A FRAMEWORK FOP. GEOTHERMAL RESOURCE MANAGEMENT IN NEW ZEALAND

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ABSTRACT

Geothermal resources are of importance to New Zealand as tourist attractions, as an energy source and have cultural signlficance to me Maori people. For some time there has been considerable dissatisfaction with the ray geothermal resources have been managed. A policy review has Seen undartakan by a committee of officials with submisslons being received from the public.

Policies for the management of New Zaaland's geothermal resources are presentad including a resource management framework for the implementation of the policies. The policies are aimed at protecting particular geothermal fields, allocating the resource amongst users, ensuring safe and efficient use of geothermal anergy, providing for public partlcipatlon. and where practicable funding the management on a user pays basis.

The Water and Soil Conservation Act 1967 will provide tho central role In geothermal resource allocation and management. The Geothermal Energy Act 1953 provides for the safe and efficient use of geothermal anergy and enables the recovery of rentals for the use of geothermal anergy.

The Town and Country Pianning Act 1977, Reserves Act 1977 and the Environmental Protection and Enhancement procedures have supporting roles.

INTRODUCTION

Over the past three years a review of New Zealand's geothermal policy has been carried out. The purpose of this paper is to outline the need for a policy review and show how the recommended policy proposals and management framework were arrived at.

The main policy proposals and the basis of the management framework are briefly outlined. The financial aspects of the policy have not been discussed in any detail.

New Zealand's geothermal resources have a number of uses which are potentially conflicting. They are important as tourist attractions, as an energy source, as scientific phenomenon and have strong cultural significance to the Maori people.

The surface features associated with some geothermal fields have become internationally recognised tourist attractions. However, such features, particularly geysers, have been lost to energy developments and some of those remaining are still at risk.

Geothermal resources have also been utilised as energy sources with Maori communities being traditional users. More recently the potential for electricity generation has been realised and it is envisaged that geothermal energy will play an increasing role in meeting New Zealand's energy requirements.

Given the importance of geothermal resources and the inherent conflicts which exist between the various uses, it is necessary to have a clear policy and legislative framework for their management.

THE EXISTING LEGISLATIVE FRAMEWORK

At present the management of geothermal resources is dealt with under a number of Acts of Parliament: principally the Geothermal Energy Act 1953, the Rotorua City Geothermal Empowering Act 1967 and the Water and Soil Conservation Act, 1967. The Town and Country Planning Act 1977 and the Reserves Act 1977 also have roles to play.

Briefly, the Geothermal Energy Act 1953 vests all geothermal energy in the Crown. It is therefore responsible for authorising the search for geothermal energy, licensing its tapping and use, and for selling the energy or obtaining an economic rent €or its use. The Rotorua Geothermal Empowering Act 1967 gives control of part of the Rotorua geothermal field to the Rotorua District Council. The licensing powers in this Act are obtained from the Geothermal Energy Act 1953.

The Water and Soil Conservation Act 1967 is designed to promote national policy in respect of natural water, making provision for its conservation, allocation and use. Such provision has to ensure that adequate account is taken of other users and values of natural water. Geothermal steam is included in the definition of natural water.

The Town and Country Planning Act 1977 provides for the wise use and management of land resources through district and regional planning. The Act does not exert any direct control over the use of geothermal energy or the extraction of geothermal fluids. Its influence is through land use policies and control of the physical development of geothermal fields.

Under the Reserves Act 1977 (and the Land Act 1948) land can be set aside as a reserve to protect the characteristics of an area. The Act can and has been used to protect areas containing geothermal features.

THE IMPETUS FOR THE PRESENT POLICY REVIEW

In the late 1970s and early 1980s a number of events occurred which increased the concern for geothermal

resources. In 1979 two major springs in the Whakarewarewa thermal reserve collapsed. Papakura geyser ceased erupting and the water levels in Korotiotio spring dropped suddenly below its normal overflow level. This further highlighted the sensitivity of geothermal features and resulted in the establishment of the Rotorua Monitoring Proyramme.

Also in that year the first of a series of legal battles concerning the use of geothermal fluid from the Waimangu geothermal field commenced. These continued for three years through three courts and hiyhlighted the lack of a clear geothermal policy or legislative framework for the management of geothermal resources (Keam V National Water and Soil Conservation Authority (1979) 7 NZTPA 11, Ministry of Works and Development V Keam (1981) 7 NZTPA 289, Keam V Minister of Works and Development (1982) 1 NZLH 319, 8 NZTPA 231).

