

**BOARD OF INQUIRY
TE MIHI GEOTHERMAL POWER STATION PROPOSAL**

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

BRIEF OF EVIDENCE IN CHIEF OF CRAIG ANTONY STEPHENSON

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Introduction

1. My name is Craig Antony Stephenson. I am the Environment and Land Manager (Geothermal) for Contact Energy Limited.
2. I have the following qualifications and experience relevant to the evidence I shall give.
3. My academic qualifications include a Bachelor of Arts Degree in Geography from the University of Otago, NZ in 1991; a Master of Arts Degree in Geography from the University of Auckland, NZ in 1993 and a Post Graduate Diploma in Environmental Management from the University of Auckland in 1997.
4. I have ten years experience working in the environmental management field, both in New Zealand and South Africa.
5. In 1996 I was employed by ADP Industries Ltd in Auckland as Production Manager and Health/Safety and Environment Officer. This company manufactured specialised ground support equipment for airlines and airforces around the world.
6. In 2000 I was employed by FFS Refiners (Pty) Ltd in Durban, South Africa and Chief Environmental Officer. This company was an oil refining business, specialising in recovering “waste” hydrocarbon streams from the large refineries in South Africa. I was responsible for the environmental compliance of the company’s six refineries, a road tanker fleet and a fleet of coastal tankers and bunker vessels.
7. In 2002 I returned to New Zealand and was employed by Meritec Ltd (now Maunsell Aecom) as a Senior Consultant, specialising in environmental management systems and management system integration.
8. At the start of 2003 I became a self employed contractor consulting primarily to the New Zealand Sugar Company Ltd on environmental issues.
9. In May 2004 I joined Contact Energy as Environmental Advisor to its geothermal operations. My current position with Contact is Environment and Land Manager (Geothermal). The position is based at Wairakei.
10. In this role I am responsible for the following:

- Co-ordinating with the other environmental staff throughout Contact to ensure a consistent approach to environment and land issues across all of Contact's generation sites and operation activities.
 - Ensuring that Contact's relevant power stations have valid land use and activity consents and permits under the Resource Management Act and other relevant legislation, including progressing resource consent applications, consultation and documentation;
 - Communicating and co-ordinating with the Generation Manager at Wairakei to ensure that resource consent and consent conditions are complied with;
 - Assisting in the development of environmental strategies, policies and practices and managing Contact's environmental management system;
 - Engaging with relevant regional and local authorities and other environmental stakeholders and promoting Contact's business and role in the community;
 - Coordinating Contact's submissions to relevant authorities on environmental matters;
 - Managing Contact's land and property assets associated with the geothermal generation assets to protect Contact's ability to use the land and property as required for present and future business operations.
11. As part of my role I have regular contact with interest groups, Iwi/ hapu, authorities and the public around the Taupo District.
12. I confirm that I have read the 'Code of Conduct for Expert Witnesses' contained in the Environment Court Consolidated Practice Note 2006. My evidence has been prepared in compliance with that Code. 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

13. My evidence will cover the following matters:
- Pre application consultation process

- Post application consultation with submitters.
- Subsidence Effects Research undertaken since Wairakei reconsealing hearing.
- The status of the East Taupo Arterial Road project.

Pre Application Consultation Process

14. I co-ordinated the consultation programme undertaken prior to the lodging of the Te Mihi resource consent applications in July 2007. This programme and the results of the consultation are described in Section 17 of the document entitled, *“Te Mihi Geothermal Power Station Project: Part B, Assessment of Environmental Effects, 31 July 2007”*. I do not propose to revisit that Section of the AEE.

Post Application Consultation with Submitters

15. Since the applications were notified and submissions received on the application, the Contact team has engaged in follow up consultation with various parties who lodged submissions on the application.

Neighbouring Land Owner Submitters

16. Nine local residents lodged submissions in opposition to the application. The location of these submitters is shown on CAS1. Mr and Mrs McLachlan, and their company MacPower, also lodged a submission in opposition. I do not consider this to be a submission by a local resident, but rather a submission by a potential competitor.
17. The main areas of concern included the risk to groundwater (drinking water sources), visual impacts, noise, traffic (particularly during construction) and air emissions (odour).
18. I have endeavoured to make contact with all of the local submitters, and have managed to meet with seven of them.
19. In response to visual / landscape issues raised by submitters, Contact requested Mr Coombs from the Isthmus Group to visit the closest neighbouring properties and undertake a more detailed assessment of the visual and landscape effects associated with their specific properties. The properties of the Prices, Ellerys, Koster/ Birdsalls and Houghtons were

visited and assessments undertaken. Mr Coombs will present the results of these assessments in his evidence.

