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NEW MEXICO LOW TEMPERATURE GEOTHERMAL RESOURCE ASSESSMENT PROGRAM

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1.0 Phase I - State-Specific Geothermal Maps

In this phase of the program, New Mexico researchers have provided state-of-the-art geothermal data to NOAA to publish the "public use" map and a "scientific user" map. Data has been provided for the following:

1. Subsurface temperatures for springs and wells in excess of 20°C.
2. Estimated total dissolved solids, floride, boron and other constituents for springs and wells.
3. Seismicity.
4. Heat flow.
5. Measured temperatures in existing wells in areas showing geothermal promise.
6. Quaternary volcanism, active faults, cinder cones, diatremes, maar cracks and recent volcanoes, and deep sedimentary basins.
7. Existing geoelectrical investigations.
8. Existing wells targeted for hydrological studies.

The public map color draft is ready now. Final publishing by NOAA should occur early in 1980. Publishing of the scientific user map should follow.

2.0 Phase II - Site-Specific Resource Assessment Studies

Using combined funding from the DOE/DGE Low Temperature Resource Assessment Program, the New Mexico Geothermal Demonstration Program, and the New Mexico R, D & D Program, we have concentrated on obtaining assessment data from Las Alturas, Socorro, Truth or Consequences, Albuquerque, Jemez Springs, Chamberino/Mesquite, Columbus, Tularosa Basin, Black Mountain and northwestern New Mexico (Figure 1). The DOE program has, in whole or part, led to the following:

Las Alturas. Work in this anomaly has led to the successful completion of two production wells in this resource area. 30m shallow gradient holes were drilled to locate two 300m test wells (Figure 2). The 6 shallow holes have measured gradients of 416°C/km (NMSU-4), 387°C/km (NMSU-5), 88°C/km (NMSU-6), 320°C/km (NMSU-7), 446°C/km (NMSU-8) and 433°C/km (NMSU-9). A tentative interpretation of all the temperature data was that hot water rises along a NNW striking fault to a zone crossing between NMSU-8 and -9, and then diffuses laterally. Of the 300m tests wells, DT-1 had a maximum of 50.8°C at 160m. Further, 12 additional 18m gradient holes (Figure 2) were drilled to help locate a production/test well. The results of these measurements indicate the anomaly extends further to the north than anticipated, and the limit to the northwest and south is not known. The boundary to the west may be determined by the Rio Grande, and not by the heat source. Seismic refraction data taken in the resource area defines the top of the water table which appears to be the top of the hydrothermal system.. A production/test well of 860 feet

with 11-inch casing has produced waters of 60°C that is expected to produce 400 gpm. Further testing of this well will occur early in 1980.

Socorro. The target is a possible aquifer within the lower Popatosa formation. Seismic reflection and refraction data revealed two faults offsetting the surface layer and suggests that the aquitard must lie at depths greater than 2200m. Tritium measurements have evidences the existance of three groundwater zones. The preliminary conclusion is that the Snake Ranch Flat water circulates very slowly and that Socorro springs are made up of a mixture of "old" water with recent recharge.

Truth or Consequences. Detailed field mapping of the Mud Springs Mountain NW of T or C and of the more recent late Cenozoic sediments and structures of the immediate T or C areas has been completed. A detailed hyrological study indicates that the regional flow pattern is southward from a recharge area in the Mud Springs Mountain. These waters intersect a reverse fault, and migrate along the fault zone, discharging waters in T or C. Electrical resistivity work has been completed. These results confirm a previous gravity study and indicate that the Palomas basin south of T or C is deeper and more abrupt than previously thought.

Albuquerque and Jemez Springs. Although not funded by the DOE program, basic resource assessment in the Albuquerque area is complete and specific target areas may now be identified. The Jemez Springs test well of 824 feet encountered water at 40 feet, 80 feet and 500 feet. The existing well can produce 20 gpm artesian flow at about 70°C (from 90 feet).

Chamberino/Mesquite. Electrical resistivity mapping of a hot reservoir in this area is currently in progress.

Southcentral New Mexico. Approximately 60 existing wells have been thermally logged in T or C, Mesquite/Chamberino, Columbus and the Tularosa basin. The high regional heat flow observed throughout the Rio Grande Rift is also observed in Dona Ana County. Superimposed upon the high regional flux are several areas of abnormally high heat flow representing potentially producible geothermal areas.

