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KLAMATH FALLS MUNICIPAL DISTRICT HEATING & RESERVOIR MANAGEMENT ORDINANCE: A PRELIMINARY OREGON MODEL ORDINANCE

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ABSTRACT

A preliminary model municipal ordinance for geothermal district heating and reservoir management has been developed for the City of Klamath Falls, Oregon and the Oregon Department of Energy. The ordinance contains provisions for: community geothermal policies; ordinance administration; a municipal district heating service; regulation of well drilling and reservoir management procedures; and authorization for small, private district heating systems.

BACKGROUND & METHODOLOGY

The residents of Klamath Falls, Oregon, have used local low to moderate temperature geothermal resources beneath their community for a variety of space and process heat uses since early in the Twentieth Century. Today, this utilization has grown to approximately $1{,}800 \times 10^8$ B_{tu} annually, with approximately 600 shallow wells individually heating homes, schools, a hospital, a college campus, and a multitude of commercial and industrial uses, in an urban area of approximately 40,000 persons.(1) In 1981, the City of Klamath Falls will initiate operation of one of the nation's first municipal geothermal district heating systems, initially serving fourteen downtown government buildings and one hundred residences; the $2 million project is being cost-shared by the City, Klamath County, Oregon Department of Energy, and U.S. DOE and HUD. During project planning in 1976, the City recognized several institutional needs, including: complete and accurate data on existing geothermal wells and reservoir characteristics; district heating operational measures; and reservoir management procedures for the co-existence of municipal and private wells. With assistance from the Oregon Department of Energy, the City contracted with the author to draft a preliminary model ordinance using the 1975 Oregon geothermal heating district statute as the principal enabling authority.

The objective of the ordinance project was to formulate and legally codify municipal policies and procedures to conserve the resource and manage public and private geothermal utilization from a shallow, urbanized reservoir. The ordinance was to address the institutional needs identified above, and thereby become a key local institutional framework for further geothermal development.

The ordinance drafting was preceded by a search for other municipal or county legislation of a similar type. Several American ordinances, principally from Californian counties, provide land-use and siting controls for geothermal drilling and power generation, but none were identified for district heating or reservoir management.(2) The only international examples identified were: Rotorua, New Zealand, where the municipality emphasizes well permitting and geothermal apparatus safety, but has no district heating; and Reykavik, Iceland, whose municipal district heating regulations are still undergoing English translation as of this writing.(3)

A format for the ordinance was developed, based upon common Oregon municipal code formats and procedures, and state statutory authorities. The principal Chapters of the Oregon Revised Statutes (ORS) utilized were: ORS 522, Geothermal Resources; ORS 523, Geothermal Heating Districts; and ORS 537, Appropriation of Water Generally. It should be noted that Oregon defines high-temperature, deep geothermal resources as a mineral, and, as in the case of Klamath Falls and most other Oregon communities, defines low and moderate-temperature, shallow resources as publically appropriated ground water. Municipalities and special districts are empowered to operate district heating systems using either type of resource. Reservoir management authority is split by resource type between the state departments for geology and ground water; this project has also investigated the local reservoir management powers of a municipal heating district.

A draft of the ordinance was circulated to the reviewers acknowledged below, and based upon their comments, and further policy refinement with City staff, a final draft of the preliminary model ordinance was produced.(4) The preliminary nature of the model is due to related work which is necessary but beyond the scope of the author's contract; this work includes: a rate and fee study based upon common municipal fiscal conditions; state legislative and/or executive clarification of the ground water or reservoir

management powers intended for local geothermal heating districts to exercise, in addition to traditional state agency roles; and a final legal review for validity and completeness. This work is expected to be completed not later than March, 1981.

THE ORDINANCE FORMAT

The ordinance is composed of five major elements or articles: general administrative provisions; City district heating service provisions; ground water and geothermal reservoir management provisions; measures for allowing small, private district heating systems within the City; and various exhibits, including facility and operational standards, and heating service maps. The ordinance was drafted to act as either a free-standing ordinance or, with the deletion or modification of certain general administrative provisions, it can be inserted as a subpart of a comprehensive municipal code. In addition, with minor terminology changes, the ordinance will be adaptable to county governments or single-purpose heating districts.

GENERAL ADMINISTRATIVE PROVISIONS

This article sets out a variety of administrative policies and procedures for using the ordinance, many of which are typical of municipal legislation, such as: severability, construction and interpretation, enforcement, appeal procedures, and definitions. The purposes of the ordinance, also set out in the first article, include:

a) Conservation and beneficial management of ground water and geothermal resources;

b) Improvement of the public welfare, by extending geothermal district heating throughout the community;

c) Protection of the environment during geothermal utilization;

d) Advancement of scientific geothermal studies; and

e) Implementation of state and local authority and policies for geothermal development.

