. The above mitigation will eliminate danger from induced charges and minimize any discomfort from touching metal objects near the right-of-way.

ALTERNATIVE LINE CONFIGURATIONS STUDIED



Source: El Paso Electric Company, 1991

Figure 3-2

ELECTRICAL EFFECTS SUMMARY

of alternative configurations

		Existing	#3	#6	#7	#8	#10	#10A
ELECTRIC FIELD (kV/m)								
	West edge of RoW	0.255	0.412	0.138	0.491	0.075	0.088	0.160
	East edge of RoW	2.352	2.402	2.391	1.540	2.390	2.377	2.360
	Nearest residence	0.062	0.072	0.076	0.055	0.080	0.071	0.067
MAGNETIC FIELD (mG)								
	West edge of RoW	75.249	46.591	17.807	38.513	30.249	8.725	10.607
	East edge of RoW	42.381	53.570	46.245	41.762	50.840	40.773	41.090
	Nearest residence	2.808	5.402	2.809	3.714	3.424	2.820	2.809
AUDIBLE NOISE (dBA)								
fair weather, L5	West edge of RoW	22.800	23.200	23.000	39.000	22.900	23.000	22.900
	East edge of RoW	27.200	27.500	27.300	43.100	27.300	27.300	27.200
	Nearest residence	20.400	20.700	20.500	36.500	30.700	20.500	20.400
RADIO INTERFERENCE (dB)								
fair weather, L50	West edge of RoW	38.100	38.100	38.100	54.300	38.000	38.000	38.000
	East edge of RoW	53.200	53.000	53.000	69.200	53.000	53.100	53.200
	Nearest residence	30.800	30.800	30.800	47.100	30.700	30.700	30.800

Source: El Paso Electric Company, 1991

Table 3-3

HOUSEHOLD MEASUREMENTS

60-Hz Electric Field Levels at the Center of Various Rooms in a typical U.S. home 1974 (kV/M)

Laundry Room	0.0008
Dining Room	0.0009
Bathroom	0.0012-0.0015
Kitchen	0.0026
Bedroom	0.0024-0.0078
Living Room	0.0033
Hallway	0.0130

Typical 60-Hz Electric Field Levels From 115V Home Appliances at 12" (kV/M)

Electric Blanket	0.250
Broiler	0.130
Stereo	0.090
Refrigerator	0.060
Electric Iron	0.060
Hand Mixer	0.050
Toaster	0.040
Hair Dryer	0.040
Color TV	0.030
Coffee Pot	0.030
Vacuum Cleaner	0.016
Incandescent Bulb	0.002

60-Hz Magnetic Flux Densities Near Various Appliances at 12" (mG)

Can openers	35-300
Hair Dryers	0.1-70
Electric Shavers	0.8-90
Drills	20-35
Mixers	6-100
Portable Heaters	1.5-50
Blenders	6-20
Television	0.4-20
Irons	1.2-3
Coffee Makers	0.8-1.5
Refrigerators	0.1-2.5

Source:WHO 1984,1987

Table 3-4

Summary

The impacts of 60 hertz EMF are currently being researched. Although effects have been shown on a cellular level, the impacts of these effects are unknown. The design of the proposed facility is such that current levels of EMF remain very nearly the same or are reduced. Figures 3-3 and 3-4 are graphical representations of the electric and magnetic fields generated by the existing 345kV transmission line and the combined fields of the proposed line using configuration #10 and the existing 345kV line. Known impacts, such as induced charges in metal structures, will be mitigated through standard practices.

SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

The construction phase of this project would represent the greatest period of impact to the natural environment. With mitigation of cultural resources, potential effects on open space lands would be short-term surface and subsurface disturbance. Productivity of these lands would be returned following completion of construction.

The degradation of the scenic quality in the visual landscape and the reduction in the quality of dispersed recreation experience would represent both short-term and long-term effects to these resources. Long-term effects could result from short-term impacts that were not mitigable.

The removal of vegetation would constitute both short-term and long-term effects to biological resources. The vegetation is relatively homogeneous throughout the study area, much of it having experienced some degree of disturbance. Clearing vegetation along access roads and the right-of-way for tower placement would result in the temporary loss of plant productivity. Grasses and forbs may invade cleared sandy roadways to some extent; grass cover may actually increase temporarily in disturbed dune areas. The proposed project, however, would have little or no long-term effect on plant productivity.

Most impacts to wildlife and wildlife habitats would be short term and temporary. Short-term displacement of wildlife species is expected to occur during the period of construc-

tion as a result of increased vehicular traffic and other associated activities, with some direct mortality to smaller, less mobile species. Transmission lines often provide perches for raptors, which may result in a decline of rodents in the area, particularly along the southern route where no transmission lines currently exist. This constitutes a long-term effect.

Additional long-term effects will be those impacts associated with maintenance activities and those potentially resulting from increased access where new roads are needed. Habitat recovery would vary according to vegetative type, and could be long term where dense vegetation (i.e., mesquite hummocks) is removed. Long-term effects to wildlife habitat are expected to be minimal due to the low sensitivity of the area, the extent of area that would be disturbed, and the type of activities associated with the proposed transmission line.

Potential short-term effects to air quality would be localized in the vicinity of construction activities. Long-term effects of the proposed project would be related to dust created from vehicles using the new access road along the new corridor.

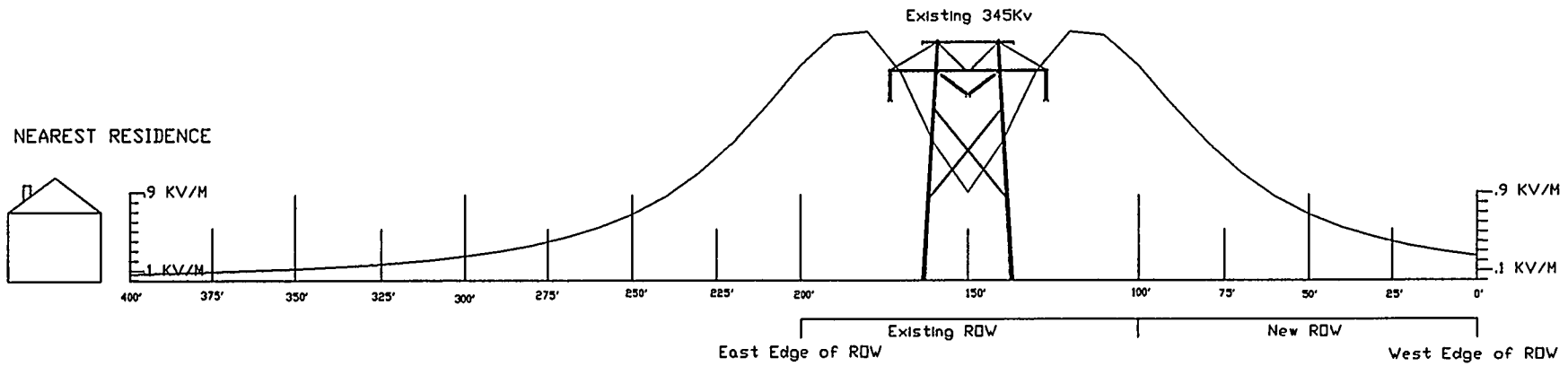
Application of the recommended mitigation measures would minimize the effect of short-term and long-term impacts to the natural environment. Long-term productivity of natural and human resources is not expected to be significantly affected by the installation of the proposed transmission line.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Subsurface cultural and paleontological resources could be damaged or lost. Mitigative data recovery at the one potentially significant prehistoric campsite on the proposed route and Alternative B that could be subject to effects from the project would minimize the impact.

ELECTRIC FIELD STRENGTH

OF EXISTING 345 KV LINE

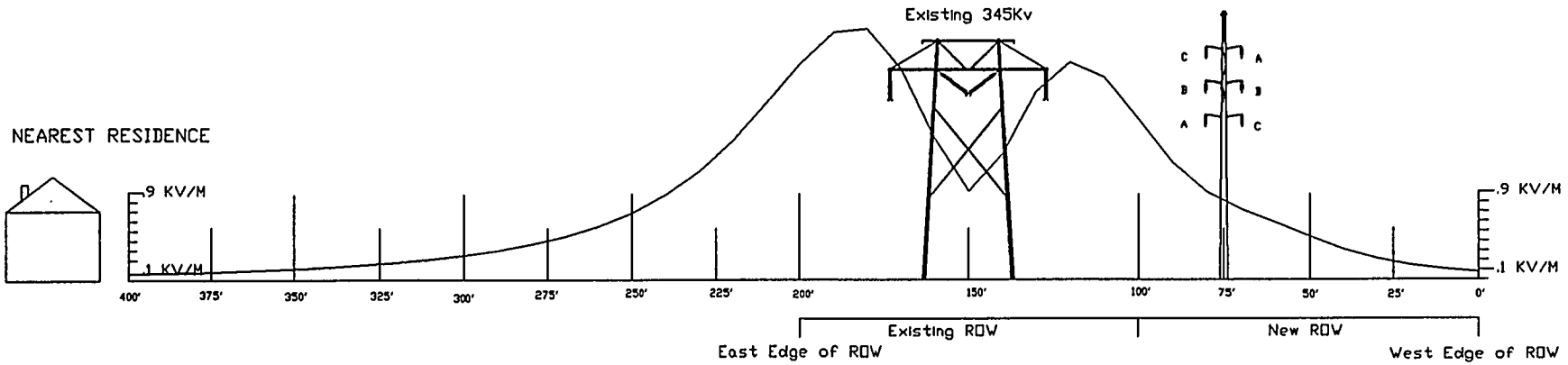


Source: El Paso Electric Company, 1991

Figure 3-3

ELECTRIC FIELD STRENGTH

OF CONFIGURATION 10



Source: El Paso Electric Company, 1991

Figure 3-4

CUMULATIVE EFFECTS

Cumulative impacts associated with this project combined with other facilities in the areas, such as the existing 345kV line, were addressed and are expected to be minimal. Visual resources and EMF were considered to be most likely impacted by the cumulative effects. The addition of another transmission line in the area would increase the impacts associated with the transmission line in the area. However, the location of the new line on the opposite side of the 345kV line from the residents combined with the distance of the new corridor from existing residences would greatly reduce the cumulative effects. The existing corridor has previously created a change in the landscape setting and views, thereby reducing the impacts associated with a similar facility. The addition of this new line to the existing 345kV corridor is not expected to increase EMF exposure to the nearest resident.

ENVIRONMENTAL COMPARISON OF ALTERNATIVES

The proposed route and Alternative B are similar in their potential impacts to the environment. Alternative B, however, does pass through four patent restricted areas containing known cultural resources. Difficulty in avoiding direct impacts to these resources suggests that the proposed route is preferable to Alternative B. Alternative B would create an additional new corridor as opposed to using the existing 345kV line corridor to the extent possible, as is the case with the proposed route. Overall, the proposed route is environmentally preferred to Alternative B.

CHAPTER 4

Agencies, Organizations, and Persons Contacted

CHAPTER 4 - AGENCIES, ORGANIZATIONS, AND PERSONS CONTACTED

The agencies and organizations contacted for information and/or consultation during preparation of this environmental assessment are listed below. In addition to these contacts, the references in Chapter 5 lists literature that was referenced.

FEDERAL

Fish and Wildlife Service
Jennifer Fowler-Propst
Field Supervisor
Ecological Services
3530 Pan American Highway, NE, Suite D
Albuquerque, New Mexico 87107

Bureau of Land Management - Las Cruces District Office
Tim Salt, Area Manager
Mimbres Resource Area
Las Cruces District Office
1800 Marquess Street
Las Cruces, New Mexico 8005

International Boundary Commission
Manny Rubio
United States Section
4171 N. Mesa, Suite C-310
El Paso, Texas 79902

United States Border Patrol
Dale A. Musegades, Chief Patrol Agent
El Paso Border Patrol Sector
P.O. Box 9578
El Paso, Texas 79986-0578

Department of Game and Fish
Andrew Sandoval, Assistant Division Chief
Habitat, Environment and Lands
Villagra Building
Santa Fe, New Mexico 87503

Energy, Minerals and Natural Resources Department
James D. Norwick, Karen Lightfoot
Santa Fe, New Mexico 87505

New Mexico Office of Cultural Affairs
Thomas Merlan
State Historic Preservation Officer
Villa Rivera, Room 101
228 East Palace Avenue
Santa Fe, New Mexico 87503

Doña Ana County
Yvonne Acosta
180 West Amador Avenue
Las Cruces, New Mexico 88001-1202

STATE

New Mexico
Department of Game and Fish
Energy, Minerals, and Natural Resources Department
State Historic Preservation Office

COUNTY

New Mexico
Doña Ana County - Planning Department

OTHER

City of Sunland Park
Nu-Mex Landfill
Charles Crowder - Landowner

Advisory Council on Historic Preservation
Claudia Nissley, Director
Western Office of Project Review
730 Simms Street, Room 401
Golden, Colordo 80401

Mescalero Apache Culture Center
Ms. Elbys Hugar
P.O. Box 176
Mescalero, New Mexico 88430

Ysleta del Sur
Governor Raymond Apodaca
119 South Old Pueblo Road
El Paso, Texas 79907

CHAPTER 5

References

CHAPTER 5 - REFERENCES

BIOLOGICAL RESOURCES

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Gomez, L. 1991. Staff Support, City of Sunland Park Administration, personal communication, September 31, 1991.

Magee, M. 1991. Operations Engineers, Joab Inc., Map of Expanded Nu-Mex Landfill, April 15, 1991.

Magee, M. nd Existing Land Use Map, City of Sunland Park, Doña Ana County, New Mexico.

___. nd Future Land Use Map, City of Sunland Map, Doña Ana County, New Mexico.

Marley, L. 1991. Planner, Doña Ana County, personal communication, September 31, 1991.

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CULTURAL RESOURCES

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U.S. Department of Energy. 1992. Letter from Anthony Como, Director, Office of Coal and Electricity, Office of Fuels Programs, Office of Fossil Energy, to Thomas Merlan, New Mexico State Historic Preservation Officer. January 31, 1992.

CHAPTER 6

List of Preparers

CHAPTER 6 - LIST OF PREPARERS

The following individuals prepared or contributed to the preparation of this environmental assessment, under the guidance of the Department of Energy.

Project Proponent

El Paso Electric Company

Darwin Jensen - Project Manager and Engineer
Fred Hill - Project Coordinator

Environmental Studies

Dames & Moore

Garlyn Bergdale	MSLA, Landscape Architecture BSLA, Landscape Architecture
Lauren Weinstein	BS, Resource Planning and Management
Paul Trenter	BSLA, Landscape Architecture
Barbara Murphy	BA, Geology
Kimberly Otero	MEM, Environmental Management BA, Biology
J. Simon Bruder	PhD, Anthropology MA, Anthropology BFA, Painting

APPENDIX A

Biological Resources Tables

Table Bio-1. Chihuahuan Desertscrub Vegetation. Characteristic species that occur, or potentially occur, within the study area. Those marked with an asterix (*) were observed on-site during a field survey on April 10, 1991.

