

APPENDIX C

GIS Coverages and Metadata Descriptions

GIS COVERAGES, METADATA DESCRIPTIONS, AND GROUND-WATER DATA SETS

One of the project goals was to compile available ground-water information into a geographically referenced format. The process of data compilation included identification of primary data sources, data acquisition, and format determination. Administration of this joint effort required that common standards be developed to facilitate the transfer of working information between cooperators. Facilitation of data compilation by uniquely different entities such as NMWRRI and TWDB into a single useable document required use of a common GIS application software, development of a base illustration, and a common coordinate system. ARC/INFO 7.0.3 on the UNIX platform was chosen as the underlying software basis for the project.

The base illustration consists of transportation, political boundaries, and the study area boundary. The transportation and political boundaries are from the TIGER 1990 data files, some corrections to arc referencing information was made in the development of the transportation coverage. The study area boundaries correspond to the political boundaries in the United States. The boundary in Mexico was generated with political and logical boundaries based on extension of US boundary limits. The common coordinate system adopted for the project is described in the projection files associated with each coverage and is:

Projection:	Lambert
Units:	Meters
Spheroid:	GRS1980
Parameters:	
1st Standard Parallel	32 30 0.000
2nd Standard Parallel	31 30 0.000
Central Meridian	-106 0 0.000
Latitude of Projection's Origin	32 0 0.000
False Easting (meters)	1000000.00000
False Northing(meters)	1000000.00000

The primary data sets (wells, aquifers, and geology) were compiled and visually checked. Summary illustrations from these coverages have been developed along with a one page description. The metadata format has been developed to meet or exceed minimum FDGC requirements and are associated with the appropriate coverage file. The secondary data sets have a metadata file developed by the originator which is included with the data file and the study reference only lists origin.

Coverages

The following is a listing of the regional illustrations, primary data coverages, and file names for data retrieval from the accompanying CD.

Regional Illustrations

- Location of Study Area
- Aquifers
- Economically Distressed Areas
- Well Locations
- Geology
- Land Surface Relief With Drainage
- Landuse
- Hazardous Waste Sites and Landfills

Arc/Info Coverages Developed by the TWDB

Category	File	Description
Aquifers	trans_tula.e00	Tularosa aquifer
	trans_hueco.e00	Hueco aquifer
	se_hueco.e00	Southeastern Hueco aquifer
	trans_mesi.e00	Mesilla aquifer
	trans_grande.e00	Rio Grande aquifer
	jornada.e00	Jornada aquifer
Study Area Boundary	cretace_3.e00	Diablo Plateau aquifer
	transelpaso.e00	Study area
Economically Distressed Areas (EDAs)	elpaso_col.e00	El Paso Co. colonias
	huds_colon.e00	Hudspeth Co. colonias
	nm_colonias.e00	New Mexico colonias
Well Locations	ephud_wells.e00	El Paso & Hudspeth Co. Wells
	otwells_p.e00	Otero Co. Wells
	dac_wells.e00	Dona Ana Co. Wells
	mex_wells.e00	Mexican wells
	juarez_wells.e00	Juarez wells
	irrga_wells.e00	Mexican irrigation wells

Water Level Contours	rg_wl73.e00	Rio Grande aquifer water levels (1973-74)
	rg_wl94.e00	Rio Grande aquifer water levels (1994-95)
	huetul_wl.e00	Hueco-Tularosa aquifer water levels
	sehu_wl.e00	Southeastern Hueco aquifer water levels
Rock Outcrops	diablo_wl.e00	Diablo Plateau aquifer water levels
	rock_out.e00	Rock outcrops on report maps

Arc/Info Coverages Obtained From Outside Sources

Data	File	Source
Relief	Image only	USGS DEM data
Landuse		USGS Landuse data (1:250,000 scale)

Hazardous Waste & Landfill Sites	lanf_elp.e00	USEPA
	haz_elp.e00	
	trans_fill.e00	

Geology		Corps of Engineers GRASS data
Texas	marf_geo.e00	BEG mapsheets (1:250,000 scale)
	elp_geo.e00	
Mexico	mexgeo.e00	NMSU map sheets (1:1,000,000 scale)
New Mexico	nm_geo_clip.e00	NMSU map sheets (1:500,000 scale)

Cities, Roads, Railroads,
Drainage, Landmarks

Texas & New Mexico trans_city.e00 TIGER 1990 census data

elpaso_rds.e00

hudspethrds_p.e00

trans_rails.e00

otero_p.e00

dona_ana.e00

Mexico mex_cult1.e00 INEGI 1:250,000 topo sheets

mex_city1.e00

mex_trans.e00

GIS Metadata Descriptions

The GIS metadata descriptions for the above Arc/Info coverages are included on the CD as text files in the directory "METADATA".

Ground-Water Data Sets

The ground-water databases included on the attached CD have been provided by the participating agencies: Texas Water Development Board and New Mexico State University Water Resources Research Institute for the U.S. side, and Comision Nacional del Agua , Junta Municipal de Agua Y Saneamiento, Ciudad Juarez, and Servicios Nacionales de Estadistica, Geografia e Informatica (INEGI) for the Mexican side.

The general types of data provided with the report are: land use, well data (construction, ownership, well use, etc.), core descriptions, ground-water levels in wells, results of ground-water quality analyses, and pumping records. The information is organized by country and, in the case of the U.S., by state. Not all data types listed above are available for each entity. The data pertinent to the U.S. can be found in the folder U.S.A. which contains two sub-folders: Texas and New Mexico. Similarly, the Mexican data is located in the folder Mexico.

All the available information has been tabulated and saved in MS Excel 7.0 workbooks. Efforts have been made to organize the U.S. information in a consistent manner. The Mexican data was grouped together in one file but was not otherwise modified or organized. Each workbook consists of spreadsheets named for the type of data they contain, as shown below:

Workbook name: SUMPUMP
Sheet name: Contains total annual pumping volumes (in m3) for El Paso and Hudspeth Counties between the years 1980 and 1992.

