

GEOHERMAL RESOURCE MANAGEMENT UNDER THE RESOURCE MANAGEMENT ACT 1991

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SUMMARY - The Resource Management Act 1991 addresses many criticisms of the previous legislation relating to geothermal resource management in New Zealand, and incorporates many of the policies suggested by the Ministry of Energy in its 1986 geothermal policy framework. However, the new statute's prime purpose of sustainability may mean that it is difficult to develop the resource for energy production. This is because a geothermal field often acts more like a non-renewable resource, such as a fossil fuel, than as a renewable resource, and the Act requires a consideration of the needs of future generations. Fossil fuels on the other hand are not subject to such provisions. Furthermore, because no national energy policy exists to provide a guide as to preferred generation options, it may be possible to argue global environmental issues, such as global warming, at every hearing involving the development of any of New Zealand's geothermal resources for energy production.

INTRODUCTION

Hochstein and Freeston (1991) have discussed the external "forces" that drive geothermal resource management in New Zealand. They found that these forces are:

- technological and scientific issues;
- non-technological issues (including "value" issues);
- market forces and economic issues; and
- legislative issues.

These legislative issues are the subject of this paper, the reason for this being due to the profound changes only very recently made to New Zealand's resource management legislation.

The Resource Management Act, which came into force on October 1, 1991, is one of the most fundamental law reforms to have occurred in New Zealand's history. It will have far reaching effects on the approach to development and conservation of New Zealand's resources, and it has significantly changed the legislative provisions relating to the management of the geothermal resource.

Firstly this paper briefly reviews the legislation relating to geothermal resource management that existed prior to the enactment of the Resource Management Act. The Act itself is then introduced by examining its approach to some of the criticisms regarding these previous statutes. The significance of the Act's prime purpose of sustainability to geothermal development is then discussed, and the parts of the Act which specifically relate to geothermal resources are highlighted.

PREVIOUS GEOHERMAL RESOURCE MANAGEMENT LEGISLATION

Other authors have outlined the previous legislation relating to geothermal resource management (eg Dench, 1975, Cowper, 1982, and Edmunds and Boast, 1990) and here only a brief summary is presented.

The Geothermal Energy Act 1953

The Geothermal Energy Act provided for the issuance of licences by the relevant Minister of the Crown to tap, take, use, or apply geothermal energy. However, licences were not required for "any domestic purpose whatever". The Minister (who first was the Minister of Works and Development, and then the Minister of Energy) could delegate powers of licensing, and this was done under the Rotorua City Geothermal Energy Empowering Act 1967 to allow the Rotorua City Council licensing powers in the city area. The Minister had powers to revoke licences and to close down bores should a bore be, amongst other reasons:

- a source of danger to persons or property;
- detrimentally affecting other bores or a specified tourist attraction.

This power was used by the Minister in 1986 to close all bores within 1.5km of Whakarewarewa in the Rotorua field, and to revoke the council's empowering act.

Water and Soil Conservation Act 1967

The Water and Soil Conservation Act had primacy over the Geothermal Energy Act in that water rights for taking and using the geothermal water were required in addition to the licence for using the geothermal energy. Furthermore, water rights were required for reinjection of fluid back into the field as this was considered to be "discharging into natural water". Geothermal waters were included as part of the definition of natural water.

Reserves Act 1977

The Reserves Act was the only statute with provision for conservation of the resource, and it allowed for the protection of features in a specified area, but only on the surface and not underground.

Criticism of the Previous Legislation

There had been a number of criticisms of the previous legislation with respect to both geothermal resource development and conservation issues, and a few of these are outlined below.

- Dual consents were required for development of the resource (water rights and geothermal licences).
- The Minister had complete discretion in granting licences, and there were no criteria in the Geothermal Energy Act regarding licensing decisions. There was no provision for public participation, objection or appeal concerning allocation decisions.
- There was no consideration of the Maori cultural and spiritual values associated with the resource (eg Tutua-Nathan, 1988, and Boast, 1989).
- There was no explicit provision for overall planning concerning the resource's management.
- Under the Water and Soil Conservation Act any public participation in the water right process required the "appropriate standing" of the objector (and establishing such standing was sometimes considered to slow down the progress of hearings).
- Water rights were not required for domestic uses.
- There was not adequate provision for conservation of the resource, as underground features, the exploitation of which can affect surface features, could not be protected.

THE RESOURCE MANAGEMENT ACT 1991

Approach To Criticism of the Previous Legislation

The Resource Management Act is administered by the Ministry for the Environment. It amends the Geothermal Energy Act, and has repealed the Water and Soil Conservation Act. It addresses the concerns outlined above as follows.