Scientific Name	Common Name
TREES/SHRUBS	
Acacia constricta*	Whitethorn Acacia
A. greggii	Catclaw Acacia
Aloysia wrightii	Wright's Lippia
Atriplex canscens*	Four-winged Saltbush
Atriplex spp.	Saltbushes
Cassia wislizenii	Shrubby Senna
Dasylirion leiophyllum	Sotol
D. wheeleri	Sotol
Dyssodia spp.*	Dogweed
Flourenisa cernua	Tarbush
Fouqueria splendens*	Ocotillo
Koerberlinia spinosa	Allthorn
Krameria parvifolia	Ratany
Larrea tridentata*	Creosotebush
Mortonia scabrella	Sandpaper Bush
Parthenium incanum	Mariola
Prosopsis glandulosa*	Mesquite
P.juliflora*	Mesquite
Rhus microphylla	Desert Sumac
Suaeda torreyana	Suaeda
Yucca elata*	Soaptree Yucca
Zinnia acerosa	Desert Zinnia
Zizyphus obtusifolia	Lotebush
CACTI	
Ferocactus wislizenii	Barrel Cactus
Mammillaria vivipara	Pincushion Cactus
M. robustispina	Pincushion Cactus
Opuntia arenaria	Sand Prickly Pear
O. leptocaulis	Desert Christmas Cactus
O. macrocentra	Shrubby Prickly Pear
O. phaeacantha	Engelmann Prickly Pear
O. spinosior	Cane Cholla
O. stanlyi	Devil Cholla

Source: Benson and Darrow 1981; Brown, D.E. 1982; Dames & Moore field notes April 10, 1991; Dodge 1985; Lamb 1975; Niehouse 1984.

Table Bio-2. Semi-Desert Grassland. Characteristic species that occur, or potentially occur within the study area. Those marked with an asterix (*) were identified during a site vist on April 10, 1991.

Scientific Name	Common Name
TREES/SHRUBS	
Acacia greggii	Catclaw Acacia
A. constricta*	Whitethorn Acacia
Agave parryi	Parry Agave
Aloysia wrightii	Wright's Lippia
Berberis trifoliata	Barberry
Calliandra eriophyla	Fairy Duster
Celtis pallida	Desert Hackberry
Condalia ericoides	Javelina Bush
Dalea formosa*	Dalea
Dasylirion leiophyllum	Sotol
D. wheeleri	Sotol
Ephedra trifurca*	Mormon Tea
Flourensia cernua	Tarbush
Fouqueria splendens*	Ocotillo
Gutierrezia sarothrae*	Snakeweed
Koerberlina spinosa	Allthorn
Larrea tridentata*	Creosotebush
Mimosa biuncifera	Wait-a-minute-Bush
M. dysocarpa	Mimosa
Nolina microcarpa	Beargrass
Prosopsis glandulosa*	Mesquite
P. juliflora*	Mesquite
Rhus microphylla	Desert Sumac
Yucca baccata	Banana Yucca
Y. elata*	Soaptree Yucca
GRASSES/GRASSLIKE SPECIES	
Aristida spp.	Three-awn
Bouteloua spp.*	Grama Grasses
B. curtipendula	Side-oats Grama
B. eriopoda	Black Grama
B. gracilis	Blue Grama
Heteropogon contortus	Tanglehead
Hilaria mutica*	Tobosa
Muhlenbergia porteri	Bush Muhly
Scleropogon brevifolius	Burro Grass
Sporobolus airoides*	Alkali Sacaton
S. cryptandrus	Sand Dropseed
Tridens pulchellus	Fluffgrass

Table Bio-2. Semi-Desert Grassland (cont.).

Scientific Name	Common Name
CACTI	
Echinocactus horizonthalonius	Turk's Head Cactus
Echinocereus spp.	Hedgehog Cacti
Ferocactus wislizenii	Barrel Cactus
Mammillaria spp.	Pincushion Cacti
Opuntia arenaria	Sand Prickly Pear
O. chlorotica	Prickly Pear
O. kleiniae	Desert Christmas Cactus
O. leptocaulis	Desert Christmas Cactus
O. phaeacantha	Engelmann Prickly Pear
O. violacea	Prickly Pear
FORBS	
Amaranthus spp.	Pigweeds
Boerhaavia spp.	Spiderlings
Erigeron spp.*	Fleabane
Eriogonum spp.*	Wild Buckwheats
Erodium spp.	Filaree
Lepidium spp.*	Peppergrass
Lesquerella spp.	Bladderpod
Lupinus spp.	Lupine
Martynia spp.*	Devils Claw
Nama demissum*	Purple Mat
Oenothera spp.*	Primrose
Phacelia spp.*	Phacelia or Heliotrope
Sphaeralcea spp.	Globe Mallow
Tidestromia spp.	White Mat

Source: Benson and Darrow 1981; Brown, D.E. 1982; Dames & Moore field notes April 10, 1991; Dodge 1985; Lamb 1975; Niehouse 1984.

Table Bio-3. Amphibians and Reptiles. Species that have the potential to occur within the alternative corridors. These are species found in grassland and Chihuahuan desertscrub communities.

Common Name	Scientific Name
AMPHIBIANS	
Hammond's Spadefoot	Scaphiopus hammondi
Couch's Spadefoot	S. couchi
Woodhouse's Toad	B. woodhousei
Great Plains Toad	B. cognatus
Green Toad	B. debilis
Red-spotted Toad	B. punctatus
REPTILE	
Ornate Box Turtle	Terrapene ornata
Banded Gecko	Coleonyx variegatus
Lesser Earless Lizard	Holbrookia maculata
Greater Earless Lizard	H. texana
Zebra-tailed Lizard	Callisaurus draconoides
Leopard Lizard	Crotaphytus wislizenii
Collared Lizard	C. collaris
Desert Spiny Lizard	Sceloporus magister
Crevice Spiny Lizard	S. poinsettii
Eastern Fence Lizard	S. undulatus
Tree Lizard	Urosaurus ornatus
Side-blotched Lizard	Uta stansburiana
Short-horned Lizard	Phrynosoma douglassi
Texas Horned Lizard	P. cornutum
Round-tailed Horned Lizard	P. modestum
Great Plains Skink	Eumeces obsoletus
Checkered Whiptail	Cnemidophorus tesselatus
Western Whiptail	C. tigris
Desert Grassland Whiptail	C. uniparens
New Mexican Whiptail	C. neomexicanus
Little Striped Whiptail	C. inornatus
Chihuahua Whiptail	C. exanguis
Texas Blind Snake	Leptotyphlops dulcis
Hognose Snake	Heterodon nasicus
Ring-necked Snake	Diadophis punctatus
Coachwhip	Masticophis flagellum
Striped Whipsnake	M. taeniatus
Western Patch-nosed Snake	Salvadora hexalepis
Gopher Snake	Pituophis melanoleucus
Glossy Snake	Arizona elegans
Common Kingsnake	Lampropeltis getulis
Long-nosed Snake	Rhinocheilus lecontei
Checkered Garter Snake	Thamnopis marcianus
Black-Necked Garter Snake	T. cyrtopsis

Table Bio-3. Amphibians and Reptiles (cont.)

Common Name	Scientific Name
Western Terrestrial Garter Snake	T. elegans
Western Ground Snake	Sonora semiannulata
Western Hook-nosed Snake	Ficima cana
Western Black-headed Snake	Tantilla planiceps
Plains Black-headed Snake	T. nigriceps
Night Snake	Hypsiglena torquata
Lyre Snake	Trimorphodon biscutatus
Massasauga	Sisturus catenatus
Rock Rattlesnake	Crotalus lepidus
Western Rattlesnake	C. viridus
Western Diamondback Rattlesnake	C. atrox

Source: Stebbins 1966

Table Bio-4. Mammalian Species. Mammalian species likely to occur in the project area. Those listed are known to occur in desert grassland and Chihuahuan Desertscrub habitats.

Scientific Name	Common Name
SHREWS	
Notiosorex crawfordi	Desert Shrew
BATS	
Myotis yumanensis	Yuma Myotis
M. thysanodes	Fringed Myotis
M. californicus	California Myotis
Pipistrellus hesperus	Western Pipistrel
Euderma maculata	Spotted Bat
Antrozous pallidus	Pallid Bat
Tadarida brasiliensis	Mexican Freetail Bat
HARES/RABBITS	
Lepus californicus	Blacktail Jackrabbit
Sylvilagus auduboni	Desert Cottontail
SQUIRRELS AND ALLIES	
Spermophilus spilosoma	Spotted Ground Squirrel
S. variegatus	Rock Squirrel
Ammospermophilus harrisii	Harris' Antelope Squirrel
GOPHERS	
Thomomys bottae	Botta's Pocket Gopher
POCKET MICE/KANGAROO RATS	
Perognathus flavus	Silky Pocket Mouse
P. flavescens	Pocket Mouse
P. hispidus	Hispid Pocket Mouse
P. penicillatus	Desert Pocket Mouse
P. intermedius	Rock Pocket Mouse
Dipodymys spectabilis	Banner-tailed Kangaroo Rat
D. merriami	Merriam's Kangaroo Rat
D. ordi	Ord's Kangaroo Rat

Table Bio-4. Mammalian Species (cont).

Scientific Name	Common Name
CRICETIC MICE/RATS	
Onychomys leucogaster	Northern Grasshopper Mouse
O. torridus	Southern Grasshopper Mouse
Reithrodontomys megalotis	Western Harvest Mouse
Peromyscus eremicus	Cactus Mouse
P. maniculatus	Deer Mouse
P. leucopus	White-footed Mouse
Sigmodon hispidus	Hispid Cotton Rat
S. fulviventer	Fulvous Cotton Rat
Neotoma albigula	White-throated Woodrat
N. micropus	Southern Plains Woodrat
VOLES AND ALLIES	
Microtus mexicanus	Mexican Vole
CARNIVORES	
Canis latrans	Coyote
Vulpes macrotus	Kit Fox
Urocyon cinereoargenteus	Gray Fox
Mustela frenata	Long-tailed Weasel
Taxidea taxus	Badger
Spilogale gracilis	Western Spotted Skunk
Mephitis mephitis	Striped Skunk
M. macroura	Hooded Skunk
Conepatus mesoleucus	Hog-nosed Skunk
Felis rufus	Bobcat
HOOFED MAMMALS	
Tayassu tajuca	Collared Peccary
Odocoileus hemionus	Mule Deer
Antilocapra americana	Pronghorn

Sources: Burt and Grossenheider 1964; Hoffmeister 1986

Table Bio-5. Avian species that are known to occur in Chihuahuan desertscrub and semi-desert grassland communities. Riparian species have been excluded from this list, although transient species that use the Rio Grande and Rio Conchos may occur.

KEY:

P-permanent resident
S-summertime resident
T-transient species
W-winter resident

Common Name	Status	Grassland	Desertscrub
Turkey Vulture	S	x	x
Northern Harrier	T,W	x	x
Swainson's Hawk	S	x	x
Red-tailed Hawk	P,T,W	x	x
Ferruginous Hawk	P,T	x	-
Rough-legged Hawk	T,W	x	-
Golden Eagle	P,T,W	x	x
American Kestrel	P,T,W	x	x
Prairie Falcon	P,T,W	x	x
Scaled Quail	P	x	x
Gambel's Quail	P	x	x
Killdeer	P,T,W	x	-
Upland Sandpiper	T	x	-
Mourning Dove	P	x	x
Greater Roadrunner	P	x	-
Barn Owl	P	x	x
Burrowing Owl	P	x	-
Great Horned Owl	P	x	x
Short-eared Owl	T,W	x	-
Lesser Nighthawk	S	x	-
Common Nighthawk	S	x	x
Common Poorwill	S	x	x
Say's Phoebe	P	x	x
Ash-throated Flycatcher	S	-	x
Brown-crested Flycatcher	S	-	x
Western Kingbird	S	x	x
Horned Lark	P	x	x
Barn Swallow	S	x	-
Chihuahuan Raven	P	x	x
Common Raven	P	x	x
Cactus Wren	P	x	x
Ruby-crowned Kinglet	S,W	-	x
Black-tailed Gnatcatcher	P	-	x
Western Bluebird	S,W	x	-

Table Bio-5 (continued)

Common Name	Status	Grassland	Desertscrub
Sage Thrasher	T	x	x
Bendire's Thrasher	S	x	x
Curved-bill Thrasher	P	x	x
Phainopepla	P	-	x
Loggerhead Shrike	P	x	x
Wilson's Warbler	T	x	x
Brown Towhee	P	x	-
Vesper Sparrow	T,W	x	-
Black-throated Sparrow	P	-	x
Lark Bunting	T,W	x	x
Savannah Sparrow	T,W	x	-
Baird's Sparrow	T	x	-
Grasshopper Sparrow	T,W	x	-
McCown's Longspur	T,W	x	-
Chestnut-collared Longspur	T,W	x	-
Eastern Meadowlark	S	x	-
Western Meadowlark	P	x	-
Scott's Oriole	S	x	-
House Finch	P	x	x

Sources: Scott 1987; Tucson Audubon Society 1987.

APPENDIX A - REFERENCES

BIOLOGICAL RESOURCES

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Tucson Audubon Society. 1987. Checklist of North American Birds.

APPENDIX B

Agency Letters Received

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
LAS CRUCES DISTRICT OFFICE
1800 MARQUESS ST.
LAS CRUCES, NEW MEXICO 88005

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:

4100 (036)

MAY 2 2 1991

Dames and Moore
440 East Broadway
Suite 703
Tucson, AZ 85711-3517

Dear Ms. Otero:

In checking the map sent to us it was noted that all the land within the proposed construction area is privately owned. In cases when public lands are not involved the U.S. Fish and Wildlife Service, the Ecological Services section needs to be contacted at Suite D, 3530 Pan American Highway NE, Albuquerque, New Mexico, 87107. The phone number is 505-883-3972.

Enclosed please find a drawing and description of the castus, Opuntia arenaria, sand prickly pear which grows within the proposed area. The cacti actually thrives with most forms of disturbance as it spreads by pad or stem dispersal. This is a candidate for Federal listing. It grows in low-forming sand dunes and is particularly common in the sand dunes leading into the Rio Grand Valley. Habitat loss from development has become the biggest threat to the species survival.

The Bureau of Land Management has proposed National Conservation Area (NCA) designation for the Organ Mountains on the mesa east of Las Cruces. The NCA proposal contains a section of Federal land set aside as having a large existing population of the cacti and a prime area for reintroduction of the species. As the species is located on lands identified for disposal or development, a portion of the plant is removed and planted in this area to maintain the genetic pool and propagate the species.

