

1.0 PURPOSE AND NEED

1.1 INTRODUCTION

The U.S. Department of Energy (DOE) is preparing an Environmental Assessment (EA) for the construction and operation of a small-scale, approximately 1 megawatt (MW), geothermal power plant near Animas and Cotton City, New Mexico (NM), southwest of Lordsburg, NM within the Lightning Dock Known Geothermal Resource Area¹ (KGRA) (Figures 1-1, 1-2, 1-3). The Proposed Action includes the direct use of geothermal fluid exhausted from the geothermal power plant as a heating source for tilapia² production at an existing geothermally-heated fish hatchery. A total of 9.3 acres (3.8 hectares [ha]) would be disturbed by the construction of the power plant and associated wells and pipelines. Approximately 6.6 acres (2.7 ha) of this would occur on previously disturbed land. The remaining 2.7 acres (1.1 ha) acres of disturbance would take place on grazing land. The funding decision of the DOE is whether or not to partially fund the Proposed Action.

Through the Geothermal Energy Program, DOE is considering providing financial assistance to Exergy, Inc., of Hayward, California, for the development and field verification of a small-scale geothermal power plant, which would be located upstream of an existing geothermally-heated fish hatchery owned by AmeriCulture, Inc., of Cotton City, NM. AmeriCulture, Inc., leases the geothermal resource from the State of New Mexico (State of New Mexico Geothermal Lease No. GTR-304 Assignment 1).

DOE is also considering partially funding AmeriCulture, Inc., for a direct-use geothermal application using fluid discharged from the proposed power plant to heat water for the hatchery before being reinjected into a new well. Two system concepts would be investigated. The preferred concept involves cascading the spent geothermal fluid from the proposed geothermal power plant to various thermal processes used for fish production. In the second concept, the proposed power plant would not be built, and the fluid from the existing geothermal well would be used for all direct-use operations associated with the project. Partial funding for this portion of the project would be provided through a National Renewable Energy Laboratory (NREL) subcontract with AmeriCulture, Inc. The proposed power plant project would be administered and managed by the DOE Golden Field Office. The direct-use application would be managed by NREL.

Since the project would involve Federal funds, it is considered to be the result of a Federal action. As such, this action is subject to the requirements of the *National Environmental Policy Act* (NEPA). DOE has determined that an EA would be prepared to evaluate the potential environmental impacts that could result from the award of the grant/subcontract and

¹ A Known Geothermal Resource Area is a region identified by the U.S. Geological Survey as containing geothermal resources.

² Tilapia are a hardy, prolific, fast-growing tropical fish that traces its origins to the Nile River. Tilapia are one of the major groups of farm raised fish in the world. Large-scale commercial culture of tilapia is limited almost exclusively to the culture of three species: *Oreochromis niloticus*, *O. mossambicus* and *O. aureus*. Of the three tilapia species with recognized aquaculture potential, the Nile tilapia, *O. niloticus*, is by far the most commonly used species in fish farming. It has a mild, soft, white fish fillet, with a slightly sweet taste.

