ALLOCATION MECHANISMS FOR IMPLEMENTATION OF THE SINGLE TAPPER POLICY FOR DEVELOPMENT GEOTHERMAL SYSTEMS IN THE WAIKATO REGION

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SUMMARY – Management and use of the Waikato regions geothermal resources as required under the Resource Management Act is principally guided by policies in the Proposed Waikato Regional Policy Statement. Policies include unitised management of Development Geothermal Systems by ensuring that the taking of geothennal energy is under the control of a single body, the Single Tapper. This paper explores allocation mechanisms for Development Geothermal Systems under a "Single Tapper" regime. Allocation / management mechanisms for geothermal resources both in New Zealand and overseas and allocation mechanisms/models used for other "mobile" resources are assessed for applicability within the "Single Tapper" framework. A recommended allocation model is developed based on voluntary unitised development and management of each Development Geothermal System by parties with property rights (correlative rights) relating to access and use of the Development Geothermal System.

1. INTRODUCTION

The Waikato Region comprises approximately 80% of the geothermal resources within New Zealands Taupo Volcanic Zone. Environment Waikato (Waikato Regional Council) has functions under the Resource Management Act 1991 (RMA) in relation to the management and allocation of geothermal resources within the region.

The RMA is the law relating to the use of land, water, and air. The purpose of the RMA is "to promote the sustainable management of natural and physical resources".

In the RMA sustainable management means:

"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 well being 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".

Natural and physical resources include geothermal water and geothermal energy.

The RMA (section 6 and 7) requires persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, to recognise and provide for matters of national importance and other matters. Matters which particularly relate to the take and use of geothermal resources include:

- The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:
- The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga
- The efficient use and development of natural and physical resources:
- The maintenance and enhancement of amenity values:
- Intrinsic values of ecosystems:
- Recognition and protection of the heritage values of sites, buildings, places, or areas:
- Maintenance and enhancement of the quality of the environment:
- Any finite characteristics of natural and physical resources:

Environment Waikato has functions, for the purpose of giving effect to the RMA in its region, under Section 30 including:-

- The establishment, implementation, and review of objectives, policies, and methods to achieve integrated management of the natural and physical resources of the region:

- The preparation of objectives and policies in relation to my actual of potential effects **of** the use, development, or protection **of** land which is of regional significance:
- The control of the taking, use, damming, and diversion of water, and the control of the quantity, level, and flow of water in any water body, including –
  - The setting of any maximum or minimum levels or flows **of** water:
  - The control of the range, or rate of change, of levels or flows of water:
  - The control **of** the taking or use **of** geothemal energy :
- The control of discharges of contaminants into or onto land, air, or water and discharges of water into water.

Under the section 60 of the **RMA ,** Environment Waikato is required to prepare a Regional Policy Statement(RPS).

"The purpose of a RPS is to achieve the purpose of the Act by providing **an** overview of the resource management issues of the region and policies and methods to achieve integrated management of the natural and physical resources of the whole region."

The Proposed RPS for the Waikato Region **was** notified in October 1993 and a revised version (incorporating decisions on public submissions) notified in March 1996.

The Proposed RPS divides the "Regional Geothermal Resource" into "Development Geothermal Systems" and "Protected Geothermal Systems" in order to maintain the variety of characteristics **of** geothermal systems in the Waikato Region.

The Proposed Waikato RPS requires that Development Geothermal Systems are unitised prior to development and this is called the "Single Tapper Policy".

While there are three references to the Environment **Court** in relation to the geothermal section, none of these challenge the Single Tapper Policy. Therefore it can be regarded **as** effectively in place **as** regional policy in the Waikato region for management of geothermal resources.

Environment Waikato have commissioned research to determine a method to implement the Single Tapper Policy taking into account commercial, environmental and legal issues. **This** research is aimed at developing an effective allocation method (detailed objectives, policies and rules) that can be implemented **through** a Waikato Geothermal Regional Plan.

A draft report "Environment Waikato – Implementing the Single Tapper Policy for Development Geothemal Systems" has been produced. This report will provide a basis for further consultation and input into drafting the Waikato Geothermal Regional Plan Draft.