If we can be of any farther assistance please contact this office at (505) 525-8228.

Sincerely,

Tim Salt
Area Manager,
Mimbres Resource Area

Enclosure

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Ecological Services
Suite D, 3530 Pan American Highway, NE
Albuquerque, New Mexico 87107

July 5, 1991

Cons. #2-22-91-I-200

Mr. Linwood Smith, Director
Biological Resources Study Group
Dames and Moore
4400 East Broadway, Suite 703
Tucson, Arizona 85711-3517

This responds to your May 30, 1991, letter concerning the black-footed ferret, grama grass cactus, and sand prickly pear that may be affected by the construction of a 115 kV electric transmission line between Diablo Substation and the United States-Mexico border in Dona Ana County, New Mexico.

The geographic area of this project is within the historic range of the black-tailed prairie dog (Findley, J. S., A. Harris, D. Wilson, and C. Jones. 1975. Mammals of New Mexico. University of New Mexico Press, Albuquerque, New Mexico). A black-footed ferret survey should be conducted if a prairie dog town is found in the area and is determined to be 80 acres or larger.

The grama grass cactus has been found at the New Mexico-Texas border in Otero County on soils similar to those in the vicinity of the project in Dona Ana County; therefore, we suggest a survey be conducted for this species. Since this species is not legally protected by the Endangered Species Act, this suggestion is provided for planning purposes only. We agree that the sand prickly pear may be found in the area, and we would appreciate receiving a copy of the April 1991 survey results for our files.

Any additional information you may have concerning these species would be helpful for future determinations concerning their status.

If you have further questions, please contact Brian Hanson at (505) 883-7877.

Sincerely,

Jennifer Fowler-Propst
Field Supervisor

cc:
Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico
Regional Director, U.S. Fish and Wildlife Service, Fish and Wildlife Enhancement, Albuquerque, New Mexico

State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
Santa Fe, New Mexico 87505

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

15 April, 1991

Carla Alford, Biologist
Dames and Moore
4400 E. Broadway, Suite 703
Tucson, Arizona 87511

Dear Ms. Alford,

This is in response to your request for information on the proposed Diablo Substation to U.S.-Mexico Border 115 kV Transmission Line Project. We have no current records of rare plants at the exact map locations you sent in your letter.

We in this office do not deal with animal species of concern. You can contact the State Fish and Game and the United States Fish and Wildlife Service to obtain a list of their concerns. Plant species of concern to the state that are known to occur in the area are listed below.

Cereus greggii (Night-blooming cereus), Opuntia arenaria (Sand prickly pear), and Pediomelum pentaphyllum (Five-leaf scurfpea) are Federal Candidate species (C2), and also State Endangered. Coryphantha scheeri (Scheer's pincushion cactus) is a Federal Candidate species (C1), and also a State Endangered plant species. Proboscidea sabulosa (Dune unicorn plant) is a State Endangered plant. These are all plants that can be found in sandy areas of southern New Mexico.

We recommend that you conduct a clearance survey for these plants. If you encounter any rare plants during your survey, we would appreciate knowing their exact locations for our database records. If you have any questions, please don't hesitate to contact Karen Lightfoot or Bob Sivinsky, the Botanists on my staff.

Sincerely,

Karen Lightfoot

for James D. Norwick
State Forester

VILLAGRA BUILDING - 408 Galisteo
Forestry and Resources Conservation Division
P O Box 1948 87504-1948
827-5830

Park and Recreation Division
P O Box 1147 87504-1147
827-7465

2040 South Pacheco
Office of the Secretary
827-5950

Administrative Services
827-5925

Energy Conservation & Management
827-5900

Mining and Minerals
827-5970

LAND OFFICE BUILDING - 310 Old Santa Fe Trail
Oil Conservation Division
P O Box 2088 87504-2088
827-5800

STATE OF NEW MEXICO
OFFICE OF CULTURAL AFFAIRS
HISTORIC PRESERVATION DIVISION

BRUCE KING
GOVERNOR

VILLA RIVERA, ROOM 101
228 EAST PALACE AVENUE
SANTA FE, NEW MEXICO 87503
(505) 827-6320

HELMUTH J. NAUMER
CULTURAL AFFAIRS OFFICER

THOMAS W. MERLAN
DIRECTOR

December 27, 1991

Mr. Anthony J. Como
Director
Office of Coal and Electricity
Office of Fuels Programs
Department of Energy
Washington, DC 20585

Dear Mr. Como:

We are writing to follow up our letter of December 6, 1991 concerning the proposed Diablo to Mexico 115 kV transmission line located in Dona Ana County, New Mexico. Since we wrote to you, we have received additional environmental information from Dames and Moore who prepared the Environmental Assessment for the El Paso Electric Company on this project. With this new information we can begin the Section 106 consultation process.

We understand that route A has been selected from the various alternatives as the final transmission corridor for this undertaking. Along this proposed right-of-way, five archaeological sites have been located and identified. These sites, and the steps that are taken to avoid or mitigate effect to them, are the subject of this consultation.

It is our opinion that sites BK 310, 311, 313, and 314 are eligible to the National Register of Historic Places under 36CFR60.4(d). Site BK 312 is potentially eligible to the National Register, although additional testing would be needed to determine its actual eligibility.

It appears that four of the five sites can be avoided. We recommend that the following measures be taken to avoid effect to sites BK 311, 312, 313, and 314. Avoidance can be achieved by hand laying transmission lines over the sites, spanning the sites by placing the transmission towers off site, and routing all construction and maintenance traffic around the limits of these sites.

Site BK310, however, will be affected by the undertaking as proposed. In this case, treatment of effect will require mitigation through data recovery. We recommend that the Department of Energy (DOE) hire an archaeological contractor to prepare a data recovery plan and DOE submit this plan for our review. We further recommend that the DOE contact the Advisory Council on Historic Preservation and inform them that the DOE has begun consultation with our office on mitigation of effect for this undertaking.

Once we have had an opportunity to review and accept the data recovery plan, we will concur with a finding of "no adverse effect" for this undertaking.

If you have any questions or need assistance, please contact Dave Cushman of our office

Thank you.

Sincerely,

Thomas W. Merlan
State Historic Preservation Officer

TWM/DWC

Department of Energy
Washington, DC 20585

JAN 3 1 1992

Thomas W. Merlan
State Historic Preservation Officer
Office of Cultural Affairs
Historic Preservation Division
Villa Rivera, Room 101
228 East Palace Avenue
Santa Fe, New Mexico 87503

Dear Mr. Merlan:

We appreciate your office's prompt response concerning the significance of archaeological sites recorded along El Paso Electric Company's (EPE) proposed Diablo to Mexico 115 kV transmission line corridor, and agree with your recommendation that sites BK 310, 311, 313, and 314 are eligible for listing on the National Register of Historic Places under criterion "d" (data potential) and that site BK 312 is potentially eligible under criterion "d" as defined by 36 CFR 60.4. As noted in your letter dated December 27, 1991, EPE has indicated that sites BK 311, 312, 313 and 314 can be avoided through the use of special construction techniques, but that site BK 310 may be affected.

We recognize that in order to comply with section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), the Department of Energy (DOE) as the lead federal agency for the proposed undertaking will need to oversee preparation of a treatment plan that considers potential project effects, details site avoidance strategies, and outlines a data recovery plan, which will mitigate the adverse effects of construction on site BK 310. We feel that acceptance of such a treatment plan by your office and the Advisory Council on Historic Preservation (ACHP) should result in a determination of "no adverse effect" for this undertaking, as defined by 36 CFR 800.9(c)(1).

DOE has retained the consulting firm of Dames & Moore, on a third party basis, to assist with complying with section 106 of the NHPA. Please be informed that DOE authorizes Dames & Moore's principal investigator, Dr. J. Simon Bruder, to coordinate directly with your office and the ACHP in this matter.

Do not hesitate to contact either Ellen Russell or myself if you should have any questions or need any additional information.

Sincerely,

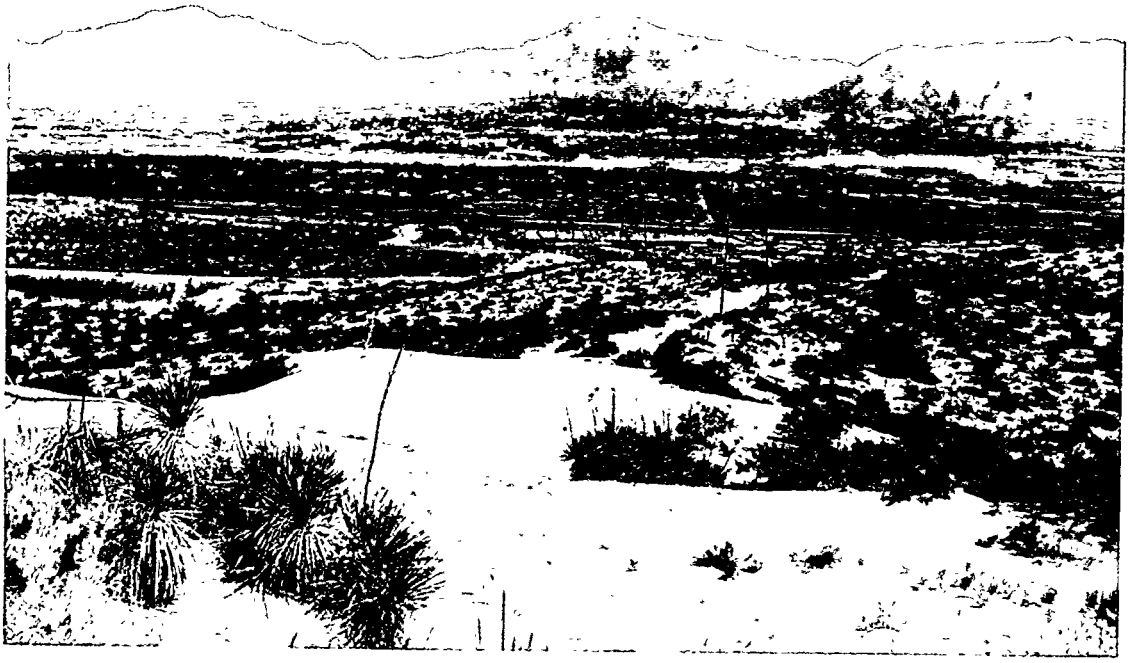
Anthony J. Como
Director
Office of Coal and Electricity
Office of Fuels Programs
Office of Fossil Energy

cc: Claudia Nissley, ACHP

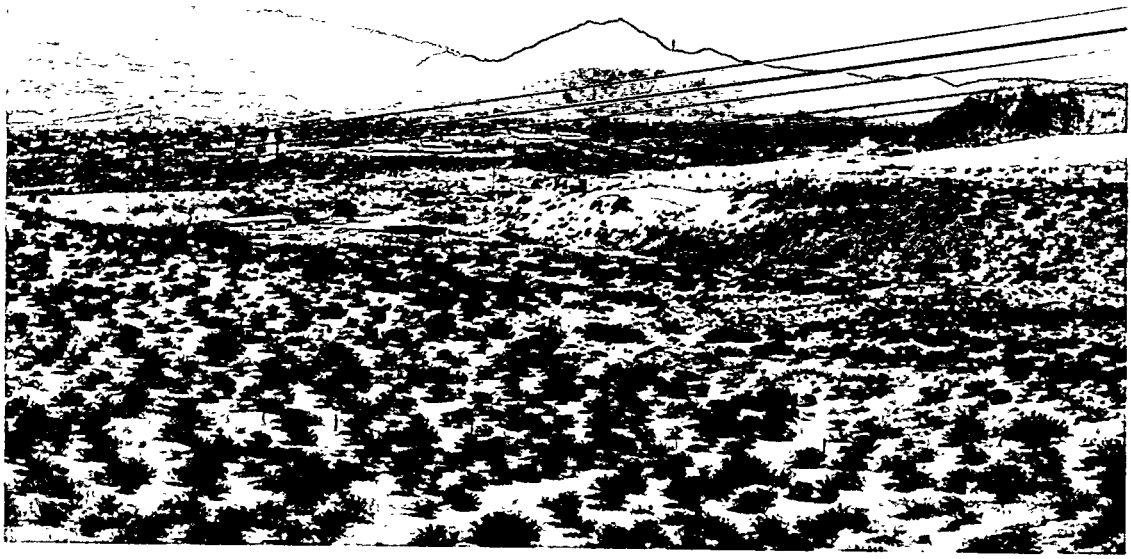
bcc: David Cushman, NM Cultural Affairs
Simon Bruder, D&M - Phoenix
Darwin Jensen, EPE

APPENDIX C

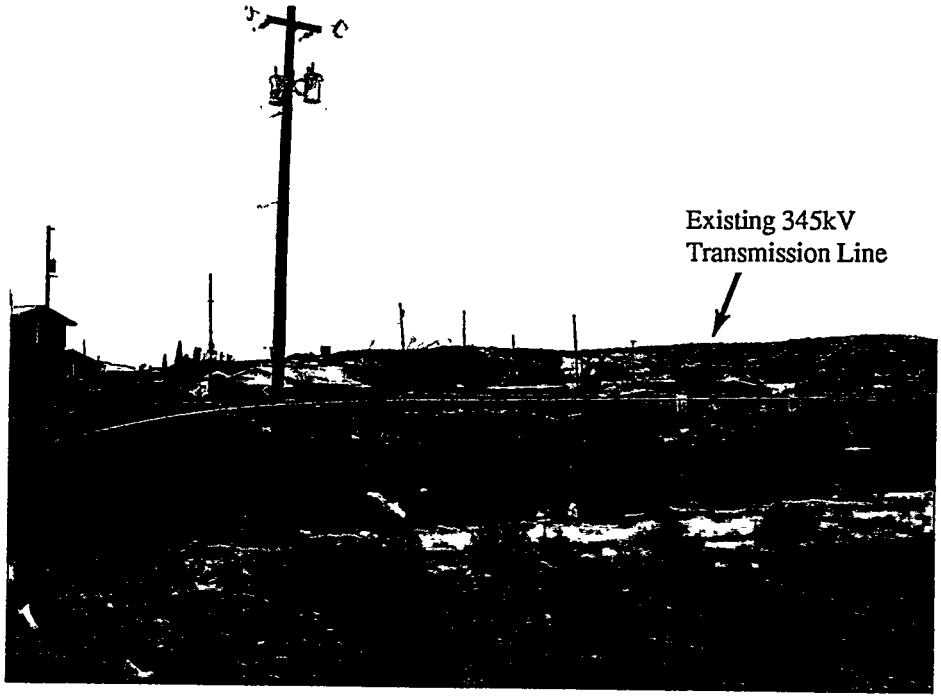
Photos of the Study Area



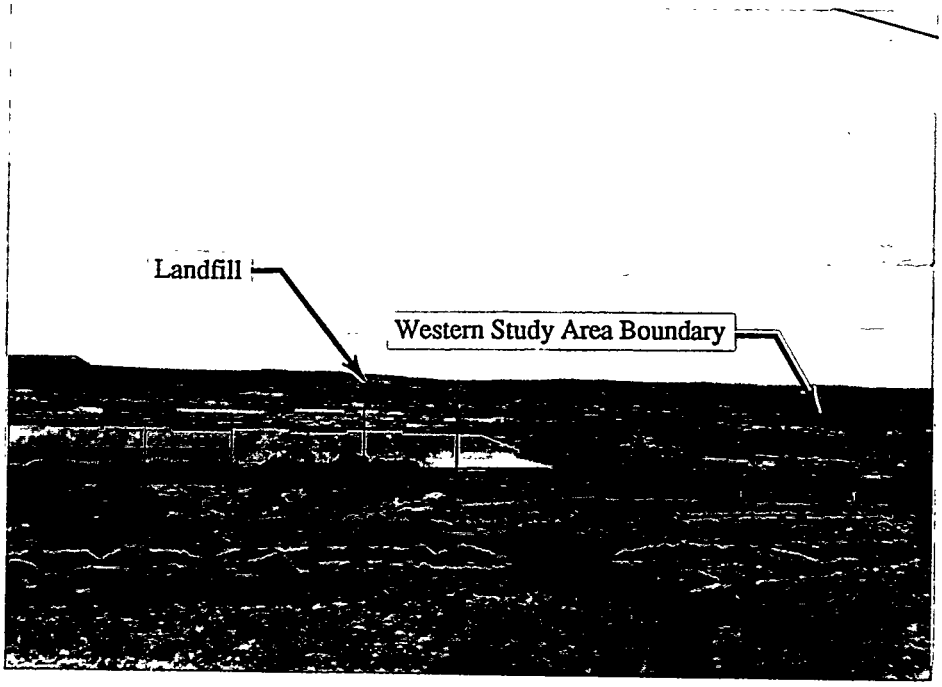
View of existing 345kV transmission line and access road - view looking northeast towards Diablo Substation.