20. Mr Coombs has recommended a Planting Plan in his Exhibit BC24 to address the landscape and visual issues associated with these properties. This plan was discussed with the owners of some of the neighbouring properties at the pre-hearing meeting held on 21 May 2008. As part of the pre-hearing meeting outcomes Contact has agreed to organise a further meeting with the Prices, Ellerys and Koster/ Birdsalls along with Mr Coombs to review this proposed Planting Plan. Any agreed revision to this proposed Planting Plan will be made available to the submitters and the Board of Inquiry through the course of the proceedings..
21. Several of the submitters raised concerns about the noise from the project, both during construction and during normal operations. Mr Hunt will cover this in more detail in his evidence. However, in response to a specific concern raised by Mrs Price, Contact has agreed to create a 100m buffer zone around the properties of both the Prices and the Ellerys in which no construction laydown activities will take place, and Mr Daysh deals with this in his evidence associated with proposed conditions. The issue raised by Mrs Price relates to possible sudden noise from the construction laydown area if, for example, a container was dropped. Mrs Price runs a riding school, and was concerned about sudden noise spooking the horses while children are riding. The consent area site has a number of physical limitations as to areas that are suitable for construction laydown activities, as discussed by Mr Pummer in his evidence. The 100m buffer zone is the maximum buffer considered possible that will still maintain appropriate areas for the contractors to utilise for this purpose. Having said this, I am planning to meet again with Mrs Price to investigate other possible options to address this particular concern.
22. The risk to groundwater, and drinking water sources, from Contact's reinjection operations was raised by several submitters. GNS have been engaged to undertake further investigations into the groundwater situation in the Te Mihi area. Mr Bromley addresses this issue in his evidence. Mr Bromley also attended the pre hearing meeting to explain his conclusions.
23. At the pre hearing meetings on 21 May 2008 Contact also committed to taking a water sample from the Birdsall/ Koster bore and to have this chemically analysed in order to act as a baseline against which future water

quality can be measured. This offer is also available to any other of the local residents in the vicinity of the proposed station.

24. Contact has made a standing offer to the local residents that if they have any questions which they would like answered by any of our technical experts they just need to contact myself or our consultation coordinator, particularly if they have any further specific queries after receipt of the Contact evidence in chief on 26 May 2008.

Transit New Zealand

25. The traffic effects, and Transit's concerns, will be discussed in detail by Brett Harries. However, Transit's key concern is the effect of construction traffic movement on the Poihipi Road / State Highway 1 intersection. Taupo District Council shares this concern.
26. I have met with Transit and TDC on several occasions to explore possible solutions to their concerns. At time of writing, the parties are exploring a potential solution which will mitigate the effects of the construction phase of the Te Mihi station on this intersection.

Ngati Te Rangiita Ki Oruanui

27. I will now outline the consultation undertaken by Contact Energy and the hapu which holds mana whenua over the Te Mihi area.
28. The Te Mihi Power Station project falls within the rohe of Ngati Te Rangiita ki Oruanui, a hapu of Ngati Tuwharetoa.
29. Ngati Te Rangiita ki Oruanui is one of the signatory hapu to a Heads of Agreement between Contact and hapu with mana whenua over the part of the Wairakei-Tauhara geothermal system covered by the Wairakei consents granted in 2007. The other hapu who are party to that Heads of Agreement are Ngati Te Urunga and Ngati Rauhoto.
30. On June 27, 2007 a Hui was held at the Wairakei Power Station to brief the hapu on the Te Mihi project and the process of compilation of the resource consent documentation. Mrs Leaf was nominated by hapu representatives to prepare a Cultural Impact Assessment and construction protocol on behalf of Ngāti Rauhoto and Ngāti Te Rangiita ki Oruanui, and to engage Dr Severne (a NIWA Manager and Scientist) to act as technical advisor to the hapu (at Contact's cost).

