

**Report, Decision and Recommendation of the Council,
through its Hearings Committee meeting
held in the Conference Room, Flames International Hotel, Whangarei
on 26-30 May 2008,
commencing at 10.00 a.m.**

The Hearing Committee (“the Hearing Committee”) of the Northland Regional Council was convened to hear resource consent applications lodged by Crest Energy Kaipara Limited relating to a proposed tidal power generation facility to be located in the entrance channel of the Kaipara harbour and an associated proposed cable crossing in the Northern Wairoa River between Tikinui and Raupo. The applications made in accordance with the Resource Management Act 1991 (“the Act”), were lodged with the Northland Regional Council and referenced as (NRC Application No. CON20061607601).

PRESENT: **Hearings Hearing Committee**
Cr L Hill
Mr J Smart
Mr J Dahm

APPLICANT: **Crest Energy Kaipara Ltd**
Ms S Simons
Mr N Eady
Mr A Hopkins
Mr G Venus
Mr P Donnelly
Mr N Hegley
Dr C Christian
Mr D Todd
Mr G Teear
Capt J Varney
Mr B Woods
Mr L Gowing

CONSENT AUTHORITY: **Northland Regional Council**
Mr A Richards
Dr M Francis
Dr D Goring

SUBMITTERS: **Rodney Economic Development Trust**
Mr S McIlwain

Winstone Aggregates
Mr A Happy

Mr A McGillivray
Dr I Visser
Ms E Fairgray

Department of Conservation

Ms K Anton
Ms P Routley
Dr PS Kench
Dr SP Du Fresne

Ministry of Fisheries

Mr R Fanselow
Ms L Mitchell

Kaipara Harbour Sustainable Management Study Group

Mr N Tiller
Ms C Yardley

Kaipara District Fisheries Hearing Committee

Mr D Subritzky
Mr D Davidson

Farmers of New Zealand

Mr B Guest

Mr RG Scott

McCallum Bros.

Mr J McCallum

Energy Efficiency & Conservation Authority

Ms R Feary

Northern Wairoa Boating Club

Mr W Crump

Te Uri o Hau & Waikaretu Marae

Ms J Chetham
Mr P Nuttall
Mr W Wright
Ms M Watene
Mr H Nathan
Ms M Fletcher

Kaipara Forest & Bird and Kaipara Cruising & Sportfishing Club

Mr B McNatty

Auckland Conservation Board

Ms K Walsh

IN ATTENDANCE:

Mr D H Alderton, Committee Secretary
Ms R Ropiha, Iwi Liaison (part meeting)
Ms M Morine (staff trainee)
Ms R Dasant (staff training)
Mr T Kingi (Maori translation service)

1. DESCRIPTION OF THE PROPOSED ACTIVITY

The application is to place 200 turbine units on the sea bed in the deepest parts of the entrance to the Kaipara Harbour for the purpose of generating up to 200 Megawatts (gross) electricity from the tidal currents and to transmit the generated energy, at an operating voltage of 75 kilovolts (kV) potential, approximately seven kilometres to a landfall at Pouto via a buried transmission cable in the seabed.

It is also proposed to thrust a duct under the sea bed of the Northern Wairoa River between Tikinui and Raupo alongside existing ducted electricity transmission cabling to house the proposed electricity transmission cables. Transmission between Pouto and Tikinui and thence from Raupo to Mararetu will be through existing Northpower distribution network.

The proposal has developed into two sub-array sites since first notification, both within the originally proposed array site (approximately 9 km long by 1 km wide). Where the term generation array has been used in this report it normally refers to the overall (originally proposed site). Where it is important to distinguish between the two arrays, this is identified.

The minimum deployment depth of the generation array will be 35 metres.

The Applicant is proposing a staged development with 20 generation units placed initially (Stage 1) followed by a further 20 (Stage 2), then a further 40 (Stage 3) and finally the last 120 units (Stage 4).

An environmental monitoring programme, which, coupled with a staged development, is also proposed by the Applicant to confirm that the actual environmental effects are consistent with those predicted in the application.

2. REGIONAL PLAN RULE(S) AFFECTED

The proposed activities are listed in the following Table 1 together with the relevant rules of the Regional Coastal Plan for Northland and the Regional Water and Soil Plan for Northland.

Table 1 Showing breakdown of Activity Classification for project elements

Consent Type	For	Detail	Classification
Coastal Permit	<ul style="list-style-type: none"> ▪ Install and occupy 	<ul style="list-style-type: none"> ▪ Generator array of up to 200 marine turbine generating units and ancillary structures. 	<ul style="list-style-type: none"> ▪ Non-complying activity under Rule 31.3.4.m of the RCP. ▪ Occupation is a Restricted Coastal Activity (RCA) under s1.9(a).
Coastal Permit	<ul style="list-style-type: none"> ▪ Occupy the seabed 	<ul style="list-style-type: none"> ▪ Circuit and transmission cables located in the vicinity of the Generator array. 	<ul style="list-style-type: none"> ▪ Non-complying activity under Rule 31.3.4.m of the RCP.
Coastal Permit	<ul style="list-style-type: none"> ▪ Extract energy 	<ul style="list-style-type: none"> ▪ From tidal currents by using rotating blades within each marine turbine unit. 	<ul style="list-style-type: none"> ▪ Discretionary activity under Rule 31.3.7.d of the RCP.

Coastal Permit	<ul style="list-style-type: none"> ▪ Disturb the seabed 	<ul style="list-style-type: none"> ▪ During placement of structures. 	<ul style="list-style-type: none"> ▪ Discretionary under s77C, RMA.
Coastal Permit	<ul style="list-style-type: none"> ▪ Discharge 	<ul style="list-style-type: none"> ▪ Suspended sediments arising from seabed disturbance when placing structures within the generation area and during installation and maintenance of submarine cables along the transmission route. 	<ul style="list-style-type: none"> ▪ Discretionary under s77C, RMA.
Coastal Permit	<ul style="list-style-type: none"> ▪ Discharge 	<ul style="list-style-type: none"> ▪ Biological residue and sediment arising from ballasting of seabed structures and cleaning and maintenance of marine turbines. 	<ul style="list-style-type: none"> ▪ Discretionary under s77C, RMA.
Coastal Permit	<ul style="list-style-type: none"> ▪ Discharge 	<ul style="list-style-type: none"> ▪ Contaminants arising from bio-fouling management of submerged marine structures. 	<ul style="list-style-type: none"> ▪ Discretionary under s77C, RMA.
Coastal Permit	<ul style="list-style-type: none"> ▪ Discharge 	<ul style="list-style-type: none"> ▪ Heat to natural waters in the coastal marine area from the generator units and cables. 	<ul style="list-style-type: none"> ▪ Discretionary under s77C, RMA.
Coastal Permit	<ul style="list-style-type: none"> ▪ Place, use and occupy 	<ul style="list-style-type: none"> ▪ Coastal marine area with two, 7 kilometre long, electric transmission cables in the seabed from a generator array at the entrance to the Kaipara Harbour to a landfall at Pouto. 	<ul style="list-style-type: none"> ▪ Non-complying activity under Rule 31.3.4.m of the RCP.
Coastal Permit	<ul style="list-style-type: none"> ▪ Disturb 	<ul style="list-style-type: none"> ▪ The foreshore and seabed during burial of two, 7 kilometre long, electric transmission cables between a generator array at the entrance to the Kaipara Harbour and a landfall at Pouto. 	<ul style="list-style-type: none"> ▪ Discretionary under s77C, RMA. ▪ Disturbance is an RCA under S1.6(b) of the CPS.
Coastal Permit	<ul style="list-style-type: none"> ▪ Place, use and occupy 	<ul style="list-style-type: none"> ▪ The coastal marine area under the bed of the Northern Wairoa River between Tikinui and Raupo, with a 200 millimetre diameter plastic conduit, approximately 700 metres long, containing electric transmission cables. 	<ul style="list-style-type: none"> ▪ Non-complying activity under Rule 31.3.4.m of the RCP.

Coastal Permit	▪ Discharge	▪ Suspended sediments arising from seabed disturbance during placement and maintenance of electric transmission cables between a generator array at the entrance to the Kaipara Harbour and a landfall at Pouto.	▪ Discretionary under s77C, RMA.
Coastal Permit	▪ Discharge	▪ Heat to natural waters within the coastal marine area from two, 7 kilometre long, electric transmission cables to Pouto; and from the plastic conduit containing electric transmission cables, between Tikinui and Raupo.	▪ Discretionary under s77C, RMA.

Overall Classification

Overall the application is classified as a non-complying activity, being the more restrictive classification in Table 1.

Accordingly, the Hearing Committee is aware that it can only grant consent if is satisfied that either:

- The adverse effects on the environment (other than any effect on a person who has given their written approval to the application) will be minor; or
- The application is for an activity that will not be contrary to the objectives and policies of the relevant plan, being the Regional Coastal Plan for Northland in this case.

Restricted Coastal Activities

Those parts of the application that relate to the occupation of space by the generation array and the disturbance of seabed caused by the burial of the transmission cables between the generation array site and Pouto are Restricted Coastal Activities (RCA).

The generation array is an RCA because it falls within the criteria of Section 1.9(a) in that it *“would exclude or effectively exclude public access from areas of the coastal marine area over 10 hectares....”* and Section 1.9(c) as it *“would involve occupation or use of areas greater than 50 hectares of the coastal marine area and such occupation or use would restrict public access to or through such areas.”* The exclusion and restriction will occur as a result of the Regional Harbourmaster’s exercise of powers under the provisions of the Local Government Act for the purposes of navigation safety. This will create a ‘no-go’ area for all vessels other than those directly involved in the operation of the generation facility.

The transmission cable burial between the generation array site and Pouto is an RCA under Section 1.6(b)(iii) of the NZCPS because the seabed disturbance will occur within a 12 month period and extends “... 1000 metres or more over foreshore or seabed.”

The Hearings Hearing Committee is required to make a recommendation to the Minister of Conservation for these elements of the proposal: items (01) and (10) in Table 1 above. For administration purposes, this means that the sub-application reference numbers in any recommended consent or consent granted by the Council will be different to those in the abovementioned table.

3. NOTIFICATION AND SUBMISSIONS RECEIVED

The original application for the generator array and two 30 km long electric submarine cables, was notified on 24 November 2006 by three Councils as the application then covered the areas managed by the Northland Regional Council, the Auckland Regional Council and the Rodney District Council. All relevant proposed activities governed by the Kaipara District Plan, provide for the proposal as a permitted activity, for which that Council has already issued a Certificate of Compliance

The proposal was later amended by routing the electric submarine cable pair to Pouto, instead of to Glorit. At that point the proposal became one for which resource consents were required only from the Northland Regional Council and the Minister of Conservation. The amendment was notified on 24 August 2007

At the closing date of the second notification:

- 242 submissions had been received;
- 118 opposed the proposal;
- 122 were in support of the proposal (of which five have given support in principle); and
- Two submitters did not respond to the Council to indicate whether or not they were in support or opposition to the application;
- There was one informal submission;
- 97 submitters stated that they wished to be heard at a hearing.

Summaries of the submissions are contained in Appendices A and B **attached**.

Due to the large number of opposing submissions, it was considered unlikely that any pre-hearing meeting would significantly improve clarification of any matter or likely facilitate resolution of issues raised in submission. Accordingly, it was determined to proceed directly to a formal hearing rather than attempting any pre-hearing meetings.

However, the Hearing Committee understands that the Applicant carried out its own further consultation with a number of submitters and others after the submission periods ended. However, these meetings were not pre-hearing meetings under Section 99 of the Act.

Many of the submissions in support of the proposal were generally on the basis that:

- The proposal was based on a naturally renewable resource and was sustainable.
- Tidal generation would reduce greenhouse emissions by displacing electricity generation from generation plants burning fossil fuels.
- The proposal supported the meeting of New Zealand's Kyoto Protocol obligations.
- The proposal contributes towards the nation's energy objectives.
- Generation north of Auckland will improve Northland's security of supply.

The main concerns raised in opposing submissions on the two proposals application relate to (with approximate proportions of numbers of submissions raised per concern):

- Effects on fishing (recreational and commercial). [30%]
- Exclusion of navigation, anchorage and general exclusion. [22%]
- Effects on fauna (fish, cetacean, and other megafauna, aquaculture and shellfish). [19%]
- Physical effects on harbour dynamics (tides, sediments and other physical processes), contaminant discharges and turbine stability. [17%]
- Untested technology/inadequate study. [12%]

4. PROCEDURAL MATTERS

PRE-CIRCULATION OF EXPERT EVIDENCE

On 18 April 2008, at the time of notifying the hearing commencement date, the Hearing Committee advised issued a direction and guidance to all parties attending the hearing requiring the circulation of the Council staff report by 24 April 2008 and all expert evidence of the Applicant and submitters to be filed with the Council by 9 May 2008. All submitters were also invited to provide any further evidence, other than expert evidence, also by 9 May 2008. The Hearing Committee advised that all expert evidence would be taken as read at the hearing.

The Hearing Committee found that the process regarding the precirculation was most helpful in the issue of time management and having the opportunity to have read the evidence were better prepared for questioning submitters. However the required procedure regarding the pre-circulation of evidence was not entirely understood by some submitters and they had arrived at the hearing with further statements that were not consistent with the required process. Submitters were informed that evidence that did not relate to their original submission would not be taken into consideration in determining the decision.

LATE SUBMISSIONS

The Hearing Committee ruled, at the outset of the hearing:

- (1) That the late submission from The Energy Efficient and Conservation Authority be received on the basis that it provides relevant information that would not otherwise be available to the Hearings Committee and was only one day late.
- (2) That the submissions from C Crosby, A R House, I M Johnson, B and L McPhun, K Nathan and Transit New Zealand not be received for the reasons that they are late and raise no new matter not already adequately raised in other submissions. In the case of the submission from I M Johnson, the submission was significantly late and the submission from Transit New Zealand was no longer relevant to the proposal.