This paper briefly discusses a range of potential resource allocation models which have been assessed and a recommended allocation model for implementing the Single Tapper Policy **for** Development Geothermal Systems along with the rational for the recommended approach.

2. ALLOCATION OF OTHER MOBILE RESOURCES

When considering allocation mechanisms for geothermal systems it is valid to consider allocation methods used for other mobile resources such as, fish, oil, and gas and how these could relate to the allocation of geothermal resources

21 Oil and Gas in New Zealand

Management and allocation of rights in respect of oil and gas is covered under the Crown Minerals Act 1991. The principal tool is the Minerals Programme for Petroleum, prepared by the Minister of Energy, which establishes the policies, procedures and provisions to be applied in respect **of** the allocation **and** management **of** petroleum permits.

The fundamental policy for the minerals programme is "To allow continuing investment in petroleum prospecting, exploration and mining which is accordance with good exploration and mining practice, provided that: there is efficient allocation of permits; the Crown obtains a fair financial return from petroleum; and there is regard to the principles of the Treaty of Waitangi." The requirements for oil and gas in New Zealand are more narrow than the requirements under the RMA.

The petroleum exploration and mining permits are obtained by way **of** a competitive tender process. The Minister of Energy advertises Blocks for tender, evaluates the tenders and determines the successful tenderers.

The allocation of oil and gas **has** potential applicability for the allocation of development geothermal systems.

2.2 Fisheries in New Zealand

The Quota Management System **(QMS) ,** under the Fisheries Act, is used to manage New Zealand's **fish** resources. The Fisheries Act

1996 provides a statement of purpose for fisheries management by providing for the utilisation of New Zealand's fishing resources while ensuring they are maintained at a sustainable level. The intention of the **Act** is to facilitate the activity of fishing while having regard to the sustainability of harvest and the effects on the fishing environment.

The QMS sets a quota for each fish species based on the previous catch history. Quota levels can be adjusted each year based on an assessment of the sustainability of the particular fish species. Existing commercial fishers gain initial quota allocation at no cost and 20% of **quota** is allocated to Maori. There is also a customary and recreational quota. Quota can be traded.

The Quota Management System has potential applicability for the allocation of development geothermal systems.

2.3 Oil and Gas in North America

Allocation of oil and gas in North America is generally based on a unitisation model where a threshold of parties with **rights** to the resource (known as correlative rights) voluntarily agree to a development, enter into a unit agreement, and develop the resource on a unitised basis. Some states, e.g. Texas, do not use this system.

In the United States, most onshore oil and gas rights are owned by the private sector, or associated with current or original surface land ownership. In off shore and frontier areas most rights are owned by the individual States. In Canada, most oil and gas rights are owned by the Provinces, Territories and Indian Affairs, except for land deeded prior to 1907 which is in the private sector.

Rights to explore, develop, and extract are normally leased fiom the rights owner, as if the oil as gas were real property, on a competitive bid or negotiated basis. However "absolute ownership" is only recognised when the oil and gas are extracted and in possession, i.e. the rule of capture applies.

Exploration, development and extraction are to be carried out in accordance with "good oil field practice" which encompasses the concepts of conservation and maximum ultimate recovery, preventing wasteful practices and duplication.

The North American model for allocation of oil and gas has potential applicability for the allocation of development geothermal systems.

3. POTENTIAL GEOTHERMAL ALLOCATION MODELS

Based on existing geothermal allocation mechanisms and allocation mechanisms for other mobile resources the following potential allocation models have been developed for Development Geothermal Systems:

- First to Gain Resource Consents Model.
- Quota Management Model.
- Tender Model.
- Correlative Rights Model.

The key features of each model are as follows:

For all models Development Geothermal Systems within the Regional Geothermal Resource would be defined in the Geothermal Regional Plan.

3.1 First to Gain Resource Consents Model

The basis of this model is that the first party to gain resource consents to take and use geothermal energy from the "deep" geothermal resource within Development Geothermal Systems becomes the Single Tapper.