Workbook name: TEXAS.XLS
Sheet name: INDPUMP
Contains annual and monthly industrial pumping volumes (in m3) for El Paso and Hudspeth Counties between 1955 and 1994.

Workbook name: TEXAS.XLS
Sheet name: MUNPUMP
Description: Contains annual and monthly municipal pumping volumes (in m3) for El Paso and Hudspeth Counties between 1955 and 1994.

Workbook name: TEXAS.XLS{1}
Sheet name: WELL DATA
Description: Contains general information about water wells in El Paso and Hudspeth Counties.

Workbook name: TEXAS.XLS
Sheet name: WATER QUALITY
Description: Contains results of water quality analyses (major ions) for ground water in El Paso and Hudspeth Counties.

Workbook name: TEXAS.XLS
Sheet name: INFREQUENTS
Description: Contains results of water quality analyses (trace metals, halides,stable and radioactive isotopes, organic compounds, etc.) for ground water in El Paso and Hudspeth Counties.

Workbook name: TEXAS.XLS
Sheet name: WATER LEVELS
Description: Contains water level measurements in wells in El Paso and Hudspeth Counties.

Workbook name: TEXAS.XLS
Sheet name: AQUIFER LIST
Description: Contains a listing of all known aquifers in El Paso and Hudspeth Counties.

Workbook name: TEXAS.XLS
Sheet name: CASINGS
Description: Contains casing data for wells in El Paso and Hudspeth Counties.

Workbook name: TEXAS.XLS
Sheet name: STORETS
Description: Contains descriptions for all measured physical and chemical parameters for ground water in El Paso and Hudspeth Counties.

Workbook name: TEXAS.XLS
Sheet name: REMARKS
Description: Contains additional general comments regarding water wells in El Paso and Hudspeth Counties.

Workbook name: NEW MEXICO.XLS{2}
Sheet name: WELL DATA
Description: Contains general information about water wells in Otero and Dona Ana Counties.

Workbook name: NEW MEXICO.XLS
Sheet name: WATER LEVELS
Description: Contains water level measurements in wells in Otero and Dona Ana Counties.

Workbook name: NEW MEXICO.XLS
Sheet name: WATER QUALITY
Description: Contains results of water quality analyses (major ions) for ground water in Otero and Dona Ana Counties.

Workbook name: NEW MEXICO.XLS
Sheet name: INFREQUENTS
Description: Contains results of water quality analyses (trace metals, halides, stable and radioactive isotopes, organic compounds, etc.) for ground water in Otero and Dona Ana Counties.

Workbook name: MEXICO.XLS
Sheet name: WATER LEVELS (JMAS)
Description: Contains water level measurements in Ciudad Juarez and surrounding area. Data supplied by Junta Municipal de Agua Y Saneamiento (JMAS).

Workbook name: MEXICO.XLS
Sheet name: WATER LEVELS (CNA)
Description: Contains water level measurements in Juarez Valley. Data supplied by Comision Nacional del Agua (CNA).

Workbook name: MEXICO.XLS
Sheet name: WATER QUALITY (JMAS)
Description: Contains results of water quality analyses (major ions) for ground water in Ciudad Juarez and surrounding area. Data supplied by Junta Municipal de Agua Y Saneamiento (JMAS).

Workbook name: MEXICO.XLS
Sheet name: WATER QUALITY (CNA)
Description: Contains results of water quality analyses (major ions) for ground water in Juarez Valley. Data supplied by Comision Nacional del Agua (CNA).

Workbook name: MEXICO.XLS
Sheet name: CORE DESCRIPTIONS (CNA)
Description: Contains lithological descriptions of cores from wells in Juarez Valley. Data supplied by Comision Nacional del Agua (CNA).

Workbook name: MEXICO.XLS
Sheet name: CORE DESCRIPTIONS (JMAS)
Description: Contains lithological descriptions of cores from wells in Ciudad Juarez. Data supplied by Junta Municipal de Agua Y Saneamiento (JMAS).

Workbook name: MEXICO.XLS
Sheet name: LAND USE
Description: Shows the cultivated crops and corresponding number of hectares for Juarez Valley.

Workbook name: MEXICO.XLS
Sheet name: PUMPAGE (CNA)
Description: Contains annual and monthly pumping volumes (in thousands of m3) for wells in Juarez Valley between the years 1989 and 1995.