31. On July 11, 2007 Contact held a Technical Focus Group Meeting at Wairakei Resort to discuss the project with key stakeholders. Both Mrs Leaf and Dr Severne attended that meeting.
32. On July 26, a site visit to the project site was undertaken with Mrs Leaf and Dr Severne, along with Contact's archaeological consultant (Dr Rod Clough) and Mr Perry Fletcher (local archaeologist and historian).
33. Through July and August, Mrs Leaf and Dr Severne compiled the Te Mihi Cultural Impact Assessment as well as a construction protocol for the project.
34. At a hui held on November 17, 2007 at Oruanui Marae, Ngati Te Rangiita ki Oruanui decided that the CIA Report [in an amended form] would be provided to Contact Energy as a confidential [for reasons of cultural sensitivity] document for the Resource Consents process. The report was subsequently submitted to the Waikato Regional Council and Taupo District Council on that basis.
35. I have attached a copy of the section of the Cultural Assessment Report identifying specific issues of concern to hapu (CAS 2). Some of the issues raised are not directly related to the specific Te Mihi consent applications (e.g. ongoing use of the Te Rau-o-te-Huia Stream under existing consents). Along with other Contact personnel I have met several times with representatives of Ngati Te Rangiita ki Oruanui to discuss all of the issues raised in the Cultural Assessment Report (and their associated submission) and have suggested to them that the following steps be implemented to address them:
 - Contact will adopt the proposed Cultural/Archaeological Sites Protocol for the construction, operation and maintenance of the Te Mihi geothermal power station.
 - Contact will undertake an investigation into the options for protecting the three rock art features as described U17/16, U17/17 and U17/21 in the Clough & Associates May 2007 Archaeological Assessment for the Te Mihi geothermal power station resource consent application. This is to include the effects of hydrogen sulphide emissions on the rock art.
 - Contact will include the Cultural/Archaeological Sites Protocol in any Construction Management Plan that is prepared for the construction of the Te Mihi geothermal power station, or in any Operational Management

Plan that is prepared for the long term operation and maintenance of the Te Mihi geothermal power station.

- Contact will not undertake any operations or maintenance of the Te Mihi geothermal power station, without further consultation with Ngāti Te Rangiita ki Oruanui, within 100 m of Te Mihi Maunga, Raparapa Maunga and the identified Rock Art Features.
- Contact and Ngati Te Rangiita will undertake a study of Te Rau-o-Te Huia, Mangaraupō, Waiharuru Streams, including water takes, habitat status and ecology. This will be used to develop a Management Plan for the streams. This will be a joint project that Contact will fund.
- Contact will present an annual progress and update report to Ngāti Te Rangiita ki Oruanui as part of the annual peer review process.

36. These commitments form the basis of a draft Heads of Agreement currently being discussed between Contact and Ngati Te Rangiita ki Oruanui. It is expected that this will be a “private agreement” but the protocol and exclusion areas around Te Mihi Maunga, Raparapa Maunga and the Rock Art Features are included in the conditions proposed by Mr Daysh in his evidence.
37. Ngati Te Rangiita ki Oruanui also raised concerns in the CIA regarding the lack of consultation with the hapu before Contact filled a RMA section 127 application to vary the Wairakei cooling water discharge consent (this application is currently being processed by Environment Waikato). Contact has discussed this with the hapu, and has confirmed that there was some confusion regarding the date that the application was lodged. The application was lodged on 10 September 2007 – a month after it was sent to the hapu’s technical expert.

Tainui (Waikato Raupatu Trustee Company Ltd)

38. The key environmental issue raised by Tainui in their submission related to the use of condensate from the proposed Te Mihi station for irrigation of land (Consent WRC 116787), in particular if this facilitated the use of the land for dairy farming and subsequent nitrogen run-off to the river. My colleague, Dominic Bowden, met with Tainui on 16 April 2008 to discuss this matter. Contact has no intention of converting the land in question to a dairy farm (it is currently mixed dry stock).

39. Contact has also engaged with Tanui and other Iwi in the Guardians Establishment Committee, which is developing a vision for the Waikato River. Views expressed in that forum are supportive of the Te Mihi project, particularly the environmental benefits this project affords the Waikato River.

Environment Waikato

40. I have not been directly involved in discussions with Environment Waikato with regards to the Te Mihi project. Mr Daysh has discussed this dialogue, and the preparation of draft consent conditions for the project, in his evidence.

Taupo District Council

41. I have been involved in several meetings with Taupo District Council staff regarding the Te Mihi project in particular around the development of a draft set of conditions for the Te Mihi Power Station. Mr Daysh has discussed this process and its outcomes in his evidence.