One of the important issues to arise concerned the relationship between the Geothermal Energy Act 1953 and the Water and Soil Conservation Act 1967. It was argued that rights under the Water and Soil Conservation Act 1967 were not required for the taking of geothermal fluids with licences under the Geothermal Energy Act 1953 being the sole requirement. The confusion was such that the Water and Soil Conservation Act 1967 was amended by the Water and Soil Conservation Amendment Act 1981. This amendment, among other things, changed the definition of natural water by extending it to more clearly include geothermal fluid, whatever its temperature. The amendment also clarified the role of this Act with respect to geothermal resources, by making it prevail over the Geothermal Energy Act 1953 where there is inconsistency or conflict between the two. These cases also revealed the lack of any clear policy for the protection of geothermal fields. The provisions introduced in the Water and soil Conservation Amendment Act 1981 for the protection of specified water bodies, did not extend to cover geothermal fluids.

A seminar organised by the Nature Conservation Council and the Environmental Defense Society in 1980 on Geothermal Systems : Energy, Tourism and Conservation, resulted in part from concern at the lack of government policy for the use of geothermal resources and further highlighted the need for a geothermal policy review. Among other things the seminar recoynised "that there is no coherent national policy for the allocation of geothermal resources in such a way that the needs of energy production, tourism, scientific research and conservation are adequately provided for "(Nature Conservation Council, 1982 pp 2).

THE POLICY REVIEW

In 1982 as part of an overall review of the funding of geothermal exploration the Officials Geothermal Coordinating Committee (OGCC) was set up to include the departments which are financially involved in geothermal exploration and development, and those which have a direct interest in geothernal resources but no direct financial involvement. The OGCC was given the task of developing policy and planning recommendations for the effective use of New Zealand's geothermal resources. It includes representatives from Ministry of Energy, New Zealand Tourist and Publicity, Department of Scientific and Industrial Research, Department of Lands and Survey, the Treasury, Ministry of Works and Development and Commission for the Environinent.

In 1982 the Minister of Energy released the document "A Review of the Role of Geothermal Resources in New Zealand" (Ministry of Energy, 1982) which was prepared by the OGCC. Public comments on this document were summarised in the subsequent publication "A Summary of Public Submissions on 'A Review of the Role of Geothermal Resources in New Zealand"' (Ministry of Energy, 1984a). After considering the submissions presented the Minister of Energy in 1984 released a "Draft Geothermal Policy" (Ministry of Energy, 1984b). Submissions were again called and on the basis of these a Geothermal Policy paper has Seen prepared.

"A REVIEW OF THE ROLE OF GEOTHERMAL RESOURCES IN NEW ZEALAND"

The objectives of this report were:

1 To identify and explain the various resources which geothermal systems possess and the conflicts that can arise in managing these areas for one or more purposes.

2 To suggest planning guidelines that could help form the basis of a national policy for the future management of New Zealand's geothermal systems.

3 To promote public comment on an appropriate policy for the future management of New Zealand's geothermal systems.

Twenty seven submissions were received and represented a wide range of interest groups and individuals. Several major points emerged from the submissions on the management of the resource (Ministry of Energy 1984a).

Few of those who made submissions considered that current geothermal policy or the policy guidelines expressed in the report, were adequate. It was felt that an overall policy to include the protection, exploitation or multiple use of geothermal areas was needed urgently. A view which had considerable support was that a least some geothermal areas should be preserved in their natural, or present, state.

A number of submissions proposed that the resource should be managed by a single authority or under a single piece of legislation. This was in response to the situation which existed with the Geothermal Energy Act 1953, and the Water and Soil Conservation Act 1967, and which led to confusion as to who was

responsible for geothermal rasources. It also arose from the situation which existed in Rotorua where control of the field was divided between the Ministry of Energy and the Rotorua District Council.

It was also felt that there should be local and public involvement in making decisions affecting geothermal areas. The Geothermal Energy Act 1953 in particular was criticised for its lack of public participation and its inability to take into account competing claims for the resource. Some support for the role of the Water and Soil Conservation Act 1967 was expressed and in particular the role of management plans.

THE DRAFT **GEOTHERMAL POLICY**

Taking into consideration the submissions the OGCC set about establishing a geothermal policy and a legislative framework within which the policy could be implemented. The first step involved establishing goals and objectives for geothermal management.