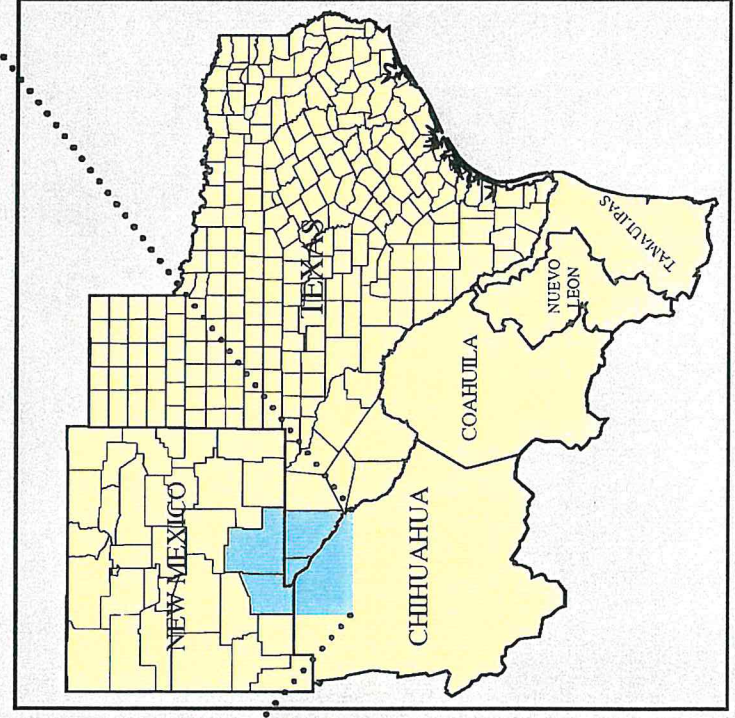
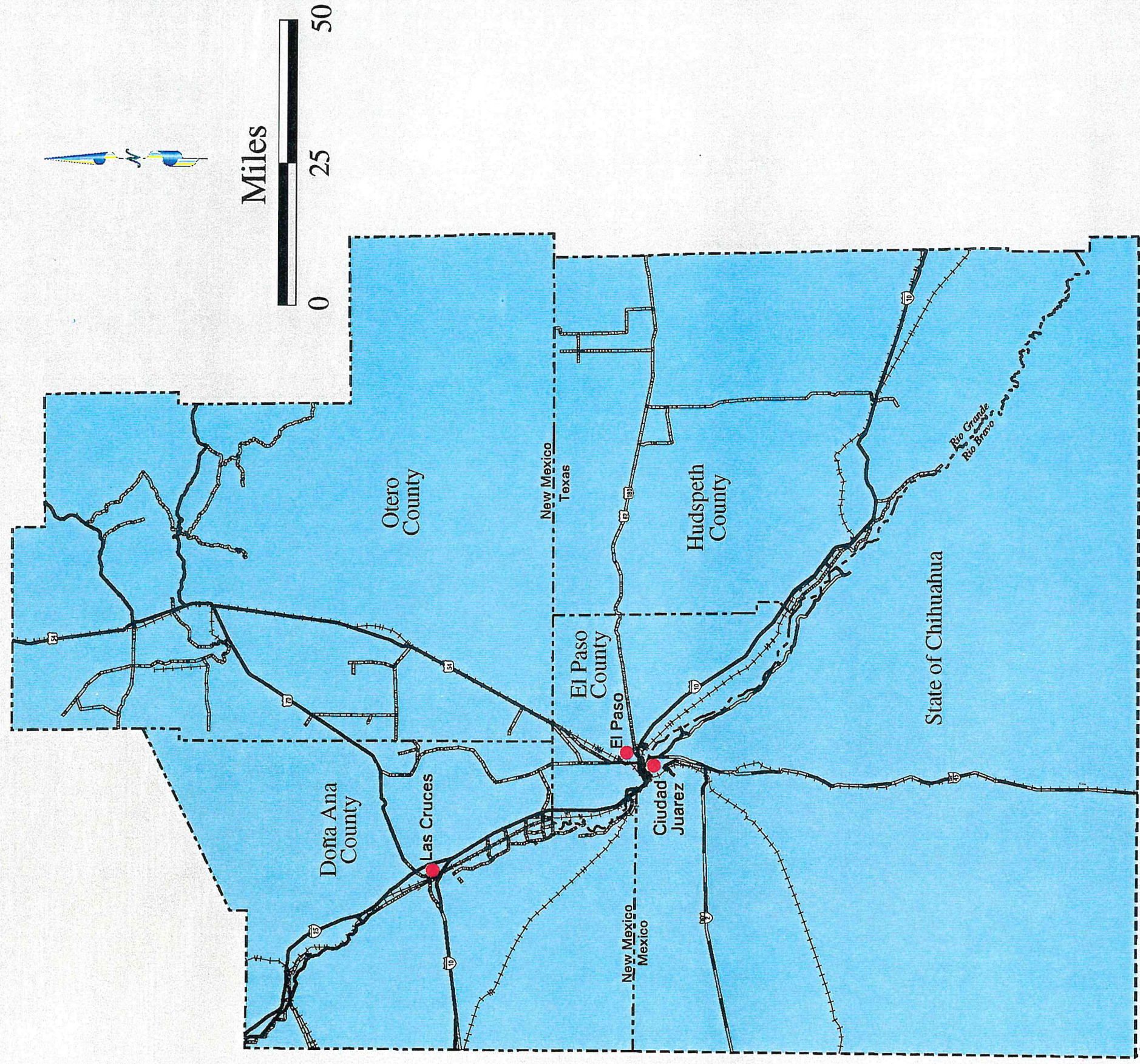
Workbook name: MEXICO.XLS
Sheet name: PUMPAGE (JMAS)
Description: Contains annual and monthly pumping volumes (in m3) for wells in Ciudad Juarez between the years 1990 and 1994.
Data supplied by Junta Municipal de Agua Y Saneamiento (JMAS).

Workbook name: MEXICO.XLS
Sheet name: WATER QUALITY (INEGI)
Description: Contains results of water quality analyses (major ions) for ground water in Juarez Valley. Data entered from the INEGI map sheets.

Workbook name: MEXICO.XLS
Sheet name: LATLONG
Description: Contains geographical coordinates for wells in Ciudad Juarez. Data derived from maps supplied by Comision Nacional del Agua.