- A "water permit" is all that is required to take and use geothermal water and its associated heat or energy component. Similarly **only one** resource consent is required for reinjection, a "discharge permit" (although a "land use consent" may be required for drilling). Water or discharge permit decisions are made by the relevant regional council, and appeals can be made to the Planning Tribunal, as was possible under the old Water and Soil Conservation Act. District councils issue any land use consents. However, hearings involving multiple consent applications, for instance those related to a large proposal such as a power station, are intended to be combined in order to speed up the process, with the regional council taking the leading administrative role.
- The parts of the Geothermal Energy Act relating to licensing are all repealed. However, the section relating to Ministerial powers to close down bores is retained.
- The relationship of Maori and their culture and traditions with their ancestral lands, water and other taonga (or treasures) are to be considered in resource management decisions as a matter of national importance. Furthermore, the principles of the Treaty of Waitangi (Te Tiriti o Waitangi) must be taken into account, as must the ethic of kaitiakitanga (stewardship and guardianship of the resource). However, it should be noted that there is still considerable debate over the difference between the principles of the Treaty, and the Treaty itself.
- Resource management planning is addressed by a comprehensive series of provisions for policies, plans and rules, at a national, regional and territorial level. Regional councils have functions including responsibility for the control of the taking and/or use of geothermal energy. There must at all times be at least one regional policy statement outlining the significant resource management issues of the region, including those of significance to iwi authorities (local Maori authorities). This latter provision alone would appear to be sufficient for geothermal resource management issues to require incorporation into regional policy statements.
- There is no requirement for "appropriate standing" in public submissions to resource allocation and management decisions.
- Water permits are not required for "reasonable domestic needs" for "fresh water" only, but fresh water specifically excludes "geothermal water".
- Provision is included for any person to apply for a water conservation order. Such an order can relate to any "water body", which by definition includes geothermal water in an aquifer. The purposes of water conservation orders in fact override any values associated with the resource that are usually to be considered in the standard "purposes and matters to be considered" sections of the Act. As part of any water conservation order regional councils are to impose "restrictions and prohibitions relating to the ranges of temperature and pressure in a water body".

The Act's Purpose - Sustainable Management

The stated purpose of the Act is "to promote the sustainable management of natural and physical resources". "Sustainable management" is defined as managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while:

- (a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
- (b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and

- (c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment.

SUSTAINABLE MANAGEMENT AND THE DEFINITION OF GEOTHERMAL FLUID

The previous legislation did not consider the concept of sustainability, whereas it is the prime purpose of the new Act, but, it is important to note that minerals are excluded from the Act's provision of meeting the needs of future generations. Although the Act covers the environmental effects of any activity, including the exploitation and development of mineral resources, mineral-related resource management issues are embodied in the separate Crown Minerals Act 1991, where sustainability is not mentioned. There are a number of approaches that could have been taken in the new Act to defining geothermal fluid, one of these in fact being as a mineral.

The Act's Definition - Water or Groundwater

The simplest legal definition of geothermal fluid is to lump the mass and energy components together and treat the fluid as a subset of water or groundwater. Such an approach is taken in Wyoming and Nevada (Bradbrook, 1987), and is also the approach taken in the Act. The Ministry for the Environment (1988), in their proposals for resource management law reform, stated that the "Government proposes that the management of geothermal resources be integrated with the management of similar resources, especially water. In essence, the management of geothermal resources parallels the management of groundwater systems".

The definition of "geothermal water" in the Act is: "water heated within the earth by natural phenomena to a temperature of 30 degrees Celsius or more; and includes all steam, water, and water vapour, and any mixture of all or any of them that has been heated by natural phenomena"; and, "geothermal water" is included in the definition of "water".

The heat or energy component of water is in fact defined in the Act as a "contaminant". Geothermal water differs from fresh water in that it is contaminated in both a quality sense, from impurities such as H₂S, but also in an energy sense. Contaminants are normally seen as detrimentally affecting water quality due to their addition to fluid, and with respect to heat could typically be associated with thermal pollution (for example the discharge of power station cooling water into a river). However, for geothermal fluid it is the removal of this so-called contaminant that detrimentally affects the fluid's "quality", and reinjection could be seen as "contaminating" the reservoir.

Interestingly enough, even though the Ministry for the Environment made it clear that the intention was to treat the mass and energy components as one and the same, in their resource management proposals they went on to note in regard to the use of heat exchangers that, "even if the water itself is not taken, these uses can deplete or destroy the geothermal resource" (Ministry for the Environment, 1988). This was a recognition of the differences between geothermal fluid and fresh water, firstly in that the heat component is important in itself, and secondly by implying that geothermal resources are not necessarily renewable.

Mineral Definition

Defining geothermal fluid as a mineral recognises heat as the useful component of geothermal fluid, and the taking of water as "heat mining". For example, the fluid's temperature property could be compared to the grade of ore. Hawaii and Texas define geothermal fluid in this manner (Bradbrook, 1987).