Columbus, Black Range, Potrillo Mountains and Southern Tularosa Basin. Mapping of all known faults in southcentral New Mexico which have been active within the last 0.4 million years has been completed. Radiometric dating of the age, chemical composition and mineralogy of 15 basaltic volcanic rocks for four geothermal areas has also been completed.

Northwest New Mexico. Approximately 12,000 well logs over 10,000 square miles have been analysed to identify the recorded bottom hole temperatures, anomalous temperature gradients and associated geologic formations in the Colorado Plateau province.

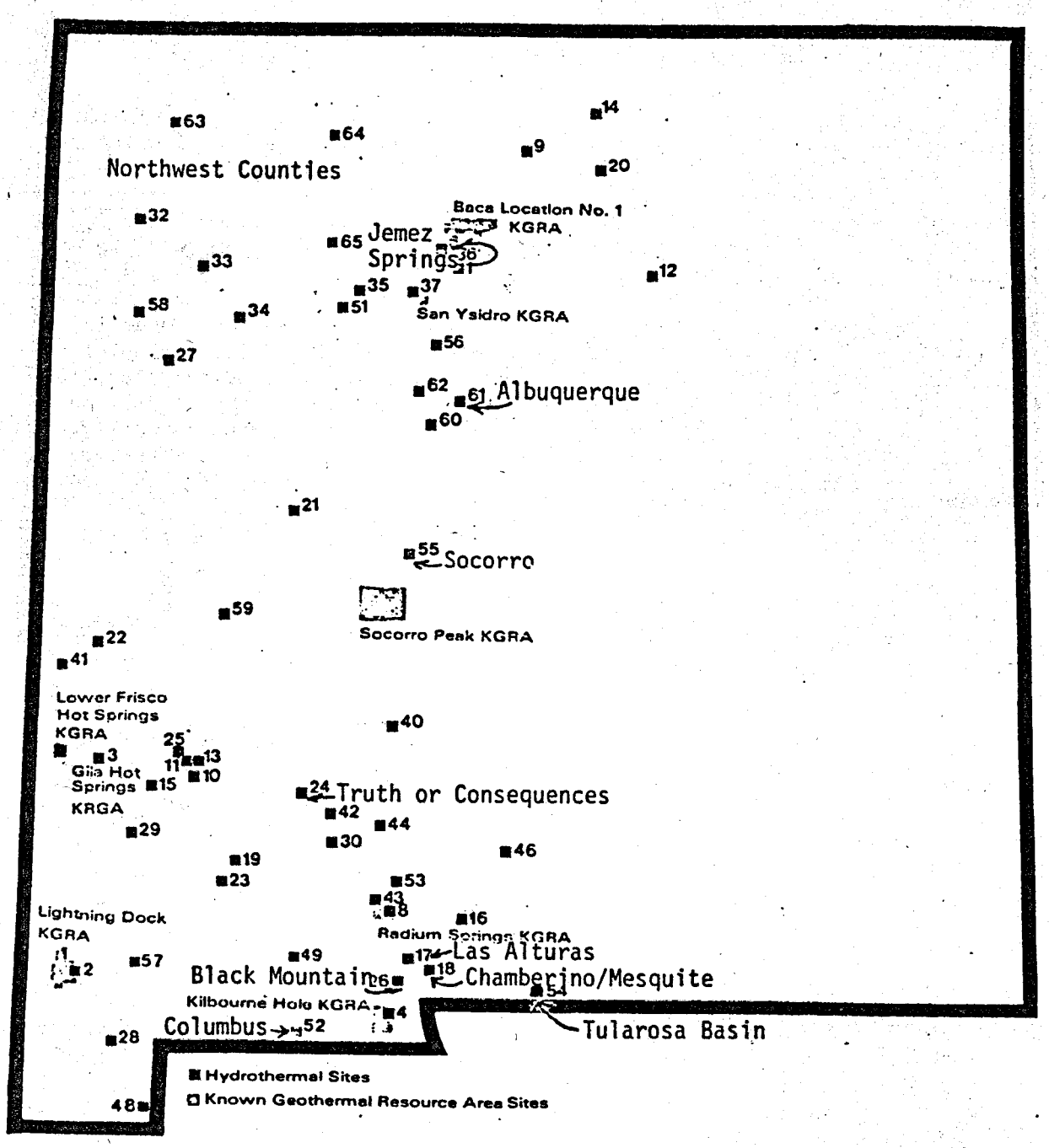

Figure 1. Location of the ten primary areas under assessment investigation in the DOE Low Temperature Resource Assessment Program.