The general goals proposed are:

1 To provide for the preservation and protection of scenic and other natural characteristics of geothermal resources.

2 To locate geothermal reservoirs which could contribute significantly to New Zealand's energy supply and to ensure that if these reservoirs are exploited they are managed for the efficient and economic use of the resource, taking into consideration other values of the surrounding araa.

3 To ensure that adequate infornation about the existing and potential values of geothermal fields is obtained and evaluated before decisions are made regarding the allocation of the resources.

4 To provide for public participation in the decision making process for the use and allocation of geothermal resources.

The more specific objectives proposed are:

1 To identify and protect geothermal fields possessing surface geothermal activity of outstanding scientific, scenic or tourist value.

2 To promote the use of geothermal energy from geothermal fields where there are no major conflicts with other uses or values of the resource, and to do so with minimum impact on the environment.

3 To have regard to the cultural beliefs of people, including the relationships as determined by customary usages and practises, between the culture and traditions of the Maori people and any geothermal fields.

4 To ensure the safe and efficient use of geothermal energy.

5 To manage the use of geothermal resources as fsr as is practicable on a system of user pays.

6 To enable royalties to be paid for the use of geothermal resources.

7 To encourage local input and involvement in the manayement of geothermal resources.

8 To review the proyress and effectiveness of the goals, objectives, policies and management framework established for the management of geothermal resources.

To achieve these objectives. the OGCC initially considered the management of the resource under one body through one piece of legislation. This was proposed to be through a Geothermal Resources Act combining the many different functions of the existing Acts.

The key aspects of the proposal were:

- that field management plans be prepared for each geothermal field. This would assist in the identification of uses, and the classification and subsequent management of geothermal fields;

- that under the Geothermal Resources Act an application for a licence to put down a geothermal well and a right to draw geothermal energy would be treated as one;

- that the Act would allow for public participation.

After considering the proposal, the OGCC concluded that there was no need for new legislation to achieve the objectives. The geothermal resource is closely allied to land, water, flora and fauna, and therefore control of the resource would need to involve other legislation. A Geothermal Resources Act would simply parallel many of the functions of the Water and Soil Conservation Act 1967, the Town and Country Planning Act 1977 and the Reserves Act 1977. For this reason special legislation was not recommended.

It became apparent that the objectives could be achieved under the existing legislation with amendments and a clear explanation.

In the Draft Geothermal Policy (Ministry of Energy, 1984b) the Water and Soil Conservation Act 1967 provides the central role in geothermal allocation and management. Those aspects which lie outside this Act - principally relating to the safe and efficient use of geothermal energy, rentals and land use questions - can be controlled through the Geothermal Energy Act 1953, the Town and Country Planning Act 1977 and the Reserves Act 1977. The Environmental Protection and Enhancement Procedures or any new procedures established under the new Ministry for the Environment will also have a role to play.

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a The Water and Soil Legislation

It is appropriate that the Water and Soil Conservation Act 1967 is presently being reviewed and a draft Water and Soil Bill has Seen prepared. This has provided an excellent opportunity to incorporate the legislative changes required to implement the goals, objectives and policies developed for geothermal resources.

Under this legislation an independent national authority is provided in the form of the National Water and Soil Conservation Authority. This Authority establishes national policy on water management and supervises the administration of natural water. At the local level, Regional Water Boards, prepare and promote water and soil policy statements and water management plans.

The water and soil legislation provides four main ways by which the desired objectives could be achieved. These are water management plans, water rights, protected water status and water conservation orders.

Water management plans, while not at present legally requirid, are central to water resource management and are to be legally required in the amended water and soil legislation. Geothermal water management plans would state the particular objectives to be achieved and would specify such matters as the uses and values for which the geothermal fluid is to be managed and set standards for levels, flows and allocation of the fluid, A number of matters are outlined in the Act which must be taken into account in the preparation of management plans. Of particular significance here is the regard which must be had for the relationships which the Maori people have with water resources.

The taking of natural water and the right to discharge *to* natural water are permitted by water rights. To eliminate the situation which exists whereby the Geothermal Energy Act 1953 and the Water and Soil Conservation Act 1967 are both responsible for allocating geothermal fluid, it is proposed that the water and soil legislation be the only legislation within which the allocation of geothermal fluid occurs.