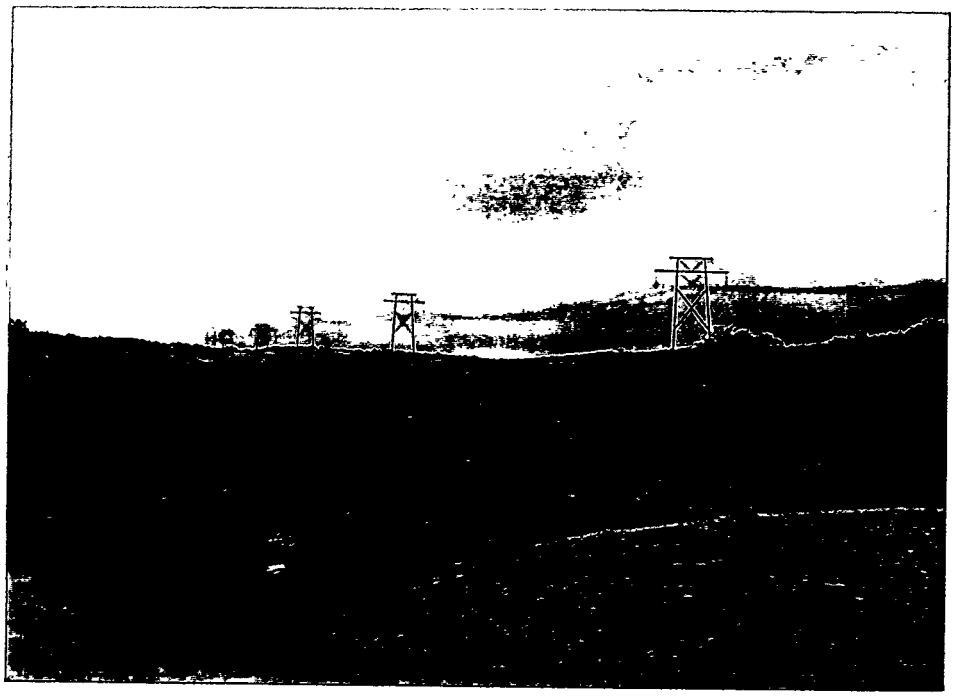
View of landfill operation - view looking east (including 345kV conductors).



Sunland Park residential subdivision - view looking southwest.

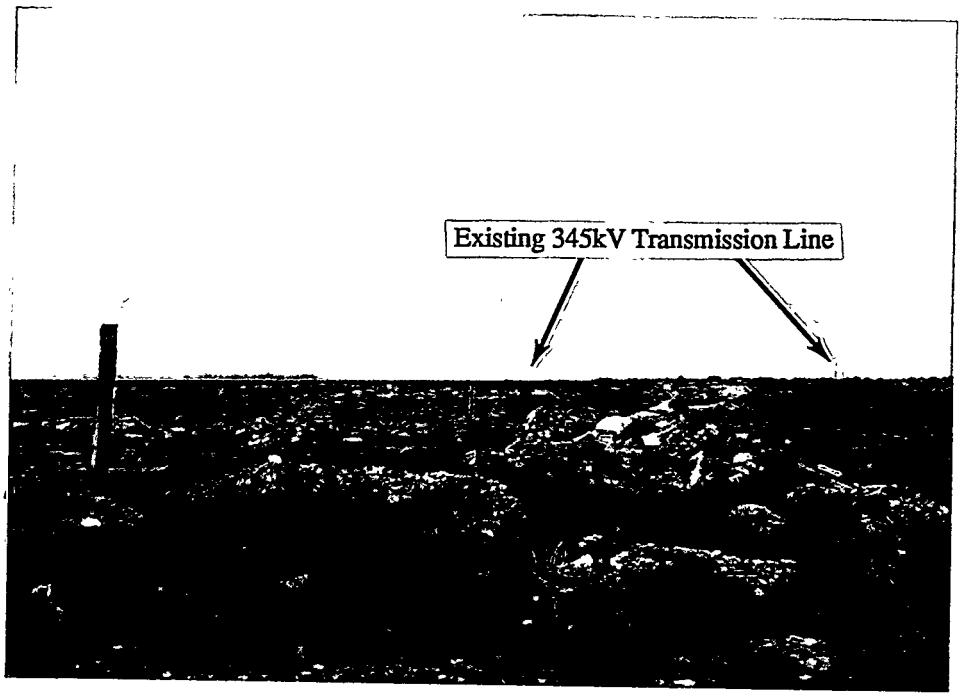


Background view (3-5 miles) from Interstate 10 of study area - view looking south.

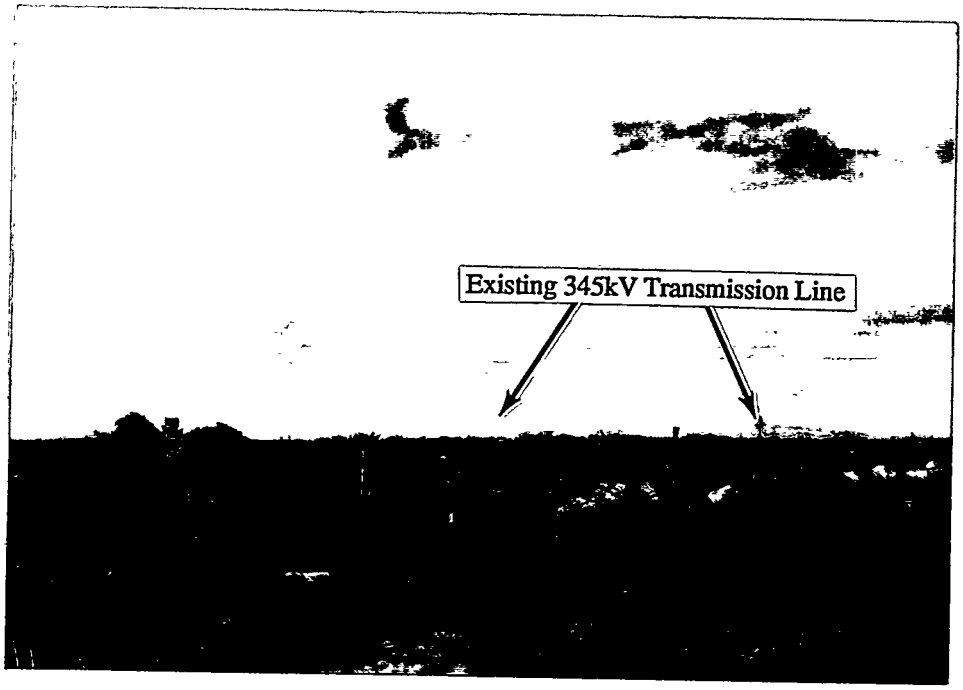


Foreground view (345kV, 0-1/4 mile) from adjacent
Sunland Park residential subdivision - view looking southwest.

Foreground view (345kV, 0-1/4 mile) from adjacent Sunland Park
residential subdivision - view looking west.



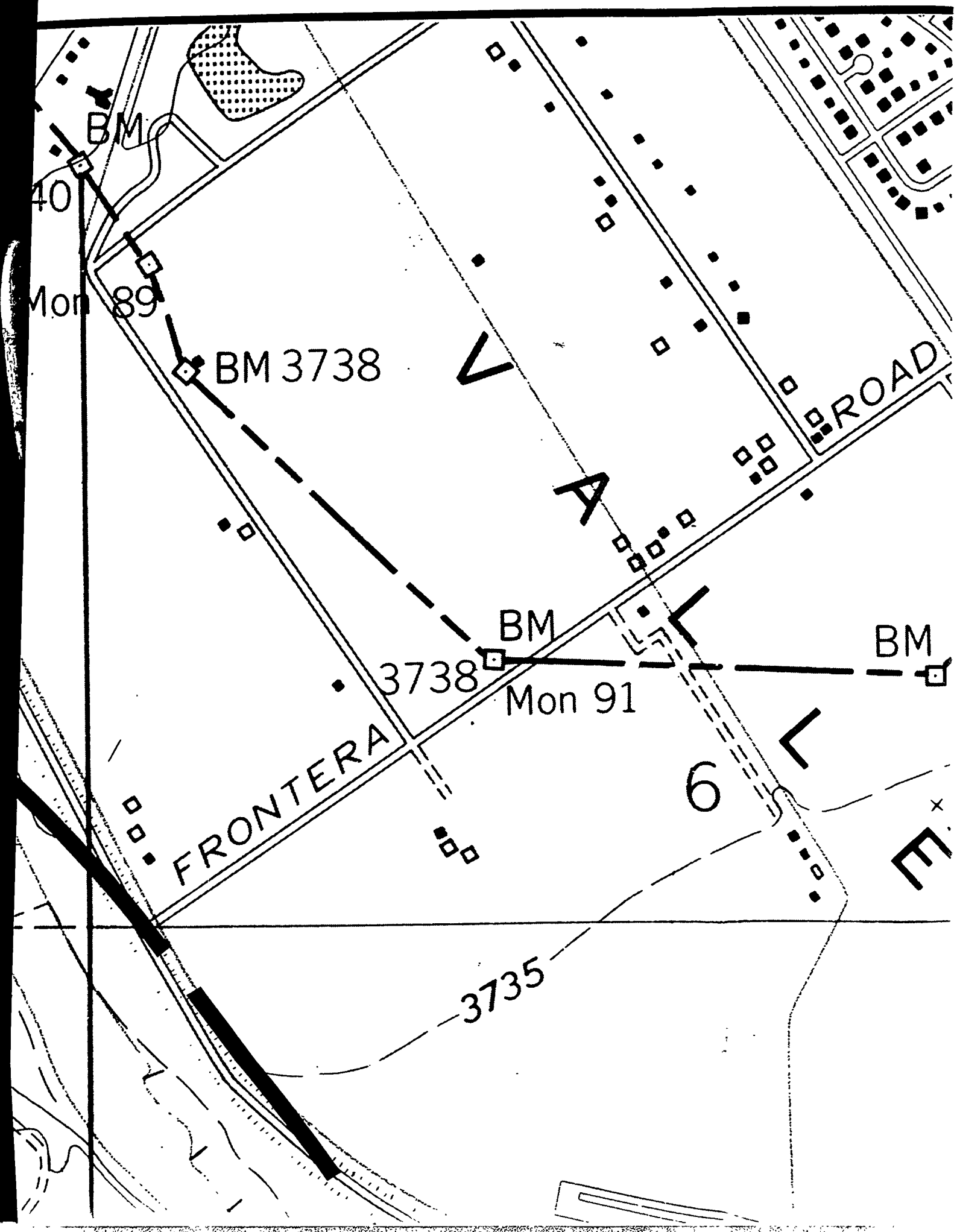
View of existing 345kV transmission line and western portion of the project area - view looking northwest.



View of existing 345kV transmission line and southwestern portion of the project area - view looking north.

