

IN THE MATTER

of the Resource Management Act 1991

AND

IN THE MATTER

of resource consent applications by Contact Energy Limited in respect of the Te Mihi Geothermal Power Station Proposal.

BEFORE

BOARD OF INQUIRY, Te Mihi Geothermal Power Station Proposal

EVIDENCE OF RICHARD JOHN MATTHEWS

23 June 2008

INDEX

	Page
1. INTRODUCTION	1
Qualifications and Experience	1
Scope of Evidence	2
2. GEOTHERM GROUP LIMITED	3
3. RELEVANT RMA CONSIDERATIONS	5
4. GEOTHERM SUBMISSION ON THE TE MIHI PROPOSAL	8
Reinjection	9
Air Discharge	10
Noise	11
Summary	12
5. RESOURCE CONSENT CONDITIONS	12
Resource Consent 116786	13
New Conditions	16
General Conditions	17
Other Provisions	25
Noise – Proposed Power Station Land Use Consent	25
Air Discharge – Resource Consents 116789 and 116790	26
6. CONCLUSION	27
SCHEDULE 1	

1. INTRODUCTION

Qualifications and Experience

- 1.1 I hold a Master of Science (Hons) degree, and have been working as a resource management adviser for more than twenty-nine years, initially in the local government sector and since 1999 in private practice with the environmental consulting practice, Mitchell Partnerships. I am a partner in this practice.
- 1.2 My specialist area of expertise is in the application of the Resource Management Act 1991 (“**RMA**”), and other relevant environmental management legislation, the development of Regional and District Plans and the acquisition and assessment of resource consent applications. In particular, I worked for twenty years with the Waikato Valley Authority and Waikato Regional Council, managing water right and resource consent processes and developing appropriate resource consent conditions for activities within the Waikato Region. I have been providing advice on these matters for more than twenty-seven years.
- 1.3 I have provided advice on the approach required for resource consent processes in general, and specifically on several hundred resource consent application projects within New Zealand since the commencement of the RMA. I have been involved in (and in several cases, managed) the resource consent projects relating to many electricity generation projects in New Zealand, and in the North Island in particular, including:
- Poihipi Power Station (Wairakei) resource consents.
 - Geothermal drilling and exploration resource consents.
 - Ohaaki Power Station air and water related resource consents.
 - Huntly Power Station, air and water resource consents, including the gas turbine power stations (the Huntly e3p and Project 40) at the Huntly Power Station site.
 - Tongariro Power Development resource consents.
 - Arapuni Power Station resource consents.
 - Hau Nui Wind Farm extension resource consent.

- Awhitu Wind Farm resource consent.

1.4 I have similarly worked on a range of other resource consent projects, including for example in the Waikato Region:

- Kinleith Complex air and water related resource consents.
- Watercare Waikato River water supply resource consents.
- Te Rapa, Te Awamutu, Lichfield and Waitoa dairy factory resource consents.
- Hamilton City and Taupo sewage discharge resource consents.
- Fletcher Wood Panels air and wastewater discharge consents.

1.5 In addition to working closely on a range of resource consent projects involving geothermal developments in the Waikato Region, I was also engaged by the Waikato Regional Council to review the submissions relating to the initial Proposed Waikato Regional Plan Geothermal Module, which was subsequently superseded by Waikato Regional Plan Variation 2 – Geothermal Module.

1.6 I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court Practice Note and that I agree to comply with it. I confirm that I have considered all the material facts that I am aware of that might alter or detract from the opinions I express. In particular, unless I state otherwise, this evidence is within my sphere of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

Scope of Evidence

1.7 In my evidence I will:

- Discuss the existing Geotherm Group Limited resource consents in relation to the existing environment in the Wairakei area;
- Discuss relevant RMA provisions relating to the Te Mihi project;
- Discuss the submissions made by Geotherm Group Limited in relation to the Te Mihi resource consent applications;

- Discuss the planning evidence presented by Mr Chrisp and the resource consent conditions proposed by Mr Daysh and detail resource consent conditions that I consider should be imposed in relation to the resource consents sought by Contact Energy Limited.

2. GEOTHERM GROUP LIMITED

- 2.1 Geotherm Group Limited (In Receivership) ("**Geotherm**") currently holds resource consents for its site located along Poihipi Road, in the south-western portion of the Wairakei-Te Mihi steam field, and is near to the area within which Contact proposes to build the Te Mihi Power Station. Geotherm's resource consents were granted by the Environment Court on 27 March 2007, by way of a Consent Order implementing an agreement reached between the parties (including Contact Energy) to appeals on the applications.
- 2.2 Geotherm holds resource consents (104979, 104980, 104981/82, 104988, 104990 and 104992) for take and discharge of geothermal fluid, and air discharges associated with the Geotherm Project.
- 2.3 Geotherm also holds a land use consent from the Taupo District Council to develop a geothermal power station on its Poihipi Road site. The consent (020357) was granted on 15 July 2003.
- 2.4 Geotherm's resource consents provide for the take and discharge of up to 70,000 tonnes per day of geothermal fluid and other activities associated with the development and operation of a geothermal power station. The resource consents enable the development of the geothermal resource for a range of activities, including different types of power stations, ranging from a conventional steam turbine plant through to, and including a binary plant.
- 2.5 Geotherm's consents were granted after an exhaustive resource consent process that confirmed the allocation of geothermal resources from the Wairakei-Tauhara Geothermal System for the Geotherm Project.

2.6 As detailed by Mr Downey, while Geotherm is in receivership, the receivers are actively seeking parties with an interest in developing the geothermal resource in accordance with the Geotherm resource consents.

2.7 I consider that there is every reason to expect that the Geotherm resource consents will be exercised in the foreseeable future. I am not aware of any reason why the consents would not be exercised, nor am I aware of any particular technical information that would suggest that the consents could not be exercised in full or in part. As Mr Downey indicates in his evidence, the interest shown by a number of parties in the resource consents held by Geotherm suggests to me that there are other parties who also consider that there may be opportunities available in relation to the exercise of the Geotherm consents.

2.8 I consider it appropriate that the existing Geotherm resource consents (and the range of development opportunities that may be available in terms of those consents) form part of the existing environment that needs to be considered in relation to the potential environmental effects of the proposed Te Mihi development. There is every expectation that the resource consents granted to Geotherm can be exercised, and in this regard they should in my opinion be considered as part of the existing environment within which the Te Mihi development would occur and that the development could affect.

2.9 In particular, I consider that it is entirely appropriate to consider the potential adverse effects that the proposed Te Mihi development may have on the exercise of the Geotherm resource consents. In this regard I note that Professor O'Sullivan observes (paragraph 32) that:

Some scenarios (such as TM2) provide a marginal benefit for Geotherm, others (such as the full injection Scenario 12) provide a marginal short term benefit for Geotherm, but medium to long term detriment. I would not expect variations in the scenarios from those which I have modelled to alter that picture.

2.10 In other words, Professor O'Sullivan predicts adverse effects on any Geotherm development. I consider that it would be appropriate for any resource consents granted in respect of the Te Mihi development to include consent conditions targeted at avoiding, remedying or mitigating any adverse effects on the

Geotherm development. This can be addressed by way of specific consent conditions, as I discuss later in my evidence.

