



## **1. Introduction**

- 1.1. My name is Mark William Brockelsby. My qualifications, experience and employment history are set out in the brief of evidence in chief which I prepared for circulation in June 2008.
- 1.2. The purpose of this brief of evidence is to address specific issues raised in evidence on behalf of Geotherm Group Ltd (In Receivership) by Richard Matthews concerning his suggested consent conditions to be attached to these consents, if granted.
- 1.3. I have been provided with a copy of the Code of Conduct for Expert Witnesses in the Environment Court Consolidated Practice Note 2006 and have read and agree to comply with that Code. Except where I state that I am relying upon the specified evidence of another person, my evidence in this statement is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions which I express.

## **2. General comments on matters raised by Mr Matthews**

- 2.1. There are a number of matters that have been raised by Mr Matthews that I wish to comment on. All of them relate to the consent conditions. As the regulatory agency, Waikato Regional Council is concerned to ensure that any conditions imposed are enforceable, certain and practicable. I have a concern that some of the conditions proposed by Mr Matthews may be inconsistent with those criteria.
- 2.2. Mr Matthews' suggestions regarding appropriate consent conditions are premised on the Board being satisfied that it is able to take account of any potential adverse effects of reinjection on Geotherm's consents and that, if it is, that there are in fact potential adverse effects that warrant intervention by way of consent conditions. Those are matters for the Board to determine and my comments are therefore contingent on the Board's findings in those matters.
- 2.3. In the following, I refer to the conditions as proposed in Mr Daysh's evidence as the "Daysh conditions" and the conditions proposed by Mr Matthews as the "Matthews conditions". I reiterate that I have engaged in detailed discussions with Mr Daysh on the conditions and, with the exception of the matters addressed

in my evidence in chief, generally agree with the approach to them as described in his evidence.

- 2.4. A fundamental element of the approach to the Daysh conditions is their linkage to the General Conditions as attached to the main existing Contact consents that apply to Contact's overall operations in the Wairakei-Tauhara Geothermal System. These General Conditions were developed with a whole system approach in mind. They were developed taking account of multiple operators in the system and, in my view, also provide a suitable regulatory framework for further developments in the system. The existing Geotherm consents are also subject to a suite of different but similar General Conditions. Each of the Contact and Geotherm versions of the General Conditions contain conditions that are specific to their individual operations, however care was taken to ensure that certain fundamental and common requirements were reflected in both and that these were mutually consistent and integrated. These included conditions pertaining to the Peer Review Panel, the system-wide management plan, much of the monitoring and annual reporting, and the multiple operator agreement. Unless there is a compelling reason to change these aspects, I am keen to see these common requirements remain as they are. It would concern me to see a different, parallel set of General Conditions relating to these matters as this is likely to result in ambiguous regulatory requirements and consequential difficulties in complying with and enforcing these consents.
- 2.5. I consider that a number of the Matthews conditions are already catered for by the existing General Conditions. To the extent that the Board considers that there are matters that aren't adequately catered for by the Daysh conditions, my suggestion is that any further conditions should be imposed as specific conditions in consent 116786, rather than in a new set of General Conditions.
- 2.6. Mr Matthews notes in his 5.22 that because the Geotherm General Conditions recognise the potential for the exercise of the Geotherm consents to have an effect on the Contact consents, therefore the reciprocal should apply in this instance ie. the General Conditions that attach to the Te Mihi consent should recognise the potential for the Te Mihi proposal to affect the Geotherm proposal. I have no difficulty with this conceptually, however, I think there are reasons why achieving this may be difficult in practice.

- 2.7. A key component of the Matthews conditions is the imposition of buffer zones around the Geotherm site within which Contact's reinjection would be restricted. The practical difficulty with this is that it will not prevent reinjection in this area because Contact already has rights to inject there. Contact has an existing reinjection consent that covers most of the area subject to the new reinjection application, but which has no restriction in terms of the proximity of reinjection wells to Geotherm's boundary. An exception to this applies in respect of an area generally to the south of the Geotherm area for which no reinjection consent is currently held but which is subject to the new reinjection application. In the area which is probably of greater concern to Geotherm ie on its immediate north-east boundary near which Geotherm's production wells are proposed to be located, Contact is already able to drill and reinject up to the boundary.
- 2.8. Furthermore, the existing consent (104718) allows for the discharge of "geothermal water, together with steam condensate, cooling water (Poihipi Rd blow-down) and added chemicals..." up to a volume of 144,000 tonnes per day (although the reinjection volume allowed to be discharged under this consent is stepped over time). This covers the same waste streams applied to be discharged under the current application. Should the current application be granted therefore, it appears that, in relation to reinjection close to the Geotherm boundary, there will be no way of distinguishing the exercise of that consent from 104718 (unless the reinjection in that close proximity exceeds the relevant volumetric limit in 104718, which allows 40,000 tpd at present, rising to 54,000 tpd in 2012). In other words, subject to compliance with those limits, Contact may argue that any reinjection of fluid within any specified buffer zone is lawful as it is pursuant to the existing consent 104718, not any new Te Mihi consent. As such it may therefore be impossible to enforce conditions such as the imposition of reinjection buffer zones.
- 2.9. The inability to distinguish the exercise of these consents from a regulatory perspective is also mirrored in a very real sense when considering the effects of these activities in the system. My understanding is that the effects of reinjection in one part of the system (ie changes in reservoir pressure and temperature) cannot necessarily be distinguished from the effects of reinjection elsewhere, at least not to the extent required for regulatory compliance purposes. Thus, the condition suggested by Mr Matthews in his paragraph 5.17 (for Contact to "...carry out its operations in such a manner as to ensure that more than minor adverse effects on geothermal production...are avoided.") is, in my view, unlikely