Key Features

- Existing holders of resource consents to take and use "deep" geothermal water automatically become the Single Tapper until the resource consents to take and use geothemal energy are either cancelled, lapses, or surrendered.
- Where no resource consents to take and use the "deep" geothermal resource have already been granted a party, or a number of parties, have the opportunity to apply for resource consents under the RMA and become the Single Tapper. Parties may apply separately for resource consents and contest the right to be the Single Tapper.
- Key decision-making criteria under the RMA for determining which party gains resource consents and becomes the Single Tapper for a development geothermal system will include:
  - Demonstration of efficient use and development of the resource;
  - Effective measures to avoid, remedy or mitigate adverse effects on the environment;
  - Effective consultation; and
  - Demonstration that the manner in which the proposal has been developed and the proposed operation takes into account the principles of the Treaty of Waitangi.

3.2 Quota Management Model

The basis of this model is that a quota is set for the take of geothermal water and energy from each Development Geothermal System and that certain parties with existing property and use rights are allocated a share of the quota on the condition that they agree to be part of a single management entity, (the Single Tapper). The quota holders jointly become the Single Tapper.

Key Features

- **O** An Initial Deep Commercial Take and Initial Shallow Take is set as the initial quota for each Development Geothermal System in the Geothermal Regional Plan.
- **O** Initial Deep Commercial Take is allocated as quota shares based on land access and existing rights (current take and use of the "deep" geothemal water and energy authorised under resource consents)..
- ❑ Under this model Maori with Mana Whenua in relation to each Development Geothermal System, could be allocated a set percentage of quota shares or energy extracted to recognise customary association with geothermal resources.
- ❑ A condition of being allocated quota shares for the "Deep Commercial Take" is that the potential quota holders agree to be part of a single management entity (the Single Tapper) for the Development Geothermal System.
- ❑ The Single Tapper, comprising the quota holders, can apply for resource consents through a certain process (say as a controlled activity subject to defined environmental performance standards) for development of the resource for the Initial Deep Commercial Take quantity set in the Geothermal Regional Plan.
- ❑ The quota is reassessed and can be adjusted (say on a five yearly basis) by Environment Waikato. The single tapper can apply for resource consents up to the readjusted Deep quota level.

3.3 Tender Model

The basis of this model is that parties tender for a permit to become the Single Tapper.

Key Features

- ❑ Parties can tender to Environment Waikato for a permit to become the Single Tapper to take and use geothermal water from the "deep" geothemal resource for each Development Geothermal System.
- ❑ Criteria for granting of a Single Tapper Permit through the tender process include:
  - The party that is most likely to effectively and efficiently prospect, explore and develop the resources;
  - A staged development programme;
  - Financial and technical capability of developing the resource; and
  - Methods to avoid, remedy or mitigate adverse environmental effects.
- ❑ The Single Tapper Permit gives right to explore and develop subject to gaining of resource consents required for the development.
- ❑ The Single Tapper has to apply for resource consents for aspects such as discharges to air and water and land use through a contestable process (say as an unrestricted discretionary activity), as many issues will affect parties who are not involved in the management or development of the geothermal resource.

3.4 Correlative Rights Model

The basis of this model is that parties privately agree to develop a geothermal system on a unitised basis. The parties determine and agree their correlative rights, (The accumulation of individual property rights relating to access and use of the deep geothermal resource as valued through a valuation process). Access rights derive from land ownership within the boundary .pf the geothermal system, in relation *to* the Development Geothermal System. If a defined threshold of parties with correlative rights agree to development of the resource in a unitised manner and put together a "Single Tapper Operating Agreement", resource consents can be applied for.

Key Features

- ❑ Correlative rights are established on a voluntary basis at least within the inner resistivity boundary (and ideally within the total resistivity boundary).
- ❑ Parties agree to develop the geothermal resource under a Single Tapper Operating Agreement and voluntarily bring correlative rights together to show unitised management of the Development Geothermal System.
- **O** A threshold of parties with correlative rights (say 70%) must be party to the Single Tapper Operating Agreement before Environment Waikato will consider a resource consent application for the take and use of "deep" geothermal resource.
- **O** If the threshold is reached then other parties with correlative rights who have not agreed

to join Single Tapper Operating Agreement (toe holders) must join, or be compensated, at an agreed valuation, or have their interests recognised by the other parties.