POINT OF ORDER ON PRECIRCULATION OF EVIDENCE

Ms Simons, Counsel for the Applicant, raised a point of order that Submitter Elizabeth Fairgray, did not pre-circulate the evidence that she was presenting, which was also raising new issues. The Hearing Committee determined that, with due respect to procedural fairness, the Hearing Committee would hear the submission without prejudice. The Hearing Committee cautioned Ms Fairgray to constrain her evidence to matters raised in her original submission and remain within those bounds. The Hearing Committee advised Ms Simons that the Applicant could comment on admissibility of any evidence in its right of reply.

Ms Simons, for the Applicant, subsequently raised a point of order that the evidence presented by P Nuttall for Environs Holdings Limited was not pre-circulated and that he was not an expert witness on some of the issues he was addressing. The Hearing Committee determined that it would hear the evidence, without prejudice, and requested that copies of the economic matrix that Mr Nuttall wanted to present be provided to the Hearing Committee.

5. SITE VISIT

On Thursday, 29 May 2008, whilst on its way to Waikaretu Marae at Pouto, inspected the proposed cable crossing site at Tikinui.

The Hearing Committee subsequently, on arrival at the marae, undertook a site visit of the proposed generation array site by helicopter. Over the course of the approximately 20 minute flight, the array area was viewed from a number of vantage points, including from the corners of the proposed array. The Hearing Committee noted the narrowness of the entrance and a number of vessels that were taking advantage of the very calm conditions prevailing on the day and was fishing in the general area of the proposed array. The Hearing Committee also noted the presence of the Outer Southern Shoal and Tory Shoal together with the nature of the coastline between North Head and Kaipara Head.

6. EVIDENCE HEARD

The Hearing Committee heard evidence from the Applicant, expert witnesses, submitters, and the Council's reporting officer. The following is a summary of the evidence heard at the hearing.

6.1 Council's Reporting Officers' (A Richards, D Goring, M Francis) Report and Evidence

In assessing environmental effects of the proposal the Reporting Officer considered that the main adverse environmental effects of it that would be more than minor were:

- The social effects on recreational fishing and navigation,
- The possible economic effects on sand extraction during the generation array structures placement, operation, maintenance and decommissioning, and
- The effects on foreshore scour arising from the trenching of the foreshore at Pouto.

Council staff's earlier concerns with regard to potential key physical effects relating to the installation and operation of the generation array had been satisfied by the results of Flow Modelling Report 2 and by advice in that regard to the Council by D. Goring, of Mulgar Consulting Limited. The results of this subsequent modelling by the Applicant indicated that the physical effects of installing 200 generating units would lead to only minor changes at larger scales and while in the vicinity of the units the changes will be more significant, the adverse effects of these changes will be minor.

With regard to the cables, placement, operation and decommissioning the main concern of staff was in regard to foreshore scour at the foreshore landing site at Pouto.

Dr Malcolm Francis of NIWA, consultant to the Council, had presented a review of the impacts of the proposed tidal facility on elasmobranchs (cartilaginous fish, e.g. sharks, skates and rays) stating that in his opinion there were three potential ways in which the turbine array could impact on elasmobranchs; the production of electromagnetic fields (EMFs), production of noise and physical impingement or physical obstruction. He recommended that if consent was granted, progression to stage 2 be undertaken only if the impacts of stage 1 are insignificant.

Due to the lack of information, the environmental effects on marine megafauna could not be completely confirmed as being only minor and Mr Richards quoted Environment Court decisions C131/2003, C77/2004 and C014 which indicated that, provided caution is exercised in considering a particular matter and that there is no “evidence of a credible threat of serious or irreversible harm”, staged progression of a proposal can be appropriate where empirical evidence supports that opinion, in due course.

The staff report identified that historic heritage and Maori cultural issues were essentially unknown. The more important issue in regard to historic heritage appeared to be shipwrecks, which may require the Applicant to comply with the Historic Places Act 1993 if these are encountered. The staff report also advised that, notwithstanding the requirements of the Historic Places Act, it was normal Regional Council practice to impose consent conditions requiring Consent Holder’s to stop activities, where such sites were discovered during implementation of consents, until any necessary authority has been obtained under the Historic Places Act. In this case, the Applicant has stated that it would carry out a detailed seabed survey prior to deployment of the turbines. The staff view was that this undertaking and the abovementioned stop-work, if sites are encountered, should be reinforced by appropriate consent condition(s), if consent is granted.

Mr Richards referred to Section 108 of the RMA 1991 and the provision for bonds to be imposed as a condition of consent. He considered that the imposition of a bond was appropriate for this proposal to ensure adequate funds were available to remove all of the facilities in the event of the Consent Holder not complying with any consent condition requiring the removal of the facilities. He supported the “staged approach” for all stages as outlined in his report but that the total value of the bond should be known from day one.

Referring to staged development, Mr Richards stated that certainty needed to be established before proceeding further and that effects of Stage 1 therefore needed to be found to be no more than minor, if consent could be contemplated by the Hearing Committee. It was his opinion based on the information available the placement and operation of 20 generation units, the associated cabling within the 20 unit generation array, the transmission cable bundle to Pouto and between Tikinui and Raupo will not likely cause effects that are more than minor.

He further considered that granting consent would compromise recreational use of parts of the harbour to be occupied by the generation array, as the Regional Harbourmaster had advised that the area occupied by the array would be excluded to vessels other than those needed to service the Applicants needs, and it will therefore be necessary to exclude the public from that area for their safety. Neither navigation nor fishing would be prevented other than in the generation array.

The Reporting Officers considered that consent for 200 generation units and associated cabling units could be granted predicated on the ongoing absence of evidence of adverse effects during the staged development.

6.2 Applicant's Evidence

S Simons – Counsel for the Applicant

Ms Simons summarised the application against the hierarchy of relevant policy and law under which this application should be considered.

Ms Simons submitted that an adaptive management approach was appropriate to address matters of uncertainty for this application. She noted that if there is a discernable risk that adverse effects on the environment may arise but an inability to accurately determine those effects, adaptive management can be used so that consent can be granted and the effects can be managed as their nature and extent becomes more certain. She emphasised that techniques such as adaptive management are permissible under the Resource Management Act (the Act) because the Act does not require “non-risk” approaches to the management of adverse effects on the environment. Various Environment Court decisions were quoted to illustrate applications of adaptive management.

In her opinion the application met the requirements of the Act and is consistent with the relevant planning documents.

Ms S.J. Simons concluded that measured against the statutory criteria, the positive effects are predictable and sizeable while the potential adverse effects are minimal and low risk. In her opinion, the imposition of appropriate conditions including a review option under s128 and staging, there is no legal impediment to the granting of a resource consent.

Right of Reply

Ms Simons submitted this project did not represent new technology, it was a new concept using proven technology, it is not experimental, it is tested and now connected and, in the case of the UK, to the national grid. There will be no visual effects to the landscape and there will be almost no evidence that a 200MW power station exists. There would be immense economic benefit to the community on a national, regional and local level.

In her view, evidence presented indicated that there would be no adverse effects on coastal processes.

With regard to the effects of noise from the turbines, evidence from Mr Hegley, the only noise expert, indicated that the design of the turbine meant that it would create only minimal noise. Both Mr Hegley and Mr du Fresne concluded that noise was not an issue with Orca. Mr Hegley also noted that turbines will make much less noise than a boat and dolphins follow them. No evidence disputed that the Orca use the harbour infrequently and Maui's Dolphin almost never.

The area of occupation of the full array of the turbines would be in the vicinity of 64 ha of a total area of around 10,500ha and Professor Montgomery's evidence confirms that the presence of the turbines is unlikely to impede the flow of fish in and out of the harbour.

Ms Simons referred to the report produced by Dr Visser which she considered would provide a helpful monitoring programme which Crest Energy would have no objection to the Hearing Committee using for guidance in terms of the conditions of consent.

The request for a full investigation to be undertaken by a maritime archaeologist was considered, but the Applicant's position was that it was appropriate, upon discovery of any archaeological artefacts, to notify the appropriate authority. In their opinion the evidence suggests that anything that may have been deposited on the seabed would have gone long ago.

Ms Simons referred to the adaptive management process and then referred to Crest's opening submissions that referred to a number of important cases that support that concept. An Environmental Monitoring Plan which would be required as a condition of consent would provide transparency, certainty and scrutiny of the process.

Ms Simons outlined the importance of monitoring, submitted that it need not be an impediment to the project proceeding in a timely fashion. While recognising that the monitoring is essential and modelling and analysis must be undertaken, the costs must not outstrip the value of the project. Also, while it was considered in the worst case scenario presented by Dr Christian, that there would be a significant increase in velocity of water around the array for a 20 minute period at maximum tidal velocity, it did not appear to be a concern for users as the area is considered dangerous and is avoided at the peak of the tidal flow.

Ms Simons submitted that the overwhelming evidence indicated there would be very little intrusion by the proposed location of the turbines on the popular fishing ground known as the "graveyard".

Reference was made to the issue of "no go" areas over the turbine array in the interest of navigation safety due to an email from the Harbourmaster. Ms Simons opinion was that in terms of safety, the issue of navigation, anchoring and diving are matters under the jurisdiction of the Harbourmaster.

Biofouling was not considered to be an issue by Luke Gowing and it was submitted that it was the intention of Crest Energy to work with the Northland Regional Council to develop a programme to ensure the right methodology is employed so there will be no adverse effects on the waters of the Kaipara Harbour.

With regard to turbine selection, Ms Simons submitted that the preferred option of Crest was to be limited to a turbine type that met the criteria of an envelope of effects. If a turbine fell outside those effects limits, then it will be necessary for an application to be made under Section 127 of the RMA 1991.

The expert evidence of Mr Teear and Mr Woods expressed no concerns with the laying of the cable and they considered that there would be no conflicts with public access.

Ms Simons described the lengths Crest Energy had gone to with regard to consultation as they had a company ethos of an inclusionary approach to the project. Consultation was a two way street and she submitted it was wrong to suggest that the Applicant had not undertaken all it should have or could have done in relation to consultation.

Ms Simons said that Crest Energy Ltd had made over 50 direct approaches to Te Uri o Hau and Tangata Whenua including Ngati Whatua. It had included other iwi but Crest was told that Te Uri o Hau are the iwi who are directly affected. While careful consideration had been made of the Tangata Whenua submissions there was still uncertainty, in her view, about what adverse effects have been identified by Tangata Whenua.

Te Uri o Hau evidence accepted there were national and regional benefits if consent was granted but expressed their concerns that there was no local benefit to the local community. Ms Simons disputed that, and pointed out that it was not necessary for the Hearing Committee to find a need for local benefit and submitted that there would be employment, security of electricity supply and a myriad of indirect benefits.

Ms Simons challenged Mr Nuttall's evidence as he was not an economist or a lawyer, and in regard to the subject of coastal occupation charges raised by him, pointed out that, in her view, Northland Regional Council and the Department of Conservation did not have the jurisdiction to consider this matter in determining this application.

Mr Donnelly, an economist, in his submission, discussed mitigation measures and that mitigation must include the overall benefits to the community of the project. Ms. Simons submitted that the concept of mitigation in the context of the RMA needs to make reference to the fact that tangible positive effects have been identified and there are no proven adverse effects.

In her opinion the Council cannot impose the establishment of a "Kaipara Harbour Trust" as a mitigation condition as it does not mitigate nor offset against any identified adverse effects. It is offered to address a general sense of community concern and ought to operate as described in the suggested conditions drafted by Gary Venus.

The directors of Crest have given their assurances that decommissioning will take place, when and if required.

Ms Simons submitted that the sum of bond recommended as a condition by the Northland Regional Council for decommissioning is unrealistic and needs to be revisited as the project would not proceed if a \$30,000,000 bond was required immediately. , If there is to be a staged process, there ought to be a staged bond.

The suggested timeframes of three years for baseline monitoring by some submitters was disputed by expert witnesses who considered baseline monitoring for one year would be sufficient.

Ms. Simons stated that Crest did not support the concept of Te Uri o Hau project managing the monitoring, and considered that to be inappropriate.

The proposed staging of the project is a response to the submissions and meets with the adaptive management approach, and she again referred to the experts who considered that one year's baseline monitoring period would be sufficient.

Counsel for the Applicant concluded by stating that everyone recognises that there would be national, regional and local benefits from the project proceeding. There is a positive, tangible, provable effect. There has been no adverse effects identified and proven, and there are some issues which have low risks of happening. This will be a staged and monitored process.

She submitted that there was no impediment, the Northland Regional Council and the Department of Conservation were supportive, and that the consents must be granted and a positive recommendation made to the Minister of Conservation.

Anthony Hopkin – Director Crest Energy Limited

Presented a summary of the key benefits of the project including:

- Limited potential for other renewable energy sources to meet future needs.
- Currently renewable energy sources have dropped from 90% to 65% in New Zealand.
- Current shortfall being met by fossil fuels.
- Demand north of Auckland is rapidly increasing and predictions are that not enough energy will be available for this area.
- Tidal energy is not always on, but is available for at least one peak time each day.

Phillip Donnelly – Economist

Economic benefits of the proposed scheme will give lower energy prices (wholesale) and also create greater savings for consumers in transmission costs.

Upgrade of transmission lines through the Auckland isthmus could be deferred if this project proceeds.

Raised concerns regarding the method used to calculate the amount required as a bond.

Neville Hegley

Noise from the turbines will be intermittent and also insignificant against the background noise of the coastal environment.

Worst scenario is three to five metres from the turbines.

With regard to the staff report re monitoring he suggested that Condition 25 be modified to:

“The Consent Holder shall, when reasonably requested by the Council under the direction of an appropriately qualified and experienced marine scientist(s), monitor noise produced by the turbines during turbine operation as follows:”

Dr C Christian – Civil Engineer and Hydraulic Modelling

He produced modelling evidence of flow rates within the array being reduced and adjacent to the array being increased, with the most significant effects adjacent to the array being on the ebb tide. Diagrams in his evidence indicated that peak ebb velocity would be increased by >0.3m/s over a width of up to 1km to the south of the western array and through to the Pouto shoreline on the northern side. Seaward of the array peak ebb velocities would be reduced by >0.2m/s for a distance of nearly 4km.