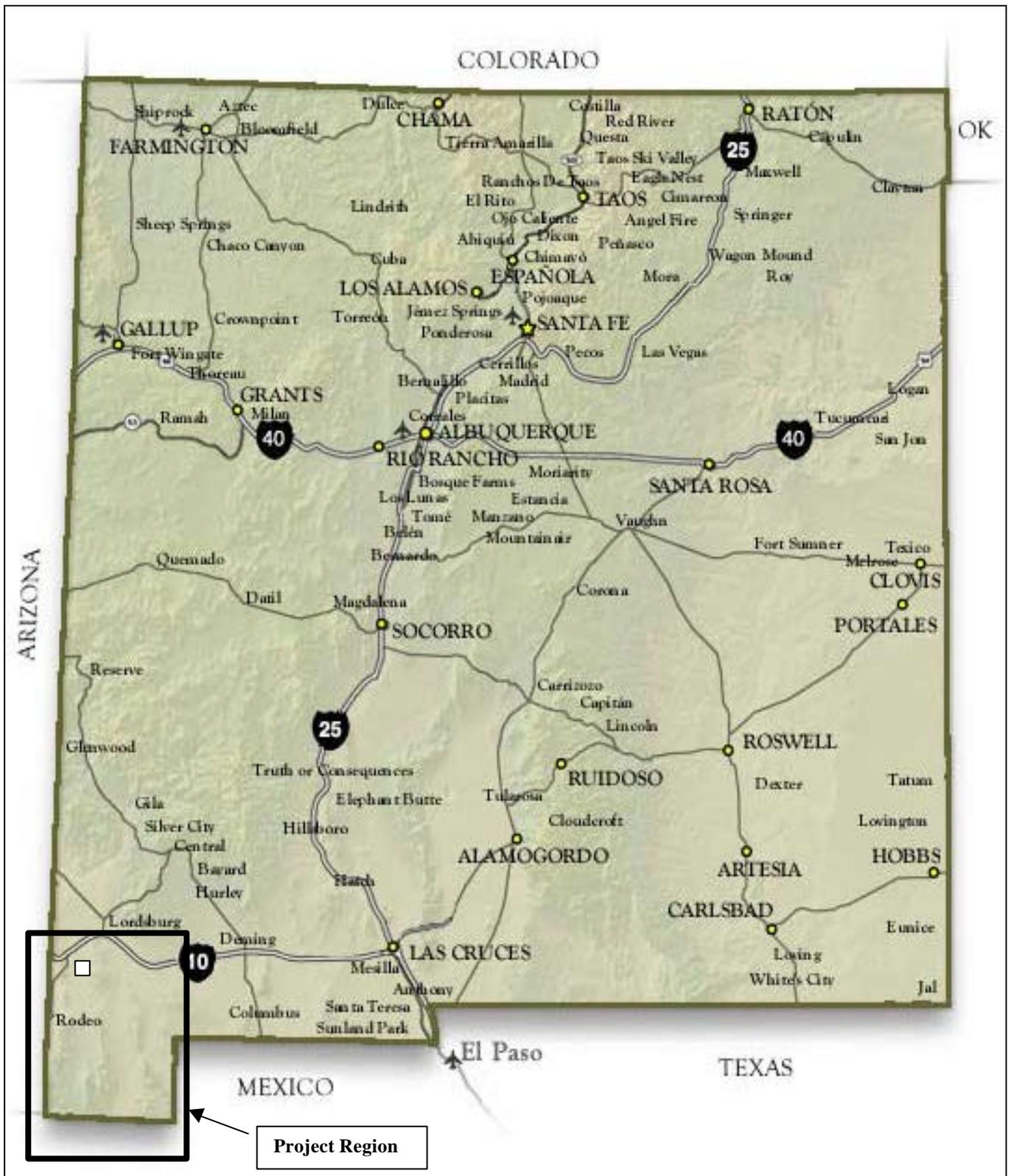


Figure 1-1. Proposed Project Region in New Mexico. (Proposed Site is Represented with White Square)