Water rights are presently required to take natural water except where the use is for domestic needs. To control the drawoff from geothermal reservoirs where domestic use is significant it is proposed that water rights be required for such use. Only well owners would require water riyhts as it is they who are directly affecting the reservoir. However, all geothermal users who discharge geothermal fluid will continue to be required to obtain discharye water riyhts. Water riyhts are also necessary to drill geothermal wells. Where there are a large number of well owners in a particular locality one oryanisation may obtain single water rights for the use and discharye of geothermal fluid. Such an organisation would then allocate the fluid amongst users. All geothermal water right applications would he considered in relation to the appropriate geothermal water management plan and would be granted with terms and conditions which are in keeping with the goals and objectives of the plan.

Some geothermal fields have outstanding scenic, scientific, natural or cultural characteristics which are worthy of protection. The draft Water and Soil Bill provides a means of protecting such natural water. A schedule of Protected Waters is proposed and would be incorporated in regulations. It is proposed that geothermal fields be included in the schedule.

Geothermal fields on the schedule would be protected by applying restrictions on the granting of water riyhts. The protection would be sufficient in most cases to ensure that the values which led to the water body being included in the schedule are fully protected. Further and more specific protection could be afforded by Water Conservation Orders. These could be applied €or whether or not the water body is on the schedule. The effective difference between a water conservation order and inclusion in the schedule will be that an order can tailor conditions specifically to the values to be protected.

All these processes under the water and soil legislation involve public participation and the management plan, and water right procedures as well as the water conservation order provisions allow €or appeals to the courts.

b The Geothernal Energy Act 1953

As outlined earlier a licence under this Act is required to sink a bore or to use geothermal energy for any purpose. This has given the Ministry of Energy a degree of responsibility for the allocation of the resource. Other sections of the Act have also been concerned with the allocation of the resource, particularly those authorisiny the search for geothermal energy. With the water and soil legislation assuming the principal role in the allocation of geothermal fluid the Geothermal Energy Act 1953 will no longer have any responsibility in this area. Licensing under the Geothermal Energy Act 1953 will only he concerned with ensuring that geothermal drilling is carried out safely and that geothermal fluid, when allocated for energy purposes, is used safely and efficiently.

Investigations into geothermal use in Rotorua have revealed that many geothermal reticulation systems are unsafe and inefficient. To enable safe and efficient use of geothermal energy all users will be required to obtain a licence. Such licences will only be issued to geothermal users if their geothermal reticulation systems comply with standards and codes of practice which are being developed by the Rotorua Task Force Team and which will be established by reyulations. Each geothermal bore owner will also require a separate licence which will impose safety standards for the installation and operation of the bore. To avoid the situation experienced in the past of licences and water rights being at odds

in permitting the use of geothermal energy, it is proposed that a geothermal energy licence only become valid if the appropriate water rights have been obtained.

Whether the control of the Rotorua field remains local or the Rotorua Geothermal Empowering Act 1967 is abolished and control reverts to the Minister of Energy, it is proposed that the licensing of geothermal energy use from the field come under the control of one body.

Under the Geothernal Energy Act 1953 the Crown is also responsible for selling geothermal energy or obtaining an economic rent for its use. In the past geothermal energy has been used with little consideration of the effect on other users. The extra costs associated with the manayement and use of the energy now have to be met. To recover some of the costs of management a principle of user pays is to be adopted as far as is practicable. The Geothermal Energy Act 1953 provides for the recovery of rentals from the use of geothermal energy. Geothermal energy users will therefore be required to pay a rental or a royalty.

c Town and Country Planning Act 1977

Through Regional Planning, United Councils should be encouraged to develop policies for the management of geothermal resources. These policies would provide a basis for agreement between central government and the region on how specific areas would be managed. These policies could also influence action under other legislation (e.g. water and soil leyislation).

District planning procedures can also provide policies for land use associated with geothermal fields, and indicate community attitudes towards the use and preservation of geothermal resources. District planning, by way of planning ordinances, can be used to control physical developments in geothermal areas. This would include structures associated with the extraction of geothermal energy (e.g. the height of towers for venting steam).

d The Reserves Act 1977

As indicated above land can be set aside as reserves and manayement plans must be prepared for them. However, such. reserves which cover areas containing geothermal faatures and their management plans do not protect the geothermal fluid associated with the reserved areas. Therefore, for a geothermal system to be completely protected geothermal water management plans will need to operate in conjunction with reserve management plans. The plans could therefore be prepared together.

e Environmental Protection and Enhancement Procedures

To date the Environmental Protection and Enhancement Procedures (EP 5 EP) have been administered by the Commission for the Environment and were designed to protect and enhance New Zealand's environment. However the recently announced Government policy to establish a Ministry of the Environment will undoubtedly mean a review of the role of the procedures.