to be practicably enforceable because it will be extremely difficult to achieve the standard of proof required that any adverse effect observed is solely attributable to reinjection at one location in the System, and not another.

### **3. Other specific comments on the suggested Matthews conditions**

3.1. In the following, I provide further specific comment on the suggested Matthews conditions, referencing his paragraph numbers.

#### **Resource consent 116786**

3.2. Condition 2 (paragraphs 5.9 – 5.11). Mr Matthews' proposed change appears to be premised on a suite of General Conditions, applicable to the Te Mihi consents, to be established in parallel with the existing General Conditions. As a general approach, I oppose it as it is likely to unduly complicate compliance matters. I refer to this in more detail later in my evidence.

3.3. Condition 4 (paragraph 5.12). While conceptually I don't oppose the intent of this condition (subject to the Board's findings on potential adverse effects), I consider that this condition is probably unenforceable for the reasons set out in paragraph 2.7 and 2.8 of my evidence.

3.4. Condition 5 (paragraphs 5.13 – 5.15). This is a condition that prescribes requirements to demonstrate that Contact's reinjection under the Te Mihi consents is within the boundary of the Wairakei-Tauhara Geothermal System. As justification for including this condition, Mr Matthews points to the fact that there is a similar requirement in Geotherm's consent number 104981. However, it is appropriate to look at the circumstances which lead to the condition being imposed on Geotherm's operations. Geotherm are situated on a small piece of land on the edge of the System. The vertically projected "track" of their reinjection wells is constrained on one side by the need to remain within their property boundaries, on the other side by the edge of the Wairakei-Tauhara Geothermal System and overall, by the need to avoid reinjecting back into its production zones. This led to some doubt as to how feasible it would be in practice to reinject within the property at a location sufficiently removed from its production wells, but also within the System boundaries – hence the condition. Contact's reinjection at Te Mihi, while also proposed to be infield, is not subject to the same practical constraints. Having said that, it is important that the Council is

satisfied that any reinjection under Te Mihi is actually infield as that is a fundamental basis upon which the applications were made and the effects assessment was undertaken. Under the existing consent Contact is entitled to undertake infield and outfield reinjection but outfield reinjection is only permitted up to certain quantities and in certain areas. Thus, the same need to know where in relation to the system boundary the reinjection will occur, exists for both the existing consent and any new Te Mihi consent.

- 3.5. Proposed condition 5 of the Daysh conditions, requires the reinjection to be within the area shown on Schedule One. Contact has stated that all reinjection will be infield. It should be noted that all wells drilled for the purposes of Te Mihi reinjection will be drilled pursuant to existing consent 104729. Unless the well is proposed to be drilled into one of the authorised outfield areas, the Council will wish to ensure that it is in fact an infield well. Condition 4 of consent 104729 requires, amongst other things, Contact to provide 10 working days notice of new wells including details of proposed well locations, intended depth and well construction details. The condition provides for Council to approve these specifications prior to drilling. That provides an “up-front” opportunity for Council to consider the well location in relation to the System boundary. Further, for each new well drilled, GC 6.6 requires information gathered during the drilling and testing of the well to be provided to the Council. This information will enable confirmation of whether the well is infield or outfield and constitutes the mechanism by which the Council will satisfy itself that any proposed infield reinjection is, in fact, infield. Thus, whilst I consider that the condition suggested by Mr Matthews is not inconsistent with this intent, in my view, the Daysh conditions already provide a suitable mechanism.
- 3.6. Proposed condition 16 (paragraphs 5.16 – 5.17). Addressed in my paragraphs 2.7 - 2.9.
- 3.7. Proposed condition 17 (paragraph 5.18). My comments in paragraph 2.7 - 2.9 apply.
- 3.8. Proposed “buffer zone” conditions (paragraphs 5.19 – 5.20). My comments in 2.7 and 2.8 apply.