Derek Todd – Geomorphologist

He used the modelling evidence of Dr Christian to infer the impact of the turbine array on sediment transport and morphology. The modelled effects on current velocities will not alter the sediment transport potential through the inlet channel. He also inferred that it would not have a significant effect on adjacent shorelines or channel bathymetry, though this aspect was not investigated in the modelling. Any increase in shoreline instability in the area as a result of the small increase in current velocity would be very difficult to detect according to the modelling of Dr Christian. He accepted that bathymetric survey before and during installation and monitoring and operation was required.

Gary Teear – Coastal Engineer

Discussed the installation of the turbine field and associated engineering challenges. He stated that the project is fully feasible from a construction and installation perspective but is likely to require the fabrication of a sophisticated specialist vessel designed to work in the shallow confines of Kaipara Harbour. The vessel may need to be on site full time once there are 200 turbines in place.

He stressed the importance of scour protection using a flexible concrete mattress for protection given the potential for deep scouring around the turbine units.

Captain Varney – Marine Consultant, Navigation and Safety

Discussed navigation and safety issues related to the turbine field and considered there were no significant navigation issues with existing water traffic. He acknowledged that, in the NRC Harbour Master's opinion, the turbine area would be designated as a prohibited navigation area if the application was approved. In his opinion, policing of the area would most likely become the duty of the operators of the marine turbine complex.

N Eady – Director of Operations and Consultation

Kaipara Harbour is considered the best place to undertake the development envisaged and outlined the benefits. He reported on extensive consultation undertaken with Te Uri O Hau/Environs Holdings, also with commercial and recreational fishers.

He addressed the uncertainty of final turbine selection but noted that the effects-based conditions could be adopted requiring “effects envelope” (eg. the same as or better than).

He emphasised the importance and the need now, and in the future, for power generation from renewable energy sources.

He acknowledged that the harbour is in environmental decline and that iwi wish for a healthy and productive harbour. Recognising this, the Applicant has proposed a Trust, and funding to assist in recovery of the harbour, if the proposal proceeds.

Bill Woods – Electrical Engineer Project Design

His evidence explained the electrical description of the direct current generation and associated advantages as well as the design of the transmission system. He noted that the staging of the project over four distinct stages was important to interface with Northpower’s existing infrastructure. He concluded that the project was in his opinion a modern state-of-art, robust and reliable system, posing a very low risk of failure or danger to the general public and the environment.

Luke Gowing- Expert Marine Biology Witness

Mr Gowing’s evidence described the biological resources and commercial and recreational and customary fishing activity in the Kaipara Harbour.

His evidence covered reporting on his findings with regard to vegetation, water quality, harbour sediments and the benthic ecology of the Kaipara Harbour.

Mr Gowing had taken surveys of the fishing activities in the area of the proposed array and his conclusion was that the main area of line fishing is the shallower reef area known as the “Graveyard”. In his opinion recreational and charter fishing activities do not appear to overlap with the proposed deployment areas. This conclusion was consistent with his analysis of the NIWA aerial survey data and was also consistent with the outcome from consultation with local fishers and boat operators.

In his opinion the potential environmental effects from the installation of the cables and marine turbines on the biological resources, commercial and recreational fishing, elasmobranchs, dolphins and whales in the Kaipara Harbour would be no more than minor.

The comprehensive environmental monitoring programme proposed to be undertaken by CREST is an integral part of the staged nature of the proposed development.

Garry Venus – Project Planner and Environmental Scientist

Garry Venus, an expert in resource management related to hydro generation, with a science degree in marine biology and an engineering post graduate diploma, gave evidence on behalf of the Applicant.

He reiterated the lack of noise issues shown by Mr Hegley's evidence and the Subacoustech research and report, and differing marine mammal sensitivity to the main noise wave lengths of the open hydro now proposed. He concluded that mammal collision was unlikely; there having been no recorded incidents or interest shown by marine mammals in the prototype generator operated. He stated that the Maui Dolphin is ecologically important but concluded that the evidence shows that the risk to them of the proposed installation is less than low.

His view was that the proposed adaptive management approach involving staged implementation and comprehensive baseline monitoring is an appropriate approach. He noted examples where the application and evidence predict no adverse effects, in which the Environment Court has held that uncertainty can be addressed by proceeding with caution [*Jackson Bay Mussels Ltd v Westcoast RC Environment Court C77-2004*]. He emphasised the power to review the consent under s128 to impose more strenuous conditions, including preventing further stages being developed, and the powers of the Environment Court to cancel or modify the consent under s314(1)(a)(ii) and/or s314(1)(e) in appropriate cases.

In his opinion, consenting the full 200 units on the basis of staged implementation, with robust monitoring and review requirements, beginning with the installation of 20 units, is an appropriately cautious approach for these passive generators and concomitant cabling. He acknowledged that a robust and detailed Environmental Monitoring Plan is central to the proposed adaptive management approach.

He agreed with, but challenged the amount of, the suggested bond to secure decommissioning and turbine removal in the remote concern that generation discontinues.

He also outlined in proposed conditions the establishment, funding, and operation of the proposed Kaipara Harbour Environmental Trust to improve the environmental health and enhance the mauri of the Kaipara Harbour and provide associated socio-economic opportunities.

He appended and tabled suggested amendments to the draft conditions proposed by the Northland Regional Council and the Department of Conservation which he said incorporated changes that the Applicant volunteered, to meet submitters' concerns.

6.3 Submitters' Evidence

Rodney Economic Development Trust

Spoke in support of the application and the benefits for the region.

A McGillivray – Submitter in opposition

My McGillivray expressed a wide range of concerns, particularly noting:

- The technology was unproven and associated risks too great;
- The “Graveyard” is one of the most important fishing areas in Kaipara Harbour and it is not appropriate to exclude the area from use;
- Concerns regarding effects of infrastructure requirements and construction;
- Possible adverse effects on tourism opportunities.

Alan Happy – Winstone Aggregates – Expert Witness – Resource and Environmental Manager at Winstones

Conditional support for the application and the proposed adaptive management approach. However he noted that there were gaps that still needed to be addressed. In particular, numerical modelling of impact on sand circulation patterns and deposition including the effects on stability of the Pouto shoreline and sand supply to the consented sand extraction site on Tapura Banks.

In light of the suggestion by Applicant witness Derek Todd, that additional hydrodynamic modelling should be coordinated with other work in the harbour, Mr Happy recommended that a new condition be included noting that the Consent Holder can undertake this further numerical modelling by participating in and contributing to the Kaipara Harbour Entrance Monitoring Programme as relevant.

Dr Ingrid Visser – Submitter in opposition (Worked with Orca for 17 years and has a PhD in this area. Studies marine mammals)

Dr Visser presented an overview of the critical importance of the Kaipara Harbour for marine mammals and expressed concern regarding the potential impacts of the proposed turbine array on them, eg. physical barrier, possible reduction of prey, and/or noise.

Requested that should consent be granted that appropriate investigations be undertaken including modelling and field observations.

Elizabeth Fairgray – Submitter in opposition

Ms Fairgray is a long term property owner in the Pouto area. She presented useful information on use of the Kaipara Harbour area by various marine mammals and highlighted the extensive geomorphic change that has occurred in the vicinity of the Kaipara Harbour entrance since 1852.

Ms Fairgray also expressed concerns about the proposed landfall of the subsea cable at Poutu Point, particularly in regard to potential effects on a proposed wharf in this area.

Information was also presented in regard to historic heritage but could not be taken into account as it was outside the scope of her original submissions.

R Fanselow – Ministry of Fisheries (MFish) – West Coast Inshore Team

Mr Fanselow presented evidence on behalf of MFish. This evidence emphasised the value of the fisheries of the Kaipara Harbour including that a substantial proportion of West Coast schnapper recruitment appears to occur in the Kaipara Harbour. It was MFish's opinion that the proposed site for the generation array is the key area for fish entry to and exit from the harbour and he noted the need for effects to be well established by appropriate investigations to ensure that valuable commercial fisheries within the harbour (eg mullet) will not be adversely impacted. He stated that a wide range of commercial fishermen use the harbour and that this industry is critical to small communities such as Ruawai and Helensville. The evidence emphasised the value of the harbour and the importance of the "Graveyard" area for recreational fishing.

MFish believes that monitoring fish movement is essential and requests input into the development of the Environmental Monitoring Plan and subsequent review of the monitoring results. If consent is granted, knowledgeable commercial and recreational fishers should be involved in this process.

MFish also requested baseline work, prior to installation of the initial turbines, and believed that this work could be completed within a year.

Mr Fanselow referred to the Te Uri o Hau Treaty Settlement and emphasised the importance of the fisheries to Te Uri o Hau. MFish considers that the potential effects of the proposal on customary fishing needs to be considered.

Overall, MFish supports the concept but believed that potential impacts need to be more thoroughly investigated, noting that there was no precedent for this project in a very dynamic area and that a lot of the existing assessment is hypothetical and difficult to predict with certainty.

Kaipara Harbour Sustainable Fisheries Management Study Group (KHSFMSG) – Neil Tiller, Chairperson and Christine Yardley, Secretary

Mr Tiller and Ms Yardley spoke on behalf of the KHSFMSG. Mr Tiller expressed various concerns with the application, noting that the community at Pouto is isolated and poorly placed to participate in the consent process.

Ms Yardley expressed concerns with regard to impacts of the project on Kaipara Fishery, channel and shoreline instability, and the fish breeding pattern. She noted significant information gaps concerning the environmental impacts of multiple device tidal turbine arrays and believed that the environmental effects were largely unknown.

Kaipara is a proposed RAMSAR site wetland of international significance.

Kaipara District Fisheries Hearing Committee (KDFC) - Des Subritzky – Submitter in opposition

Mr Subritzky spoke on behalf of the KDFC. Concerns that the proposal may cause damage to the harbour and shoreline, safety problems for boats using the area, scouring and lack of consultation re the changes to the application.

Mentioned possible effects on boating and coastal shipping in the future, but acknowledged that the area would pose no impediment to shipping unless a “no go” area for navigation was declared.

Farmers of New Zealand (FNZ) – Bill Guest – Submitter in opposition

Mr Guest spoke on behalf of FNZ. Considered that consultation was inadequate and had concerns re the transmission design and possible pylons on farmer’s properties.

Department of Conservation (DoC) – Submitter – Conditional Support:

This submission was supported by the following experts:

Dr Paul Kench – Assoc. Prof., PhD Coastal Geomorphology – Expertise in sediment hydraulics

Dr Kench presented expert evidence on coastal processes on behalf of DoC. His review of the impact of the proposal on coastal processes concurred with the Applicant’s expert, Mr Todd. It was his opinion that the increased velocity may affect the morphological stability of the shoreline but stated that baseline monitoring will be required to discriminate the effects from natural changes. He recommended that three year baseline monitoring occur along the shoreline prior to commencement of the project together with investigation of decadal to centennial scale dynamics to provide a further frame of reference against which the monitoring results can be analysed. He acknowledged the difficulty of discriminating natural from turbine induced changes and indicated that this provided some difficulties for the adaptive management process. On questioning, he also agreed that modelling of sediment dynamics would be required to properly assess the effect of the proposal on channel and shoreline stability.

Dr Samuel Du Fresne – DoC expert witness in marine mammals

Dr Du Fresne presented expert evidence on behalf of DoC addressing the potential impacts of the proposal on Maui’s dolphin. He noted that potential effects include collision, physical barrier, and noise. The risk associated with potential threats is probably small and certainly not quantified. However, while the likely occurrence of fatal interaction with the turbines is probably small, the consequences to a population as critically endangered as Maui’s could be high.

It was his opinion that the concerns may not be an impediment to the development, but he emphasised that they need to be addressed by an appropriate and well designed monitoring programme. He further emphasised the big consequences of getting it wrong given the small population of one of the rarest marine mammal populations in the world (Maui’s Dolphin).

He provided specific recommendations with regard to monitoring and mitigation options.

Katherine Anton – Counsel - Director General of Conservation (DGC)

Ms Anton spoke as Counsel for the DGC.

A legal submission was received from K Anton on behalf of the DGC along with some appended case reports. The distinction between the capacity of the DGC and the Minister of Conservation was drawn to the attention of the Hearing Committee.

The DGC initially opposed the application, but now agreed it may be appropriate to proceed using the proposed staged approach within the parameters of a robust adaptive management regime. The submission gave a context to the cases and the use of an adaptive management plan as has been suggested by and with conditions proposed by the Applicant. The DGC had proposed a set of amended conditions to those of the Applicant.

The evidence of Mr Varney also was referred to and the tabled email from the Regional Harbourmaster which indicated that he would exclude all navigation from the array for navigation safety (no measure of any “stand off” dimensions were given). Ms Anton said that the only evidence that was before the hearing is that proposed turbine placement depths had been increased to facilitate freedom of navigation over the turbines, but that anchoring, diving and fishing within the generation array were inappropriate.

The conclusion of the submission was that the evidence seemed to conform to a suitable application for adaptive management.

Various case law was cited in respect to adaptive management, certification and approval identifying the key ingredients for a robust monitoring regime.

She emphasised the importance of the Environmental Monitoring Plan being subject to Council approval if consent is granted.

Trish Routley – Statutory and Resource Planner for DoC

Ms Routley saw the potential for the proposal to provide sustainable renewable energy and satisfy the Resource Management Act requirements.

She emphasised the considerable uncertainty she had regarding actual measurements of effects on coastal processes, marine mammals, other megafauna and elasmobranchs. Her view was that until baseline monitoring, and then consequential monitoring, is analysed, it is unknown what might be the effects.

Her evidence was clear that she sees a need for three years of baseline observations as a foundation for an adequate Environmental Monitoring Plan standard.

She also observed that the application is not for exclusive occupation and that apart from the seabed, fishing and anchoring, passage over the array should not be excluded.

Her evidence included recommendations for monitoring and amendments to proposed conditions if the application is approved.

McCallum Bros Limited – W McCallum – Submitter in Support

McCallum Bros Limited has applied for resource consent for sand extraction approximately 4km seaward of the proposed Crest Energy Limited’s application, McCallum Bros Limited supports the proposal and does not believe it will impact adversely on its proposed activities of removing sand from the entrance bar by vessels navigating from and returning, loaded, to Onehunga, Manukau Harbour.