FOOTNOTES*****

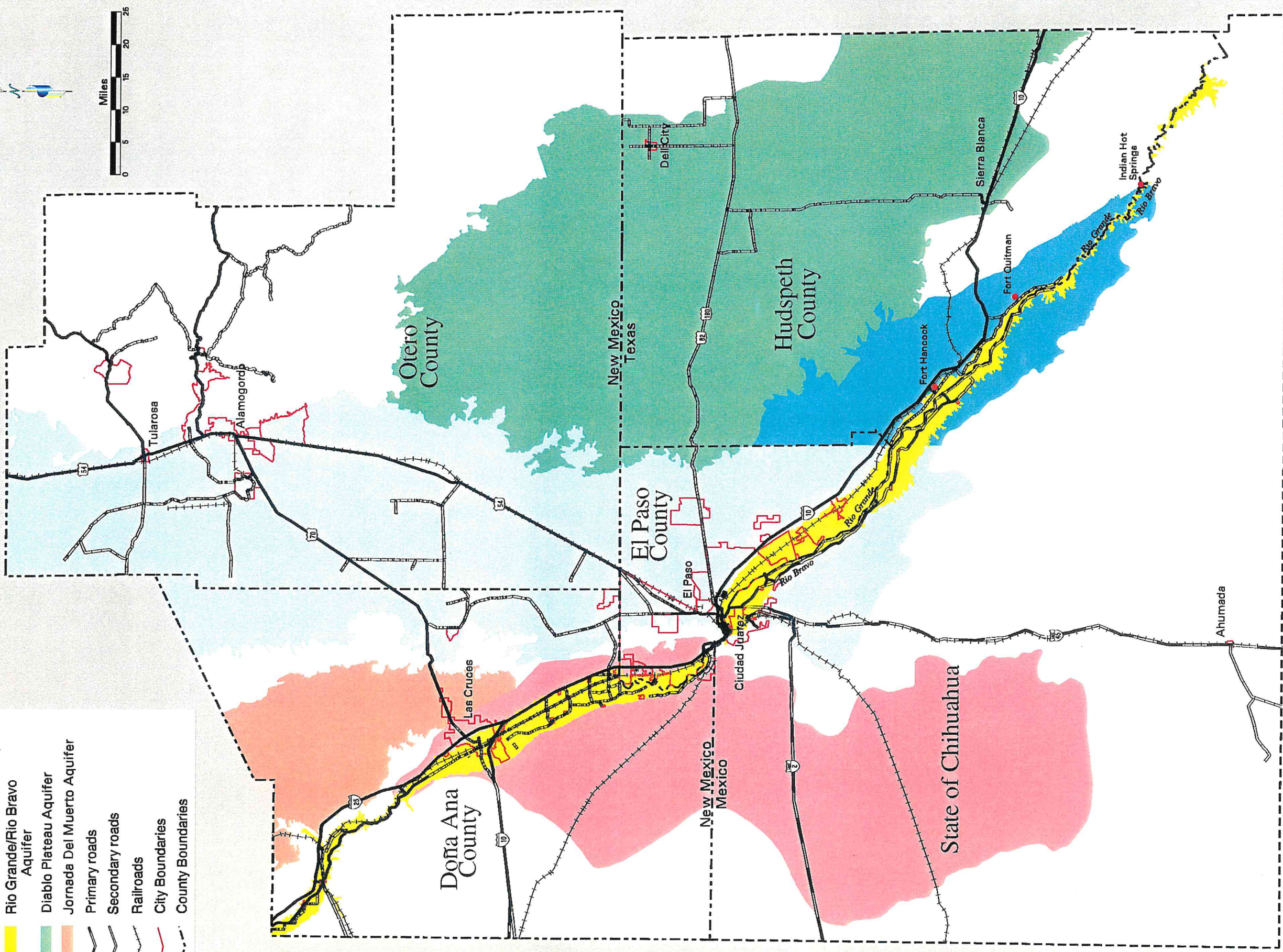
- {1} Please refer to document REFGUIDE.DOC for explanation of codes used in the TEXAS.XLS database
{2} Please refer to document TULACODE.DOC for explanation of codes used in the NEW MEXICO.XLS database



LOCATION OF STUDY AREA

LEGEND

- | | |
|------------------------------|-------------------|
| Mesilla Aquifer | Primary roads |
| Hueco-Tularosa Aquifer | Secondary roads |
| Southeastern Hueco Aquifer | Railroads |
| Rio Grande/Rio Bravo Aquifer | City Boundaries |
| Diablo Plateau Aquifer | County Boundaries |
| Jornada Del Muerto Aquifer | |