- 3.9. Proposed amendment to GC 1.1 (paragraph 5.23). While I don't disagree with the intent of the amendment, I consider it unnecessary and, to the extent that it would result in a parallel set of General Conditions, I do not support it.
- 3.10. Proposed amendment to GC 1.6 (paragraphs 5.24 – 5.25). I oppose this amendment for the reasons stated in my paragraphs 3.4 – 3.5 (ie a suitable mechanism to achieve the same intent already exists by way of proposed condition 5 of consent 116786 of the Daysh conditions, condition 4 of consent 104729 and GC 6.6).
- 3.11. Proposed GC 1.11 (paragraphs 5.27 – 5.28). The only activity that may potentially affect Geotherm's operation is reinjection under 116786. My comments in paragraph 2.7 and 2.8 apply.
- 3.12. Proposed amendment to GC 3.2 (paragraphs 5.29 – 5.30). To the extent that the amendment would result in a parallel set of General Conditions, I do not support the amendment. In any event, reviews of the Discharge Strategy (and the System Management Plan which incorporates the Discharge Strategy) can be required by the Council on essentially an "as required" basis (refer GCs 3.2 and 5.2). The imminent commencement or exercise of new resource consents for something as significant as the Te Mihi development is exactly the type of development that would trigger a Council requirement to review those documents.
- 3.13. Proposed amendment to GC 5.2 (paragraphs 5.31 – 5.32). My comments in paragraph 3.1 apply.
- 3.14. Proposed amendment to GC 5.3 (paragraph 5.33). While I don't necessarily disagree with the intent of the amendment, to the extent that it would result in a parallel set of General Conditions, I do not support it.
- 3.15. Proposed new GC 6.1A and 6.1B (paragraph 5.37). I disagree with the inclusion of these proposed conditions. The premise behind them is that changes to the resource that occur after the commencement of the Te Mihi consents can be attributed to the exercise of those consents. In my view, this misunderstands the complexity of the cause and effect relationship in the geothermal system. In my understanding, this relationship is extremely complex and does not generally lend itself to the identification of specific cause and effect on any kind of "one to one"

basis. Trends (effects) can be observed and monitored over time but attributing specific causes to those trends to the extent implied by the suggested condition is not usually possible or, given the time lag between cause and effect (which may be years), possible only in retrospect.

- 3.16. Monitoring of the various parameters itemised in proposed GC 1.6A and B, is required in the General Conditions under Schedules One and Two (refer pages 104 -107 of Mr Daysh's evidence). The timing and frequency of monitoring is specified. Other monitoring is required in accordance with GC 6.5 and 6.6 (well information from the drilling and testing of wells) and in the specific existing consents for production and reinjection. GC 6.8 cross-references to Schedules One and Two and builds in flexibility for the Council to require monitoring further to, or at a greater frequency than, that specified in the Schedules. Part of the Peer Review Panel's role will be to consider when amendments to the specified monitoring may be required. It may be that the commencement of Te Mihi consents triggers a need for further monitoring of some form, but, in my view, that is a decision best made at the time by the Council, on the Peer Review Panel's advice, pursuant to GC 6.8.
- 3.17. Proposed new condition 6.6A (paragraph 5.38). I disagree with this condition as the information specified in it is at a level of detail that the Council would be unlikely to make use of. Generally speaking, the Council is interested in total reinjection volumes and reservoir trends generally, rather than specific well information. Should there be a need for Council to examine well specific information in future, Council can, under GC 6.7 or 6.8, request that it be provided.
- 3.18. Proposed new conditions 8.1A and B (paragraph 5.39). I disagree with these conditions because, if imposed, they will result in two separate MOPs being required – the first pursuant to the existing General Conditions in relation to the existing consented reinjection (and other activities) of Contact and Geotherm, and a second, in relation to new Te Mihi reinjection and the same Geotherm activities. I am unclear as to how that would work from either a practical or regulatory perspective.
- 3.19. Proposed new condition 9.1(g) (paragraph 5.40). This proposed condition would enable review of the Contact consents to achieve consistency and give effect to Policy 5 of Variation 2 of the Plan. That policy seeks to:

*“[e]nsure mechanisms (multiple operator agreements such as steamfield management agreements and field operation protocols) are in place where more than one consent holder for large takes is to exist within a system.”*

The policy then goes on to itemise what should be in such a protocol. However, a “multiple operator protocol” requiring the specified matters, is already provided for by the existing consents (refer GC 8 of the Contact General Conditions and GC 3 of the Geotherm General Conditions). The suggested review condition is, in my view, therefore redundant.

- 3.20. Proposed dispute resolution condition (paragraphs 5.41 – 5.43 and Schedule 1). Mr Matthews comments that this condition is necessary because GC 8.3 would not oblige the Te Mihi consent holder to participate in dispute resolution measures associated with the exercise of the Te Mihi consents.
- 3.21. The Daysh conditions propose that the reinjection consent will be subject to compliance with the General Conditions that apply to consent 104718. The relevant part of GC 8.3 of that consent is as follows:  
*“...the consent holder shall participate in any dispute resolution processes that may be contained in resource consents held by any subsequent operator on the Wairakei-Tauhara Geothermal System.”*
- 3.22. It appears to me that the requirement to participate in dispute resolution would apply equally to the Te Mihi consent holder.