Subsidence Effects Research

42. The effect of subsidence on buildings was a key issue in the Wairakei Re-consenting process between 2001 to 2007. The background and conclusions of the Environment Court on the evidence it heard are set out in its May 2007 decision. I do not therefore intend to revisit the independent investigations into property damage potentially caused by subsidence that the Environment Court heard evidence about. Rather I would like to update the Board with regards to work that has been undertaken since the Wairakei Re-consenting hearing closed in February 2007.
43. The general conditions on the Wairakei consents that received final confirmation from the Environment Court in August 2007 require research and investigation of subsidence mechanisms.
44. Mr Bromley has provided evidence on the work Contact has underway with regards to investigating the causes, and avoidance, of subsidence on the Wairakei-Tauhara Geothermal System to satisfy Contact's consent obligations.
45. In parallel with the subsidence investigation project. Contact has continued to fund the inspection work being undertaken by the Building Research

Association of New Zealand (BRANZ). BRANZ was engaged in February 2005 under a brief of work developed between Contact, Environment Waikato, Taupo District Council and the Department of the Prime Minister and Cabinet to investigate subsidence related damage to properties in Taupo. Six structures were identified as possibly suffering from subsidence related damage. The buildings were:

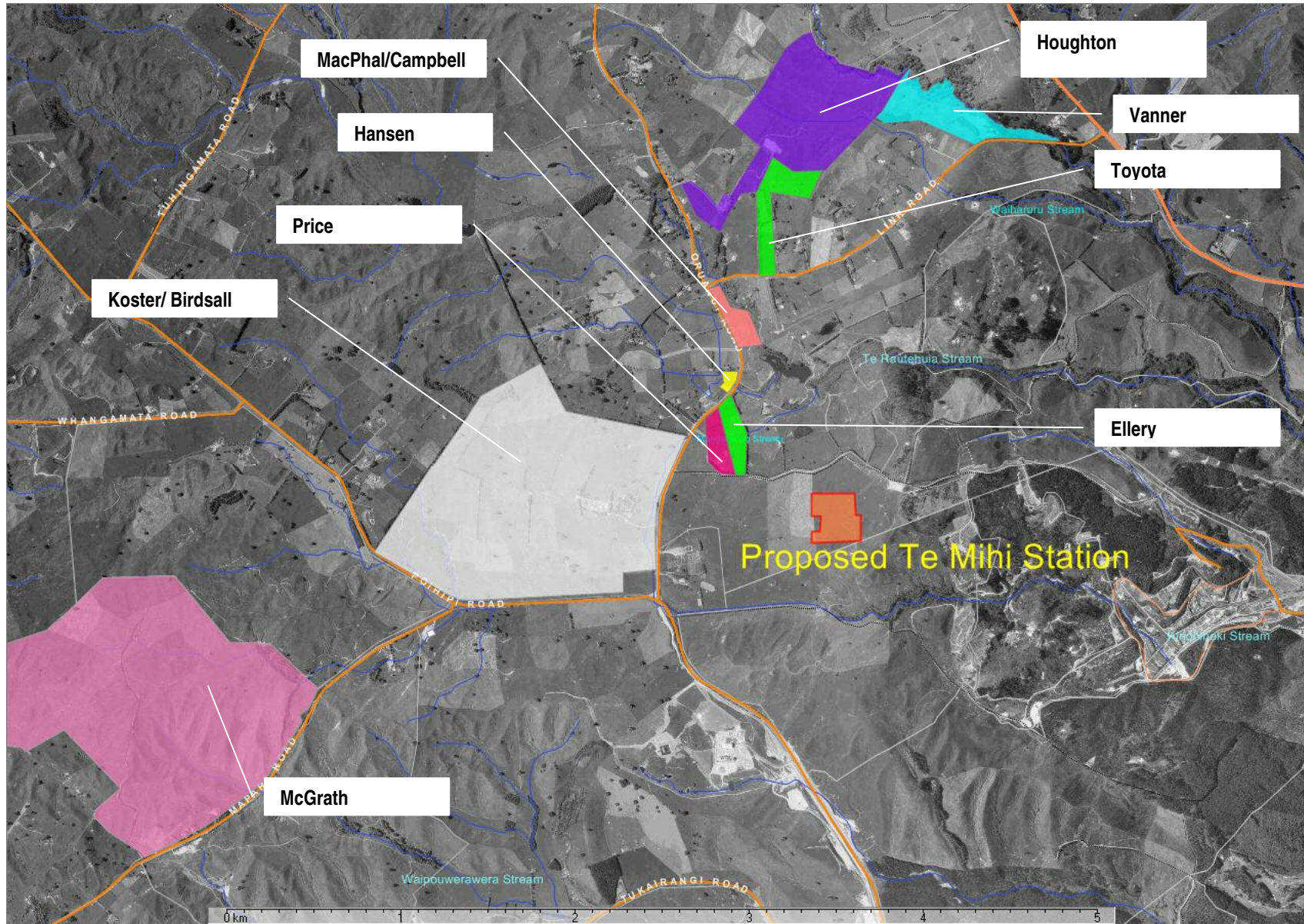
- 32 Invergarry Road (Residential Property)
 - 24b Invergarry Rd (Residential Property)
 - 34 Invergarry Rd (Residential Property)
 - 36 Invergarry Rd (Residential Property)
 - Care and Independence Hospital (now Liston Heights) (Retirement Village)
 - Taupo Base Hospital.
46. Since the Wairakei Re-consenting hearing BRANZ has conducted a further inspection of the properties (in November 2007), with the exception of 24b Invergarry Rd. The owners of that property no longer wanted BRANZ to inspect the property. No unusual damage has been detected in any of the properties.
47. In late April 2008, Contact was alerted to possible subsidence damage at 2 Invergarry Rd. Upon inspection of the property, in conjunction with staff from DBCon Engineers Ltd, I observed a crack had opened in the floor of the garage and basement of the property, running along the subsidence contour of the Crown Road subsidence bowl, suggesting a link to that subsidence anomaly.
48. I arranged for BRANZ to inspect the property and BRANZ confirmed the likely link to subsidence.
49. I discussed the position with the property owner and explained to him Contact's responsibilities with regards to subsidence damage within the Crown Road subsidence area under the General Conditions of Contact's resource consents. As a result, Contact has purchased the property and is in the process of putting in place an investigation and monitoring programme involving precise levelling and ongoing inspection by BRANZ.