- The criteria for being able to apply for resource consents would be that:
  - Correlative rights have been established and the threshold level of parties has agreed to develop the geothermal system;
  - Parties with correlative rights who do not wish to be part of the Single tapper have been compensated (either through purchase of their correlative rights or some other form of compensation that recognises their interests); and
  - A Single Tapper Operating Agreement is in place.
- Once these criteria have been satisfied resource consents to take and use geothermal water and energy for the purposes of exploration and development is through a certain process (say as a controlled activity subject to defined environmental performance standards).

4. EVALUATION OF ALLOCATION MODELS

A set of criteria for evaluation of the models was established. The criteria were designed to:

- Meet the requirements of Section 32 of the Resource Management Act 1991;
- Recognise the Environment Waikato Policy directions outlined in the Proposed Regional Policy Statement; and
- Build on the initial policy work in the Geothermal Section of the Outline Plan - April 1997.

One principle guiding the evaluation of the Development Geothermal System allocation models is efficient take and use of the resource. This and other evaluation criteria recognise the finite characteristics of the resource and the promotion of sustainable development of the Regional Geothermal Resource. The opportunity for social, economic and cultural wellbeing is enhanced by sustainable development of the Regional Geothermal Resource.

Each of the allocation models was evaluated in terms of the following criteria:

- Effectiveness:- The ability of the model to achieve Environment Waikato's anticipated environmental results;
- Implementation Costs:- Costs of legislative change and establishing policy framework, transaction costs, and costs of gaining resource consents;
- Commercial Risks:- Stability of model, security and duration of rights, knowledge about the resource, extraction and reinjection limitations;
- Environmental Costs and Benefits:- Ability of model to incorporate environmental costs and benefits into decisions;
- Transferability:- Ability to transfer rights;
- Flexibility:- Ability of model to adapt in response to new ideas, information or technology;
- Market Distortion:- Evaluation of any market distortions that may arise from the model;
- Information Requirements:- Assessment of information requirements for implementation for each model; and
- Maori Interests:- Assessment of effectiveness in providing for Maori interests.

Based on the evaluation of the models a recommended model was developed.

5. RECOMMENDED ALLOCATION MODEL

The following outlines the approach recommended for the allocation and management for Development Geothermal Systems in our draft report to Environment Waikato.

5.1 Guiding Principles

The following guiding principles have been defined in relation to the recommended policy approach for implementing the Single Tapper policy:

- Environmental outcomes including efficient take and use of the resource;
- Unitisation of parties wishing to utilise the geothermal resource;
- Recognition of existing use rights;
- Recognition of the principles of the Treaty of Waitangi; and
- The importance of the process of developing the Single Tapper allocation mechanisms in the Geothermal Regional Plan, i.e. whereby all interested parties have the opportunity to formally comment on and have an input into the implementation of the Single Tapper policy.

5.2 The Recommended Allocation Model

The recommended allocation model is a hybrid model, consisting of what is considered the best applicable features of the four allocation models evaluated.