Dreamride Charters – Ray Scott – Submitter in opposition – Charter Boat Operator

Mr Scott spoke on behalf of Dreamride Charters. His family has been in the Kaipara for 140 years and has commercially fished the area for over 100 years. He currently operates a charter boat out of Helensville. He stated that the “Graveyard” is one of the most renowned areas in New Zealand for snapper fishing and that 80 – 90% of his business is in that area. He fishes on the northern edge at the deep water area, the area proposed for the turbine array, where there are mussels on the reef, which attract the snapper.

If the application is approved and the area is not available for fishing he and other charter boat operators would be severely affected and probably lead to their businesses closing.

If consent is granted he sought to be involved in the adaptive management plan. In his view, if a “no go” zone is applied it must be clearly identified.

Energy Efficiency and Conservation Authority (EECA) – Rose Feary – Submitter in support

Ms Feary, a Renewable Energy Advisor with EECA stated that EECA supported the proposal as it is a renewable energy development that will make a very valuable contribution to New Zealand’s energy target, government energy policy and international commitments.

With specific regard to the Resource Management Act 1991, EECA submitted that the proposal is consistent with Part II, Sections 7(i) and 7(j) and should be given significant weight in the consideration required to achieve the purpose of the Act.

Northern Wairoa Boating Club (NWBC) – Wayne Crump – Submitter in opposition

Mr Crump spoke on behalf of the NWBC. The NWBC considered a part of its fishing area would be lost forever. In his view the project was based on modelling and limited real information. It will have an impact on coastal shipping and will create a safety hazard because of limitations imposed on anchoring.

Waikaretu Marae and Environs Holdings – Submitters in Opposition

Peter Nuttall introduced Hugh Nathan, Wiremu Wright (Kaumatua), Mihi Watene

Mr Nathan (Te Uri o Hau) is a long time resident and spoke of his experience of flying over the proposed site of the generation array. He said he was originally in support of the project but, during the flight, when he saw all the boats fishing he thought about the ancestors who had fished there.

Wiremu Wright – Director of Environs Holdings gave an account of the histories of Te Uri o Hau and how four of their Marae had received copies of the apology from the Crown re their rightful ownership. The Claim (Wai 271) Settlement Process acknowledged the cultural, spiritual, historic and traditional association of Te Uri o Hau with the Kaipara Harbour and the Statutory Acknowledgement had reaffirmed Te Uri o Hau’s status as the kaitiaki of this area.

Mihi Watene introduced herself and spoke of her family and outlined the obligations their ancestral marae has to all other whanau marae. She stated that the Kaipara Harbour is not a pristine harbour, but is a spiritual place for Te Uri o Hau. Their people have always lived off the water which is considered their “foodbasket” and she was concerned of the possible effects on that resource. Mihi considered that trust and patience was needed and emphasised the importance of proper monitoring processes.

Juliane Chetham – Manager of Environs Holdings Limited, a subsidiary of the Te Uri o Hau Settlement Trust responsible for the implementation of activities that advance the wellbeing of people and their environment within the Te Uri o Hau rohe, submitted her concerns regarding the many “unknowns” involved in this application and asked that the application be declined. In the event of the Commissioners granting approval she considered that serious consideration should be given to their submissions regarding monitoring, adaptive management and mitigation in the conditions of consent.

The Cultural Impact Assessment (CIA) submitted covered the concerns of Te Uri o Hau which included:

- Delay consideration of application until more concrete testing of effects is completed in real world deployment of similar power plants overseas, and
- Re-evaluate when complete information is available- e.g. turbines are chosen and data of the technical construction and operation of these turbines is available.

She said that there had been preliminary discussions with the Applicant regarding potential mitigation measures but at this stage they were still opposed.

The CIA had also stated that a social impact assessment should have been undertaken and she considered this had been validated by the officer's report who had considered the social impacts of the proposal on fisheries and vessel movements.

Concerns were expressed with regard to consultation and the fact that Ngati Whatua and neighbouring iwi should not have been ignored nor excluded.

Mr P Nuttall – Witness for Environs Holdings Ltd.

Mr Nuttall assisted in the design, facilitation and preparation of the CIA and stated he was available to answer any queries the Commissioners may have regarding that document.

He submitted that the Officers' Report indicated that the Harbourmaster had determined that navigation over the generation array would be prohibited and Mr. Nuttall expressed concerns on the effects this exclusion would have on the customary rights of Te Uri o Hau.

Patrick Paraone, Chairperson - Waikaretu Marae

Mr Paraone, in opposition to the application, voiced his concerns regarding economic development and social well-being not being addressed by the application. He spoke of the surrounding lands being zoned 30 years ago for forestry and the Kaipara Harbour being used to ship out the logs. He could not see any benefits to the local community if this application was approved. He wanted unrestricted use of the harbour as this was paramount for the whanau of the area.

Marina Fletcher- Trustee of Pouto Topu A Trust Board

She expressed concerns on the size of the project, the lack of assessment of the effects the proposal could have on the cultural or spiritual or other special values for present or future generations of the tangata whenua living on the rivers that fed into the Kaipara. She sought further consultation by the Applicant with tangata whenua.

Auckland Conservation Board (ACB)–Kathy Walsh

The submitter presented evidence that had not been precirculated as required which had raised issues that were not in the ACB's original submission. The submission supported in principle the concept of renewable alternative energy generation, including tidal energy but had concerns with this application because of possible effects on elasmobranchs, maui dolphin, installation vessels carrying quantities of contaminants and the possibility of the turbines moving around on the seabed by storm surge.

7. PRINCIPAL ISSUES

The principal issues that were in contention were:

- (a) Marine mammals and Elasmobranchs
 - Collision/obstruction
 - Noise
 - Electromagnetic fields

The concern regarding marine mammals is that they may be injured in collision with the generating turbines, or be so affected by noise from the turbines creating a barrier excluding them from the harbour feeding and breeding areas.

- (b) Fisheries and commercial fisheries
 - Fish entry to, and exit from, the harbour
 - Restrictions on fishing within popular recreational fishing grounds

Commercial fishing within the harbour could be harmed if the food chain was broken by generators or the noise or other affects obstructed access for breeding or feeding, of either target fish or food sources of such target species. Generating turbines and fishing at the same location are incompatible so the array as an area popular for recreational fishing, including fishers who utilise charter operators, would be excluded and thus restricting their activity.

- (c) Navigation and safety
- Safety for water users
 - Navigation restriction over area of turbines

Navigational freedom was important to many. There was clear difference of view about navigation within the array by passage, although the need to exclude anchoring, fishing and diving, from within the array and anchoring within the transmission cable corridor was accepted.

- (d) Hydrodynamics, sediment transport, and morphology/erosion
- Impacts on tidal flows
 - Erosion of Poutu shoreline
 - Effects on bathymetry and scour
 - Effects on sediment supply to sand extraction

The effect of both the constriction of water flows affecting water speeds, thus the erosion and accretions of the Kaipara were concerns for some submitters.

- (e) Tangata Whenua
- Kai moana gathering
 - Exclusion from area
 - Te Uri o Hau Settlement Deed

The health of the harbour is a vital interest of the indigenous people whose life enjoys sources in the Kaipara. More extraction from the harbour, and access limitations, without clear returns and restorative contribution were opposed and contrary to tangata whenua wishes, recognising that their kaitiaki status has been reaffirmed by Statutory Acknowledgement.

- (f) Maintenance
- Water quality and biofouling.

The possible injury to the health of the immediate surrounds, and on the harbour generally from dissolving chemical antifoulants, loading of waste and detritus from maintenance.

- (g) Heritage
- Some concern was expressed for the local people who see potential for disruption of the remoteness of Poutu, access and experience, and for the loss or injury to historic artefacts by the works involved for the proposal.

- (h) Decommissioning
Remnants of industrial material left on discontinuance of the tidal generation under this application if consented together with damage to the environment and surrounds needed to be avoided to resolve some issues.

8. MAIN FINDINGS OF FACT

The Hearing Committee considers that the following are the main facts relating to this application:

- (a) There is a national need for renewable generation of electricity, such as tidal generation. It is also efficient to have generation near to the point of consumption. This application satisfies both these criteria. There was no evidence contradicting this. However, there was some resistance to the location as intruding on present occupiers and users of the harbour.

The Hearing Committee concurred that the constraints on transmission of power through the Auckland isthmus puts the area north of Auckland at risk in respect of continuity of power supply.

- (b) Evidence from the experts showed that Electromagnetic fields (EMF), collision/obstruction and noise from the proposal were unlikely to have any effect on benthic life, elasmobranchs, fish or marine mammals.
- (c) The adverse effects of the proposal on commercial and recreational users relate to reduced access to the Kaipara Harbour entrance to popular fishing locations (e.g. the "graveyard"), notwithstanding the tidal flows that limit fishing to about two hours around low tide.
- (d) The evidence that was received by the Hearing Committee did not enable it to reach a finite conclusion regarding any potential for adverse effects on fish entry to or exit from the harbour, habitat or migratory patterns.
- (e) The Kaipara harbour entrance is relatively remote. Only low levels of marine mammal presence within the harbour could be established. However, more studies are needed to verify the effects on marine mammals and other megafauna from the installation and operation of the generating turbines and accompanying plant and cabling.
- (f) While a wide range of concerns over the potential for adverse environmental effects were expressed during the hearing, there was no evidence presented that clearly showed that adverse environmental effects would be more than minor.
- (g) The natural draft limitation at the entrance to the Kaipara Harbour is approximately 4 metres below Chart Datum. The draft limitation to navigation over the generation array will be approximately 7 metres below Chart Datum. Therefore the array would be unlikely to physically compromise the passage of vessels over the array.

- (e) The generation array would not be a safe area within which to anchor, fish, dive, or carry out similar activities.
- (f) In the event that the buried transmission cable between the array and the landfall becomes exposed, this can be satisfactorily remedied by either reburial or by the use of protective matting.
- (g) The transmission cable landfall at Pouto is in an area of relatively high use by people. The use of directional drilling across the foreshore at the landfall would avoid adverse environmental effects associated with a trench at this location.
- (h) The potential for erosion and adverse accretion, or reduced mineral conveyance in and out of the harbour was shown as virtually unchanged by the proposal. However this should be confirmed by the preliminary monitoring and by the observation after the installation of Stage 1.
- (i) The generation array will cause some changes to tidal flows in and immediately adjacent to the array. Increased tidal velocities will occur adjacent to the array. Reduced tidal velocities will result immediately downstream of placed turbines.
- (j) The Hearing Committee recognised that, by Statutory Acknowledgement, Te Uri O Hau is the kaitiaki for the locations covered by the proposal. The Kaipara Harbour has been the main source of kai moana for tangata whenua, who regard the harbour as their “food basket”.
- (k) The visual effects of the proposal will be no more than minor, as the installation is underwater. Only navigation aids and work boats will be visible.
- (l) The required maintenance of the turbines will result in the removal of biofouling and other material from these units. Any biocidal component of this material will be a contaminant that would need to be dealt with in a way that would not cause adverse effects on water quality.
- (m) The entrance to the Kaipara Harbour is a known location of a number of shipwrecks, some of which will have historic heritage value under the Historic Places Act 1993. The Hearing Committee was not presented with any assessment of the effects of the proposal on any site of historic heritage that might be affected by the proposal.
- (n) The generation array may be decommissioned at some future date and it is appropriate to make provision to ensure that all facilities associated with the proposal are removed from the seabed at that time.

9. RELEVANT STATUTORY PROVISIONS

9.1 Policy Statements and Plan Provisions

In considering this application, the Hearing Committee has had regard to the matters outlined in Section 104 of the Act. In particular, the Hearing Committee has had regard to:

- (a) The relevant provisions of the following planning documents:
 - The New Zealand Coastal Policy Statement;
 - The Regional Policy Statement for Northland (RPS);
 - The Regional Coastal Plan (RCP);

- (b) The Te Uri o Hau Claims Settlement Act 2002.

Some elements of the proposed activity contravene Section 15 of the Act, and therefore the Hearing Committee has also had regard to the matters outlined in Sections 105 and 107 of the Act.

9.2 Part 2 Matters

The Hearing Committee, under Section 5 considered:

- The use of tidal energy, being a natural and physical renewable resource, as providing a power generation source for the benefit of people and communities, and with this generation having the potential to displace other less environmentally sustainable generation sources.
- The sustainable nature of the extraction of tidal energy to produce electrical power.
- The improvement to the present security of electricity supply to Northland, even though this would be limited to the operating periods of the tidal generating plant.

The Hearing Committee, under section 6, recognised and provided for the following matters of national importance:

- The natural character of the coastal environment would not be compromised by the proposal.
- The proposed generation array is located within an area of known habitat of indigenous fauna. This has been provided for by adopting an adaptive management approach involving baseline monitoring and a staged development.
- Public access to the generation array area will be limited, but the degree of restriction of public access is not major in the context of the overall harbour. It would be inappropriate to provide for unrestricted access to the generation array area for safety reasons.

- In regard to the relationship of Maori and their culture and traditions with sites of the proposal, the Hearing Committee recognises Te Uri O Hau as kaitiaki and has provided for this by requiring three representatives of Te Uri O Hau on a “Kaipara Harbour Environment Trust” as a consent condition.
- The generation array may contain historical heritage sites. Conditions of consent provide for the identification of such sites and the involvement of the New Zealand Historic Places Trust in the event that such sites or items are discovered.

The Hearing Committee had regard to the following matters under Section 7:

- Kaitiakitanga as practiced by local tangata whenua.
- The general responsibility towards the natural environment of the Kaipara Harbour conveyed by the ethic of stewardship.
- The efficient use of the tidal energy, being a natural and physical resource.
- The intrinsic value of ecosystems such as those relating to megafauna species and the need to maintain these values.
- The maintenance of the quality of the waters of the Kaipara and its coastal marine area generally.
- The benefits that will be derived through use of the renewable tidal energy resource.

The Hearing Committee also took into account the principles of the Treaty of Waitangi in reaching its decision.