CITY HEATING SERVICE

The second article establishes a municipal geothermal district heating service, with the City Council acting as governing body and the City Manager as chief administrative officer. The heating service is empowered, within and without the City, to: explore for and develop geothermal resources; distribute and sell geothermal heat; establish and maintain a resource data center; perform certain drainage work; and participate in scientific studies. The heating service boundary is established to encompass the entire City and, automatically, all future annexations. The City Council is given authority to extend service by contract beyond the City boundary.

Heating service financing sources, for operations and improvements, are designated, to include: service rates and fees; ad valorem taxation; general obligation and revenue bonding; special property assessments; and grants or gifts. A revolving loan fund is authorized to provide low-income retrofitting assistance.

Heating service improvement procedures are established, to include: City Council or property owner initiation authorities; requirements for a reservoir impact assessment report and monitoring, when imporvements affect the local geothermal reservoir; and procedures for neighborhood expansion projects, when new service construction costs are paid by benefitted property owners.

Service connection procedures and fees are established and categorized by type of use, including: single-family residential; multi-family residential; commercial; industrial space; industrial process; public facility; and secondary use. Special connection incentive fee reductions are provided for: low-income persons; and persons with existing geothermal wells, willing to abandon such wells when City service is provided.

User service procedures and rates are established and categorized by type described above. Heating service is provided contingent upon several conditions, including: normal seasonal operation periods; emergency shut-down; residential heat priority above all other users; no assumption of City liability for conditions beyond each user's service connection; and no guarantee of fluid temperature or quality.

RESERVOIR MANAGEMENT

The third article establishes regulations for all wells existing prior to the ordinance, and for those to be constructed subsequently. A well registration program is established in order to compile comprehensive resource data in a central, public repository at City Hall. Due to surface thermal pollution, and in order to promote injection, all old wells are ordered to cease any surface discharging within five years of ordinance adoption, and no new surface discharging will be allowed for new wells. New wells must receive a City well construction permit, in addition to filing a traditional state well start report. The City Manager is empowered to act on permit applications using standard criteria developed by the City and the state ground water agency. The City resource data center is required to conduct an annual well survey for updating data, and measures are established to collect new drilling and pumping data. And procedures are established to identify wasteful or defective wells, or operational interference between wells, and to remedy these problems with joint City and state agency cooperation.

PRIVATE SUBDISTRICT HEATING SYSTEMS

The fourth article allows the City Council to authorize small, private geothermal district heating systems for purposes of serving: structures in areas of the City where municipal service is not planned; special industrial process-heat users; and new subdivion developments, where developers will be granted a franchise by the City Council for operating an independent, private heating service.

Such private subdistrict systems are subject to various conditions for continued operation, which essentially serve to retain the City's overall control of geothermal development within the urban area.

ORDINANCE EXHIBITS

Exhibits to the ordinance include: standards and specifications for heating service connection; standards for maintenance-related well surface discharges; and maps of the heating service. Other appended material to the model ordinance report includes: geothermal overlay zoning provisions established for the City of Klamath Falls Community Development Ordinance; and geothermal service provisions established for the Klamath Falls City-County Urban Area Management Agreement.

CONCLUSION

The preliminary model ordinance provides a comprehensive institutional framework for municipal management of a critical natural resource. The ordinance policies and procedures seek to extend the benefits of geothermal heat as widely as possible through district heating, while allowing individual (normally down-hole heat exchanger) use to continue. Uniform data collection and reservoir management practices are established to increase knowledge of the resource, and to conserve and enhance its productivity. And both public and private sector participation in district heating is allowed by authorization for privately-franchised systems.

The model ordinance represents an important institutional tool for community's possessing proximate and confirmed resources. As a direct embodiment of community goals and policies, the ordinance will act as the principal conduit for local geothermal development and utilization.

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(1) City of Klamath Falls, Oregon, 1980, Draft Comprehensive Plan, p. 161.

(2) County of Lake, California, 1979, Draft Geothermal Policy Statement.

County of Mono, California, 1977, Draft Policies & Standards for Geothermal Resource Development.

County of Napa, California, Ord.No. 499, Regulating the Use of Land for Exploration & Development for Oil & Gas or Geothermal Resources by Use Permit.

(3) City of Rotorua, New Zealand, 1973, Geothermal Energy By-Law Powers & Authorities.

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