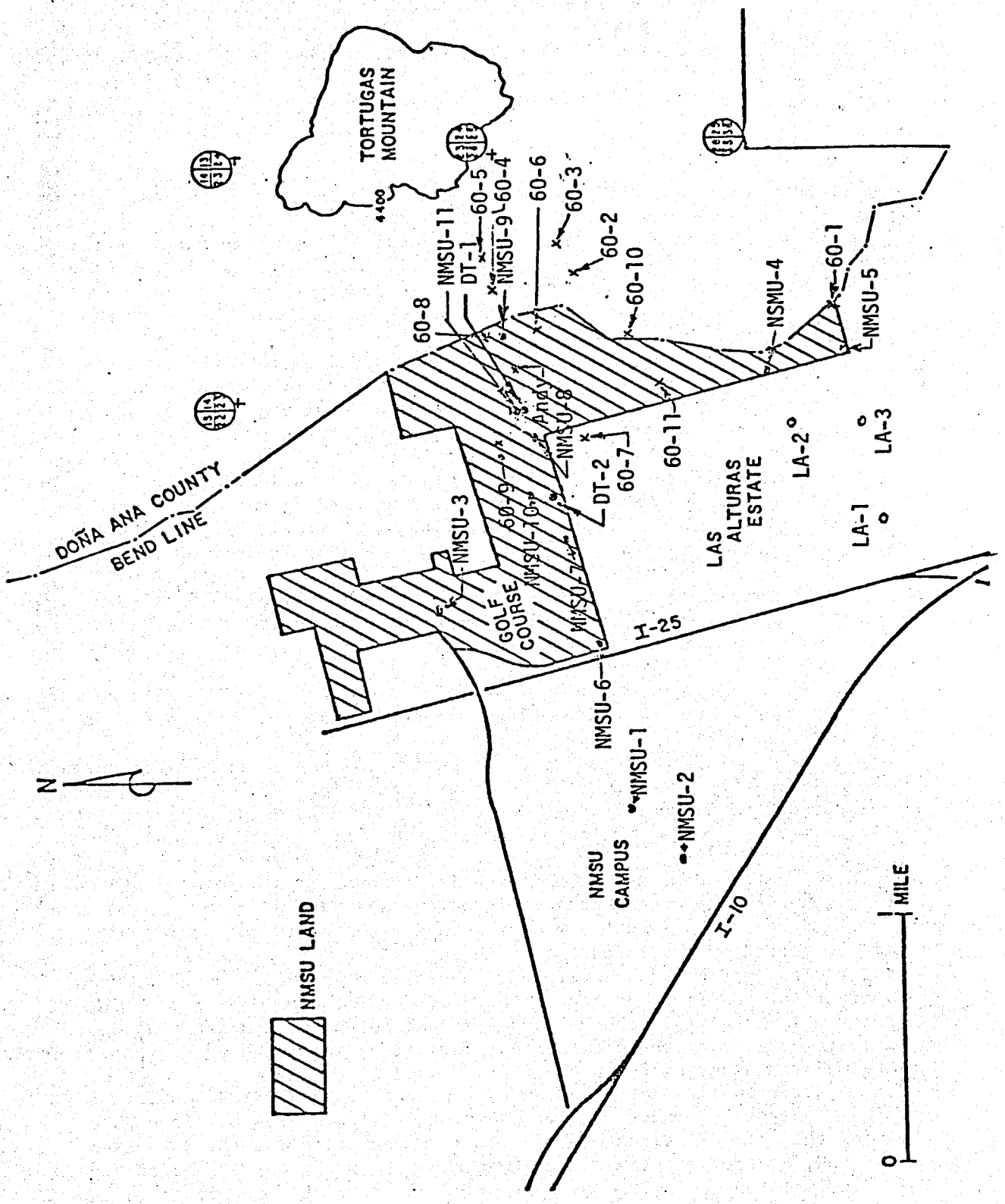

Figure 2. Map of the Las Alturas anomaly area, Las Cruces, New Mexico, showing the location of existing wells and thermal gradient holes.