50. Environment Waikato and the Taupo District Council have been kept informed of the 2 Invergarry Rd issue and have been supportive of Contact's actions.
51. Contact is also undertaking inspections of properties close to 2 Invergarry Rd.

East Taupo Arterial Road

52. The reinjection application (WRC116786) that forms part of the Te Mihi consent applications extends over a large part of the Tauhara Geothermal Field, on the eastern side of the Waikato River. This is well beyond the area that can be accessed by deviated drilling from the western side of the River. The exercise of this consent in the areas to the east of the Waikato River (if granted) therefore relies on the ability to get geothermal fluid from the Te Mihi Power Station site across the river. It is intended that this will be accomplished by installation of pipes on the bridge constructed for the purposes of the East Taupo Arterial Road (ETAR) near the Wairakei Power Station site.
53. Contact has been actively involved in the design of the ETAR over the past several years.
54. Currently the ETAR project is in its tender phase with tenders closing on 30 May 2008. My understanding based on discussions with Taupo District Council staff is that it is anticipated that construction will commence in early 2009, with construction taking 3 years.
55. Once completed, the ETAR bridge will open up additional discharge options for Contact. Mr Carey will address in his evidence the management planning framework which will determine what options are ultimately implemented.

C.A. Stephenson



Note: The leasehold interest of Mr and Mrs McLachlan currently the subject of litigation in the High Court is not shown

CAS 2 – Extract from Ngati Te Rangiita Cultural Impact Assessment

APPENDIX I

Table 2: Adverse effects and issues of concern to Ngā Hapū.

Activity	Concerns identified to hapū	Contact Response	Progress
<p>WRC 116786 Discharges to land and ground water: 95 kilo tonnes per day of geothermal water, steam condensate, cooling water blow-down, suspended material and added chemicals into land and underground water through reinjection wells.</p>	<p>The reinjection consent application area (Drawing 124922-RC01) represents Wairakei and Tauhara hapū interests and associated Land Trusts (under Te Ture Whenua). There is no question that increased reinjection will have environmental benefits to both the wairua of the river and the geothermal system. The hapū are seeking:</p> <ol style="list-style-type: none"> 1) Clarification on where Contact intend to reinject to enable full assessment of localised impacts of reinjection on cultural values and traditional use areas for Ngā Hapū. Ngā Hapū seek a 5 year plan indicating location and rate of reinjection for their consideration. 2) To support in principle adaptive management in relation to reinjection but require Contact to consider particular taonga or surface features in the Spa area and Onekeneke valley which may benefit from staged reinjection. 3) Clarification on the exclusion zones for reinjection. Do they exclude the Wairakei Valley, (old geyser area)? It is understood by Ngā Hapū that the mitigation of impacts from early generation activities are not considered in this process. However, post commissioning very little fluid will be withdrawn from the western borefield. The hapū are seeking information on the status of these areas and any potential for enhancement of the taonga/surface features. 		