- 2.11 If the Geotherm resource consents (and the potential development that could occur in accordance with those consents) are not considered as part of the existing Wairakei environment and appropriate provision is not made to avoid, remedy or mitigate adverse effects, then any benefit that may accrue through those consents, or the exercise of those consents may be limited or even precluded altogether, without consideration of the relative merit of any development proposal.

3. RELEVANT RMA CONSIDERATIONS

- 3.1 Rather than repeating an assessment of the relevant RMA and Statutory Planning provisions relevant to the Te Mihi project, I note that I generally concur with the assessment presented for Contact Energy by Mr MB Chrisp. I discuss below a number of areas where further consideration should be given in relation to the matters discussed by Mr Chrisp.

- 3.2 In particular, I concur with Mr Chrisp's discussion and assessment of the activity status of the resource consents for the Te Mihi project under the Proposed Taupo District Plan. The land use consents sought are discretionary activities in terms of the Proposed District Plan. I note that this means that discretion can be exercised in relation to all aspects of the proposal, and that specific conditions can be imposed on any consents granted. Such conditions are not limited to relying on the more generic District Plan standards that might otherwise apply to the project consents but should set specific standards to comply with. I will discuss specific conditions that I consider should be applied in relation to the land use consents later in my evidence.

- 3.3 I also agree with Mr Chrisp that the Regional Consents sought are discretionary activities in terms of the Waikato Regional Plan.

- 3.4 I note that in paragraph 31 of his evidence, Mr Chrisp observes that the proposed Te Mihi Power Station will enable people and communities to provide

for their social, economic, and cultural well-being and for their health and safety by the provision of electricity. The same applies equally to the Geotherm project, where electricity generated would enable people and communities to provide for their social and economic well-being and for their health and safety. I consider that there is a need to be careful that any such benefit derived in relation to the Te Mihi project is not at the expense of similar benefit that could be derived from the already consented Geotherm project.

- 3.5 Mr Chrisp comments in paragraph 32 of his evidence that “*Electricity generated from geothermal sources is also consistent with the Government’s policy of encouraging the use of renewable energy sources, particularly where this assists the Government in meeting its international commitments in relation to the Kyoto Protocol due to the low emissions of CO₂ associated with geothermal electricity generation*”. While I agree with this statement in general terms, where such electricity is generated at the expense of electricity generated in a similar way at another location it would not necessarily be consistent with the Government policy nor would it necessarily assist in meeting its international Kyoto Protocol obligations. As noted by Professor O’Sullivan, the proposed Te Mihi development may have an adverse effect on the Geotherm project and may therefore limit electricity generation via that project.
- 3.6 Mr Chrisp also discusses (in paragraph 32) the Climate Change (Emissions Trading and Renewable Preference) Bill 2007 (“**the Bill**”) in the context of this further reinforcing the Government policy position, and implying that this should be a relevant consideration in terms of the Te Mihi project. I note that the Bill is still being considered by Parliament and if passed, may end in a different form to when it was introduced. In my opinion, little reliance should be placed on or consideration given to the Emissions Trading Scheme and the Bill.
- 3.7 At paragraph 33, Mr Chrisp notes the anticipated benefits of the proposed Te Mihi Power Station project, as highlighted by Mr D Hunt in his evidence. I note that several of those benefits would also apply to the Geotherm project, and may be precluded unless appropriate conditions are included in the Te Mihi resource consents to avoid, remedy or mitigate adverse effects on the exercise of the Geotherm consents.

- 3.8 Mr Chrisp observes in paragraph 54 that the National Policy Statement (“NPS”) on Electricity Transmission 2008 is relevant to the proposed transmission lines and associated switchyard proposed to convey the electricity generated by the proposed Te Mihi Power Station to the National Grid. While I agree that the NPS is a relevant consideration in relation to the transmission of electricity generated, I also note that this also applies to the Geotherm project. In this regard if the exercise of the Te Mihi consents (or construction and use of transmission lines in the area) adversely affects the exercise of the Geotherm resource consents, then in part the relevance of the NPS is lessened.
- 3.9 Both Mr Chrisp and Mr Hunt observe that the proposed Te Mihi development would be consistent with realising the benefits to be derived from the use and development of renewable energy and is therefore consistent with Section 7 (j) of the RMA. As I noted earlier, this is also the case for the Geotherm project, and any adverse effect on that project would be inconsistent with Section 7 (j) on the same basis.
- 3.10 Section 7 (j) of the RMA requires the consent authority to have “*particular regard to*” the “*benefits to be derived from the use and development of renewable energy*”. In this regard, the Geotherm resource consents enable the development of a renewable energy project that could be compromised if there are adverse effects on it resulting from the exercise of the consents sought by Contact Energy for the Te Mihi development.
- 3.11 In essence, the benefits to be derived from the use and development of geothermal energy that Contact Energy is seeking could be, at least in part, at the expense of similar benefits from the use of renewable energy that Geotherm already has consents for. As noted earlier in my evidence, if such effects are not appropriately avoided, remedied or mitigated then any benefit that may accrue through those consents may be limited or precluded altogether, without consideration of the relative merit of any development proposal because other parties may be unwilling to invest in the consents already held by Geotherm.
- 3.12 I consider that adverse effects on Geotherm could be avoided, remedied or mitigated through appropriately worded conditions being included in any

resource consents granted for the Te Mihi project. The conditions could take the form of providing a buffer zone external to and around the Geotherm site, where no reinjection is to occur, and requiring further modelling and consultation prior to any changes to the reinjection strategy set out in the application documents.

- 3.13 A buffer zone has some downsides in that any adverse effects are likely to arise as a result of the permeability between the Contact Energy reinjection and Geotherm production areas, rather than being limited by any physical separation. A large buffer zone would be needed to ensure the effects are minimised (for example, by avoiding fault zones). However Dr Burnell has specified appropriate buffer zone areas and I propose conditions based on his recommendations later in my evidence. In addition to the proposed buffer zones, additional modelling, consultation and peer review would have advantages in that it would provide for some certainty for Geotherm while providing some flexibility for Contact Energy in future. I discuss conditions requiring additional modelling, consultation and peer review later in my evidence.

4. GEOTHERM SUBMISSION ON THE TE MIHI PROPOSAL

- 4.1 Geotherm's interest in the Contact Energy proposal is primarily to protect and preserve its proposed development and existing rights under its resource consents to explore for, drill for, extract, reinject and otherwise use geothermal fluid and any other associated resources.
- 4.2 As noted by Mr Downey, Geotherm does not, in principle, oppose the Contact proposed new geothermal power station at Te Mihi and associated resource consent applications required to establish and operate a new geothermal power station within the Wairakei-Tauhara Geothermal System.
- 4.3 However, the Geotherm submission is concerned with aspects of the Te Mihi proposal that may have an adverse effect on the Geotherm geothermal development within the Wairakei-Tauhara Geothermal System and its

associated resource consents to explore for, drill for, extract, reinject and otherwise use geothermal fluid and any other associated resources.

4.4 The main concerns that Geotherm has identified, as set out in their submission, include:

- Adverse effects on Geotherm as a result of the proposed reinjection at Te Mihi.
- Cumulative effects of discharges to air.
- Cumulative noise effects.