10. SECTION 104D

The Hearing Committee was satisfied that the adverse environmental effects of the activity of Stage 1 were sufficiently minor that the proposal could proceed, but that future stages depended on the monitoring programme confirming that any adverse environmental effects of the proposal were minor. In respect of the relevant objectives and policies, future confirmation of only minor adverse effects, if any, in regard to marine megafauna would enable the proposal to also comply with Section 104(1)(b) of the Act.

11. SECTION 105 OF THE ACT

The Hearing Committee conclude that the incidental discharges of sediments and biological residue arising during installation and cable installation, and maintenance and the discharge of heat were not significant in respect of the sensitivity of the receiving waters, and there were no alternative methods of such discharge nor opportunity for discharge into another receiving environment.

However, it considered that there were viable alternatives to the discharge of biocidal contaminants arising during maintenance of the turbines.

12. SECTION 107 OF THE ACT

In respect of the suspension of sediments during installation works and ballasting of the structures and the laying of transmission cables, the Hearing Committee found that this would not likely be conspicuous nor have any significant effects on aquatic life, and would be of a temporary nature.

It also considered that the discharge of biological residue and sediment during cleaning of the turbine units was not likely to give rise to material that will prevail in suspension for any length of time and, in any event, will be necessary maintenance work to maintain the efficiency of the marine turbine units.

However, if biofouling management includes removal of biocidal material, then such a discharge could give rise to adverse effects on aquatic life because the maintenance of 200 units would be a regular and ongoing activity. It was not convinced that the level of dilution afforded by the Kaipara entrance tidal flows, even though this would be high, justified the discharge on the basis that it was associated with necessary maintenance work.

The Hearing Committee found that the discharge of heat to coastal water from the cables and turbine units would be so low as to be most unlikely to give rise to any adverse effects on aquatic life either at Pouto or at Tikinui/Raupo.

13. RECOMMENDATION AND DECISIONS

A. PROCEDURAL MATTERS

The Hearing Committee resolved:

- (1) That the failure by The Energy Efficient and Conservation Authority, to meet the statutory timeframes in lodging its submission, be waived on the basis that its submission provides relevant information that would not otherwise be available to the Hearings Hearing Committee and was only one day late.
- (2) That the failure by submitters C Crosby, A R House, I M Johnson, B and L McPhun, K Nathan, I M Johnson and Transit New Zealand, to meet the statutory time requirements for lodging of submissions, not be waived for the reasons that they are late and raise no new matter not already adequately raised in other submissions. In the case of the submission from I M Johnson, the submission was significantly late and on the submission from Transit New Zealand it was also considered to be no longer relevant to the (revised) proposal.

B. RECOMMENDATIONS TO THE MINISTER OF CONSERVATION

CON20061607601 – 02 Notified New

B 1 Pursuant to Section 104B of the Act, the Hearing Committee recommends that the Minister of Conservation grants consent to:

**CREST ENERGY KAIPARA LIMITED, C/O ARGO ENVIRONMENTAL LIMITED,
PO BOX 105774, AUCKLAND CITY, AUCKLAND 1143**

To carry out the following activities:

- (01)** Occupy the coastal marine area (CMA) with a generator array of up to 200 marine turbine generating units and ancillary structures (including navigation structures and cable junction unit(s)) on the bed of the Kaipara Harbour, within generator array area boundary location co-ordinates at or about 1697825E 5970820N, 1703085E 5970735N, 1703085E 5969700N, 1697825E 5970110N.
- (02)** Disturb the foreshore and seabed during burial of two, seven kilometre long, electric transmission cables between a generator array at the entrance to the Kaipara Harbour and a landfall at Pouto at or about location co-ordinates 1706025E 5975140N.

Advice Note: All location co-ordinates in this document refer to Geodetic Datum 2000, New Zealand Transverse Mercator Projection.

Subject to the following conditions:

ACTIVITIES IN GENERAL ACCORDANCE WITH APPLICATION

- 1 That subject to compliance with the conditions of this consent the activities authorised by this consent shall be undertaken in general accordance with the application and documents submitted as part of the application.

For the avoidance of doubt, where information contained in the application documents is contrary to the conditions of these consents, the conditions shall prevail. Where information contained in the application documents is contrary within itself, there shall be a presumption that the document which is the most recent in time and/or the most specific will prevail.

Advice Note: The documents referred to in Condition 1 include:

- *Crest Energy Limited Resource Consent Applications and Assessment of Effects on the Environment July 2006;*
- *Crest Energy Limited Revised Application for Resource consents and Further Information Pursuant to S 92 RMA September 2006;*
- *Crest Energy Limited Subsea Cables to Pouto Point and Wairoa River Crossing at Tikinui July 2007;*
- *Crest Energy Limited Substation Site Drawings September 2006;*
- *Crest Energy Limited S92 Response January 2008;*
- *Flow Modelling report No.2 January 2008;*
- *Draft Environmental Monitoring Plan, November 2007;*
- *Crest Energy Limited's revised response re Decommissioning Costs 2008;*

- *Crest Energy Limited's further response re Decommissioning Costs 2008;*
- *Crest Energy Limited's DTec Consulting Limited Assessment of Effects on Coastal Processes January 2008;*
- *Crest Energy Limited DTec Consulting Comment on Dr Paul Kench comments February 2008;*
- *Crest Energy Limited Feedback on Department of Conservation Review by Jonas Teilmann 2008.*

LAPSE

- 2 Except as provided for in Condition 3, this consent shall not lapse until ten years after the date of commencement of the consent.
- 3 The works for each Stage shall be undertaken in accordance with the construction timetable required in Conditions 17 and 18. If this condition is not met the Council may initiate a Section 128 Review for the purposes of determining whether the consents will be:
- (a) Amended to continue to the extent to which effect has been given to the consent, but lapse for the undeveloped portion of the area authorised for the proposal or;

Under section 125 of the Resource Management Act 1991:

- (b) Be considered to have lapsed or;
- (c) Be extended.

STAGING OF DEPLOYMENT

- 4 The consent shall be exercised in a staged manner as follows:

Preliminary stage:

Preparation and implementation of an Environmental Monitoring Plan in accordance with the conditions of Resource Consent CON20061607603-13, minimum of one year monitoring and observation followed by evaluation, then preparation of the consequent Biosecurity Management Plan and Operation and Maintenance Plan required by conditions in that consent.

Generation instalment stages, following the adaptive management process provided in CON20061607603-13:

Stage	Number of Units	Cumulative Number of Units
1	20	20
2	20	40
3	40	80
4	120	200

Advice Note: Staging was adopted in view of the uncertainties available at the time of application with regard to actual and potential adverse effects

- 5 This consent is subject to the conditions precedent:
- (a) That the monitoring, required before stage 1, is carried out, and that the results satisfy the Council that it is very probable that implementation will not give rise to significant adverse effects on cetacean or elasmobranchs.
 - (b) That after Stage 1 the monitoring results satisfy the Council that it is very probable that the development beyond Stage 1 (20 turbine units) will not give rise to significant adverse effects on cetacean or elasmobranchs.
- 6 Deployment of each Stage following Stage 1 shall be subject to the Council's approval following a review as set out in Condition 30 of this consent.

Advice Note: Development of the generation array by the Consent Holder from Stage 1 to subsequent stages shall be based on an adaptive management regime.

Monitoring results and other sources of information will be used to form decisions on continuation to the next stages. Components of the monitoring will be assessed against agreed criteria to determine if the proposal is having unacceptable adverse effects. Other more general information may be used to provide a broader context for understanding actual or probable effects. As part of this assessment, the Council, after consultation with the Consent Holder, may require the Consent Holder to provide further information to assist its determination.

This assessment will result in one of the following decisions by the Council:

- (a) The level of effect is considered to be acceptable, and development to the next Stage may proceed.*
- (b) The level of effect is considered unacceptable, and down-scaling of existing array is required to reduce effects to acceptable levels.*
- (c) The level of understanding of turbine effects is considered insufficient, and further development will be put on hold until additional assessment or investigations provide information suitable to support either decisions (a) or (b).*

- 7 In the event that the Council determines that the proposal is having unacceptable adverse effects, the Consent Holder, after consultation with the Council, shall adapt the proposal to the extent necessary to avoid those identified adverse effects. The adaptation of the proposal shall include, as necessary, but not be limited to, the following:
- (a) Reduction in turbine numbers;
 - (b) Removal of the turbines and transmission cable;
 - (c) Not implementing subsequent stages in whole or in part.

OCCUPANCY

- 8 The occupancy area is restricted to:
- (a) That part of the general array area where turbines and ancillary structures including junction boxes are installed; and
 - (b) The transmission cable route, once the transmission cable is installed.
- 9 The Consent Holder is, by this consent, authorised to prohibit anchoring, fishing and diving within the array and along the cabling route but shall not exclude navigational passage within elevations above minus seven metres below Chart datum on NZ Chart 4265 Kaipara Harbour except:
- (a) Within the site and during installation and maintenance; or
 - (b) Pursuant to any authority and/or at the direction of the harbour authority under the Local Government Act 1974.

GENERATION ARRAY AND CABLES

- 10 The generation array shall be located within the area defined by the four corner location co-ordinates at or about 1697825E 5970820N, 1703085E 5970735N, 1703085E 5969700N, 1697825E 5970110N.
- 11 The location of the transmission cable route between the generation array and Pouto shall be generally as shown on NRC plan 4205A **attached**.
- 12 Navigation marks defining the generation array area shall be placed by the Consent Holder as required by the harbour authority for the array area. The Consent Holder shall maintain all such navigation marks.

CONSTRUCTION

- 13 The Consent Holder shall install that section of transmission cabling which crosses the foreshore zone at Pouto, by directional drilling or similar method. The transmission cabling so installed shall be located at least two metres below the upper surface of any sandstone or similar material that is exposed at the time of installation or which could be exposed as result of normal coastal processes at the location. In the event that no such sandstone or similar material is present, then the transmission cabling shall be located no less than three metres below the lowest foreshore level that may exist as a result of normal coastal processes at the location. Trenching of the foreshore shall not occur.

Advice Note: This condition recognises that this location is used for a variety of activities, such that it is appropriate to locate the transmission cabling more remotely from the surface of the foreshore.

- 14 The Consent Holder shall provide a copy of the plan of the proposed cable route across the foreshore and the intended depth of burial, together with details of the geomorphic stratification at the site to the Council no later than one month before the intended date of installation of this section of the transmission cable.
- 15 At least six months prior to commencing installation of turbines, cables or ancillary equipment for each stage, the Consent Holder shall notify the Council in writing of the intended date of commencement of each of:
 - (a) Foundations for turbines and turbine placement;
 - (b) The installation of the transmission cable between the generation array and Pouto; and
 - (c) The installation of transmission cable between Tikinui and Raupo.
- 16 At least 20 working days prior to the commencement of installation works for each stage of the development the Consent Holder shall notify the Council in writing of the exact locations (surveyed grid references shown on a plan) of the components of that stage (turbine units, cabling and ancillary equipment).
- 17 At least 20 working days prior to the commencement of installation works for conductor cables, replacement cables or substitution cables, the Consent Holder shall submit to the Council the following:
 - (a) Engineer certified final design details and the construction methodology for the cable installation, and scour protection;
 - (b) A construction timetable for (a) above.
- 18 The Consent Holder shall, at least 10 working days prior to the proposed start date for each of the generation installation stages 1, 2, 3 and 4, notify the Council in writing of the proposed date of commencement and the timetable for the proposed stage works to be installed.
- 19 At least 10 working days before the date of first installation of turbines, the Consent Holder shall notify the Council in writing, the commencement date of first installation of turbines.
- 20 At least 10 working days prior to the commencement of installation of turbines, cables and ancillary structures, the Consent Holder shall notify Maritime New Zealand and Land Information New Zealand in writing to the specification standards of those organisations of:
 - (a) The proposed works;
 - (b) Their geographical location;
 - (c) Placement and type of navigation marking; and
 - (d) Any installation or action which may affect bottom contours, navigation aids or safe navigation.

- 21 No works in the coastal marine area (including installation) shall take place until the Council has been provided with the Environmental Monitoring Plan, the Operation and Maintenance Plan, and the Biosecurity Management Plan in accordance with Conditions 32 to 61 of Consent CON20061607603 - 13.
- 22 The Consent Holder shall within one month after each year from the date of commencement of this consent, provide the Council with an Annual Report on what was done in that year and is proposed for the following year including:
- (a) Engineering and construction work;
 - (b) Programmed maintenance and fixtures replacement, substitution and removal;
 - (c) Generation capacity and power utilisation of the installation over the year;
 - (d) Supply location and plans of any updates to “as built” in respect of all relocations of turbines, ancillary installations or cables.

OPERATION

- 23 The Consent Holder shall exercise this consent in a manner which ensures that the quality of the receiving waters at any point:
- (a) 200 metres outside the generation array area, and
 - (b) 100 metres either side of the position of the transmission cable route to Pouto, where outside the 200 metre mixing zone for the generation area, and
 - (c) 100 metres either side of the transmission cable crossing at Tikinui/Raupo,

as a result of exercise of these consents, always meets the following standard:

Natural pH	Not changed by more than 0.2 units
Concentration of Dissolved Oxygen	Not reduced below 80% saturation
Natural Visual Clarity	Not reduced more than 20%
Natural Hue	Not changed more than 10 Maunsell units
Oil/grease Film, Scum, Foam, Odour	No conspicuous oil or grease film, scums or foams, floatable or suspended materials, or emissions of objectionable odour

- 24 Where from any cause any contaminant escapes from the Consent Holder's operations otherwise than within limits in this consent the Consent Holder shall:
- (a) Immediately take such action, or execute such work as may be necessary, to stop and/or contain such escape;
 - (b) Immediately notify the Council by telephone of an escape of contaminant;

- (c) Take all reasonable steps to remedy or mitigate any adverse effects on the environment resulting from the escape; and
 - (d) Within seven days report to the Council in writing on the substances and volume of the contaminant, the cause of the escape and the steps taken or being taken to effectively control or prevent such escape.
- 25 The Consent Holder shall ensure that any structure permitted to occupy the coastal marine area by this Consent is maintained in a good and sound condition, and shall make any repairs that are necessary.