5.2.1 Outline of the Recommended Model

- Development Geothermal Systems within the Regional Geothermal Resource are defined in the Geothermal Regional Plan.
- The take and discharge to soakage of up to 15 tomes of geothennal fluid per day, and extraction of energy via heat exchangers from the shallow resource, i.e. at less than 200 m depth, [suggested depth may need to be reviewed], will be a permitted activity in Development Geothermal Systems. [a limit may need to be set to provide for sustainable shallow takes] Takes fi-om the shallow resource over 15 tomes per day will be treated as a discretionary activity.
- Environment Waikato will define the following process and criteria in the Regional Geothermal Plan for showing unitised management of the deep resource for a Development Geothermal System:
  - Parties voluntarily determine and agree their correlative rights to the resource. (Correlative rights can be defined as the accumulation of individual property rights relating to access and use of the deep geothermal resource - as valued through a valuation process);
  - Parties with correlative rights voluntary agree to Unitised development and management of the development geothermal system, prepare a Unit Agreement, and form a Unit Company;
  - A 75% threshold level of agreement to unitised development and management, by parties with correlative rights to the deep resource, must be achieved for the Development Geothermal System;
  - Once the threshold level has been achieved other parties within the defined geothermal system have the option of joining or being compensated for their correlative rights under the Unit Agreement. Compensation will be at fair market value or a voluntary negotiated value; and
  - Parties can assign or transfer their rights as detailed in the Unit Agreement.
- Environment Waikato will establish the following criteria for determining the single tapper or Unit manager for Development Geothermal Systems in the Geothermal Regional Plan.
  - Unitised management must be shown to exist for the development geothermal system under consideration;
  - A Unit Agreement is in place; and
  - The Unit Agreement contains a Unit Operating Agreement which identifies the one body that will develop and manage the development geothermal resource.
- Only after unitisation is established, i.e. threshold criteria are reached and the unit agreement is in place, can resource consents be applied for by the Unit Company.
- Existing resource consent holders for the deep geothermal resource on Development Geothermal Systems will continue to operate under their existing resource consents. Existing resource consents may be renewed up to the existing consented take levels where application is made, subject to the provisions of the Resource Management Act. Resource consent applications to take and use additional geothermal water and energy fi-om Development Geothermal Systems where existing resource consents are held will not be considered unless unitised management for the deep geothemal resource is shown to exist.
- An "Allowable Deep Take" for each Development Geothermal System will be set in the Geothermal Regional Plan by Environment Waikato. (The final level of this take will be debated and confirmed through the Regional Plan submission process).

lll The Unit Company would apply for resource consents through a certain process (say as a controlled activity subject to defined environmental performance standards) for development of the resource up to the Allowable Deep Take quantity. The Unit Company would need to supply the following documentation with the resource consent applications:-

- A Steamfield Management Plan (including staged development process);
- An Environmental Management Plan outlining measures to avoid remedy or mitigate adverse environmental effects; and
- A monitoring plan

lll When the Unit Company gains resource consents for developing the geothermal system they become the "Single Tapper"

for the particular Development Geothermal System.

- The Allowable Deep Take quantity can be amended upward on application for further resource consents, as a discretionary activity, if the Single Tapper can demonstrate that the effects can be managed. Consideration of changes to the Deep Allowable Take by Environment Waikato will take into account the results of the monitoring program and knowledge gained about the geothermal system from outcomes of development.
- A requirement of the resource consents is to supply non-commercial data and monitoring information regarding the resource and its development.
- Annual administration and monitoring fees are paid to Environment Waikato.

5.2.2 Key Features

Key features of the recommended model are:

- Limited takes fiom shallow aquifers are permitted.
- Voluntary unitisation is a prerequisite to be able to apply for resource consents as the Single Tapper.
- Once unitisation is established, resource consents to take and use geothemal water for the purposes of exploration and development could be gained through a certain process (up to a defined allowable take for each system).
- Existing take and use rights are maintained and can be renewed to existing levels (without unitisation)
- Allowable Deep Take quantities are set in the Regional Geothermal Plan for each Development Geothermal System and can be adjusted upward on application and provision of supporting evidence from Single Tapper.

6. CONCLUSIONS

It is considered that the recommended model can meet the requirements of the Resource Management Act and reflects the policies in the Proposed Waikato RPS as set out below.

- Sustainable management of the Waikato regions regional geothermal resource is achieved by provision of Protected and Development Geothermal Systems.
- Allocation of the regions Development Geothermal Systems by way of the recommend model provides for:
  - The principles of the Treaty of Waitangi in that both Maori and Paheka will potentially have correlative rights to the geothemal resources and therefore both will be parties to the "Single Tapper" management of Development Geothermal Systems.
  - Efficient take and use of the geothermal resource
  - Recognition of existing use rights

The recommended model will form the basis for extensive consultation on allocation of Development geothermal Systems under the Single Tapper policy and formulation of policy and rules in a Waikato Geothermal Regional Plan.

6. REFERENCES

Environmental Management Services Limited (1997). Environment Waikato – Implementing the Single Tapper Policy for Development Geothermal Systems.