4.5 I discuss these matters in turn below.

Reinjection

4.6 I consider that Contact Energy has not defined specific reinjection locations for the Te Mihi reinjection proposals. While the Contact application (and subsequent evidence for the hearing) modelled reinjection at specific locations under two scenarios, the resource consent sought would enable reinjection almost anywhere in the Wairakei-Tauhara Geothermal System, at locations, depths and in ways that may have different effects to that modelled by Professor O'Sullivan.

4.7 It is therefore possible, in terms of the Te Mihi proposal as detailed in the Contact's resource consent application and in its evidence for the hearing, for reinjection to occur in a way, and in locations which could adversely affect the Geotherm Project and the exercise of Geotherm's resource consents. The evidence from Professor O'Sullivan acknowledges that there are likely to be adverse effects on the Geotherm project.

4.8 As discussed earlier in my evidence, the Geotherm project should be viewed as part of the existing environment, as the resource consents may be exercised at some stage in the near future. It is important that any resource consents granted for the Te Mihi proposal take into account the potential adverse effects on the Geotherm operations.

- 4.9 Contact Energy's modelling does not appear to cover all possible reinjection scenarios for which it has sought resource consent. It is therefore difficult to make a full assessment of how the Contact Energy proposal will impact upon Geotherm activities (and almost impossible given the range of reinjection scenarios that might be possible).
- 4.10 As suggested in Professor O'Sullivan's evidence, the Contact Energy proposal may have some detrimental effects on Geotherm but does not identify what the full extent of the effect would be. It is therefore appropriate that resource consent conditions reflect the modelled locations. If Contact Energy intends to reinject in a location not modelled in the Te Mihi Assessment of Environmental Effects ("**AEE**"), these areas and the reinjection proposals should firstly be subject to modelling, effects assessments, peer review and to consultation with other users of the resource, and to Council approval to ensure that reinjection in these locations will not adversely affect the exercise of the Geotherm resource consents.
- 4.11 I consider that the Te Mihi consent conditions should limit the areas where reinjection may occur to locations where effects have been modelled and where the likely extent of the adverse effects on the consented Geotherm activities has been identified. The consent conditions should also ensure that any reinjection (both directly as a result of the Te Mihi resource consents and the Te Mihi consents in combination with other existing consented reinjection) do not adversely affect the exercise of the Geotherm resource consents.
- 4.12 Defining buffer zones around the Geotherm property would also help mitigate the adverse effects from the Te Mihi proposal on the Geotherm consents.
- 4.13 I will discuss conditions that I consider should be imposed to achieve these outcomes in Section 5 of my evidence.

Air Discharge

- 4.14 There is some uncertainty in the Contact Energy air modelling assessment regarding the cumulative effects of the Te Mihi proposal and the Geotherm project. The applicant has used dispersion modelling to predict the

environmental effects of the discharge of contaminants to air for the Te Mihi proposal. This modelling assessed the effects of the proposed Te Mihi development in combination with the consented Geotherm discharge (using an assumed development model), the existing Wairakei Power Station discharge, and the existing Poihipi Power Station discharge.

4.15 The consent conditions to be included in any air discharge consent granted for the Te Mihi development should ensure that the effect, in combination with the consented Geotherm discharge, does not adversely affect air quality and does not compromise the exercise of the Geotherm discharge consent and conditions should reflect the limits of the modelling predictions as set out in the AEE.

4.16 In this regard, I note that the air discharge modelling undertaken by Mr Stevenson for Contact Energy uses hydrogen sulphide (“**H₂S**”) discharge rates of 28.3 grams per second and 7.9 grams per second for the Te Mihi and Poihipi power stations respectively, whereas Mr Daysh proposes conditions based on discharges of 50 grams per second (180 kilograms per hour) and 17 grams per second (61 kilograms per hour). The consent limits should be based on what has been assessed, that is discharges of 28.3 grams per second for the Te Mihi proposal and 7.9 grams per second for the Poihipi power station.

Noise

4.17 Contact Energy has modelled the proposed noise levels associated with the Te Mihi development, and assessed compliance with District Plan noise provisions at the boundary of their site, and at nearby existing dwellings. However, the AEE does not specifically address the cumulative noise effects in association with the Geotherm activity authorised by resource consent 020357.

4.18 Appropriate conditions should be put in place to ensure that cumulative noise levels from the proposed Te Mihi development and existing consented activities do not exceed District Plan levels and do not adversely affect the ability of the Geotherm development to meet the noise limits set in its resource consent. A noise boundary should also be defined and a noise standard specified.

- 4.19 I note also that the conditions proposed by Mr Daysh do not include a specific noise standard for the project; rather the land use consent he proposes relies on compliance with generic District Plan provisions.

Summary

- 4.20 Appropriate conditions of consent need to be implemented to control the effects of the proposed activity at Te Mihi in such a way that the actual effects of the activity are consistent with those modelled and assessed, particularly in relation to reinjection, and that the activity does not have an adverse effect on the exercise of resource consents held by Geotherm (including existing resource consents 104979, 104980, 104981/82, 104988, 104990, 104992 and 020357).
- 4.21 In Section 5 of my evidence, I set out consent conditions which I consider should be adopted for the Te Mihi proposal. I discuss these and the conditions proposed by Mr Daysh further below.

5. RESOURCE CONSENT CONDITIONS

- 5.1 The conditions proposed by My Daysh for the Te Mihi proposal focus on the continuation of the existing Contact Energy Wairakei Power Station operation, based on the concept that the “existing” power station activities should be protected from any adverse effects of a new generator using the same geothermal system.
- 5.2 This is also reflected in the Geotherm resource consent conditions in that they focus on enabling the Geotherm activities to be undertaken in a way that does not adversely affect the “existing” activities undertaken by Contact Energy.
- 5.3 As noted earlier, there is every expectation that the Geotherm resource consents will be exercised, and therefore in my opinion, Geotherm should equally gain some “protection” from the exercise of new consents sought in respect of the development of the Wairakei geothermal system.

- 5.4 In this regard, I consider that the “basic” conditions used for the present Contact Energy resource consents should be amended in a way that is consistent with the Geotherm consents to afford the same level of participation in the management of the steam field for all operators.
- 5.5 In particular, I note the “General Conditions” applicable to Contact Energy’s existing resource consent 104718 are focussed on the existing Wairakei Power Station operations. In my opinion these General Conditions require modification to address the potential effects that the proposed Te Mihi power station activities would have on the Geotherm resource consents. Conditions specifying buffer zones relating to the reinjection of separated geothermal water and condensate reinjection from the Te Mihi proposal are also required.
- 5.6 I also consider that a specific and enforceable noise condition is required for the Te Mihi land use consent. I recommend such a condition to address cumulative noise from the Contact Energy and Geotherm proposals below.
- 5.7 As noted earlier, I consider that the proposed H₂S standard for the air proposed discharge consent should be amended to reflect the assessment undertaken. Wording for this condition is set out below.
- 5.8 I consider that the conditions proposed by Mr Daysh should be amended as follows.