Advice Note: Further resource consents may be required before some repairs can be undertaken.

- 26 Prior to the expiry, cancellation, or lapsing of this consent the Consent Holder shall remove all generating and other plant, structures, cables, navigation and cable marks and other materials and refuse associated with this consent from the consent area, and shall restore the consent area to the satisfaction of the Council, unless an application for a replacement consent has been properly made beforehand.
- 27 In the event that generation is permanently ceased from part or all the generation array during the term of this consent, then the Consent Holder shall remove all relevant plant, structures, cables, navigation and cable marks and other materials and associated refuse from the coastal marine area.

MONITORING

- 28 The Consent Holder shall, as part of the Environmental Monitoring Plan required in consent CON20061607603–13, at no more than two yearly intervals monitor the depth below seabed of the transmission cables to Pouto Point and shall, within one month of each survey, provide the results to the Council. Except where the transmission cables are covered by a protective matting, if the cables are exposed at the seabed at any point, then remedial work shall be undertaken to:
- (a) Return the burial depth to no less than one metre; or
 - (b) Install protective matting over the cable.
- 29 If, after any five year period of records, there has been no incident of monitored cable exposure, then the required survey interval shall extend to five years. Should any subsequent survey show cable exposure at the seabed at any point on the cable, other than that covered by protective matting, then the survey interval shall return to two yearly.

REVIEW

- 30 The Council, may, in accordance with Section 128 of the Resource Management Act, and subject to Section 119A of the Act, serve notice on the Consent Holder of its intention to review the conditions of this consent. Such notice may be served at the following times:
- (a) annually within one month commencing after each anniversary of the date of commencement of this consent; or

- (b) within one month commencing after the date of receipt of any report or estimate required from the Consent Holder by the conditions of this consent; or
- (c) at any time after the date reasonably required by the Council for supplying by the Consent Holder to the Council any report or estimate or validation of any report or estimate.

31 The review may be initiated for any one or more of the following purposes:

- (a) To deal with any adverse effects on the environment that may arise from the exercise of the consent and which it is appropriate to deal with at a later stage, or to deal with any such effects following assessment of the results of the monitoring of the consent and/or as a result of the Council's monitoring of the state of the environment in the area;
- (b) To require the adoption of the best practicable option to remove or reduce any adverse effect on the environment;
- (c) To provide for compliance with rules in any regional plan that has been made operative since the commencement of the exercise of the consent;
- (e) To deal with any material inaccuracies that may in future be found in the information made available with the application. (Notice may be served at any time for this reason);
- (f) To determine whether the Consent Holder might proceed to subsequent Stages in the Project, based on the findings of Conditions 32 to 71 of Consent CON20061607603-13, and any other information provided by the Consent Holder in relation to environmental effects;
- (g) To determine whether the consents will be considered under Condition 3 if the consent has not been exercised within required time or time agreed by the Council.

The Consent Holder shall meet all reasonable costs of any such review.

EXPIRY DATE: 30 MAY 2043

B. 2 That part of the application relating to the occupation of the western end of the proposed generation array area, be declined

C. DECISION OF THE NORTHLAND REGIONAL COUNCIL

CON20061607603-13 Notified New

C. 1 Pursuant to Section 104B of the Act, the Hearing Committee grants consent to:

**CREST ENERGY KAIPARA LIMITED, C/O ARGO ENVIRONMENTAL LIMITED,
PO BOX 105774, AUCKLAND CITY, AUCKLAND 1143**

To carry out the following activities:

- (03)** Install a generator array of up to 200 marine turbine generating units and ancillary structures (including navigation structures and cable junction unit(s)) on the bed of the Kaipara Harbour.
- (04)** Occupy the seabed with electric circuit and transmission cables located in the vicinity of the generator array.
- (05)** Extract energy from tidal currents by using rotating discs within each marine turbine unit.
- (06)** Disturb the seabed during placement of structures.
- (07)** Discharge suspended sediments arising from seabed disturbance when placing structures within the generation area and during installation and maintenance of submarine cables along the transmission cable route.
- (08)** Discharge biological residue and sediment arising from ballasting of seabed structures and cleaning and maintenance of marine turbines.
- (09)** Discharge contaminants arising from bio-fouling management of submerged marine structures.
- (10)** Discharge heat to natural waters in the coastal marine area from the generator units and cables.
- (11)** Place, use and occupy the coastal marine area with two, seven kilometre long, electric transmission cables in the seabed from a generator array at the entrance to the Kaipara Harbour to a landfall at Pouto.
- (12)** Place, use and occupy the coastal marine area under the bed of the Northern Wairoa River between Tikinui and Raupo, with a 200 millimetre diameter plastic conduit, approximately 700 metres long, containing electric transmission cables.
- (13)** Discharge heat to natural waters within the coastal marine area from two, seven kilometre long, electric transmission cables to Pouto; and from the plastic conduit containing electric transmission cables, between Tikinui and Raupo.

Advice Note: All location co-ordinates in this document refer to Geodetic Datum 2000, New Zealand Transverse Mercator Projection.

Subject to the following conditions:

ACTIVITIES IN GENERAL ACCORDANCE WITH APPLICATION

- 1 That subject to compliance with the conditions of this consent the activities authorised by this consent shall be undertaken in general accordance with the application and documents submitted as part of the application.

Advice Note: The documents referred to in that condition include:

- *Crest Energy Limited Resource Consent Applications and Assessment of Effects on the Environment July 2006;*
- *Crest Energy Limited Revised Application for Resource consents and Further Information Pursuant to S 92 RMA September 2006;*
- *Crest Energy Limited Subsea Cables to Pouto Point and Wairoa River Crossing at Tikinui July 2007;*
- *Crest Energy Limited Substation Site Drawings September 2006;*
- *Crest Energy Limited S92 Response January 2008;*
- *Flow Modelling report No.2 January 2008;*
- *Draft Environmental Monitoring Plan, November 2007;*
- *Crest Energy Limited's revised response re Decommissioning Costs 2008;*
- *Crest Energy Limited's further response re Decommissioning Costs 2008;*
- *Crest Energy Limited's DTec Consulting Limited Assessment of Effects on Coastal Processes January 2008;*
- *Crest Energy Limited DTec Consulting Comment on Dr Paul Kench comments February 2008;*
- *Crest Energy Limited Feedback on Department of Conservation Review by Jonas Teilmann 2008.*

Advice Note: For the avoidance of doubt, where information contained in the application documents is contrary to the conditions of this permit, the conditions shall prevail. Where information contained in the application documents is contrary within itself, there shall be a presumption that the document which is the most recent in time and/or the most specific will prevail

MARINE TURBINE TECHNOLOGY

- 2 The marine turbine technology used shall be an open vane turbine unit (e.g. Openhydro) or equivalent device which has a similar effects envelope.

LAPSE

- 3 Except as provided in Condition 4, this consent shall not lapse until ten years after the date of commencement of the consent.
- 4 The works for each stage shall be undertaken in accordance with the construction timetable required in Condition 14. If this condition is not met the Council may initiate a Section 128 Review for the purposes of determining whether the consents will be:
 - (a) Amended to continue to the extent to which effect has been given to the consent but lapse for the undeveloped portion of the area authorised for the proposal; or

Under section 125 Resource Management Act 1991:

- (b) Be considered to have lapsed; or
- (c) Be extended.

STAGING OF DEPLOYMENT

5 The consent shall be exercised in a staged manner as follows:

Preliminary stage:

Preparation and implementation of an Environmental Monitoring Plan in accordance with the conditions of Resource Consent CON20061607603-13, minimum of one year monitoring and observation followed by evaluation, then preparation of the consequent Biosecurity Management Plan and Operation and Maintenance Plan required by conditions in that consent.

Generation instalment stages, following the process of the adaptive management process provided in CON20061607603-13:

Stage	Number of Units	Cumulative Number of Units
1	20	20
2	20	40
3	40	80
4	120	200

Advice Note: Staging was adopted in view of the uncertainties available at the time of application with regard to actual and potential adverse effects.

6 This consent is subject to the conditions precedent:

- (a) That the monitoring required before stage one is carried out, and that the results satisfy the Council that it is very probable that implementation will not give rise to significant adverse effects on cetacean or elasmobranchs; and
- (b) That after stage one the monitoring results satisfy the Council that it is very probable that the development beyond stage 1 (20 turbine units) will not give rise to significant adverse effects on cetacean or elasmobranchs.

7 Deployment of each stage following stage 1 shall be subject to the Council's approval following a review as set out in Condition 85 of this consent.

Advice Note: Development of the generation array by the Consent Holder from Stage 1 to subsequent stages shall be based on an adaptive management regime.

Monitoring results and other sources of information will be used to form decisions on continuation of the next stages. Components of the monitoring will be assessed against agreed criteria to determine if the proposal is having unacceptable adverse effects. Other more general information may be used

to provide a broader context for understanding actual or probable effects. As part of this assessment, the Council, after consultation with the Consent Holder, may require the Consent Holder to provide further information to assist its determination.

This assessment will result in one of the following decisions by the Council:

- (a) The level of effect is considered acceptable, and development to the next stage may proceed.*
- (b) The level of effect is considered unacceptable, and downscaling of existing array is required to reduce effects to acceptable levels.*
- (c) The level of understanding of turbine effects is considered insufficient, and further development will be put on hold until additional assessment or investigations provide information suitable to support either decisions (a) or (b).*

8 In the event that the Council determines that the proposal is having unacceptable adverse effects, the Consent Holder, after consultation with the Council, shall adapt the proposal to the extent necessary to avoid those identified adverse effects. The adaptation of the proposal shall include, as necessary but not be limited to, the following:

- (a) Reduction in turbine numbers;
- (b) Removal of the turbines and transmission cable;
- (c) Withholding approval to implement subsequent stages in whole or in part.

9 The Consent Holder may not progress to or commence any stage beyond stage 1 until advised in writing by the Council of its decision that:

- (a) The current number of turbines is not having any unacceptable adverse effects; and
- (b) The Environmental Monitoring Plan and other relevant observations and information show that any subsequent stage is not likely to have any unacceptable adverse effects as a stage and cumulatively with earlier stages.

10 In the event that the Council determines that the proposal is having unacceptable adverse effects, the Consent Holder, after consultation with the Council, shall adapt the installation process to the extent necessary to avoid those identified adverse effects. The adaptation of the proposal shall include as necessary, but not be limited to, the following:

- (a) Reduction in turbine numbers;
- (b) Removal of the turbines;
- (c) Withholding approval to implement subsequent stages in whole or in part;

- (d) For the avoidance of doubt, Council may exercise this power at any time during which the consent is exercised.

GENERATION ARRAY AND CABLES

- 11 The generation array shall be located within the area defined by the four corner location co-ordinates at or about 1697825E 5970820N, 1703085E 5970735N, 1703085E 5969700N, 1697825E 5970110N.
- 12 The location of the transmission cable routes between the generation array and Pouto and between Tikinui and Raupo shall be generally as shown on NRC plans 4205A and 4206 **attached**.

CONSTRUCTION

- 13 At least six months prior to commencing installation of turbines, cables or ancillary equipment for each Stage, the Consent Holder shall notify the Council in writing of the intended date of commencement of each of:
- (a) Foundations for turbines and turbine placement;
 - (b) The installation of the transmission cable between the generation array and Pouto; and
 - (c) The installation of transmission cable between Tikinui and Raupo.
- 14 At least 20 working days prior to the commencement of installation of turbines, cables or ancillary equipment for each stage, the Consent Holder shall:
- (a) Submit finalised engineering designs for all aspects of that stage, including, but not limited to, appropriate information on geotechnical conditions at precise placement locations, including analysis of settlement, scour and displacement;
 - (b) Submit certified final design details and the installation methodology for the turbines, cables and ancillary structures;
 - (c) Provide a construction timetable;
 - (d) Provide survey grid co-ordinates of locations plotted on a plan showing the exact location of the components to be installed during that stage.

Advice Note: This consent is granted on the basis of the Consent Holder's assertions that final engineering design of the turbines and support structures will provide for acceptable stability, with appropriate offshore factors of safety (see Project Update and Further Information pursuant to section 92 RMA July 2007, 3.1.2 and DTec Consulting Ltd comment on review of coastal processes information by Dr Paul Kench 7 February 2008 p 2).

- 15 At least ten working days prior to the commencement of installation of turbines, cables and ancillary structures, the Consent Holder shall notify Maritime New Zealand and Land Information New Zealand in writing to the specification standards of those organisations of:

- (a) The proposed works;
 - (b) Their geographical location;
 - (c) Placement and type of navigation marking;
 - (d) Any installation or action which may affect seabed contours, navigation aids or safe navigation.
- 16 No installation of turbines, cables and ancillary structures, shall take place until the Council has been provided with the information required by the conditions of this consent.
- 17 Within 10 working days of completion of installation works for each stage, the Consent Holder shall notify the Council in writing that each of the following has been installed in accordance with information provided to Council under this consent, for all components including:
- (a) Generation turbines; and
 - (b) The transmission cable between the generation array and Pouto; and
 - (c) The transmission cable between Tikinui and Raupo,
 - (d) Verification of the date for compliance with Condition 19 of this consent.
- 18 The Consent Holder shall, within one week following the completion of each stage, remedy to the extent practicable, all damage and disturbance from the construction works.
- 19 The Consent Holder shall within three months of completion of works for each Stage, provide a copy of the following to the Council:
- (a) As-built plan(s) of submarine transmission cable routes, showing way-points that are sufficient, in the opinion of the Regional Harbourmaster, to show the actual position of the cables at all points along the length;
 - (b) As-built turbine layout plans, with location co-ordinates and footprint of each turbine;
 - (c) As-built cable layout within the generation array, showing positions of all cables, junction boxes and all other ancillary plant and equipment;
 - (d) A description of the standard daily operational parameters, procedures and general operating conditions of the turbines and cables;
 - (e) Confirmation in writing from a suitably qualified person(s) that the works are in accordance with design plans and drawings submitted to the Council.
- 20 The Consent Holder shall within one month after each year from the date of commencement of this consent, provide the Council with an Annual Report on what was done in that year and is proposed for the following year regarding:
- (a) Engineering and construction work;
 - (b) Programmed maintenance and fixtures replacement, substitution and removal;
 - (c) Generation capacity and power utilisation of the installation over the year;

(d) Supply location and plans of any updates to “as built” in respect of all relocations of turbines, ancillary installations or cables.