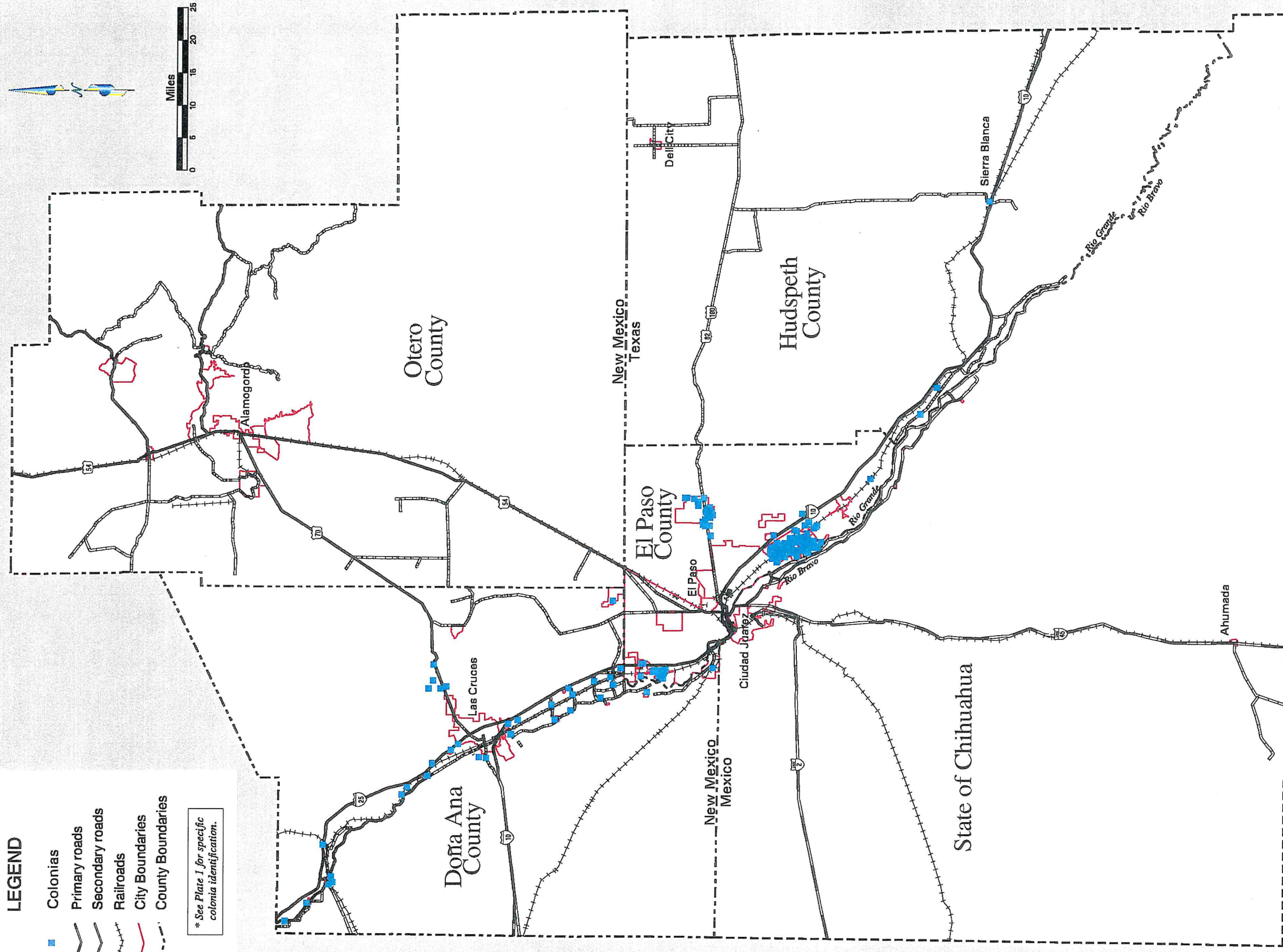


REGIONAL AQUIFERS

LEGEND

- Colonias
- Primary roads
- Secondary roads
- Railroads
- City Boundaries
- County Boundaries

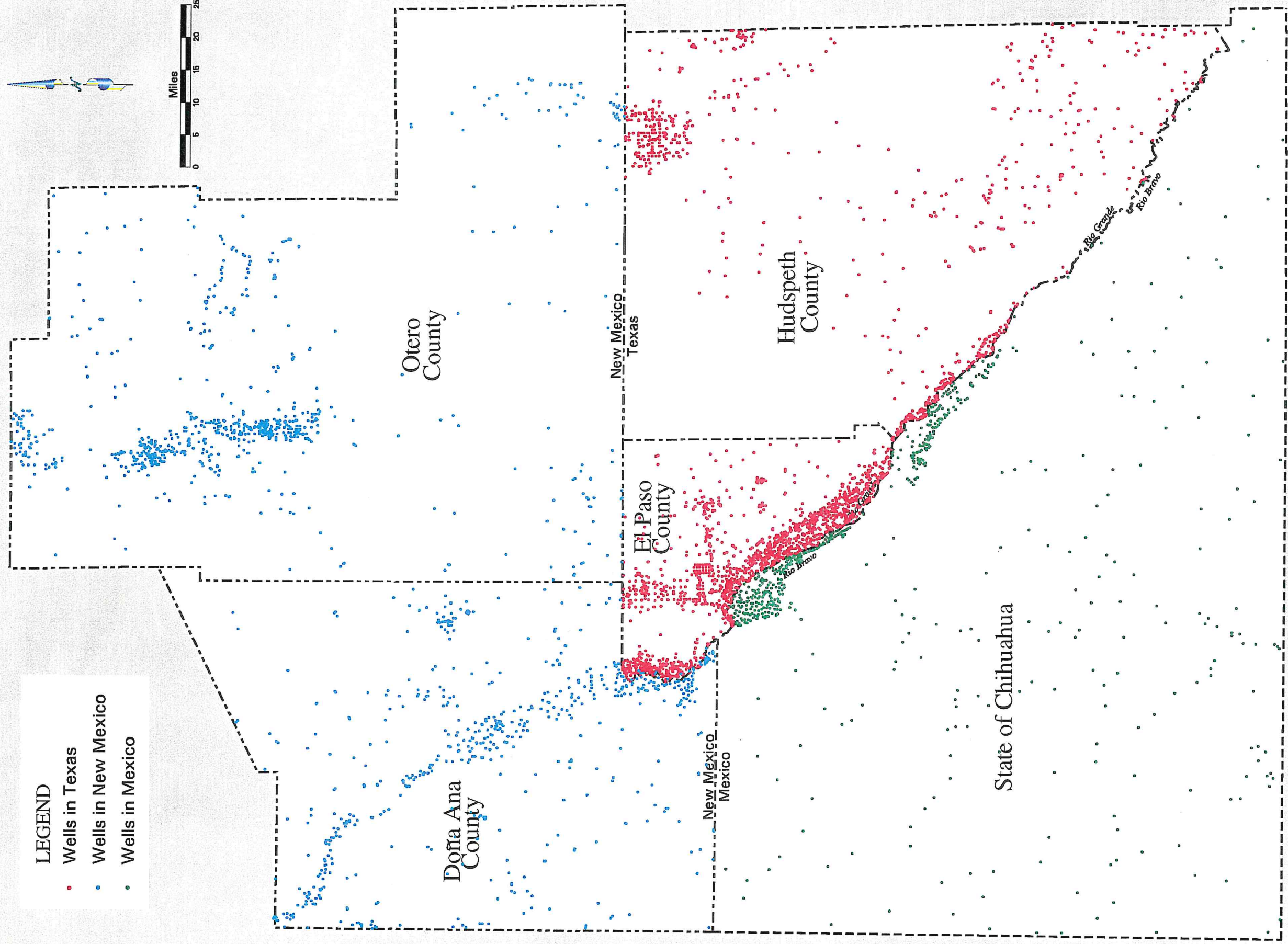
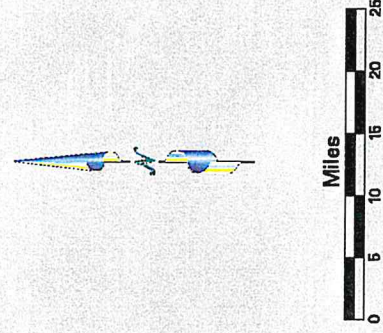
* See Plate 1 for specific colonia identification.