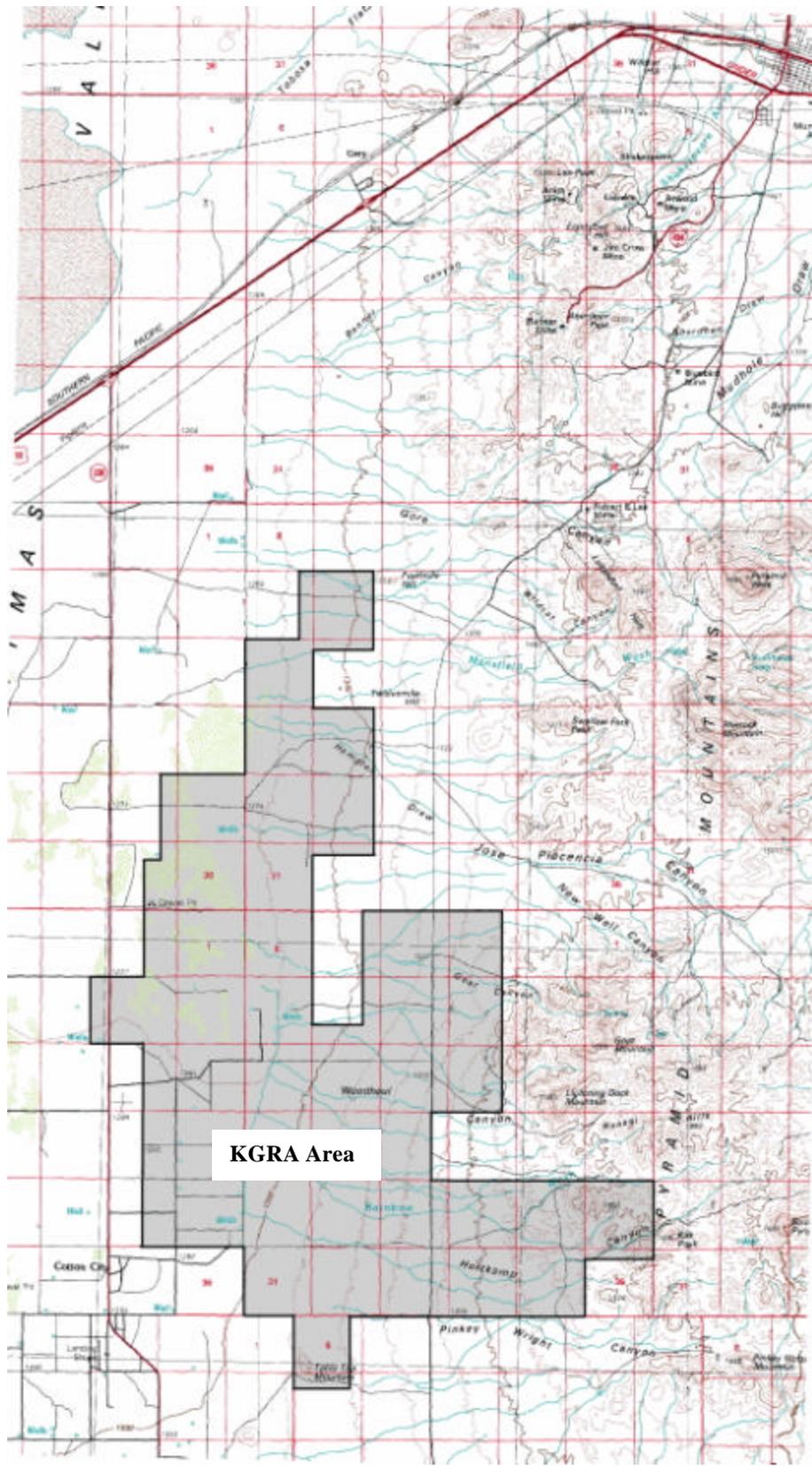


Figure 1-2. Location of Lightning Dock Known Geothermal Resource Area.