Resource Consent 116786

Condition 2

- 5.9 Condition 2, as proposed by My Daysh, requires the exercise of the Te Mihi reinjection consent to comply with the General Conditions applicable to the existing Wairakei Power Station reinjection consent (104718).
- 5.10 As indicated earlier, I consider that the “General Conditions” applicable to resource consent 104718 require some modification to address the potential effects of the exercise of the Te Mihi reinjection consents on the Geotherm activities. I will discuss my proposed changes to the General Conditions later in

my evidence, but note here that proposed condition 2 should be amended to delete reference to consent 104718 as follows:

2. *The exercise of this consent is subject to compliance with the General Conditions ~~that apply to consent 104718.~~*

5.11 In addition, the General Conditions should be amended to provide a specific list of conditions applicable to the Te Mihi development by amending the conditions applicable to consent 104718 by the addition of the changes discussed later in my evidence. These General Conditions should specifically reference resource consent 116786.

Condition 4

5.12 Condition 4 proposed by Mr Daysh provides for notice of any new well to be used for reinjection to be given to the Waikato Regional Council 10 days prior to use of that well. This may be appropriate for reinjection wells within the area modelled by Professor O'Sullivan as there is some information available as to what effects reinjection in this area would have. However, any reinjection outside of this area has not yet been modelled and the potential effects of it are largely unknown. I therefore consider that the condition should be reworded as follows:

- 4(a) *The consent holder shall notify the Waikato Regional Council in writing 10 working days prior to the first commencement of reinjection in any new wells pursuant to this consent drilled within the reinjection areas shown in Figure 1.9 "Scenario TM2 Injection Areas", Wairakei-Tauhara Modelling Report, M O'Sullivan and A Yeh, June 2007.*
- 4(b) *For any new reinjection wells outside of the area identified in Figure 1.9, the consent holder shall first undertake comprehensive modelling of the likely effects of reinjection outside of the area identified in Figure 1.9, and shall submit a report on the modelling undertaken and results obtained to the Waikato Regional Council, Geotherm and the Peer Review Panel established in accordance with the General Conditions referred to in Condition 2 of this consent for their consideration. Reinjection shall only commence in these areas once the Peer Review Panel and Waikato Regional Council are satisfied that the effects of reinjection are no greater than the potential effects associated with reinjection within the area identified in Figure 1.9.*

Condition 5

5.13 Condition 5 as proposed by Mr Daysh, requires all reinjection wells to be located within the vertical boundaries of the overall area of the Wairakei Geothermal system, as requested by Contact Energy in its application. As noted previously, the modelling undertaken by Professor O'Sullivan in relation to the potential effects associated with the proposed Te Mihi reinjection focuses on only a small part of the area for which consent is sought to reinject, and there are significant areas beyond this (but within the area sought) that could be used for reinjection in terms of the proposed conditions.

5.14 As indicated for condition 4 above, I consider that a similar condition to that used in the Geotherm resource consent 104981 should be included in the Te Mihi consent as follows (replacing the condition 5 proposed by Mr Daysh):

5. *All fluid reinjected or injected under this consent within the area shown in Schedule One shall be reinjected/injected to a location within the hydrological boundary of the Wairakei Tauhara Geothermal System. To this end, the consent holder shall provide evidence in respect of each reinjection/injection well, demonstrating compliance with this condition to the satisfaction of the Waikato Regional Council prior to reinjection/injection into that well in accordance with this consent. In considering this matter the Waikato Regional Council may seek the assistance of the Peer Review Panel. Evidence required by Waikato Regional Council may include any of the following:*

- (a) Stable downwell temperatures at the intended reinjection/injection depth;*
- (b) A petrographic report on cores and cuttings from the well;*
- (c) Downhole water chemistry at the intended reinjection/injection depth;*
- (d) Pressure response of the well during testing;*
- (e) Proximity of the reinjection/injection well to Taupo Township;*
- (f) The effect that reinjection/injection at that location will have on raising and/or keeping reservoir pressures at levels which avoid subsidence effects at Taupo.*

5.15 The conditions should also include a requirement that reinjection wells within the area identified for reinjection in Figure 1.9 of the O'Sullivan and Yeh report should not be deviated from that area, unless further modelling, consultation and assessment is undertaken in accordance with proposed conditions outlined in my evidence.

New Conditions

5.16 In addition to the conditions recommended by Mr Daysh, I consider that further conditions are required in order to ensure that any adverse effect on the exercise of the Geotherm resource consents is avoided or mitigated. In particular, the following conditions should be added to the conditions proposed by Mr Daysh for resource consent 116786. I note that for simplicity I have used sequential numbering from the last condition recommended by Mr Daysh.

5.17 Condition 12 of Geotherm resource consent 104981 requires that the Geotherm resource consent is exercised in such a manner as to avoid any adverse effect on the “*geothermal production and electricity generation activities of Contact Energy*”. A similar condition should be imposed on the Te Mihi resource consents in relation to potential effects on the Geotherm activities, as follows:

16. *The consent holder shall carry out its operations in such a manner as to ensure that more than minor adverse effects on geothermal production or electricity generation activities of Geotherm Limited (or its successor) are avoided.*

5.18 Condition 9 of Geotherm resource consent 104979 requires Geotherm to pay compensation to Contact Energy if the exercise of that consent causes a reduction in the output of steam from any of the Contact Energy shallow wells. In my opinion, a similar provision should be included in the Contact Energy consents as follows:

17. *If the reinjection of fluid by the consent holder causes a reduction in the mass output of energy of greater than 10% from any well drilled in relation to the resource consents held by Geotherm Limited (or its successor), or alternatively of greater than 5% from all the wells drilled in relation to the resource consents held by Geotherm Limited (or its successor) collectively, the consent holder shall pay compensation to Geotherm Limited (or its successor) on the basis of the corresponding reduction in generation output (measured in MWh) from the Geotherm Limited wells multiplied by the final spot price at PPI 2201 as defined in the Electricity Governance Regulations for each relevant trading period, together with actual and reasonable costs incurred by Geotherm Limited for any well rehabilitation works on the Geotherm Limited wells necessitated by the effects of the consent holders activities.*

5.19 As discussed by Dr Burnell, given the potential for adverse effects from the Te Mihi proposal on Geotherm’s production and the uncertainty around the

reservoir properties and effects of reinjection, Contact Energy should not reinject geothermal fluid within a 1.5 km radius of the Geotherm property to provide a buffer zone around the Geotherm activities. To address this, I consider that a condition as follows should be included in the conditions for resource consent 116786:

The consent holder shall not reinject any geothermal water or cooling water blowdown into the ground within the area defined by the vertically projected boundaries of a circle with a radius of 1.5 kilometres centred at map reference NZMS260 U18 7586 7996.

- 5.20 Also, as discussed by Dr Burnell, a similar (but larger, because condensate would be cooler) buffer zone is required for condensate reinjection. Dr Burnell considers that a buffer zone of 3 km around the Geotherm property is appropriate. To address this, I consider that a condition as follows should be included in the conditions for resource consent 116786:

The consent holder shall not reinject any steam condensate into the ground within the area defined by the vertically projected boundaries of a circle with a radius of 3.0 kilometres centred at map reference NZMS260 U18 7586 7996.