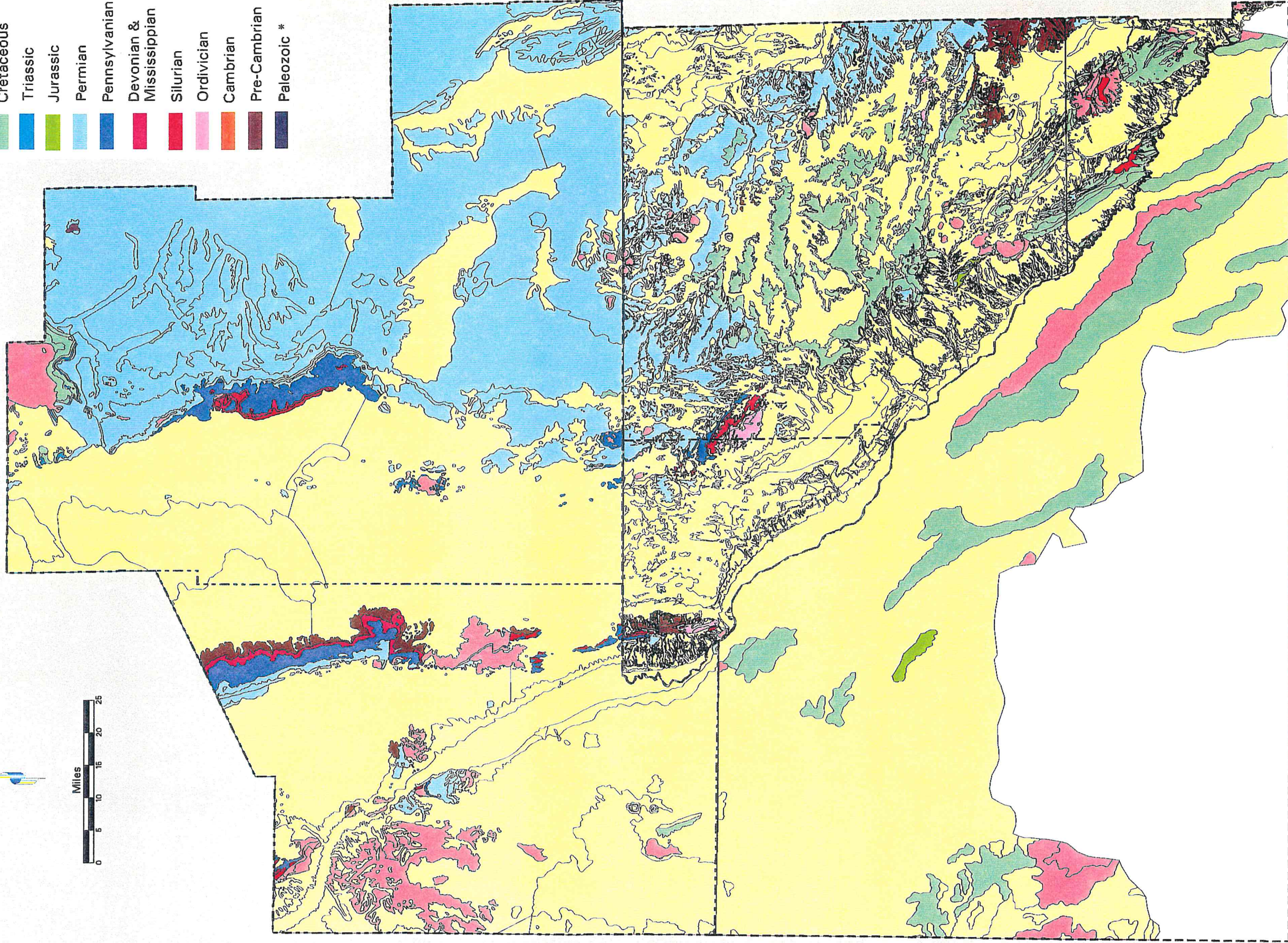
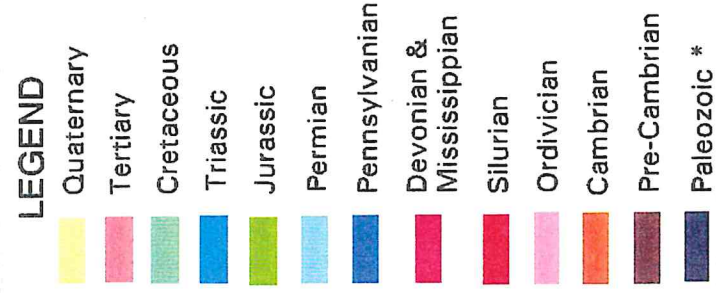
ECONOMICALLY DISTRESSED AREAS (In the United States)