	<p>4) Further clarification on the potential impact of in-field reinjection on Karapiti. The Mauri of this area has been severely impacted by past consent activities. Adverse impacts on Karapiti would not be viewed favourably by Ngā Hapū.</p>		
<p>WRC 116787 Discharge of 6,500T/day cooling water blowdown and condensate to land.</p>	<p>As kaitiaki of Taupō nui a Tia, Ngā Hapū are concerned that discharge to land may compromise the integrity of groundwater resources and seek clarification of the key chemical constituents of the discharge water.</p>		
<p>WRC 116788 Discharge up to 50 cubic metres/day of water including contaminants and sewerage into land through septic tanks.</p>	<p>It appears that the system developed for the disposal of sewerage meets the standards required by EW for wastewater treatment. Ngā Hapū seek the generation of a map which identifies the septic tanks in relation to areas/sites of significance identified in the CIA and if outside the area of the CIA, the area should be appropriately mapped for cultural significance.</p>		
<p>WRC 116789 Discharge contaminants to air from Te Mihi Powerstation.</p>	<p>Ngā Hapū request a series of spatial maps that layer information identifying the cultural values associated with Oruanui No 5 and the modelled air discharge contaminant information including early commissioning contours.</p>		
<p>WRC 116790 Discharge contaminants to air from Pohipi Rd.</p>	<p>This activity is not related to the CIA carried out for Te Mihi. The Power Station is located on the original Rangatira Blk. For completeness the Ngā Hapū expect that a CIA report be completed for this activity.</p>		
<p>WRC 116791 Discharge to air from steamfield.</p>	<p>Construction within the Borefield is likely to impact on cultural values associated with the Wairakei and Oruanui No 5 Blks. Ngā Hapū are seeking details on planned construction/earthworks in</p>		

	<p>relation to the values identified in this CIA Report and the earlier Wairakei Te Taonga-a-Te Tupuna Ngatoroirangi Report and are seeking a extensive inventory of historical sites in relation to the steamfield.</p>		
<p>WRC 104709 (existing consent). For intermittent drilling and well testing.</p>	<p>The CIA identifies Te Rau-o-te-huia as a key taonga of the descendants of the Oruanui Blk. The hapū are seeking:</p> <ol style="list-style-type: none"> 1) Clarity around the proposed nature of the take from Te Rau-o-te-huia. From the discussion at Part B AEE page 17, it appears that the take will not be intermittent but ongoing for cooling water and domestic supply. Ongoing water take could have significant implications for the mauri of the stream. This is of particular concern to Ngā Hapū as Te Rau-o-te-huia is of great cultural significance and at present is relatively unspoiled. 2) Clarity around the extent of monitoring to date of the stream. 3) Te Rau-o-te-huia was culturally significant as the traditional source of resources including kōura, paru, harakeke. The hapū would like to evaluate the status of the traditional fishery and options for access to this stream. <p>Ngā Hapū oppose the proposed ongoing water take from Te Rau-o-te-Huia Stream, on account of that stream's cultural significance, and seek that Contact source the water take from Waikato River or elsewhere.</p>		
<p>Section 127 Variation to WRC 104712</p>	<p>The draft variation was sent to Dr Severne on the 9th August 2007. Unfortunately it did not arrive at NIWA until after the 14th of August hui a hapū. The variation was lodged on the 12th August by Contact. Ngā Hapū</p>		

	<p>are very concerned about the process and lack of consultation prior to lodging. Ngā Hapū representatives will inform the Regional Council of their concerns.</p> <p>Ongoing discharge of contaminants to the Waikato River for six more years will have significant implications for the mauri of the river and the health of the fishery and ecosystem.</p> <p>Accordingly, Ngā Hapū oppose the variation on the basis that the existing resource consent should be complied with for the protection of the river.</p>		
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