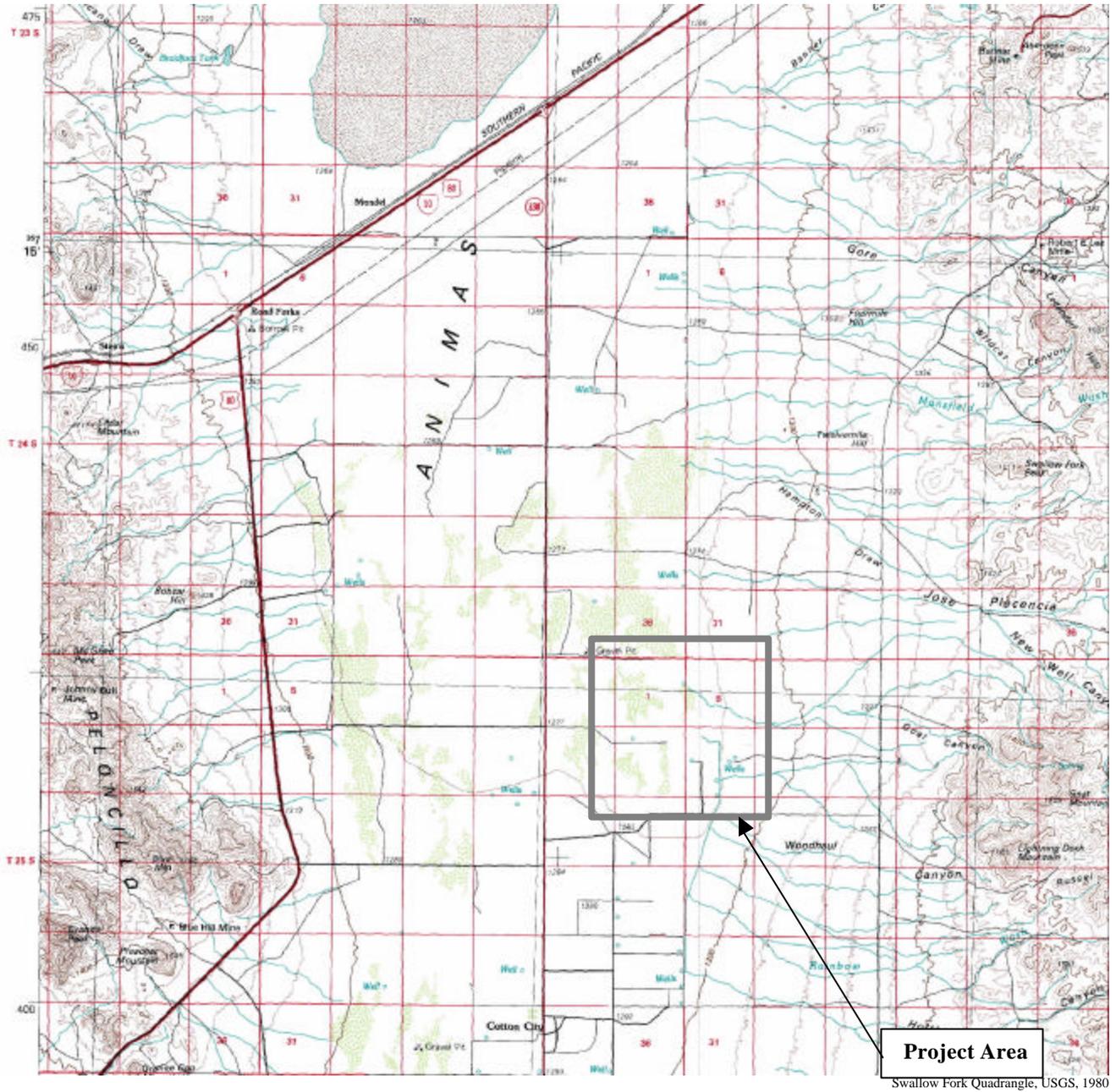


Figure 1-3. Topographic Map of the Vicinity of the Project Area.

any connected actions (i.e., the construction and operation of the geothermal power plant and direct use of the geothermal fluid prior to reinjection).

1.2 PURPOSE AND NEED FOR AGENCY ACTION

Geothermal power plants currently generate approximately 2,800 MW of electricity in the United States, most of which is provided by plants over 5 MW in size. Although worldwide there are approximately 50 geothermal power plants at or below 5 MW power generating capacity, only 6 plants in the United States are smaller than 1 MW. Small geothermal power plants have the potential for widespread application, but achieving cost-effectiveness in small plant sizes presents a number of challenges. To address these challenges, DOE is supporting the small-scale field verification projects to (1) determine and validate the economics, performance, and operational characteristics of small-scale geothermal electric power plants in different regions, and (2) determine their ability to provide distributed power in order to facilitate their increased use in the western United States.

DOE needs to decide whether to authorize the expenditure of Federal funds to Exergy, Inc., for partial funding of construction and field verification of a small-scale geothermal power plant south of Lordsburg, NM, at the AmeriCulture site. DOE also needs to decide whether to authorize the expenditure of Federal funds to AmeriCulture, Inc., for the direct use of geothermal fluid to determine, demonstrate, and validate the operational performance of a geothermal direct-use system.

DOE/NREL will take this opportunity to monitor and evaluate the technical and economic performance of the proposed power plant and the direct-use project. This information will be used to advance the design and use of small-scale geothermal technologies.

This EA was prepared in accordance with Section 102(2) of the NEPA of 1969, 42 U.S.C. 4332, Council of Environmental Quality regulations, and DOE NEPA Implementing Procedures (10 CFR 1021).

1.3 PUBLIC INVOLVEMENT

As part of the EA process, comments on the scope of the assessment were sought from the public, regulatory agencies, and other interested parties. A letter describing the scope of the project was sent out to all parties on the project's distribution list. Two responses were received. One response was to request a copy of the Pre-decisional Draft EA when it was issued. The other response raised the issue of the possible use of the cooled geothermal water for irrigation.

The Predecisional Draft EA was sent out for public review. Comments were received from the State of New Mexico Environment Department. These comments and associated responses are presented in Appendix D.