LEGEND

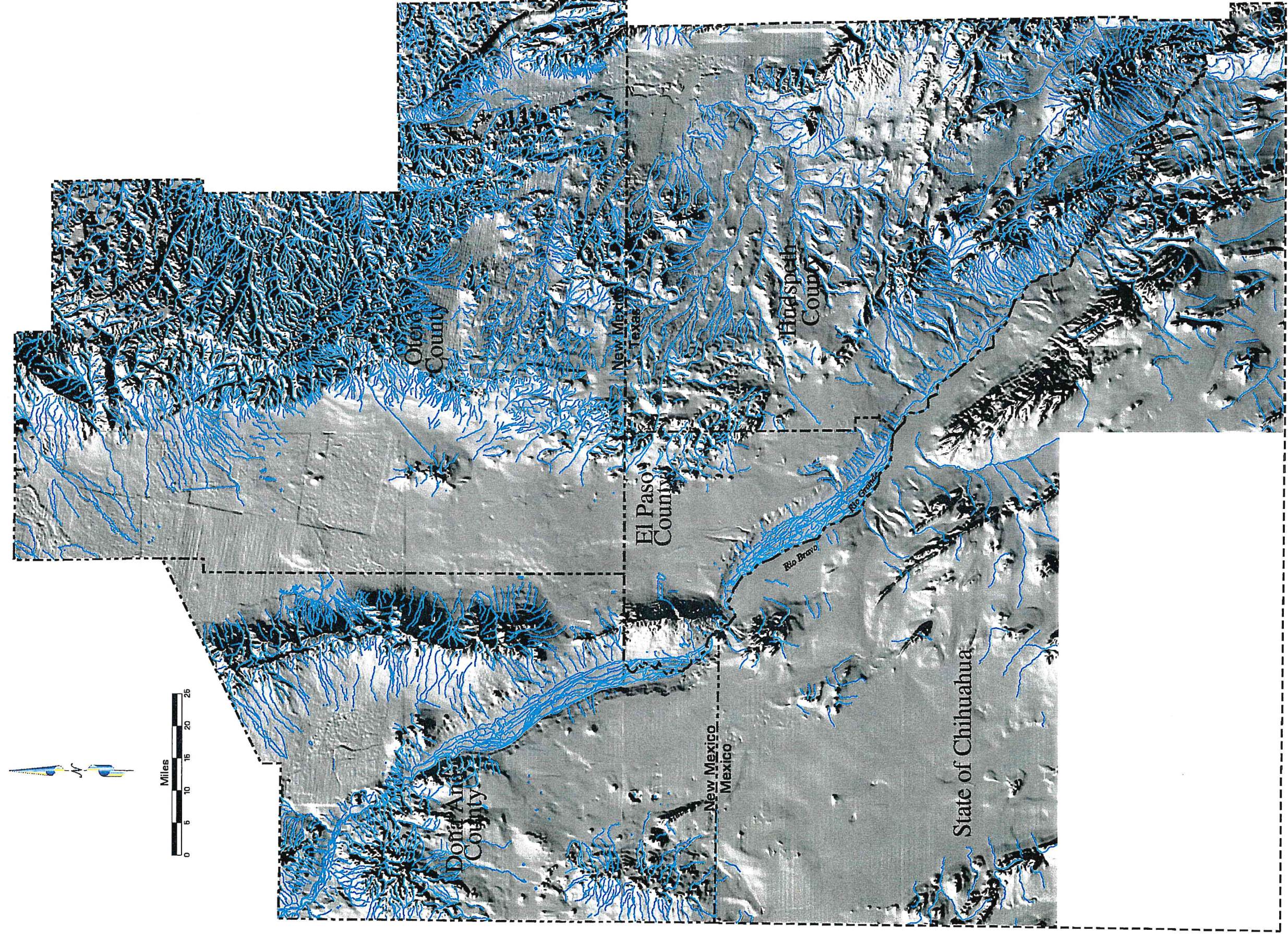
- Wells in Texas
- Wells in New Mexico
- Wells in Mexico