General Conditions

- 5.21 Condition 2 proposed by Mr Daysh refers to compliance with the General Conditions that apply to existing Contact Energy resource consent 104718. As noted above, I consider that the General Conditions applying to the exercise of the Te Mihi consents should be amended to take account of the potential for adverse effects on the Geotherm Limited resource consents. In this regard, the General Conditions proposed by Mr Daysh should be amended as I set out below.
- 5.22 The Geotherm Limited General Conditions are in many respects similar to the General Conditions proposed by Mr Daysh, except that they recognise the potential for the exercise of the Geotherm Limited resource consents to have an effect on the existing Contact Energy Wairakei Power Station activities. I consider that the proposed Te Mihi consents should equally include conditions recognising the potential for adverse effects on the Geotherm activities.

Condition 1 – Peer Review Panel

5.23 General Condition 1 sets out the requirements for a Peer Review Panel to “oversee” the exercise of the various consents operative for the Wairakei Tauhara Geothermal System. It should be made clear, as it is for the Geotherm resource consents, that there is to be one Peer Review Panel for the system as a whole, and to that end, the following should be added to General Condition 1.1:

For the avoidance of doubt it is expected that there will be a single Peer Review Panel established for the Wairakei-Tauhara Geothermal System (“WTGS”) 'as a whole to assist WRC in the supervision and monitoring of the exercise of all consents for large extraction and discharge in the WTGS. This should be the same Peer Review Panel as that established in respect of the existing consents.

5.24 As noted earlier, the Peer Review Panel should be able to review any reinjection proposals made by the consent holder that fall outside the scope of what has been modelled for the purposes of the applications made by Contact Energy, given that the consent sought would enable reinjection areas beyond what has specifically been considered.

5.25 In this regard, I consider that General Condition 1.6 should be amended to include provision for this by adding a further point as follows (numbered sequentially from the conditions proposed by Mr Daysh):

- (b) *Providing advice to Waikato Regional Council as required by these conditions or as requested by Waikato Regional Council in relation to:*
 - (i) *The approval of the siting of new wells in accordance with conditions 4 and 5 of Consent Number 116786*
 - (ii) *Evidence provided by the consent holder in relation to the relative locations of reinjection/injection wells and the hydrological boundary of the WTGS in accordance with condition 5 of Consent Number 116786.*

5.26 I note in passing that General Condition 1.7 as proposed by Mr Daysh should be amended by deletion of the word “draft” from the first line. The condition should read as follows:

- 1.7 *The Peer Review Panel shall, within two months of receipt, review the ~~draft~~ Annual Report prepared by the consent holder...*

5.27 Because of the potential for the exercise of the new consents sought by Contact Energy to have an adverse effect on the Geotherm activities, I consider that it would be appropriate for the General Conditions to be amended to include a similar provision to condition 1.7 of the Geotherm General Conditions giving the Peer Review Panel an additional function of seeking to integrate the activities undertaken by all of the consent holders associated with use of the resource.

5.28 An additional condition should therefore be added to the General Conditions proposed by Mr Daysh as follows (numbered sequentially from those recommended by Mr Daysh):

1.11 The Peer Review Panel shall have the additional function of seeking to ensure through its review of the Wairakei-Tauhara Geothermal System Management Plan, the integration of the consent holder's activities and management of effects arising from those activities with the existing consent holders on the WTGS.

Condition 3 – Discharge Strategy

5.29 I note that General Condition 3.1 requires the consent holder to submit a “draft Initial Discharge Strategy” and General Condition 3.2 for this to be updated at within four years of the commencement of the consent. It is unclear in the condition when this draft should be submitted or whether one has been submitted in relation to existing Wairakei Power Station consents. In any case, it should be made clear that a Discharge Strategy should be submitted for approval within six months of the commencement of the Te Mihi consents. The strategy should also be lodged after consultation with other “large” geothermal consent holders.

5.30 These provisions need to be updated to take account of the commencement of any resource consents for the Te Mihi project. I consider that General Condition 3.2 should be amended as follows:

*3.2 The consent holder shall, within ~~4~~ years **6 months** after the commencement of the **Te Mihi** consents and within every 4 years thereafter, unless required earlier by the Waikato Regional Council on the advice of the Peer Review Panel, prepare and forward to the Waikato Regional Council for its approval, a reviewed Discharge Strategy, the approved version of which shall form part of the*

*Wairakei/Tauhara Geothermal System Management Plan. Prior to approving any reviewed Discharge Strategy the Waikato Regional Council shall seek the advice of the Peer Review Panel and consult with Taupo District Council **and all consent holders of any large (> 6,000 tonnes per day) geothermal fluid extraction consents in the WTGS** as to measures recommended in the document.*

Condition 5 – System Management Plan, Modelling and Annual Reporting

5.31 This condition sets out the requirements for modelling and system management and is similar in many respects to the System Management condition included in the Geotherm consents, except that it does not take account of other consent holders or for changes likely to arise in relation to the Te Mihi development.

5.32 For the Te Mihi resource consents, I consider that General Condition 4.2 should be amended by deletion of the first sentence, on the basis that the System Management Plan should already have been submitted pursuant to the existing Contact Energy Wairakei Power Station resource consents. What is required is an update to the System Management Plan to reflect the new Te Mihi development. Provision should be made for review of the System Management Plan, following consultation with other users, as it is within the Geotherm general conditions. General Condition 5.2 should therefore be amended as follows:

5.2 ~~*Within 6 months after the commencement of these consents, the consent holder shall provide to Waikato Regional Council, for its approval, a System Management Plan for the Wairakei-Tauhara Geothermal System (the “System Management Plan”). The overall purpose of the System Management Plan is to assist Waikato Regional Council with the efficient and integrated management of the operation and effects of the Wairakei-Tauhara Geothermal System, in the context of it being a “Development Geothermal System” as defined in the Waikato Regional Policy Statement dated 15 August 2006 and Proposed Waikato Regional Plan dated 15 August 2006. The specific objectives of the Management Plan are to document:*~~

- ~~*(a) Field developments proposed for the next management plan period;*~~
- ~~*(b) Operational procedures for ensuring compliance with consents;*~~
- ~~*(c) Procedures for avoiding, remedying and mitigating effects;*~~
- ~~*(d) Other relevant matters contained in Policy Four of the Proposed Waikato Regional Plan Variation 2 (as at 15 August 2006).*~~

The System Management Plan shall be reviewed every four years after the preparation of the first Plan under these consents, or more frequently at the option of the Peer Review Panel.