21 The Consent Holder shall maintain all facilities authorised by this consent in good order and repair and shall also, notwithstanding the generality of the foregoing, ensure that they are restrained and secure at all times so as to not create a navigational hazard.

22 All turbine structures shall have a minimum clearance of at least seven metres below Chart Datum on NZ Chart 4265 Kaipara Harbour.

23 Total ballast placement in any twelve month period shall not exceed 50,000 cubic metres.

Advice Note: This volume is the trigger volume for a Restricted Coastal Activity, for which a notified consent application would be required.

24 All ballast used in the facilities shall be of sufficient dimension and density and placed so as to preclude its movement away from its placed position under the most extreme action the sea is likely to impart.

25 The Consent Holder may relocate generation units, within the generation array boundaries, under this consent provided that:

(a) The Consent Holder shall inform the Council of each proposed relocation, together with the reason for relocation at least three months in advance of the proposed relocation date;

(b) If the relocation is outside the area that has been notified to Council under Condition 14 of this consent then Council may notify the consent holder of an intention to review the relocation under Section 128;

(c) All conditions shall apply to any relocation of a turbine as for construction plus amending “as built” to be provided showing the site of removal as well as the relocated placement.

26 The Consent Holder shall, immediately upon completion of each stage of the works associated with this consent, notify in writing:

Nautical Information Advisor
Land Information New Zealand
Private Box 5501
Wellington

Maritime New Zealand
P O Box 27-006
Wellington

The Kaipara District Council
Private Bag 1001
Dargaville

Northland Regional Council
Private Bag 9021
Whangarei

The Consent Holder shall include scale plans of the completed works or stage, including generation array layout and transmission cable routes, with the notification.

Advice Note: These addresses are as at the date of this consent, but the Consent Holder must ensure that a current address is used for these notifications.

- 27 The Consent Holder shall keep the coastal marine area free of debris resulting from the Consent Holder's activities.
- 28 In the event of archaeological sites or koiwi being uncovered, activities in the vicinity of the discovery shall cease. The Consent Holder shall then consult with Te Uri o Hau and Waikaretu Marae and the New Zealand Historic Places Trust, and shall not recommence works in the area of the discovery until the relevant Historic Places Trust approvals to damage, destroy or modify such sites have been obtained.
- 29 Navigation marks defining the generation array area shall be placed by the Consent Holder as required by the Regional Harbourmaster. The Consent Holder shall maintain all such navigation marks.
- 30 A cable mark indicating the location of the landfall of the transmission cabling shall be placed as required by the harbour authority for the cable route.
- 31 The Consent Holder shall liaise with the Regional Harbourmaster, at least six months prior to installation of the generation array and transmission cables, to arrange:
 - (a) Any Notices to Mariners; and
 - (b) The type and positions of navigation marks; and
 - (c) The marking of the positions of facilities on navigation charts.

OPERATIONAL

Operation and Maintenance Plan

- 32 The Consent Holder shall prepare and follow an Operations and Maintenance plan (OMP) for each Stage of the Project. The OMP shall include but not be limited to:
 - (a) Diagrams, details and dimensions associated with the turbines and ancillary structures;
 - (b) Diagrams, details, dimensions and composition of the power cables;
 - (c) Standard operational parameters, procedures and general operating conditions of the structures and cables while in the coastal marine area;
 - (d) A description of the measures that will be undertaken to avoid, remedy or mitigate the effects of additional monitoring equipment, specifically lighting and additional acoustic equipment;
 - (e) A description of the emergency procedures that will be undertaken should an emergency occur, with particular regard to the retrieval of an unscheduled detachment or displacement of the turbines and ancillary structures from the seabed and the movement of any turbines and ancillary structures from their intended locations;
 - (f) A description of the processes that will be used to install and remove the turbines and ancillary structures from the seabed;

- (g) A description of the process that will be used to remove the turbines, ancillary structures and power cables from the seabed, with particular focus on the interface between the coastal marine area and land.
- 33 If the Council considers it necessary, the OMP shall be reviewed by an appropriately qualified person acceptable to the Council. The Consent Holder shall address any findings of this review, in consultation with the Council, prior to adopting the OMP.
- 34 The OMP for each stage of the project, shall be provided to the Council for review pursuant to Condition 33, a minimum of three months prior to the commencement of installation of the power cables, turbines and ancillary structures for each stage.

Displacement

- 35 Should the turbine(s) and/or ancillary structures become displaced, the Consent Holder shall:
- (a) Inform the Council immediately;
 - (b) Inform the Regional Harbourmaster immediately;
 - (c) Apply the emergency retrieval procedures as outlined in the OMP; and
 - (d) Provide the Council with an explanation why the turbine(s) and/or ancillary structures became detached from the seabed and the steps taken to ensure that the turbine(s) and/or ancillary structures will not become displaced or move again.

Biosecurity

- 36 Prior to the first use of any vessel, marine turbine or ancillary plant including cables, in the Kaipara Harbour pursuant to this consent, the Consent Holder shall arrange inspection of the vessel, marine turbine or ancillary plant including cables, for infestation of any unwanted or risk species and certification of it having been treated and inspected as required by this condition by a suitably qualified and experienced person. A copy of this certification shall be provided to the Council on request. The Consent Holder shall not allow any vessel under its control or direction, marine turbine or ancillary plant including cables, associated with the proposal not certified as having been treated and inspected as required by this condition, or showing any indication of being infected with any unwanted or risk species or having visited an area infested with such species to be used.
- 37 The Consent Holder shall lodge with the Council prior to installation of any structures, a Biosecurity Management Plan (BMP) The BMP shall address measures to avoid the introduction of any unwanted or risk species through the installation and operation of the turbines and ancillary equipment and transmission cables and minimise any impacts through propagation on the turbines or transmission cable if such species are introduced and shall include details regarding the cleaning and inspection of vessels brought into the Kaipara Harbour and on staff training, monitoring and reporting mechanisms.

- 38 The BMP shall have the following objectives:
- (a) To avoid the introduction of any unwanted or risk species into the Kaipara Harbour through the marine turbine power generation activities;
 - (b) To detect any introduced populations of any unwanted or risk species established in the Kaipara Harbour;
 - (c) To reduce any unwanted or risk species spreading from the turbine structures and ancillary equipment to the Kaipara Harbour should any such species establish at the marine turbine power generation site;
 - (d) To eliminate any unwanted or risk species from the permit area if any such species are detected on the marine turbines and ancillary equipment;
 - (e) To ensure effective treatment of all the equipment used in association with the marine turbine power generation activities to ensure it does not become a vector for the spread of any unwanted or risk species;
 - (f) To set out a staff biodiversity monitoring and reporting system.
- 39 The BMP shall be reviewed annually by an appropriately qualified person acceptable to the Council for the purpose of determining whether the plan is adequate to meet the objectives set out in Condition 38, having regard to any change in circumstances and the review shall be lodged with the Council within one month after each year from the commencement of this consent. The BMP may only be modified in consultation with the Council but the Council may require modification using the information in the review.

Contaminant Release

- 40 The Consent Holder shall exercise this consent in a manner which ensures that the quality of the receiving waters at any point:
- (a) 200 metres outside the generation array area;
 - (b) 100 metres either side of the position of the transmission cable route to Pouto, where outside the 200 metre mixing zone for the generation area;
 - (c) 100 metres either side of the transmission cable crossing at Tikinui/Raupo,

as a result of exercise of these consents, always meets the following standard:

Natural pH	Not changed by more than 0.2 units
Concentration of Dissolved Oxygen	Not reduced below 80% saturation
Natural Visual Clarity	Not reduced more than 20%
Natural Hue	Not changed more than 10 Maunsell units
Oil/grease Film, Scum, Foam, Odour	No conspicuous oil or grease film, scums or foams, floatable or suspended materials, or emissions of objectionable odour

- 41 Where from any cause contaminant escapes from the Consent Holder's operations otherwise than within limits in this consent the Consent Holder shall:
- (a) Immediately take such action, or execute such work as may be necessary, to stop and/or contain such escape;
 - (b) Immediately notify the Council by telephone of an escape of contaminant;
 - (c) Take all reasonable steps to remedy or mitigate any adverse effects on the environment resulting from the escape; and
 - (d) Within 7 days report to the Council in writing on the substances and volume of the contaminant, the cause of the escape and the steps taken or being taken to effectively control or prevent such escape

Decommissioning

- 42 Prior to the expiry, cancellation, or lapsing of this consent the Consent Holder shall remove all generating and other plant, structures, cables, navigation and cable marks and other materials and refuse associated with this consent from the consent area, and shall restore the consent area to the satisfaction of the Council, unless an application for a replacement consent has been properly made beforehand.
- 43 In the event that generation is permanently ceased from part or all the generation array during the term of this consent, then the Consent Holder shall remove all relevant plant, structures, cables, navigation and cable marks and other materials and associated refuse from the coastal marine area.

Advice Note: For the avoidance of doubt, this condition does not apply to any relocation of generation plant within the generation array.

MONITORING

Monitoring –Environmental Monitoring Plan

- 44 The Consent Holder shall prepare an Environmental Monitoring Plan (EMP). The EMP shall include but not be limited to the matters listed in Conditions 45 to 48 and shall include all matters listed in the Crest Energy Limited (CEL) Draft Environmental Monitoring Plan (**attached** as Schedule 1) as amended by all subsequent application documents including comments from CEL feedback on Department of Conservation review by Dr Jonas Teilmann and DTec Comment on Review of Coastal Processes Information by Dr Paul Kench 02/08 and also as amended by any subsequent Council review (together referred to as the Environmental Monitoring Plan) and include provision for marine mammal reporting by the Consent Holder.
- 45 The EMP shall comprise the following components:
- (a) A pilot survey to define sampling parameters and techniques;
 - (b) Baseline monitoring;
 - (c) Ongoing monitoring;
 - (d) Definition of acceptable vs unacceptable effects;

- (e) Reporting requirements;
- (f) Variation procedures;
- (g) Methodology of gathering data, specifications and units;
- (h) Provision to the public of data, reliability, accuracy and veracity of information drawn from data;
- (i) Public access to data for independent analysis and reporting;
- (j) Sharing with and accommodation of other harbour interests, including sand mining, commercial and recreational fishing and inhabitants such as Te Uri o Hau.

46 The EMP shall include monitoring and assessment of the following:

- (a) Total copper and total zinc levels in seabed sediments (if copper and/or zinc based antifoulants are used);
- (b) Noise produced by turbines;
- (c) The degree to which turbines or their effects are an impediment to the movement of marine species;
- (d) Any effects on important spawning areas within the harbour and array area;
- (e) The effects of the main transmission cables on elasmobranchs and elasmobranch habitat;
- (f) Impingement of elasmobranchs and cetaceans;
- (g) monitoring of the cetaceans using the harbour entrance, including recording species, numbers and timing – using pod and shore based electronic monitoring;
- (h) Benthic invertebrates;
- (i) Tidal currents;
- (j) Sedimentation within the generation array and along the transmission lines;
- (k) Electro-magnetic field production associated with turbines and cables;
- (l) Recreational and commercial fishing;
- (m) Seabed bathymetry and bathymetric change (including historic bathymetric and shoreline change to provide an improved context against which to evaluate future changes);
- (n) Presence, or otherwise, of historical artefacts likely to be disturbed by the placement of the facilities;
- (o) Coastal processes and shoreline morphological changes;
- (p) Seabed sediment dynamics;
- (q) Natural pH in units;
- (r) Concentration of dissolved oxygen as a saturation percentage;
- (s) Natural visual clarity so that the Condition 40 percentage can be assessed;
- (t) Natural hue in maunsel units;

- (u) Oil/grease film, scum, foam, odour as a baseline perspective;
- (v) Such other matters as are appropriate to assess effects.

47 The EMP shall address monitoring for:

- (a) Marine mammals (pod and shore based electronic monitoring); and
- (b) Coastal processes and shoreline morphological changes; and
- (c) Bathymetric changes over the whole potentially affected harbour.

as matters of the highest priority and shall provide for studies in these areas to cover the greatest time practicable prior to commencement of the operational phase and thereafter. Given the relatively short period available for baseline monitoring, investigation of historic bathymetric and shoreline change using available information shall also be carried out to provide an improved context against which future bathymetric and shoreline changes can be evaluated.

48 The EMP shall give particular recognition to those matters set out in Conditions 49 to 58 as follows.

Water/Sediment Quality

49 If the Consent Holder opts to utilise antifoulant coatings containing copper and/or zinc, the Consent Holder shall monitor total copper and total zinc levels in seabed sediments at the far-field and control sites every two years and shall report on the results to the Council within one month of sampling. Reports shall include an assessment of the results as well as comment on any changes from previous results.

50 Use of antifoulant shall be confined to only the:

- (a) Disc/vane within the collar of each turbine and,
- (b) Inside only of the collar to the disc and,
- (c) Inside only of any venturi fitted to enhance flows through any turbine disc.

51 If biocidal antifoulant coatings are used on any part of the installation then all material that is removed during cleaning or removal of marine growth shall be contained and disposed of to an authorised on shore disposal site.