On the other hand, the water or mass component is the medium whereby the energy is conveyed to the surface. Minerals utilized for their energy component (ie fossil fuels) must be processed or burned to produce energy and are always non-renewable.

Unique Definition - "Sui Generis"

The other possibility is not to treat the fluid in the same manner as any other substance, but to provide it with its own unique definition (what lawyers term "sui generis"). Such an approach was suggested to the New Zealand Commission for the Environment to allow recognition of the various uses of the resource and their complex nature (Gresham *et al.*, 1983). This approach is taken in Montana and Washington for instance (Bradbrook, 1987).

Sustainability, Renewability and Development

As noted above, the allocation of minerals is not governed in the Act by the principle of sustainable management. The Ministry for the Environment (1991) stated that "to apply this principle would require Ministers and planners to draw up depletion policies. In respect to these finite and non-renewable resources, the Government does not believe this can be done in a sensible way".

Geothermal resources are not defined as a mineral resource and thus are subject to the principle of sustainability, implying that they are renewable resources. The Ministry of Energy (1989) noted that "although often considered as a renewable resource ... geothermal energy behaves as a very slowly regenerating pool resource and under intense exploitation it behaves more like a non-renewable resource".

The Review Group Report on the Act, whilst still in its draft Bill form (Randerson *et al.*, 1991), commented that "non-renewable resources are not confined to hard-rock minerals and fossil fuels. A river, for example, has the characteristic of perpetually running water which may be regarded as a renewable resource, but it may also have wild and scenic characteristics which are essentially non-renewable. ... The review group has concluded that many resources do in fact combine renewable and non-renewable characteristics".

Recognition of this conclusion has been incorporated into the Act under the "other matters" that must be considered in addition to the overall purpose of sustainability. Persons exercising functions under the Act "shall have particular regard to any finite characteristics of natural and physical resources". In relation to geothermal resources this means that any development must assess the impacts on the surface manifestations of a geothermal field, such as geysers and hot springs, as these are generally considered to be non-renewable. In this case there is a parallel to the review pup's example given above of the wild and scenic river.

However, this raises the question as to the difficulty in obtaining resource consents for developing a geothermal field with regard to sustainability, when it could be argued that a particular resource is non-renewable in its entirety, and not just in its surface features. The level of exploitation therefore becomes a significant issue, as any development of a geothermal field must consider the reasonably foreseeable needs of future generations, whereas fossil fuels are exempt from this consideration.

Hochstein and Freeston (1991) have discussed that the link between "value" issues, such as sustainability, and the legislative framework, as represented by the new Act, is very strong in comparison to the link between technological issues and the law, and thus causes an imbalance in the "forces" affecting geothermal resource management. By contrast, the main point of contention with respect to the Crown Minerals Act, and therefore fossil fuel exploitation, is the issue of land access rights.

OTHER REFERENCES IN THE ACT RELEVANT TO GEOTHERMAL RESOURCES

Regional and National Policy Statements, and Global Environmental Issues

Regional councils now have the responsibility for managing geothermal energy, and as noted above, inclusion of geothermal resource issues into policy statements could be interpreted as being mandatory. In preparing such regional

policies councils have a duty under the Act not to be inconsistent with any relevant national policy statements.

One draft of the Act in its Bill form provided a framework for the Minister of Energy to prepare a national policy statement concerning the allocation of hydro-electric and geothermal energy. The review group recommended that such a policy in fact be mandatory within six months of the Act coming into force (Randerson *et al.*, 1991). However, the Act as it stands makes no specific reference to national policy statements relating to geothermal energy. All national policy statements (with the exception of those related to the coastal environment) are to be prepared by the Minister for the Environment.

The absence of such a policy acting as a guideline in the area of energy resources may allow debate on the "efficiency" of geothermal energy as a substitute for other means of power production to occur at every relevant hearing. Furthermore, without any such signals from the government of the day each regional council is currently able to draw up completely different, and potentially inconsistent policy statements.

The issue of global warming and CO₂ emissions are open to debate when considering the sustainability of the global environment to various options of power production. The Ministry for the Environment (1991) noted that the Act is "unlikely to be the primary vehicle for tackling these global environmental issues. They are likely, however, to be addressed by way of national policy statements". As Hochstein and Freeston (1991) have pointed out, with no link between the legislative framework and the technological/scientific issues, by virtue of a national power policy, then development of the geothermal resource is likely to stagnate.