5.33 In addition to the above, the consent holder should be required to submit an updated System Management Plan following the exercise of the proposed Te Mihi resource consents that identifies what changes are being contemplated and what implications this may have for other users in the system. I consider that General Condition 5.3 should read as follows to reflect this (with parts h and i in particular being additions to the condition proposed by Mr Daysh):

5.3 *Within 6 months after the commencement of these consents, and following consultation using its best endeavours with all consent holders of any large (> 6,000 tonnes per day) geothermal fluid extraction consents in the WTGS as to the changes required to any existing WTGS Management Plan, the consent holder shall provide to Waikato Regional Council, for its approval, an updated System Management Plan for the Wairakei-Tauhara Geothermal System (the "System Management Plan"). The System Management Plan is to include, as a minimum, the following indicative information for the next four years:*

- (a) *Proposed new wells, workovers and abandonments;*
- (b) *Other proposed field developments e.g. pipelines, changes to infrastructure, earthworks, activities relating to water ways etc;*
- (c) *Proposed significant changes to fluid production, station output or station operations;*
- (d) *Proposed changes to, or new, reinjection/injection operations;*
- (e) *Operational procedures for monitoring and responding to any adverse effects that may be caused by the exercise of these consents;*
- (f) *Operational procedures for limiting unwanted thermal activity at the ground surface;*
- (g) *Operational procedures for subsidence monitoring and responses to changes in prevailing subsidence trends.*
- (h) *Measures for contributing to the optimisation of system wide efficiency of extraction having regard in particular (but not limited) to:*
 - (i) *Production well location;*
 - (ii) *Depth of extraction;*
 - (iii) *Volume of extraction at each location;*
 - (iv) *Reinjection/injection locations;*
 - (v) *Preserving "Craters of the Moon" as a geothermal feature for as long as practicable (acknowledging however that it may decline over time as reservoir management changes).*
- (i) *Measures for contributing to the optimisation of system wide efficiency of reinjection and injection having regard in particular (but not limited) to:*
 - (i) *Well location;*
 - (ii) *Depth of reinjection/injection;*
 - (iii) *Volume of reinjection/injection at each location;*

- (iv) *Limiting interference effects on production wells;*
- (v) *Raising and/or keeping reservoir pressures at levels which avoid adverse subsidence effects at Taupo;*
- (vi) *Preserving "Craters of the Moon as a geothermal feature for as long as practicable (acknowledging however that it may decline over time as reservoir management changes).*

5.34 I note in passing that General Condition 5.11 as proposed by Mr Daysh should be amended by deletion of the word "draft" from the first line. The condition should read as follows:

5.11 The consent holder shall each year produce a ~~draft~~ Annual Report to be provided to Waikato Regional Council...

5.35 Alternatively, the conditions should provide for the draft to be updated to a "final" report following the review by the Peer Review Panel.

Condition 6 – Resource Monitoring

5.36 Condition 6 sets out several provisions relating to monitoring to be undertaken within the Wairakei-Tauhara Geothermal System. In my opinion, these have not been updated to reflect the "new" Te Mihi development, but are focussed on the existing Wairakei Power Station operation. By way of an example, General Conditions 6.1 to 6.4 deal with monitoring of subsidence associated with the exercise of the consents, which is an effect primarily associated with the exercise of the "existing" Wairakei Power Station consents. While I consider that it is appropriate to retain these conditions, the monitoring should be updated to reflect the potential effects of the proposed development. The monitoring should therefore include, as a minimum:

- A requirement to document the state of the resource at the commencement of the resource consents for Te Mihi so that any changes associated with exercise of the consents can be identified; and
- Ongoing recording of the discharges made in terms of the exercise of the resource consents.

5.37 To this end, I consider that the following conditions should be added into General Condition 6, to require an assessment of the state of the resource at

the outset of the power station operation, and to identify the scope of monitoring required:

6.1A *Within six months of the commencement of the Te Mihi resource consents, the consent holder shall measure and describe and report to the satisfaction of the Waikato Regional Council the then state of the consent area and, subject to land access, those other parts of the WTGS which are likely to be affected by the consent holder's activities on the consented area, providing topographic maps for locating the surveys and sites specified in these General Conditions, completing and documenting initial surveys, and where appropriate photographs, and/or videos covering:*

- (a) Gravity;
- (b) Geology (structural features and stratigraphy);
- (c) Resistivity;
- (d) Reservoir chemistry and hydrothermal alteration;
- (e) Ground water (chemistry, water levels);
- (f) Vertical and horizontal levelling;
- (g) Heat flow;
- (h) Vegetation;
- (i) Surface features including springs and steam vents (chemistry, mass and energy flux), flora' and fauna;
- (j) Pressures; and
- (k) Air quality.

6.1B *The key indicators to be monitored and reported on pursuant to the monitoring requirements of this General Condition 6 are:*

- (a) Subsidence and ground deformation;
- (b) Surface heat flows;
- (c) Air discharges and quality; and
- (d) Well information, especially in interface areas between deep, liquid zones and any steam zones.

5.38 In addition to the above, to record the reinjection activities undertaken in terms of the resource consents sought, the following condition should be added to General Condition 6:

6.6A *For each injection well used for the purpose of these consents, the consent holder shall collect and deliver to Waikato Regional Council annually, data and information describing:*

- (a) The mass flow of fluid injected each day;
- (b) The temperature of the injected fluid, once each day;
- (c) The well head pressure of each injection well, once each day;
- (d) Down hole temperature and pressure profiles of each injection well shall be measured at six and twelve months following the commencement of injection and thereafter at annual intervals with an accuracy of measurement of +/-1%;

- (e) *The pH of the injected fluid and concentrations of sodium, calcium, potassium, lithium, magnesium, chloride, fluoride, sulphate, bicarbonate, boron, ammonia, silica, arsenic, and hydrogen sulphide in the injected fluid shall be measured at six monthly intervals.*

Condition 8 – Multiple Operator Mechanisms

5.39 The Multiple Operator Mechanisms set out in General Condition 8 proposed by Mr Daysh are based on the premise that the Wairakei Power Station was already operating and in existence. With respect to the Te Mihi development, I consider that these mechanisms need to be updated to ensure that consideration is given to the existing resource consents held by Geotherm consents. The following conditions should be included in General Condition 6:

8.1A *The consent holder shall prepare an updated Multiple Operator Protocol ("MOP") the objective of which is to document measures and procedures for managing the operational relationship between operators on the WTGS, and specifically to integrate the activities of the consent holder with the activities of the other existing consent holders for large extractions (> 6,000 tonnes per day) of geothermal fluid in the VVTGS.*

8.1B *Pursuant to condition 3.1 above, the MOP shall, as a minimum, include the following matters:*

- (a) *Measures' to ensure the consent holder's operations contribute to optimising system-wide management requirements in relation to monitoring, information reporting, research, and computer modelling required by the consent conditions with respect to the WTGS;*
- (b) *How the consent holder proposes that its liability / responsibility with regard to adverse effects arising from the cumulative effects of extraction and discharge in the WTGS will be identified and addressed;*
- (c) *Arrangements for the facilitation of testing and monitoring as required under Consent Number 116786;*
- (d) *Land /well access arrangements;*
- (e) *Information and data access arrangements;*
- (f) *Any arrangements the WTGS operators may have agreed in relation to consultation, notice and advice that will be given to other operators in relation to significant events and activities;*
- (g) *Any arrangements the WTGS operators may have agreed in relation to compliance with consent conditions (e.g. monitoring, annual reporting, etc.);*
- (h) *Any arrangements for the apportioning of costs between WTGS operators relating to joint undertakings including monitoring, investigations, etc.; and*

- (i) *Any other matters that are agreed by the WTGS operators to promote the sustainable, efficient and/or co-operative development of the WTGS.*

5.40 In addition to these changes to the Multiple Operator General Condition, I consider that the Council should have the opportunity to review the Contact Energy resource consents in order to seek changes to give effect to Policy 5 (Multiple Operators) of the Proposed Waikato Regional Plan. A similar provision is included in the Geotherm resource consents. In this regard, the following should be added to General Condition 9.1:

- (g) *To achieve consistency and give effect to Policy 5 (Multiple Operators) of the Proposed Waikato Regional Plan: Proposed Variation 2: Geothermal (dated 15 August 2006).*

Other Provisions

5.41 I note that the Geotherm resource consents include extensive provisions relating to mechanisms for dispute resolution in relation to issues associated with the exercise of the Geotherm resource consents.