APPENDIX D

Study Area Map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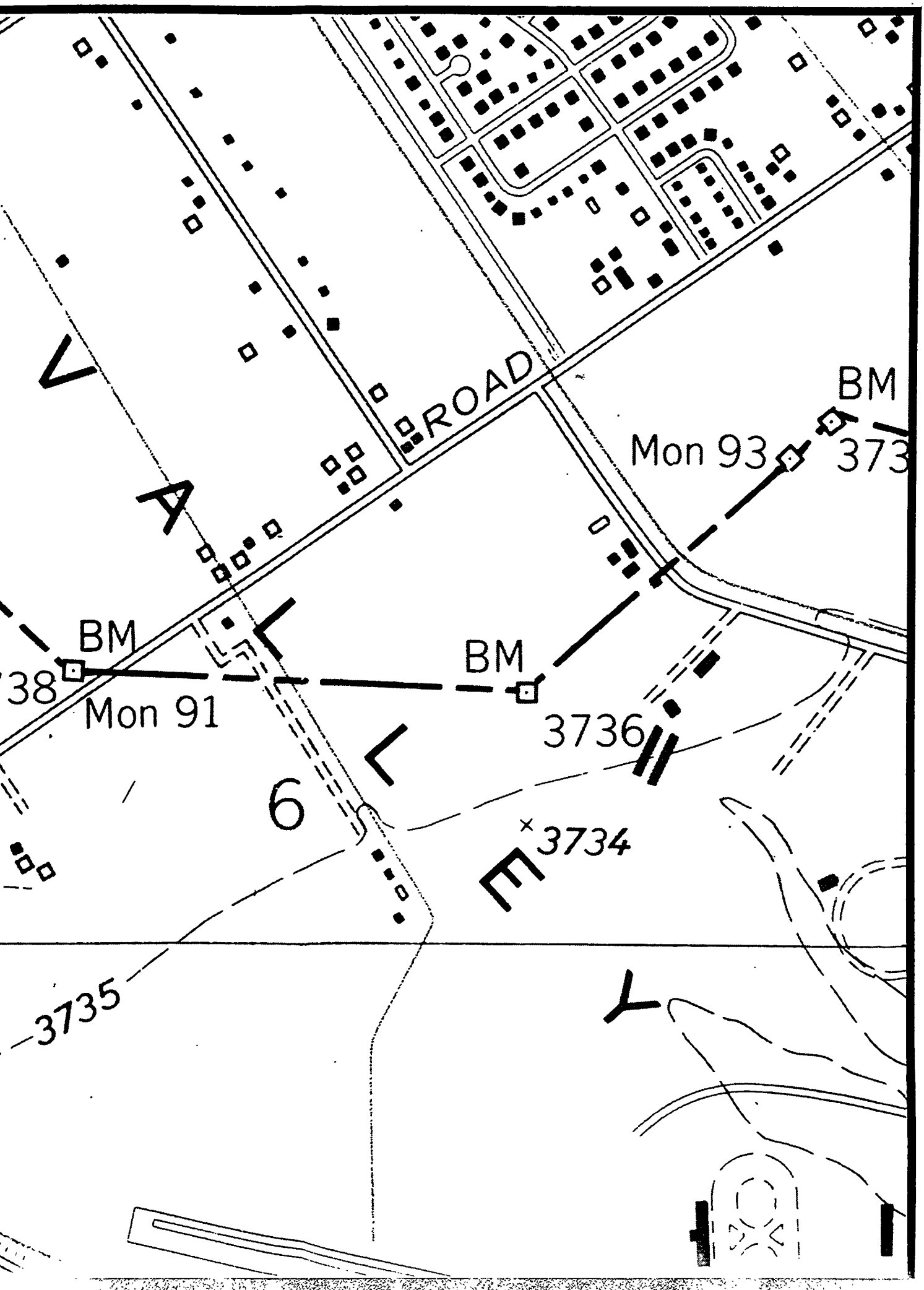
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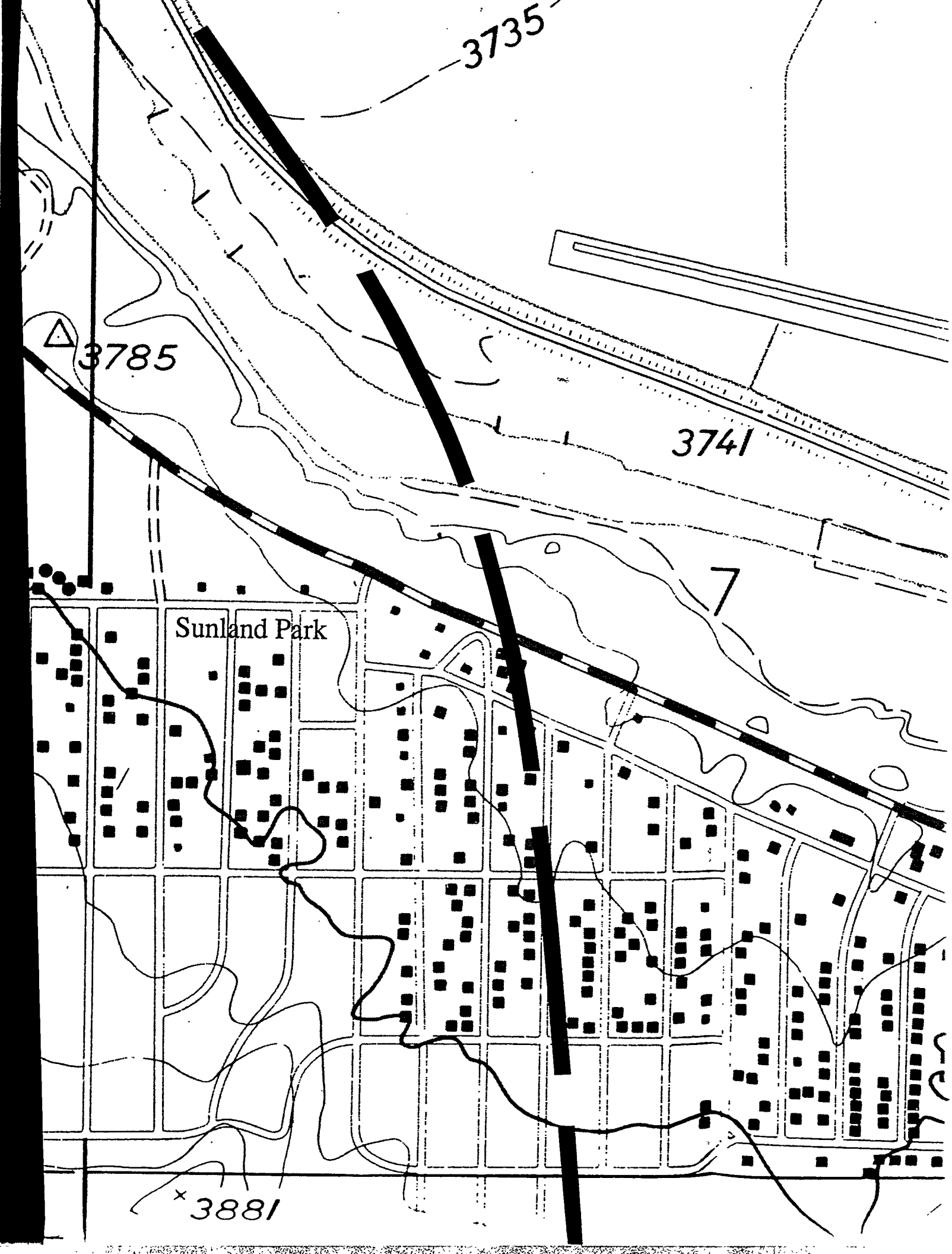
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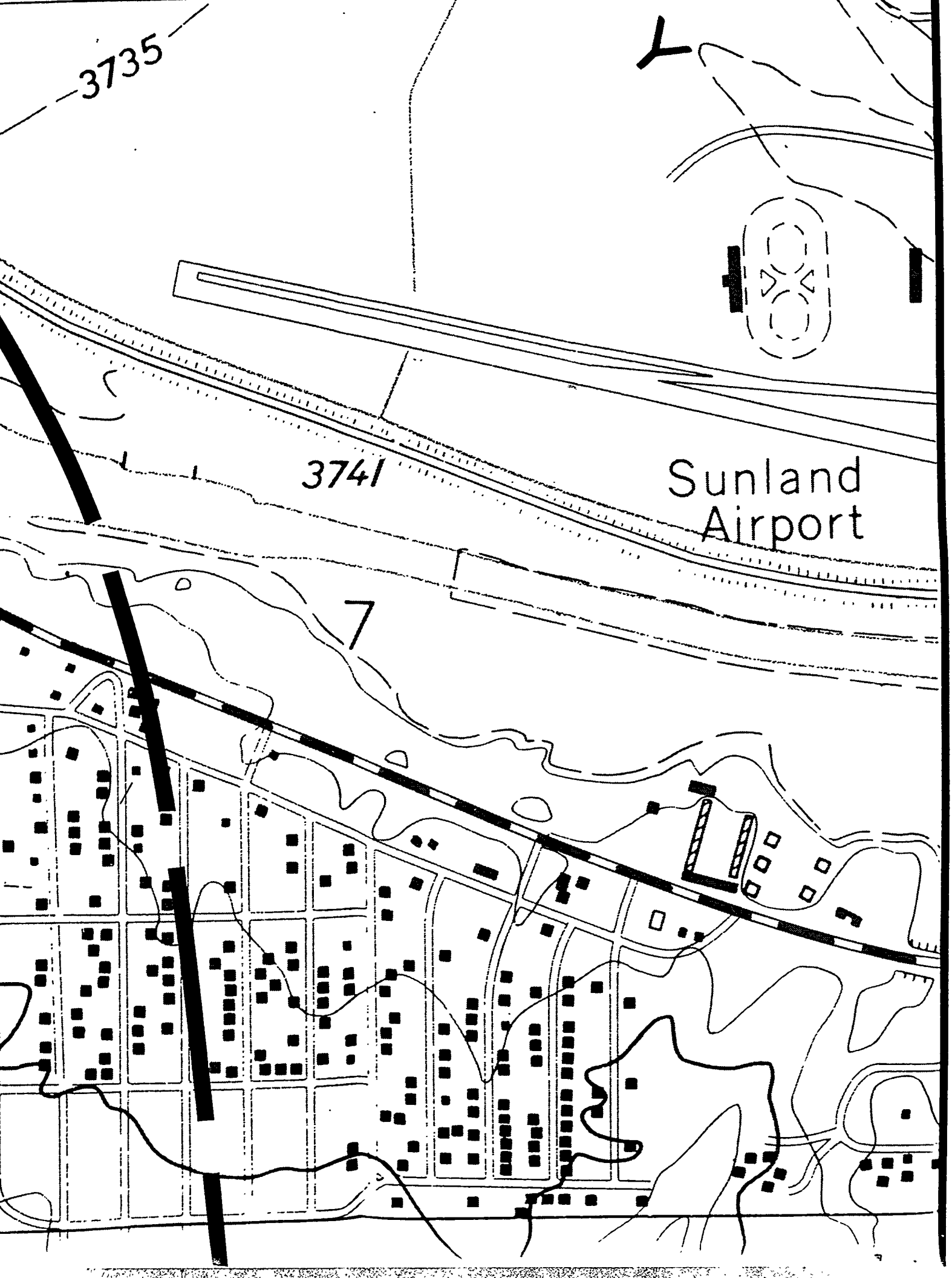
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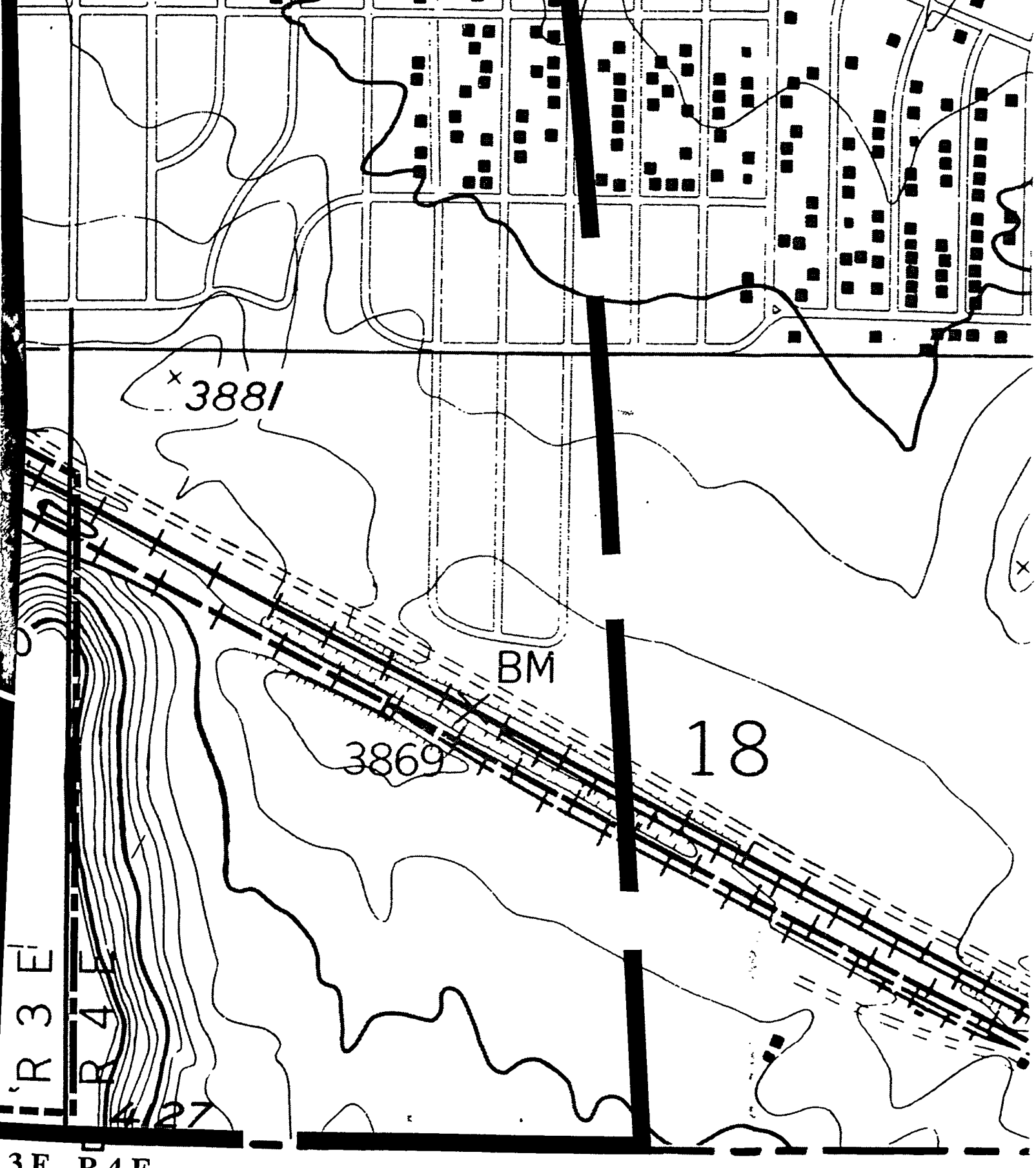

