SALTON SEA UNIT 6 PROJECT
GEOTHERMAL RESOURCE EVALUATION

Steve Baker

INTRODUCTION

CE Obsidian Energy LLC proposes to build and operate a 185 MW (net) geothermal electric power plant, to be located near Obsidian Butte on the southeast shore of the Salton Sea in Imperial County, CA (CEOE 2002b). The purpose of this testimony is to present Energy Commission staff's evaluation of the ability of the geothermal resource at this site to support the project.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Section 25540.2 of the Warren-Alquist Act allows an applicant to avoid the prerequisite of first filing and obtaining approval of a Notice of Intention if "at the outset of the proceeding, the applicant can reasonably demonstrate [the site] to be capable of providing geothermal resources in commercial quantities."

The Energy Commission's Power Plant Site Certification Regulations require the Commission to "…hold a hearing for the sole purpose of determining whether the proposed site is reasonably capable of supplying geothermal resources in commercial quantities." (Cal. Code Regs., tit. 20, § 1809(a)) These regulations require the project applicant to "present testimony, studies or other evidence in support of its contention that sufficient geothermal resources have been confirmed at the site," and further require Energy Commission staff to "…present its evaluation of the site's resource capabilities." (Cal. Code Regs., tit. 20, § 1809(b))

ANALYSIS

SOURCES OF INFORMATION

In April 2002, the applicant presented to Energy Commission staff a draft document entitled, "Geothermal Resources for Salton Sea Unit 6 Power Plant Development" (CEOE 2002a). Some of the information in that document was then repeated in the Application for Certification (CEOE 2002b).

Further, the author of this testimony was previously employed by Southern Pacific Land Company, which was an original co-owner of the Salton Sea Unit 1 project, a 10 MW geothermal power plant now owned by the applicant. In that employ, the author was privy to resource evaluation information compiled by Union Oil Company's (later UNOCAL's) Geothermal Division, the operating partner of the Salton Sea Unit 1 project.

RECOGNITION AS A GEOTHERMAL RESOURCE

The Salton Sea region and the Salton Trough are acknowledged as an established geothermal resource by several government entities. The region is designated a Known Geothermal Resource Area (KGRA) by the US Department of the Interior, Bureau of Land Management (BLM) and by the United States Geological Service USGS). The California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR) has designated the area as a geothermal field. The California Department of Conservation, Division of Mines and Geology recognizes the area as one underlain at shallow depths by thermal waters of sufficient temperature for direct heat application. The Imperial County General Plan Geothermal and Transmission Element designates this area as being planned for development of geothermal resources and geothermal power plants.

MAGNITUDE OF THE RESOURCE

The Salton Sea KGRA encompasses 102,887 acres (160.76 square miles). Of this area, only 4,808 acres (7.5 square miles, or 4.7 percent) is currently developed for the production of electric energy. Ten existing power plants, all owned by the applicant, operate in the KGRA, with a total electrical output of 326.4 MW net. The Salton Sea Unit 6 project will develop a further 3,180 acres (4.97 square miles), generating an additional 185 MW net (CEOE 2002a, 2002b).

ESTIMATES OF RESOURCE CAPACITY

THE APPLICANT'S ESTIMATES

The applicant believes that the Salton Sea KGRA contains proven reserves of 680 MW, probable reserves of 1,200 MW, and possible reserves of 2,300 MW (CEOE 2002a, pp.2-3).

The estimate of probable reserves is based, in part, on a third-party resource evaluation performed by GeothermEx, Inc., which identified 1,200 MW of reserves solely within that portion of the Salton Sea field dedicated to the Salton Sea Unit 6 project. The estimate of possible reserves is concurrent with an estimate by the Energy and Geoscience Institute at the University of Utah, which points to the possible existence of sufficient energy within the Salton Sea KGRA to produce 2,330 MW net output (CEOE 2002a, Attachment A, p. 3).

STAFF'S ESTIMATE

In 1984, Union Oil Company's Geothermal Division produced an estimate of potential geothermal energy resources under Union Oil's holdings at the Salton Sea. (At that time, Union Oil Co. and Magma Energy Co. were the two major resource holders at the Salton Sea KGRA; both these companies' holdings have since been acquired by the applicant.)

That estimate pointed to the likelihood that the geothermal energy currently existing under only that portion of the Salton Sea KGRA subject to Union Oil's holdings in conjunction with Southern Pacific Land Co. (not counting the recharge, over time, of thermal energy and liquids) was approximately equal to the energy in five billion

barrels of oil. Adding to this additional lands under Union Oil control, but outside the agreement with Southern Pacific Land Co., this number would grow to the energy equivalent of approximately 7.5 billion barrels of oil. Further adding to this those lands under the control of Magma Energy Co. would expand the estimates considerably further.

Using the figure of 7.5 billion barrels of oil equivalent, and assuming an energy conversion efficiency of 35 percent, Union Oil's estimates of energy reserves under only that land controlled by Union Oil Co. would sustain the generation of 18,000 MW of electrical production for 30 years (not counting recharge over time). Adding the lands not under Union Oil control could increase this estimate to 25,000 MW for 30 years.

Staff recognizes the great disparity between this estimate and the applicant's estimate, and offers this explanation. First, the Union Oil Co. estimate was performed with less information on the resource. Many test wells have since been drilled, and more sophisticated modeling techniques have been brought into play to allow better estimates of the resource. Second, staff believes that applicant's estimates are extremely conservative. Staff believes the true capacity of the resource lies somewhere between these two estimates.

CONCLUSION

Energy Commission staff fully supports the applicant's claim that the Salton Sea resource contains sufficient energy resources to support the Salton Sea Unit 6 Project.

REFERENCES

CEOE (CE Obsidian Energy LLC). 2002 a. Draft Geothermal Resources for Salton Sea Unit 6 Power Plant Development. Submitted to California Energy Commission staff, April 2002.

CEOE (CE Obsidian Energy LLC). 2002 b. Application for Certification, Salton Sea Unit 6 Project (02-AFC-2). Submitted to the California Energy Commission, July 29, 2002.