A policy and management framework for geothermal resources has been prepared, although it has not been made official national policy (Ministry of Energy, 1986). At any rate it does not address the issue of generation substitution with regard to global environmental issues as it examines the geothermal resource "in isolation". However, one of its policies does state that the use of geothermal energy should be actively encouraged where no major conflicts exist with other uses and values. Other policies put forward in this document have been addressed directly in the Act itself. These include:

- regional preparation of consistent policies and water management plans (as there is provision for regional councils to jointly prepare management plans relating to significant cross-boundary issues);
- the requirement of water rights for bore use and reinjection;
- provision for water conservation orders; and
- Environmental Planning and Enhancement Procedures to be applied when considering development.

The Environmental Planning and Enhancement procedures (Commission for the Environment, 1981), inherited by the Ministry for the Environment, have been allowed for in the Act through the requirement for an environmental assessment to accompany each application for a resource consent. A comprehensive schedule is part of the Act outlining what should be included and considered in such an assessment.

Transferable Water Permits

An emphasis was placed in reports concerning drafts of the Act on so-called "economic instruments"; which are intended to be incentives for reducing adverse environmental effects by way of self-regulating market forces (eg Randerson *et al.*, 1991, and, Ministry for the Environment, 1991). One of these provisions specifically incorporated into the Act itself is to allow the transfer of water permits for the taking and use of water. Such a transfer is allowed when the conditions of the permit or a regional plan expressly allow it. The transfer may be to another person at another site, or to another site, if both sites are in the same geothermal field.

The provision for transferable water permits would be an advantage where one user is developing a single field but when more than one user is developing the same field,

interference may become an issue. However, there is no explicit provision in the Act for considering the effects of a development on any other developers, but only on the environment itself. The only consideration with regard to the multiple use of any resource is that the "efficient use and development of natural and physical resources" shall be considered. "Efficiency" can be a somewhat subjective concept, but in relation to geothermal developments has technical overtones in addition to the financial, social and environmental aspects implied by the Act.

The Act provides no definition of geothermal "field" which may leave room for debate as to whether site to site transfers are possible between fields when two fields are interconnected.

Discharge permits on the other hand are not transferable under any condition, meaning that production wells but not reinjection wells might be allowed to be resited without applying for a new consent.

Consent Review and Revocation

The Minister of Energy retains the power to close bores, but cannot revoke water or discharge permits as such, or change their associated conditions. Permit conditions can be reviewed when the conditions themselves so state, or when a regional plan becomes operative that sets rules relating to the "ranges of temperature or pressure of geothermal water" in a water body covered by the permit. Consent conditions may also be reviewed or revoked if the information made available at the permit application hearing contained inaccuracies which influenced the final decision.

Other factors that may affect the conditions of a permit include the Act's provision for:

- anyone to apply to the Planning Tribunal for an enforcement order, or under extreme circumstances an interim enforcement order, to stop any activity that is causing significant adverse effects to the environment;
- the regional council to declare a water shortage direction which can relate to any water body, including the use of a geothermal field.

Enforcement orders may require the restoration of any natural and physical resource to the state it was in before the adverse effect occurred. Such a provision may be somewhat academic when considering restoring geothermal surface manifestations (Houghton *et al.*, 1989).

Water conservation orders cannot be used to regulate an existing lawful use, and cannot affect the conditions of any existing resource consent. Subsequent permits granted with respect to the water body covered by the water conservation order will have to take account of the provisions of the order however.

Water and discharge permits can have a duration of no more than 35 years, and last 5 years if the duration is not specified in the conditions of the consent. The consent will lapse within two years of the date of granting unless effect is given to it before that time.

Maori Customary Uses

The Act does not address the issue of the ownership of the geothermal resource which is currently before the Waitangi Tribunal. The Act makes a nod to Maori uses of the resource by excluding geothermal energy used or taken in accordance with tikanga Maori (Maori customary values and practices) from requiring a water permit, as long as those uses do not have an adverse effect on the environment. Edmunds and Boast (1990) commented that "under the present wording of the Act, it now appears open to Maori to argue for their use of geothermal water for commercial purposes without the necessity of a permit".

Payments for Geothermal Energy

The Act provides for the Governor-General to make regulations prescribing the circumstances and manner in which holders of permits relating to the use of geothermal

energy shall be liable to pay for such use. Furthermore, every such permit shall contain an implied condition that the holder shall throughout the period of the permit pay to the relevant regional council, on behalf of the Crown, any sum of money required to be paid under any such regulation.

Transitional Provisions

Any taking or use of geothermal energy that was lawful before the Act was passed, but was not authorised as such by virtue of a licence under the Geothermal Energy Act, continues to be lawful until a regional plan provides otherwise. A number of other such exceptions concerning licences are also given. However, in general terms, existing geothermal licences are deemed to become water permits if the taking and use of geothermal energy was allowed under the Water and Soil Conservation Act. Depending on how the original water right was granted, the new permit may last either ten or thirty-five years, unless the right is due to expire before such a date anyway.

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