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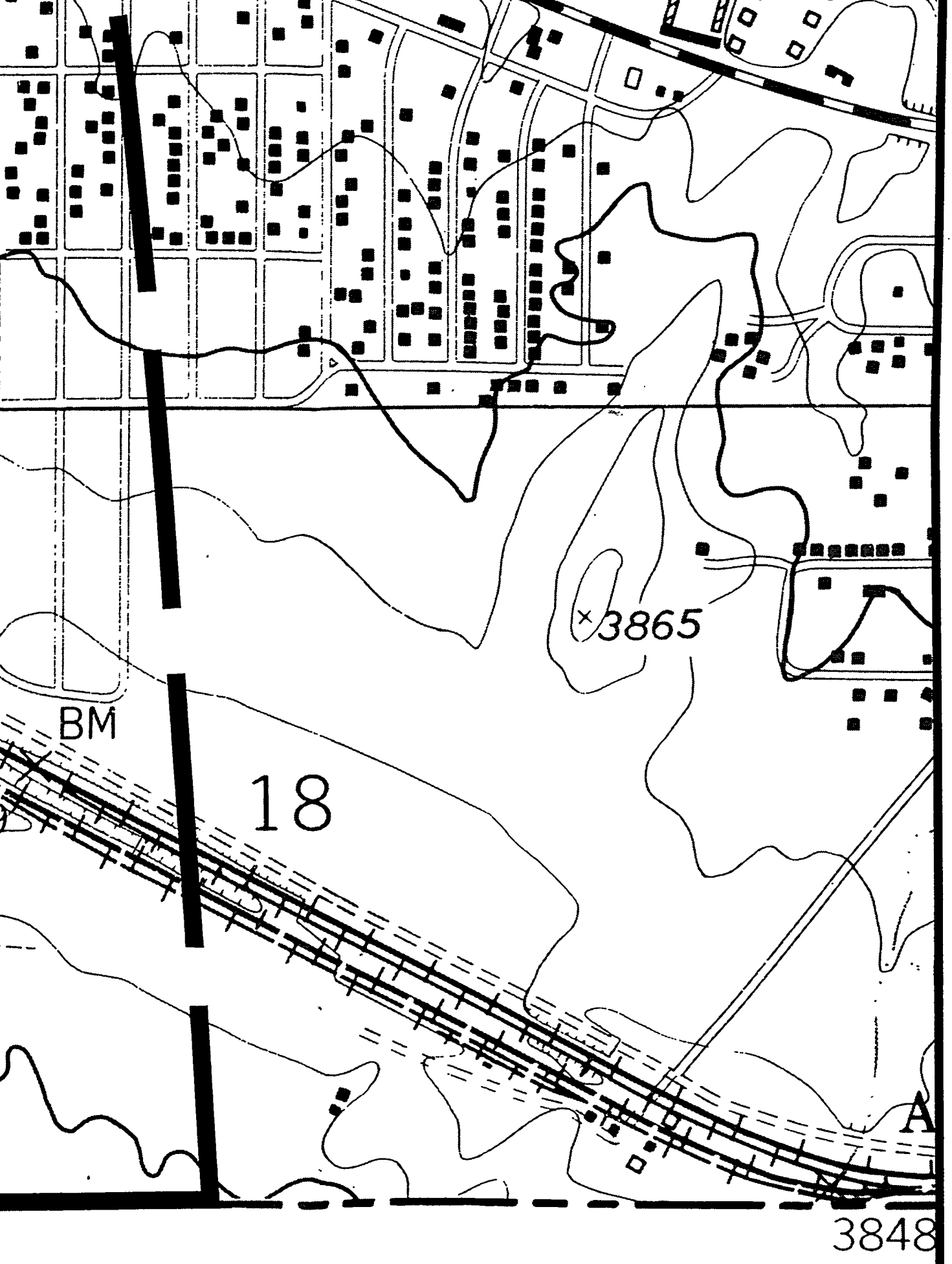
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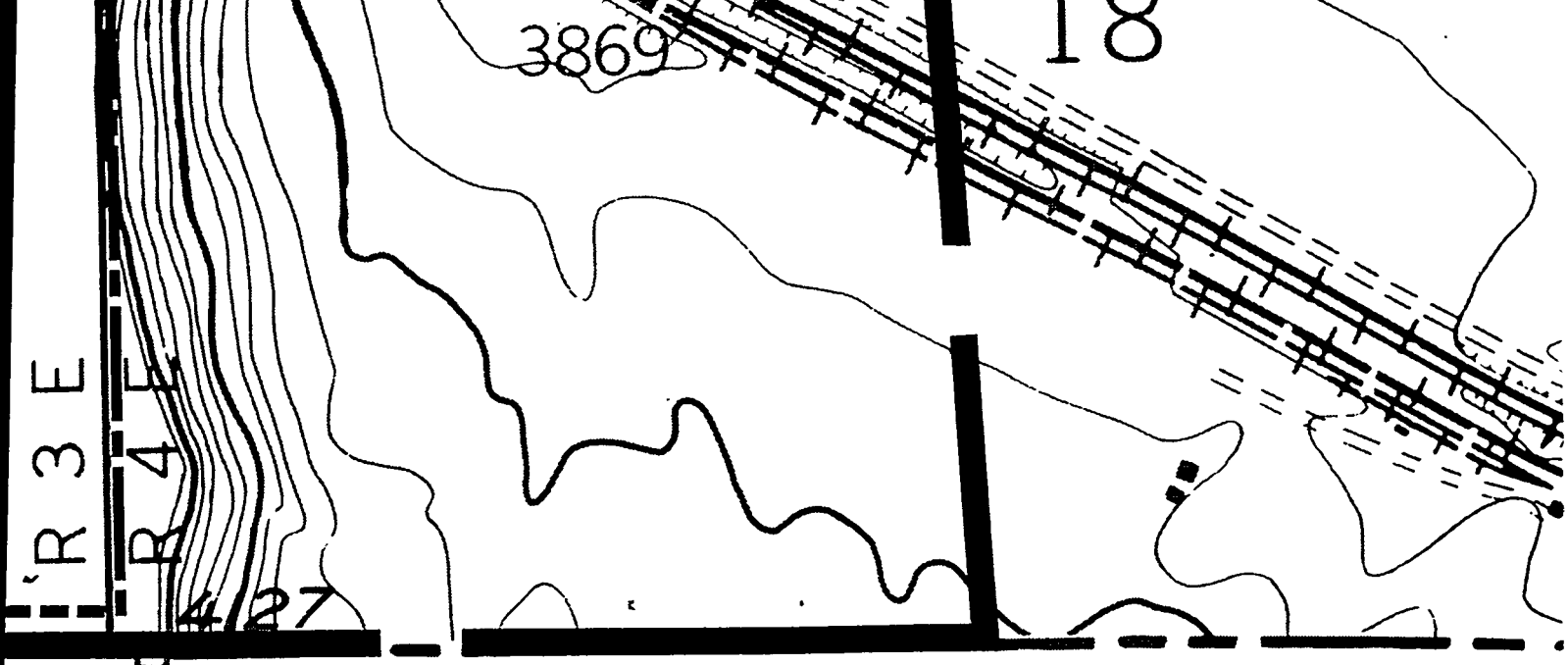

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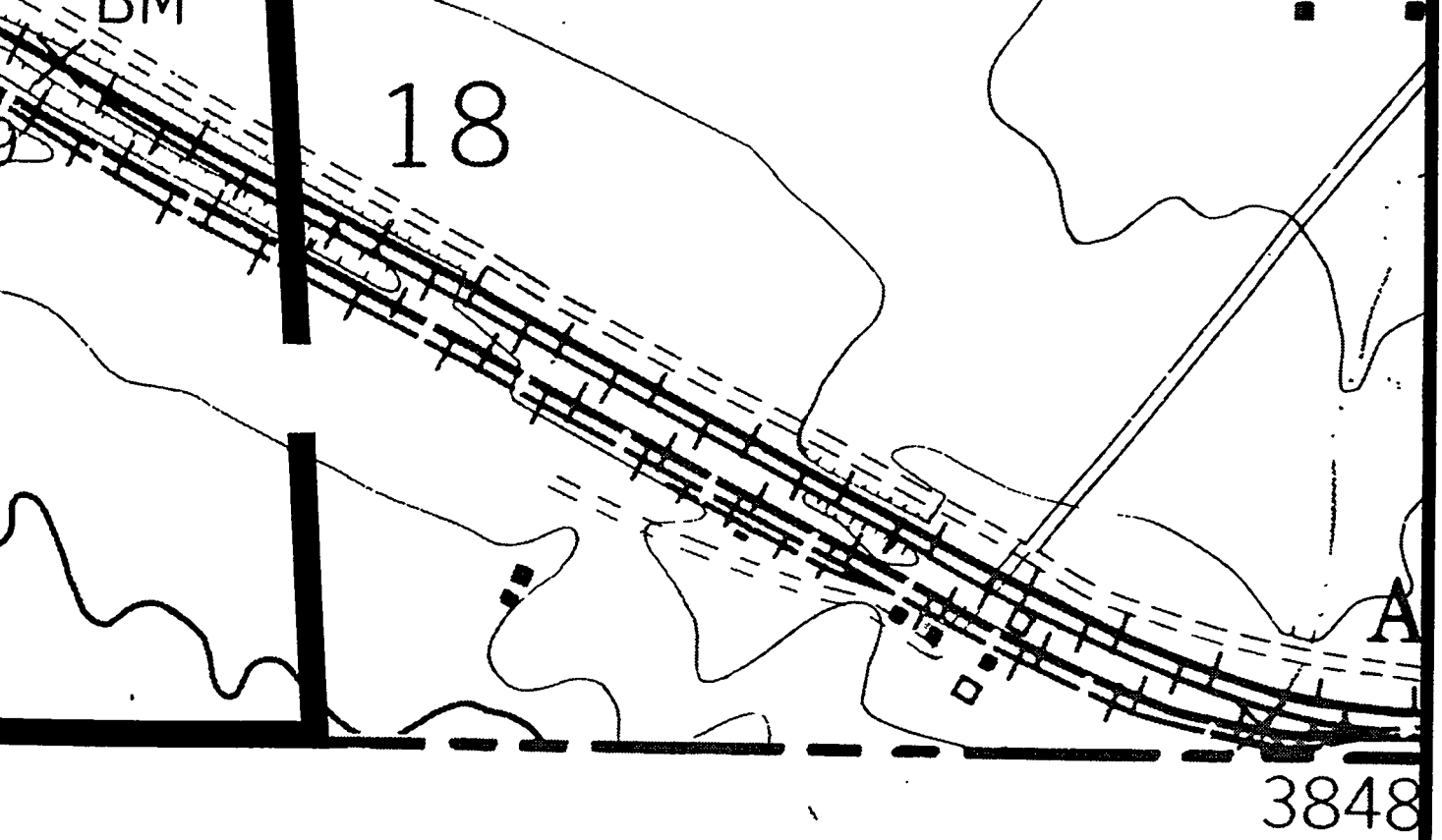
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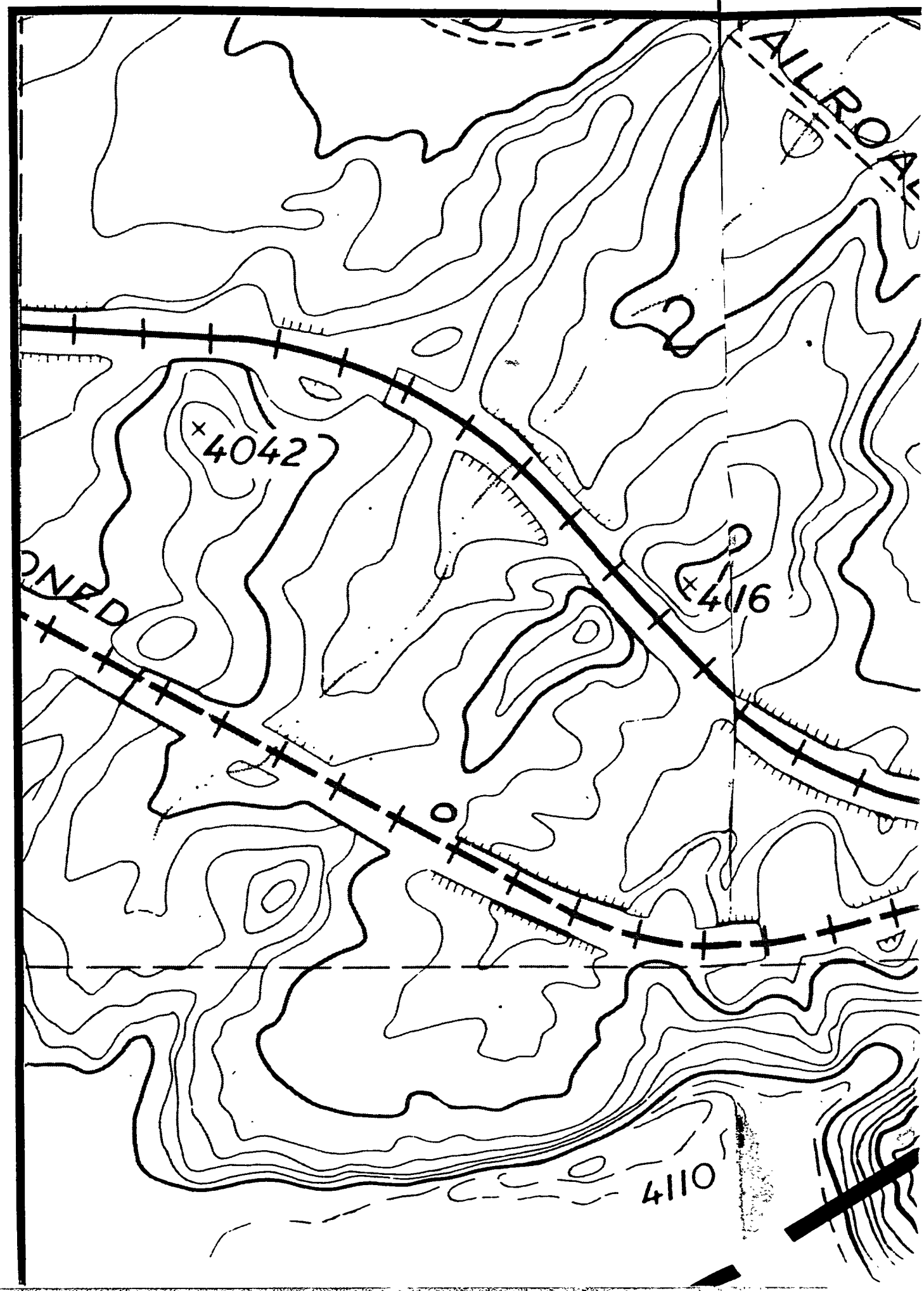