The core of the EP & EP has Seen the process of environmental assessment. Usually a brief document summarising the environmental impacts was prepared by the developer as part of the process of environmental assessncnt. However, for some proposals it became clear that the imgacts on the environment were siynificant and an environmental impact report (EIR) was prepared. They were therefore important in determining the impact of large developments such as power stations, but could also have been applicable to the more passive uses of geothermal fields, such as tourist developments.

Generally, an EIR was a substantial document which described the project, its likely environmental impact, alternatives if they existed, and ways of mitigating the impact. The EIR was available for public comment, and was formally audited by the Commission for the Environment. The audit included an analysis of the public comments.

It is envisaged that the new legislation will enable the promotion of regulations outlining specific mechanisms or procedures to be followed where existing resource allocation statutes are considered to be environmentally deficient. An enhancement of tne existing procedures is envisaged.

THE SUBMISSIONS ON THE DRAFT GEOTHERMAL POLICY

A total of 51 submissions were received from a wide range of geothermal user groups, interest groups, local and central government bodies and individuals. The response rsceived was generally supportive of the proposals presented.

There was support for the water and soil legislation and particularly geothermal water manayement plans.

Opposition was expressed and centered on a preference for a one act framework and opposition to the water and soil legislation. The principle reasons given for preferring a single act or administering body included; simplicity, better centralised national control, and a mistrust of local bodies to deal with matters of national importance. . As discussed earlier a single Act would simply parallel many of the functions of the existing legislation and if the proposals in the draft Water and Soil bill are adopted this would be even more so.

Some of the concern did arise from the ..fact that the Draft Policy Paper did not make it clear that the water and soil legislation would be the only legislation with responsibility for the allocation of the geothermal resource. The water and soil legislation does provide for an independent national authority in the form of the National Water and Soil Conservation Authority. This Authority has the power to establish sub-committees which can deal

with specific issues. Such a committee could be established with the appropriate expertise to deal with geothermal rzsources. Concern as to the suitability of Regional Water Boards as geothermal managers has stemmed to some extent from the confusion and uncertainty which some Boards have had over the role of the Water and Soil Conservation Act 1967 in the management of geothermal resources. One of the purposes of the policy review was *to* clarify this position.

Some of the other concerns raised about the suitability of the water and soil legislation included; its multiple use approach, its treatment of Maori values, the appropriateness of Water Conservation Orders, and disagreement with domestic water rights.

The OGCC considers that the amendments proposed in the draft Water and Soil Bill will provide for and deal with some of these issues; notably, the treatment of Maori values, and the approach to Water Conservation orders by way of the Interim Protected List of Water Bodies which could include yeothermal fields. The multiple use approach is also being reviewed. Domestic water rights are considered essential for the effective management of geothermal resources where domestic use is a major use.

A number of submissions pointed to the need to protect geothermal fields and considered that specific fields which should be protected had to be identified in the policy. It is envisaged that when the policy is released by Government it will identify geothermal fields which are considered priorities for the preparation of management plans and which should be protected by water conservation orders.

FUTURE GEOTHERMAL POLICY REVIEWS

The management framework presented outlines a complementary suite of legislative controls that can be applied to the overall management of geothermal resources. Because the process involves government departments, local bodies, and user groups, it will be necessary for these to meet periodically to review the progress and effectiveness of the framework in meeting the goals and objectives. The goals and objectives themselves could also be reviewed to allow for changes which may have occurred in the use or knowledge of the resources.

CONCLUSION

A review of geothermal policy in New Zealand has been carried out involving several rounds of public participation. Policies and a management frarnework have been developed which will enable the protection of certain geothermal fields and allocate other geothermal fields for energy development. Both these processes involve public participation. The water and soil legislation provides the central role in the management and allocation of the resource. Through the Geothermal Energy Act 1953 the safe and efficient use of the resource will be controlled and the recovery of rentals for the use of geothermal energy will be possible. The Town and Country Planning Act 1977 can provide for the wise use and management of land resources associated with geothermal reservoirs while the Reserves Act 1977 can protect and manage land forms associated with geothermal reservoirs. The new Environmental legislation will also play a part in considering proposals for the use of geothermal resources.

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