WELL LOCATIONS



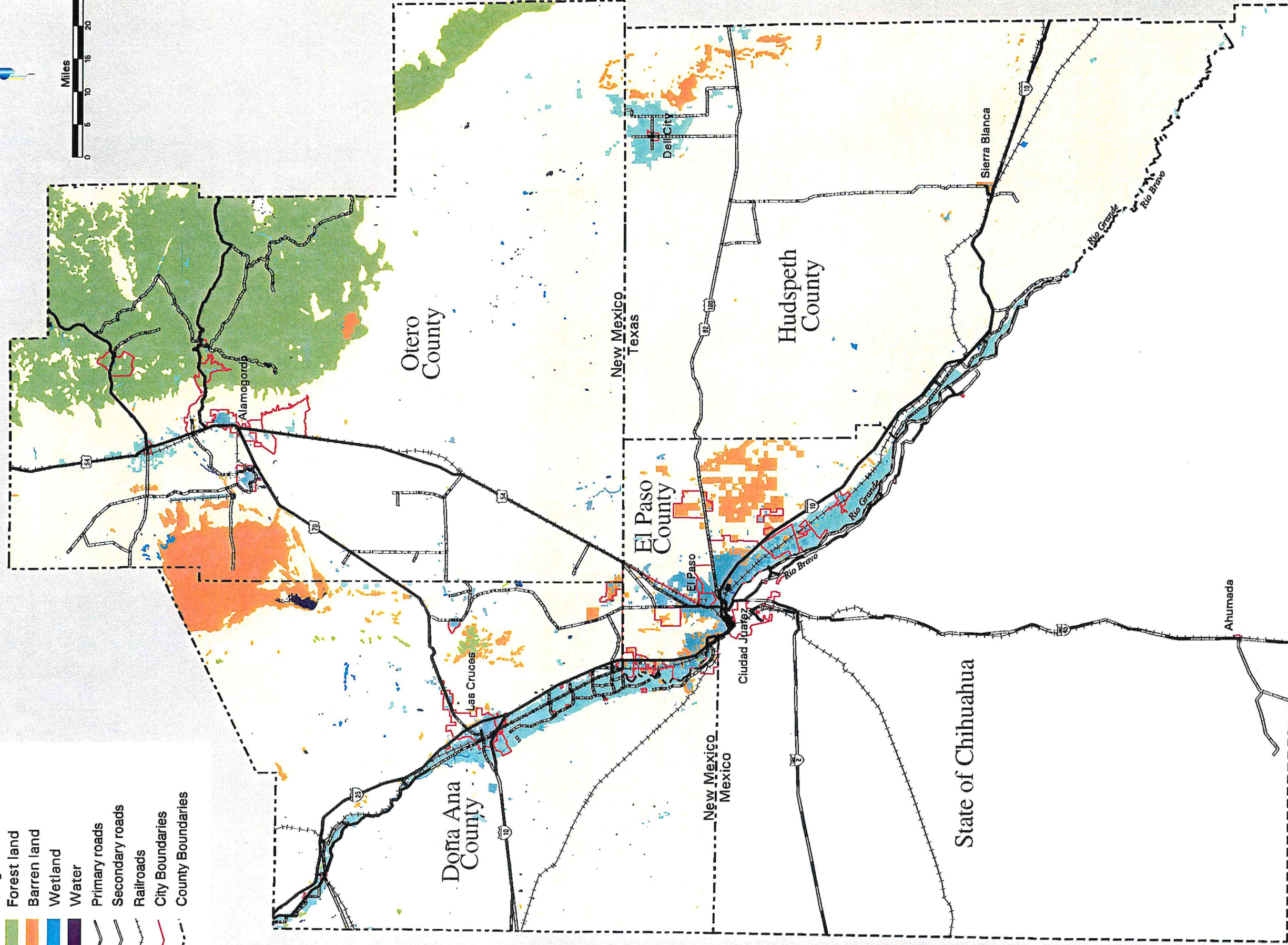
GEOLOGY



LAND SURFACE RELIEF WITH DRAINAGE

LEGEND

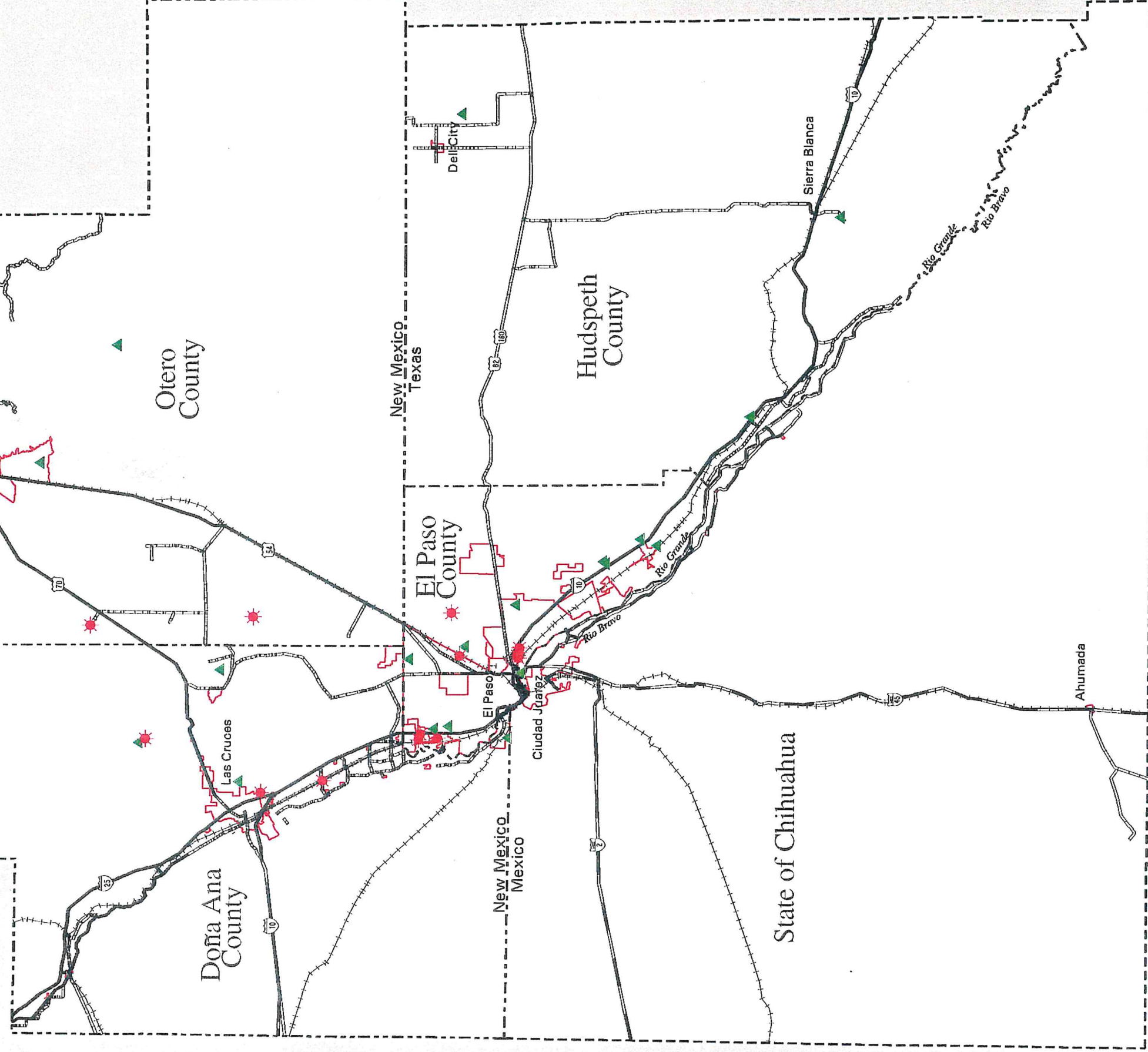
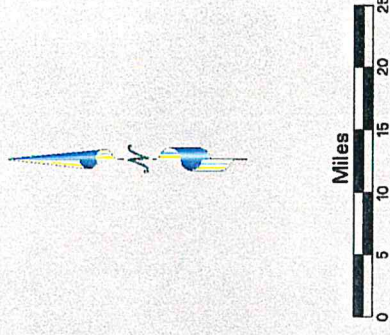
- Urban or Built-Up land
- Agricultural land
- Range land
- Forest land
- Barren land
- Wetland
- Water
- Primary roads
- Secondary roads
- Railroads
- City Boundaries
- County Boundaries



LANDUSE (In the United States)

LEGEND

- Landfills
- Hazardous waste sites
- Primary roads
- Secondary roads
- Railroads
- City Boundaries
- County Boundaries



LANDFILLS AND HAZARDOUS WASTE SITES (In the United States)