5.42 While General Condition 8.3 as proposed by Mr Daysh would require the consent holder to participate in such mechanisms associated with the exercise of consents held by other parties, there would be no obligation on the Te Mihi consent holder to participate in any such dispute resolution measures associated with the exercise of the Te Mihi resource consents.

5.43 I consider that similar provisions to those included in the Geotherm resource consents should be included in the General Conditions for the Contact Energy Te Mihi resource consents. I set out such conditions in the attached Schedule 1.

Noise – Proposed Power Station Land Use Consent

5.44 The land use consent conditions proposed by Mr Daysh for the proposed Te Mihi Power Station (Exhibit SGD 1, Te Mihi Land Use Application, Proposed Power Station Consent) does not include any specific condition relating to the noise standard the proposed station must meet, other than conditions relating

to noise emitted during steam venting. Exhibit SGD 1 does include reference to the Taupo District Plan noise requirements by way of advice note 7, drawing the consent holders attention to the District Plan provisions. However, this cannot be enforced as a condition, and there is no explicit performance standard for the proposed station itself.

5.45 I consider that a condition is required to address the cumulative noise effects from the Contact Energy and Geotherm activities. The effects of the Te Mihi proposal have been assessed as being minor based on the noise contours prepared by Mr M Hunt. To ensure that the project is developed as indicated and modelled, I consider that a specific noise condition setting out the compliance criteria for the project should be determined from the noise contours predicted by Mr Hunt. Such a condition would establish the specific compliance requirement for the proposed station and would be enforceable as a consent condition. It would be clear to all parties that the consent holder has implemented what it said it would do, and what it has to comply with.

5.46 To this end, I propose that a noise boundary is defined for the Te Mihi proposal reflecting the predicted 40 dBA contour for typical maximum operation, as defined by Mr Hunt in Exhibit MH3 of his evidence. The condition should take the following form:

OPERATIONAL NOISE

35 *The noise levels for the operation of the Te Mihi site shall not exceed a limit of 40dBA L_{eq} at the noise contours as set out in Exhibit MH3 (attached to Mr M Hunt's evidence) and shall be measured in accordance with the Taupo District Plan requirements as at the time of granting the consent.*

Air Discharge – Resource Consents 116789 and 116790

5.47 I consider that the Te Mihi air discharge consent (116789) and the Poihipi Power Station air discharge consent (116790) conditions need to be amended to reflect the air discharge modelling undertaken by Mr Stevenson for Contact Energy. As discussed earlier, the consent limits should be based on what has been assessed.

5.48 Condition 1 of the Te Mihi air discharge consent (116789) should be amended as follows:

1. *The Consent Holder shall keep total hydrogen sulphide emissions discharged pursuant to this consent and consent 940553 to a practicable minimum and in any event less than 480 102 kilograms per hour.*

5.49 Condition 2 of the Poihipi Power Station air discharge consent (116790) should be amended as follows:

2. *The Consent Holder shall keep hydrogen sulphide emissions discharged pursuant to this consent to a practicable minimum and in any event less than ~~64~~ 28 kilograms per hour.*

6. CONCLUSION

6.1 Geotherm currently holds resource consents for its site located along Poihipi Road, in the south-western portion of the Wairakei-Te Mihi steam field, and is near to the area within which Contact proposes to build the Te Mihi Power Station. These resource consents provide for the take and discharge of up to 70,000 tonnes per day of geothermal fluid and other activities associated with the development and operation of a geothermal power station.

6.2 Although Geotherm is currently in receivership, there is every expectation that the resource consents granted to Geotherm can be exercised, and in this regard they should be considered as part of the existing environment within which the Te Mihi development would occur and that the development could affect.

6.3 In my opinion, Geotherm should gain some “protection” from the exercise of new consents sought in respect of the development of the Wairakei geothermal system, to avoid, remedy or mitigate adverse effects on Geotherm. As I have set out in my evidence, the “basic” conditions used for the present Contact Energy resource consents should be amended to address the potential effects that the proposed Te Mihi power station activities would have on the Geotherm resource consents, and should be amended in a way that is consistent with the

Geotherm consents to afford the same level of participation in the management of the steam field for all operators.

6.4 I consider that the Te Mihi resource consent conditions need to require that any variation from the scenarios provided in the application or evidence must be subject to modelling, effects assessments, peer reviewed and to consultation with other users of the resource, and to Council approval before implementation. This would provide for some certainty for Geotherm while providing some flexibility for Contact Energy in future.

6.5 I consider that there is a need to be careful that any such benefit derived in relation to the Te Mihi project is not at the expense of similar benefit that could be derived from the already consented Geotherm project. The amendments I propose to the Te Mihi resource consent conditions, as I have set out in my evidence, would enable both the Contact Energy and Geotherm operations to provide for the social and economic well-being of people and the community and provide for their health and safety.

Signature:



Richard J Matthews

Date: 23 June 2008

SCHEDULE 1

DISPUTE RESOLUTION CONDITIONS TO BE INCLUDED IN THE TE MIHI GENERAL CONDITIONS

X. DISPUTE RESOLUTION

X.1 *This dispute resolution condition binds the consent holder to resolving disputes between the consent holder and any other operator on the WTGS relating to:*

- (a) *The operational relationship between operators on the WTGS, and specifically to the integration of the activities of the consent holder with the activities of any other operator on the WTGS through the development of the MOP required under General Condition 8; and*
- (b) *Ensuring that the consent holder carries out its activities authorised under these consents in such a manner to ensure that no more than minor effects on geothermal production, geothermal reinjection/injection or electricity generation activities ("operations") of any other operator: on the WTGS or any adverse interference effects are avoided.*

X.2 *For the avoidance of doubt, General Condition X is not intended to narrow or waive any obligation any person has at law (including any relevant common law obligation), or to limit any rights which any other operator may have, or to limit any discretion or power vested in the Waikato Regional Council to administer, monitor or enforce the consent conditions or otherwise carry out its functions, powers and duties in relation to the WTGS.*

X.3 *By way of summary; the dispute resolution process includes the following:*

- (a) *Notice by any other operator to the consent holder (condition X.4);*
- (b) *Urgent consultation by the consent holder with the other operator to see if agreement can be reached (condition X.5);*

For alleged adverse interference effects:

- (c) *If no agreement can be reached, reference to a group of experts (condition X.7);*
- (d) *Action by the consent holder in accordance with the determination of the group of experts (condition X.10);*
- (e) *Further negotiation between the consent holder and the other operator if either of them is not satisfied with the determination of the group of experts (condition X.13); and*

For all disputes falling within the scope of this condition:

- (f) *If the consent holder or the other operator is not satisfied with the outcome of further negotiations, reference to arbitration (condition X.14).*

- X.4 *If another operator considers that there is a dispute within the terms of condition X.7 with the consent holder and wishes to invoke General Condition X, that operator shall give written notice to the consent holder which identifies the particular issue(s) of concern, the extent of any adverse effects (if applicable), stating the reasons for their view, and including any relevant supporting data and/or other information.*
- X.5 *If notice is given under condition X.4, the consent holder shall urgently, and in any event no later than 5 working days after the receipt of notice, consult with the other operator to resolve, if possible, the concern(s) raised by that operator.*
- X.6 *If there is no resolution of the concern(s) following consultation as provided for in condition X.5, then if the concern(s) relates to alleged adverse interference effects by the consent holder's activities on the other operator then conditions X.7 – X.15 (inclusive) shall apply. Condition X.16 shall apply to all other concerns.*

Alleged Adverse Interference Effects

- X.7 *Within 70 working days of written notice given under condition X.4 (or such longer time period nominated by the other operator), then the matter shall be referred to a group of experts consisting of:*
- (a) An expert geothermal engineer or scientist nominated by the consent holder who shall not be an employee of the consent holder;*
 - (b) An expert geothermal engineer or scientist nominated by the other operator who shall not be an employee of the other operator; and*
 - (c) A person independent of both parties, with relevant technical expertise agreed between the nominated experts on behalf of both parties (note that a candidate is not excluded from the group of experts solely because he/she is a member of the Peer Review Panel or because he/she may have advised one or other party on unrelated matters in the past). If no agreement can be reached within 15 working days of notice given under condition X.4 (unless otherwise agreed in any particular case) then a person nominated by the President for the time being of the Institute of Professional Engineers New Zealand (IPENZ);*

Provided that if the parties agree, the concern(s) may be referred to a single independent expert.

- X.8 *The purpose of referral to the group of experts shall be to determine as quickly as reasonably possible having regard to the urgency of the matter, and in any event, within 15 working days of notice given under condition X.4 (unless otherwise agreed by the parties in any particular case or where additional time is required to appoint an independent expert under condition X.7(c)), the following:*
- (a) Whether the particular aspect of the consent holder's activities which are the subject of the notice under condition X.4 concerns an adverse interference effect, including actual or potential diminution in temperature or pressure at a production well, causing adverse effects on the other operator's operations on the WTGS which may require action by the consent holder and which is not an effect excluded by condition X.15;*

And if so:

- (b) *Whether the adverse interference effect is more than minor; and*
 - (c) *What action by the consent holder would be most appropriate to avoid, remedy or mitigate the adverse interference effect on the other operator's operations; and*
 - (d) *What the timeframe for that action should be having regard to the impact on the other operator's operations.*
- X.9 *If a majority of the group of experts is satisfied that there is an adverse interference effect which is more than minor and action is warranted by the consent holder, then condition X.11 shall apply. If a majority of the group of experts is satisfied there is no effect which is more than minor, then no action under condition X.11 need be taken by the consent holder. In either case, either party may invoke the continuing dispute resolution process under condition X.13 (further negotiation) or (in the absence of either party requiring further negotiation under condition X.13) condition X.14 (arbitration).*
- X.10 *Both parties shall provide the group of experts with any relevant and available supporting data and/or other information, or if requested by the group of experts, allow the group physical access to any relevant part of any site owned or controlled by the respective party. Any confidential information provided by either party to the group of experts shall remain confidential to the experts unless the party to whom the obligation of confidence is owed agrees otherwise.*
- X.11 *If under condition X.9, a majority of the group of experts finds that there is an adverse interference effect which is more than minor that warrants action by the consent holder, then at the direction of the majority of the group of experts, the consent holder shall:*
- (a) *Cease the particular aspects of its activities identified in the other operator's notice and found by the group of experts to be a substantive issue warranting such action; or*
 - (b) *Modify those particular aspects of its activities identified in the other operator's notice and found by the group of experts to be a substantive issue warranting such action in a way that the other operator agrees or the group of experts has directed; and/or*
 - (c) *If both parties agree, provide a financial bond or other form of surety in favour of the other operator and on terms satisfactory to the other operator (acting reasonably in that regard) that ensures that pending the outcome of further 'negotiation and/or arbitration, the failure to take the steps determined by the group of experts under conditions X.9(c) and (d), the other operator will nevertheless be kept financially neutral.*
- X.12 *The consent holder's obligations under condition X.11 are not suspended pending any further negotiations and/or arbitration under conditions X.13 and X.14 respectively.*
- X.13 *After receipt of the determination of the group of experts, either party may require the other to further negotiate in good faith and will use their respective best endeavours to reach agreement on:*

- (a) *Whether and, if so, to what extent, the particular aspects of the consent holder's activities identified in the other operator's notice are having or have had an adverse interference effect on the other operator's operations; and*
- (b) *If it is agreed that particular aspects of the consent holder's activities are having an adverse interference effect on the other operator's operations:*
 - (i) *The steps the consent holder will take to remedy the adverse interference effects on the other operator's operations on the WTGS at that point;*
 - (ii) *If it is impractical or impossible for the consent holder to remedy the past adverse effects on the other operator's operations, the amount of compensation to be paid by the consent holder to the other operator to ensure that the effect of the consent holder's activities on the particular aspects of the other operator's operations is financially neutral to that operator; and*
 - (iii) *The steps the consent holder will take to ensure that such adverse interference effects are avoided in future.*

X.14 *After receipt: of the determination of the group of experts, and if, within 3 months of written notice under condition X.4 (unless otherwise agreed in any particular case) the parties have not reached agreement on any matter identified in condition X.11, either party may refer the matter/s not agreed to arbitration under the Arbitration Act 1996. The person or persons appointed to be the arbitrator or arbitrators shall be as agreed between the parties or, if agreement cannot be reached within 10 working days, such person or persons with appropriate technical qualifications as may be appointed by the President for the time being of the Arbitrator's and Mediator's Institute of New Zealand (AMINZ).*

X.15 *For the purposes of General Condition X, the term "an adverse interference effect on another operator's operations does not include an effect on well operations of another operator which were not authorised or contemplated by any resource consents in existence or the subject of application on or before 30 June 2008.*

Other Concerns

X.16 *If the parties fail to agree on any matters put in dispute under condition X.4 not relating to alleged adverse interference effects following consultation under condition X.5 and further negotiation, either party may refer the matter(s) not agreed to arbitration under the Arbitration Act 1996. The person or persons appointed to be the arbitrator or arbitrators shall be as agreed between the parties or, if agreement cannot be reached within 10 working days, such person or persons with appropriate technical qualifications as may be appointed by the President for the time being of the Arbitrators' and Mediators' Institute of New Zealand (AMINZ).*

Reporting

X.17 *In the event of this dispute resolution procedure being invoked, the consent holder shall as soon as practicable inform the Waikato Regional Council of that*

fact and shall provide the Waikato Regional Council with such relevant information as the Waikato Regional Council may reasonably require as to the nature of the dispute, the steps taken or to be taken in the dispute resolution procedure and the outcome of any such procedure.