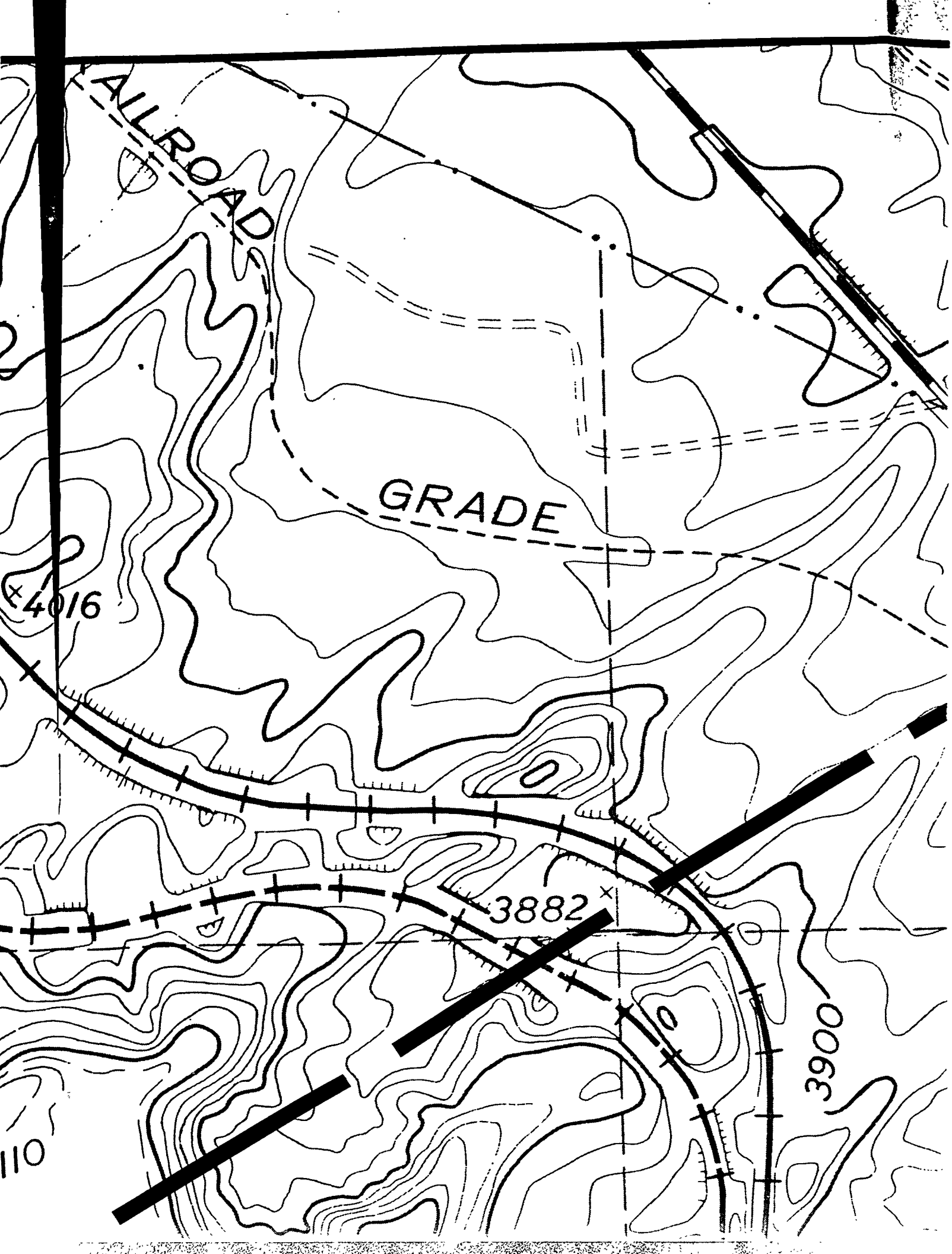
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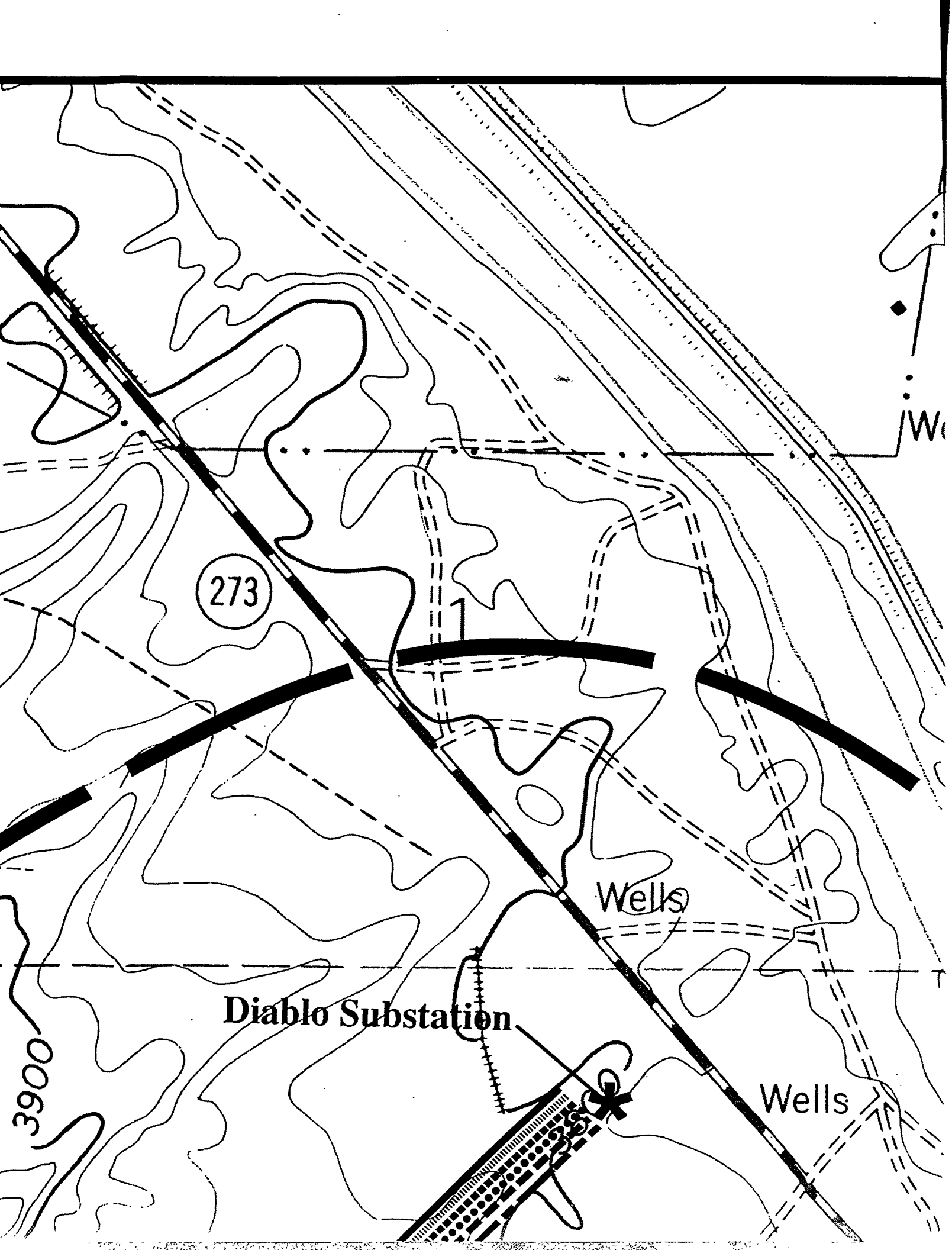
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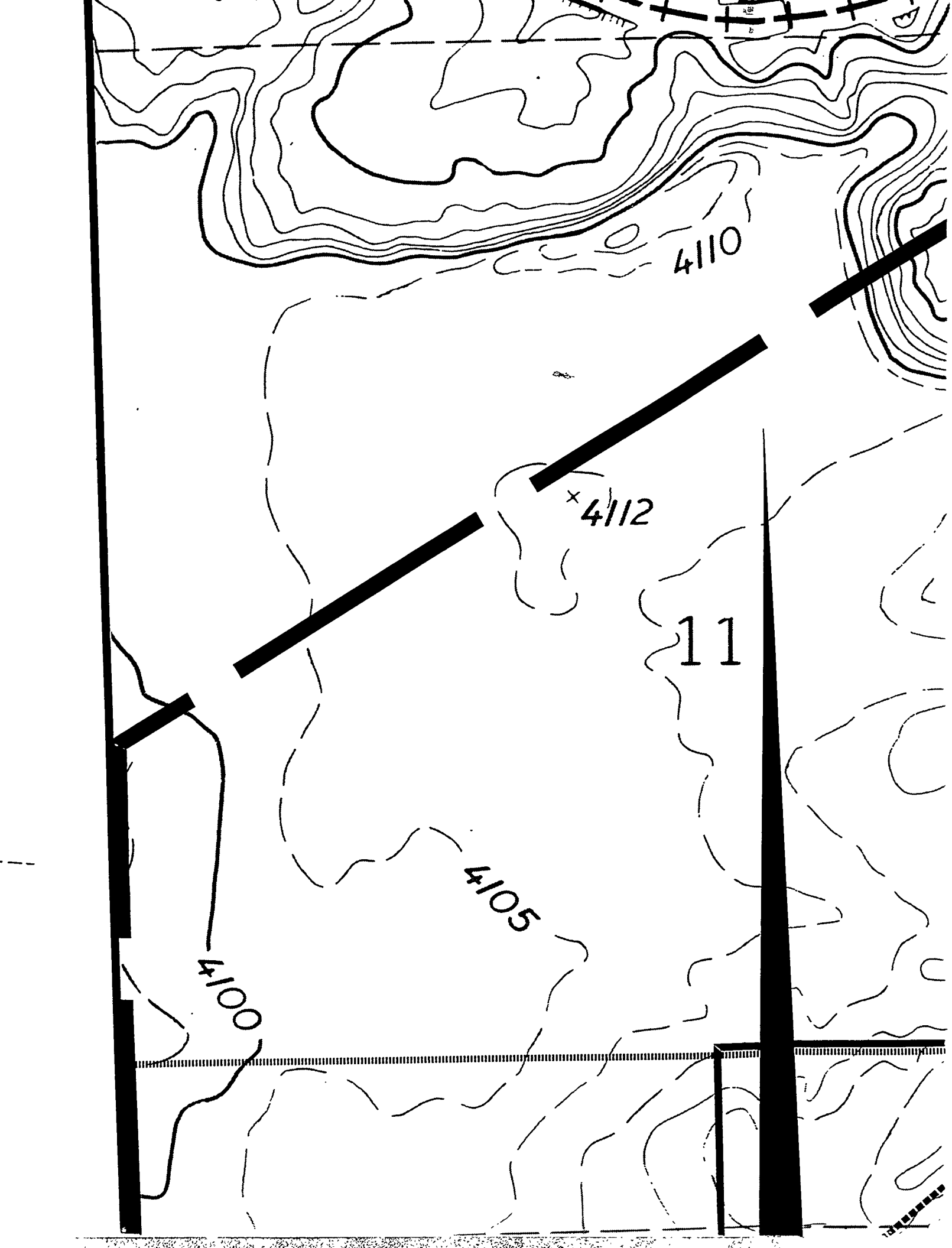
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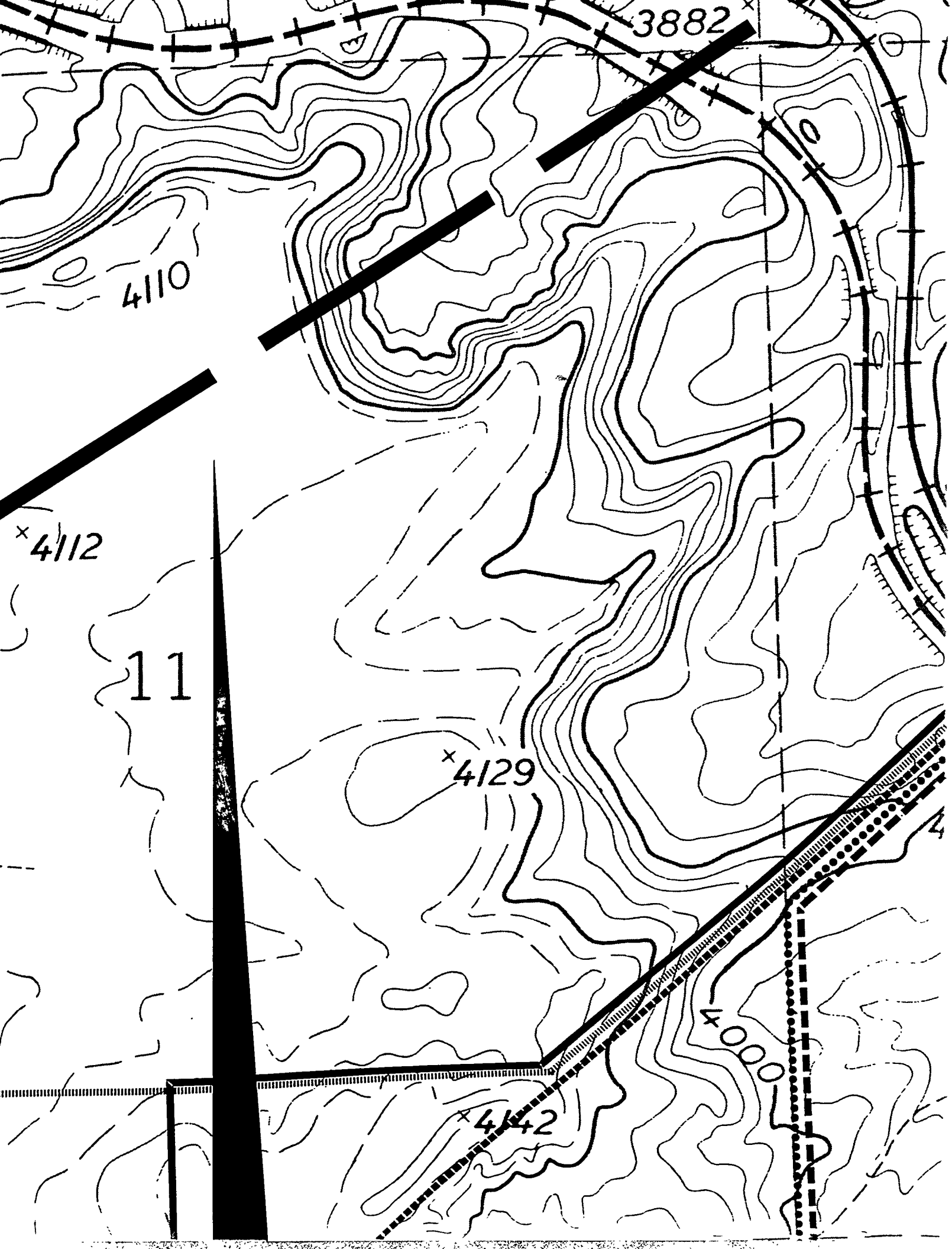
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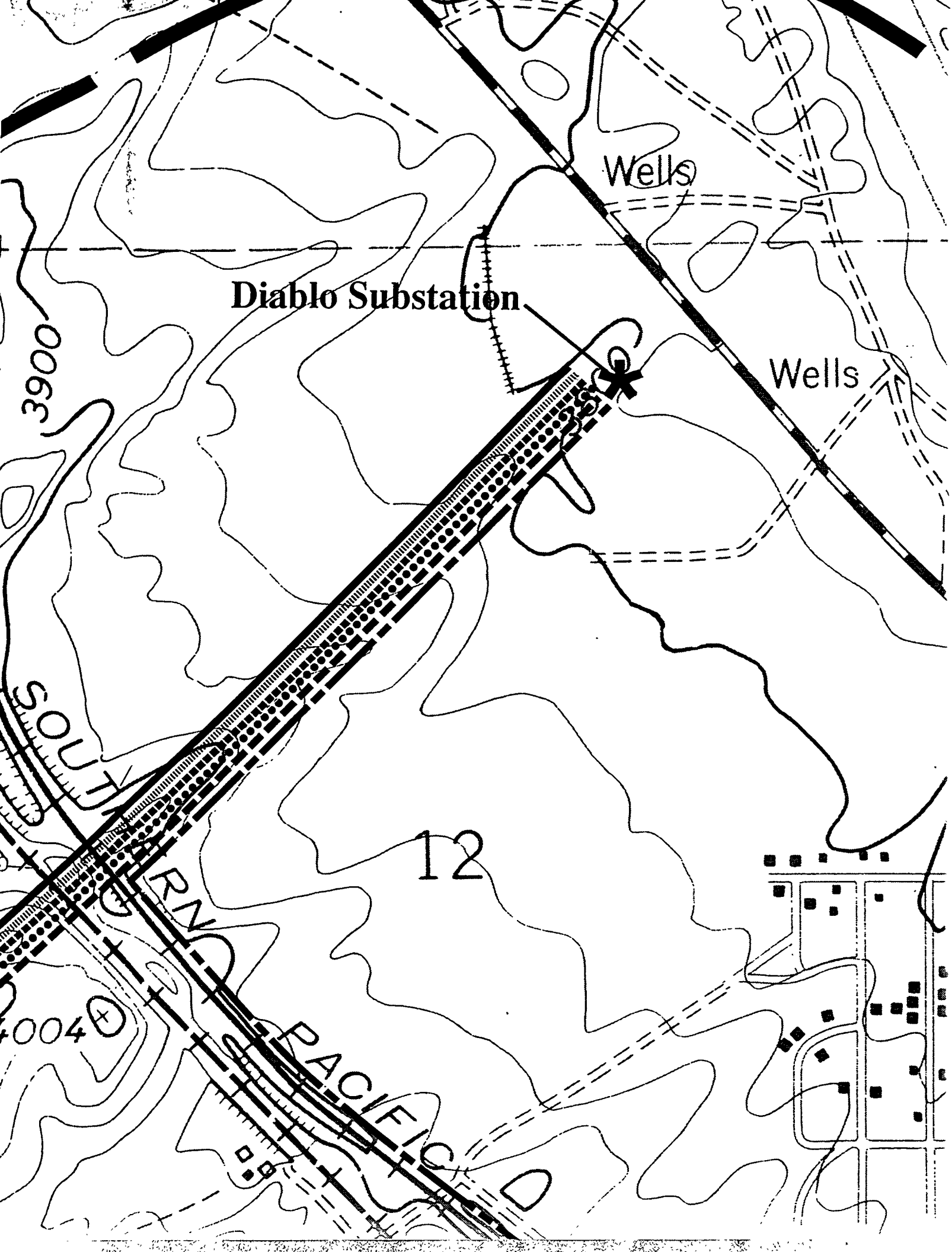
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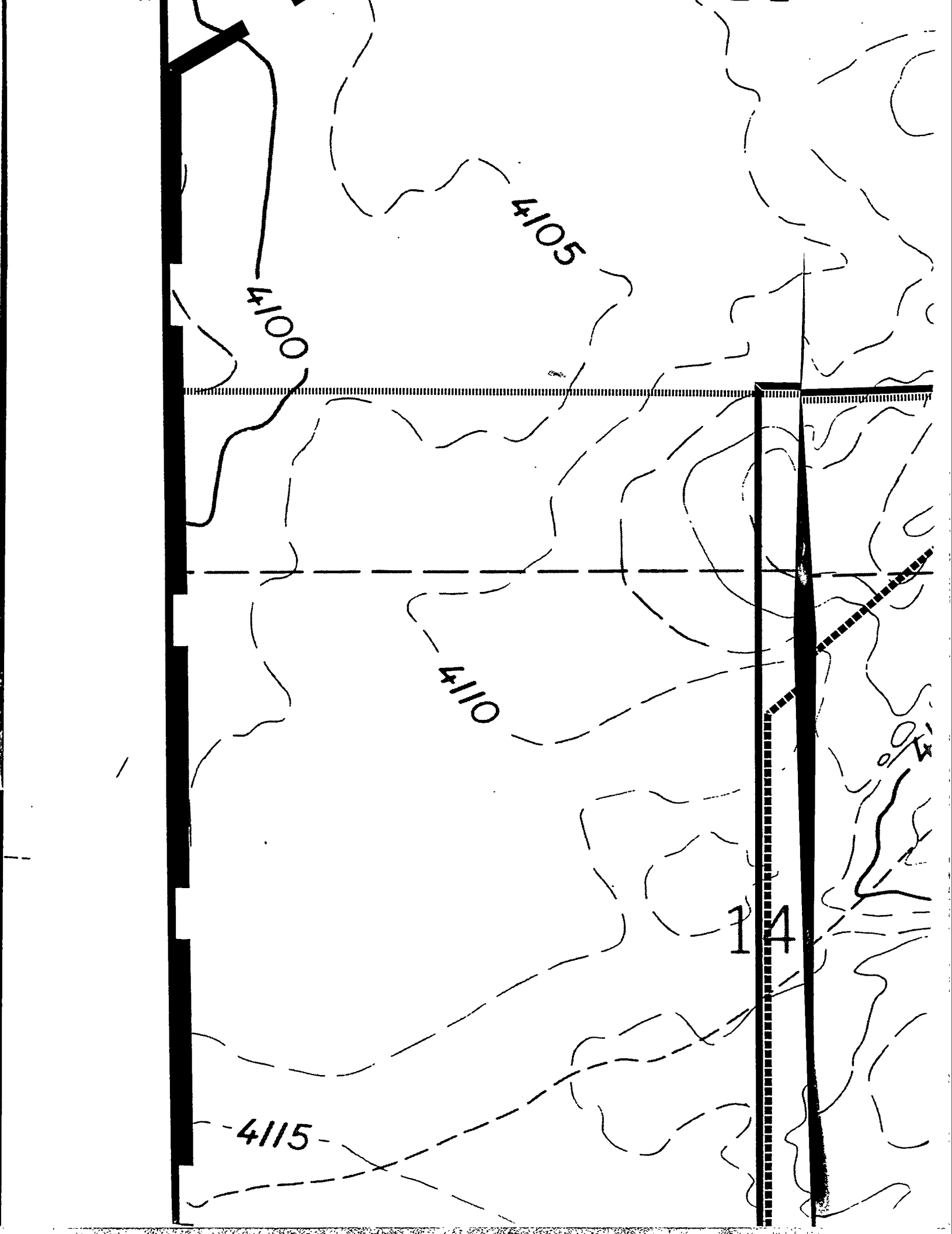
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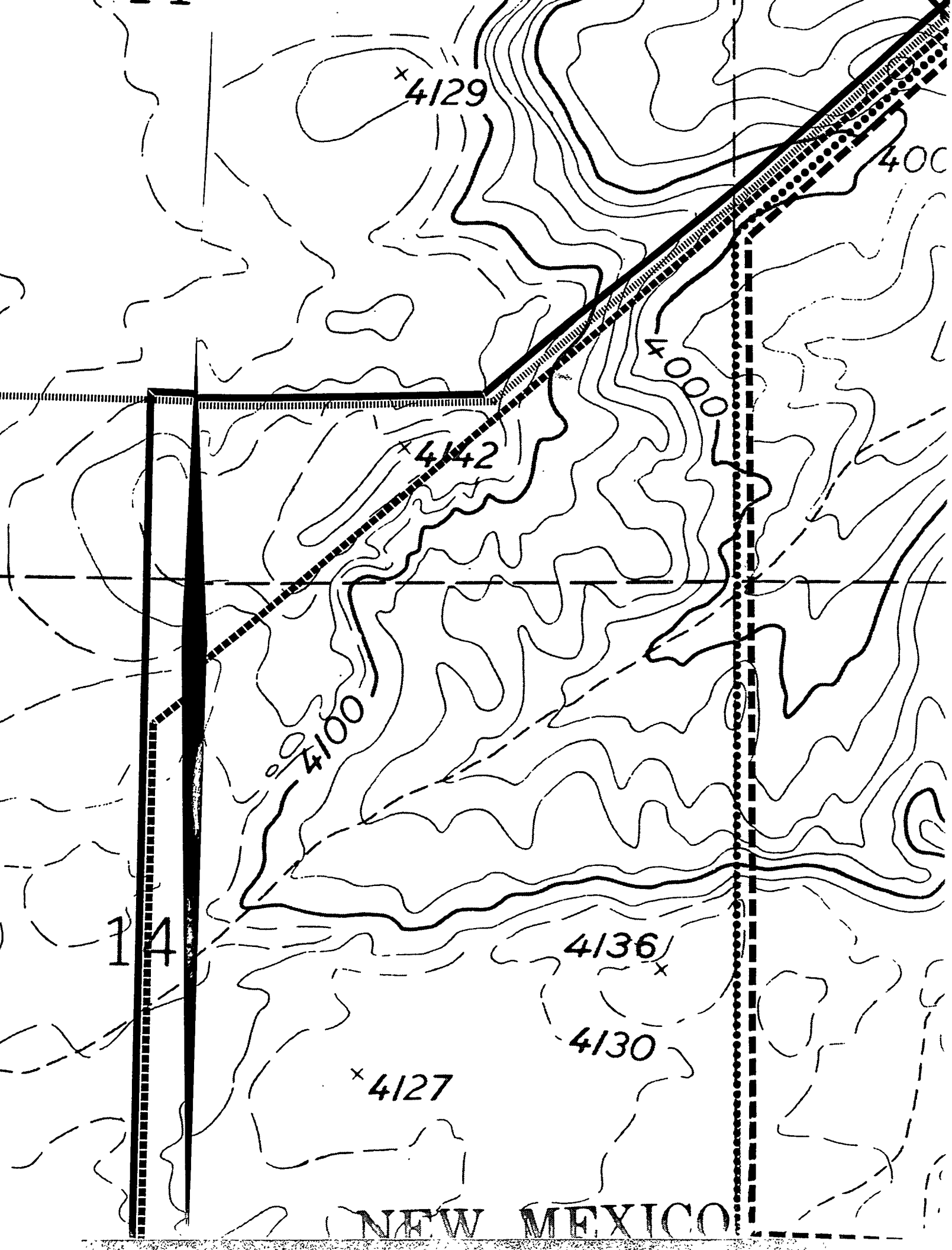
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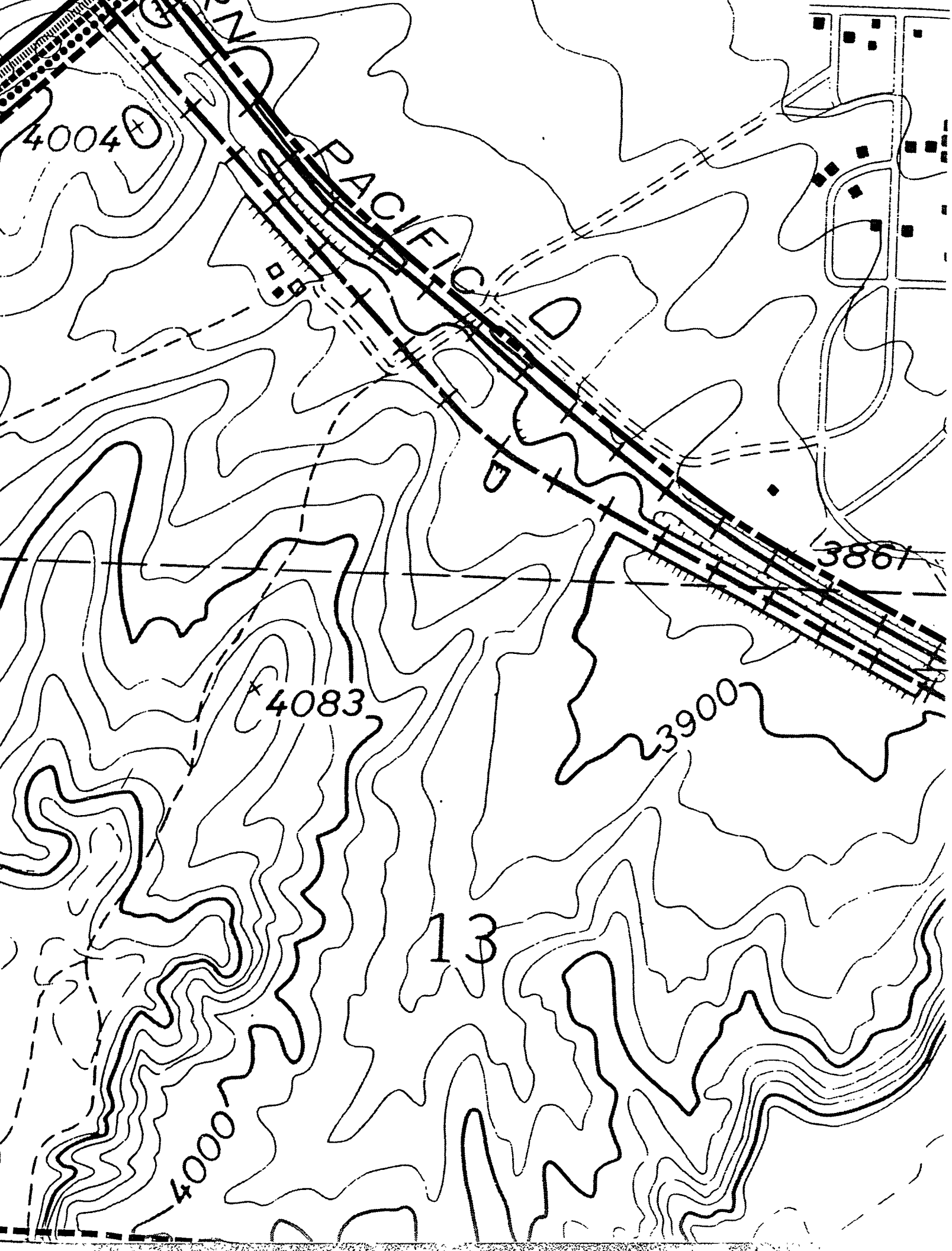
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Diablo Substati
115 kV Transmis

4/1/91

Alternative A (propose action)

Alternative B

Alternative C

Alternative D

Alternative E

Existing 345kV

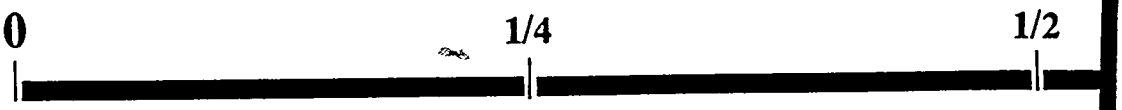
Study Area B

action)

.-Mexico Border
Project

1 Inch = 500 Feet

Diablo Subs
115 kV Trans



4/1/91

Alternative A (propose

Alternative B

Alternative C

Alternative D

Alternative E

Existing 345kV

Study Area Boundary