Noise/Impediment

52 The Consent Holder shall monitor noise produced by the turbines during turbine operation following installation of the first 20 turbines (stage 1) and during successive stages, and monitoring shall include but not necessarily be limited to the following:

- (a) Measurements of noise at a variety of current speeds and positions both within and outside the array and with both clean and fouled turbine blades. (A fouled blade is defined for this purpose as one that has been left in situ for the maximum anticipated lag time between turbine cleaning operations, and thus has accumulated the maximum anticipated amount of fouling);
- (b) Placement of underwater video cameras or other devices for detection of fish and cetaceans, on or around randomly chosen units to monitor any impediment in the movement of fish and cetaceans in relation to the presence of the turbine units;
- (c) Undertaking other monitoring studies to determine whether impediment to movement of marine species represents a significant adverse effect or not. These studies may comprise, but not be limited to, tagging and catch per unit effort (CPUE) studies for commercially fished species in the harbour, and observational monitoring for elasmobranchs, large fish and cetaceans, to provide evidence of the ability of animals to pass through the harbour entrance in the presence of the turbine array;

The monitoring required by this condition shall be carried out with the objective(s) of determining:

- Whether any adverse effects on elasmobranch and/or cetacean movement in and out of the harbour are due to turbine operation; and
- Whether or not these effects are considered to be environmentally significant.

Fish Spawning

- 53 The Consent Holder shall engage an appropriately qualified and experienced marine scientist (fish), acceptable to the Council to carry out an investigation in the Kaipara Harbour to determine if the generation array is an area important for spawning and feeding of key fish species.

Elasmobranch Behaviour

- 54 The Consent Holder shall, if monitoring EMFs under Condition 57 indicates EMF levels above background, monitor elasmobranch behaviour in the region northwest of the main transmission cable, between the transmission cable and the northern shoreline after each stage has been made operational to determine whether any channelling of elasmobranch movement occurs.

Impingement (Collision)

- 55 The Consent Holder shall, carry out monitoring of the impingement (collision) of elasmobranchs and cetaceans for at least two years following the implementation of each stage of the proposal as follows:
- (a) Deploy video cameras, sound recording or other devices for detection of fish and cetaceans, to record impingement (collision) events, and the fate of affected animals, at randomly selected turbines;
 - (b) Other monitoring study to assist in determining whether or not impingement of marine species occurs.

The monitoring required by this condition shall be carried out with the objective(s) of determining:

- Whether any adverse effects on elasmobranchs and/or cetacean impingement are attributable to the turbine array; and
- Whether or not these effects are considered to be environmentally significant.

Tidal Flows, Morphology and Sediment Characteristics

56 The Consent Holder shall monitor tidal flows, seabed bathymetry and sediment characteristics and movement in and near the generation array during turbine operation following installation of the first 20 turbines (Stage 1), and at each deployment stage thereafter. The monitoring shall be carried out with the objectives of determining:

- (a) Whether there have been significant differences between the actual currents and those predicted by the modelling at the time consent was sought, and
- (b) Whether there have been significant changes in bathymetry since the commencement of the consent, and
- (c) Whether there have been changes in sediment characteristics;
- (d) And, if there have been changes, whether or not the effects of such differences or changes are considered to be environmentally significant.

Advice Note: If significant changes in coastal processes or morphology are detected following stage 1 or successive stages, this will signal the need for improved numerical modelling of coastal processes and sediment transport to be considered prior to the next deployment stage.

Electro-magnetic Fields (EMF)

57 The Consent Holder shall measure electromagnetic field (EMF) production by the turbines and cables, both within the generation array and between the array and the landfall at Pouto, during turbine operation following installation of the first 20 turbines (stage 1), and at each deployment stage thereafter.

The monitoring required in this condition shall be carried out with the objective of determining whether any adverse effects on elasmobranchs are due to EMF and whether or not these are considered to be environmentally significant.

Cable Burial

58 The Consent Holder shall, as part of the Environmental Monitoring Plan required in this Consent at no more than two year intervals, monitor the depth below seabed of the transmission cables to Pouto Point and shall, within one month of each survey, provide the results to the Council. Except where the transmission cables are covered by a protective matting, if the cables are exposed at the seabed at any point, then remedial work shall be undertaken to:

- (a) Return the burial depth to no less than one metre; or
- (b) Install protective matting over the cable.

If, after any five year period of records, there has been no incident of monitored cable exposure, then the required survey interval shall extend to five years. Should any subsequent survey show cable exposure at the seabed at any point on the cable, other than that covered by protective matting, then the survey interval shall return to two yearly.

Approval of Draft Environmental Monitoring Plan (EMP)

59 The Consent Holder shall, no later than three months after the date of issue of this Consent provide a Draft Environmental Monitoring Plan (EMP) to Council. This Draft EMP shall initially be based on the Crest Energy Limited Draft Environmental Monitoring Programme (Document Reference KAI1611071739), November 2007 (**attached** in Schedule 1), modified to satisfy the conditions of this consent and shall be prepared in consultation with the Council.

60 The Council, in making any decision as to the acceptability of the Draft EMP, may require a peer review, commission an independent Peer Review Report or otherwise seek advice on the survey or monitoring programme by or from an independent scientific research provider approved by the Council.

61 The Draft EMP required under Condition 59 shall if necessary be revised to account for information arising from the review process set out in Condition 60, to the satisfaction of the Council.

Implementation of EMP

62 The Consent Holder shall monitor for all matters set out in the approved Environmental Monitoring Plan

63 All survey and monitoring programmes shall be carried out by suitably qualified personnel with appropriate (recognised) experience in the matters being surveyed or monitored.

64 All costs of surveys and monitoring including the design, provision of equipment, payment of researchers, and payments associated with obtaining peer reviews shall be met by the Consent Holder.

- 65 Reports on the findings of the EMP shall be made available to the Council and other parties as specified in the EMP in accordance with reporting protocols specified in the EMP to enable public access to the data and to the protocols for collection, classification and analysis.

Annual Review of EMP

- 66 The EMP shall be reviewed annually by the Consent Holder for the purpose of determining whether the monitoring is adequate to address the matters set out in conditions to this consent having regard to any change in circumstances. Amendments to the EMP shall be subject to review under Section 128 if the Council requires or opposes changes proposed by the Consent Holder.

SURVEYS/MONITORING - PRIOR TO THE IMPLEMENTATION OF STAGE 1

- 67 The Consent Holder shall conduct the following survey and monitoring work as a preliminary to implementing stage 1 for establishing baseline information before any intrusion by the exercise of this consent:
- (a) A Pilot Survey to define sampling parameters and techniques;
 - (b) Baseline Monitoring with appropriate classifications and categories.
- 68 The Baseline Monitoring for all matters set out in the approved EMP shall be undertaken over a minimum of a 12 month period from the date of granting of this consent or such longer period set out in the EMP.

Ongoing Monitoring

- 69 During (as far as relevant) and following commencement of implementation of Stages 1 to 4 the Consent Holder shall carry out the monitoring required by the approved EMP.

Reporting requirements

- 70 Notwithstanding any relevant reporting requirement stipulated in the approved EMP, within three months of the completion of the Baseline Monitoring the Consent Holder shall provide a report to the Council which sets out details of the monitoring results and an assessment of the likely potential effects of the Proposal and any changes proposed by the Consent Holder to avoid, remedy or mitigate such effects. This report shall be accompanied by a peer review report prepared by an appropriately qualified and experienced marine scientist(s), who is acceptable to the Council.
- 71 Reports on the findings of the environmental monitoring shall be submitted by the Consent Holder in accordance with the reporting protocol set out in the EMP, and in any case as follows:
- (a) Progress Reports at yearly intervals, and
 - (b) Report, no later than six months prior to the commencement of installation of the first and any subsequent stage.

Advice Note: The results of the EMP will be used by the Council in undertaking reviews of the under Section 128 of the Resource Management Act to assess whether the proposal is having any unforeseen and less than minor adverse effects on the environment, to review the scale, location, orientation and layout of any existing and further development and to satisfy the Council that it is very probable that development from one stage to the next will not give rise to significant adverse effects on cetaceans or elasmobranchs.

COMMUNITY INVOLVEMENT

Kaipara Harbour Environmental Trust

72 The Consent Holder shall establish a Kaipara Harbour Environmental Trust for a period of no less than the duration of this consent. The objective of the Kaipara Harbour Environmental Trust will be to provide environmental benefit to the Kaipara Harbour community. It will achieve this by, among other things, financially supporting projects and initiatives to:

- (a) Improve the environmental health and enhance the mauri and vitality of the Kaipara Harbour; and
- (b) Provide associated socio-economic opportunities.

Advice Note: Projects involving appropriate scientific study could be candidates for such financial support.

73 The Consent Holder shall fund the Kaipara Harbour Environmental Trust in the amount of at least \$(2007)100,000 per annum from 12 months after the date of first exercise of this consent up to the date of installation of the first turbine unit for stage 2, and thereafter \$(2007)250,000 per annum for the balance of the term of this consent; subject to funding being discontinued if it is decided to decommission the project. The annual amount shall be adjusted for inflation each year according to the movement of the Consumers Price Index.

Advice Note: For the avoidance of doubt, the first payment will be due at 12 months after the date of issue of this consent.

74 The Kaipara Harbour Environmental Trust shall operate generally in accordance with the following procedures:

- (a) The Consent Holder shall establish and convene the first meeting of the Kaipara Harbour Environmental Trust within six months of the date of issue of this consent. Further meetings shall be convened as determined by the Kaipara Harbour Environmental Trust.
- (b) The Kaipara Harbour Environmental Trust shall comprise six members as follows:
 - Three representatives nominated by Te Uri o Hau;
 - A local community representative from the Pouto area;
 - A representative of the Kaipara recreational fishing community; and

- A representative of the Consent Holder.
- (c) It shall be the responsibility of the Consent Holder to convene the meetings and to provide administrative support to arrange the running of the meetings.
- (d) The Kaipara Harbour Environmental Trust may review and if desired, change the composition and procedures of the Trust, but only by unanimous agreement.
- (e) The Consent Holder shall provide an annual report to the Northland Regional Council and Kaipara District Council by 30 June each year on the outcomes of the Kaipara Harbour Environmental Trust activities over the preceding year. The report shall include, but not necessarily be limited to:
 - Statements on achievements resulting from the application of the funds by Kaipara Harbour Environmental Trust in the past year and comparison of these with those planned; and
 - The actual total expenditure by the Kaipara Harbour Environmental Trust in the past year and comparison with that planned; and
 - The planned programme for the next year in respect of the Kaipara Harbour Environmental Trust and the budgeted funds to achieve this.

Advice Notes: 1 The Kaipara Harbour Environmental Trust is intended to be an ongoing point of contact between the Consent Holder and the interest groups represented by the membership, to ensure that development (both now and in the longer term) is carried out in an appropriate way and that channels of communication are kept open.

2 The initial Kaipara Harbour Environmental Trust could consist of tangata whenua representatives nominated by Te Uri o Hau, an appointee of the people of the Pouto area (eg. through a community group, if any) and an appointee from one of the various Kaipara Harbour recreational fishing groups). They are suggested here to assist in enabling the initial meeting to get under way promptly. Following this, the Kaipara Harbour Environmental Trust can, by unanimous agreement set its own protocols for the future makeup to the Hearing Committee.

Bond

75 The Consent Holder shall enter into a Bond with the Council to cover the potential costs to the Council of decommissioning the units. The Bond amount shall be determined by the Council for each stage prior to commencement of that Stage.

The Bond for Stage 1 (initial 20 turbine units) shall be \$(2007)3,100,000.

- 76 The value of the Bond for each stage after stage 1 shall be determined by the Council on the basis of accurate cost estimates for decommissioning. To this end, the Consent Holder shall provide the Council with an estimate of predicted turbine and transmission decommissioning (removal) costs to the Council if the Council were to decommission and remove the facilities. Each estimate shall have been peer reviewed by an appropriately qualified and experienced marine quantity surveyor, marine engineer or marine architect acceptable to the Council.
- 77 The Consent Holder shall not proceed to any stage subsequent to Stage 1, even if all other requirements for proceeding have been met in accordance with this Consent, until the Council has approved in writing, the Bond for the existing installation and the proposed installation stage.
- 78 The value of the bond shall be adjusted for inflation at five yearly intervals and the Consent Holder shall provide any additional bond amount required as a result of this.
- 79 Should the numbers of turbines installed at each stage vary from that indicated, then, notwithstanding any variation to consent that may be necessary, the level of bond required shall be proportioned accordingly.
- 80 The form of the bond shall be a cash amount or a bank or other security acceptable to the Council. The total bond may comprise combinations of the above alternatives.
- 81 If a bond is provided by a bank or other security, then it shall be prepared by the Northland Regional Council's solicitor, and shall be signed and sealed by both parties. All costs associated with the preparation and registration of the bond shall be met by the Consent Holder. The bond shall be in accordance with the principles and terms set out in Schedule 2 (**attached**).
- 82 The Consent Holder shall advise the Council in writing of its chosen form of the initial bond within three months of the date of commencement of this consent.
- 83 If the coastal permit is transferred in part or in whole to another party or person, the transferor Consent Holder shall not be entitled to the release, if sought, of any part of its bond until the transferee Consent Holder has a replacement bond of the same value, or proportional value in the case of partial transfer, and which is fully compliant with this consent, in place with the Council.
- 84 The bond will be released to the Consent Holder upon the expiry of this consent, provided that, prior to the expiry date of this consent, the Consent Holder has removed the generating and other plant, structures, cables, navigation and cable marks and other materials and refuse associated with this consent from the coastal marine area and has restored the consent area to the satisfaction of the Council, in compliance with the conditions of this consent.

REVIEW

85 The Council may, in accordance with Section 128 of the Resource Management Act, serve notice on the Consent Holder of its intention to review the conditions of this consent. Such notice may be served at the following times:

- (a) Annually within one month commencing after each anniversary of the date of commencement of consent; or
- (b) Within one month commencing after the receipt of any report or estimate required from the Consent Holder by the conditions of this consent; or
- (c) At any time after the date reasonably required by the Council for supplying by the Consent Holder to the Council any report or estimate or validation of any report or estimate.

The review may be initiated for any one or more of the following purposes:

- To deal with any adverse effects on the environment that may arise from the exercise of the consent and which it is appropriate to deal with at a later stage, or to deal with any such effects following assessment of the results of the monitoring of the consent and/or as a result of the Council's monitoring of the state of the environment in the area.
- To require the adoption of the best practicable option to remove or reduce any adverse effect on the environment.
- To provide for compliance with rules in any regional plan that has been made operative since the commencement of the consent.
- To deal with any material inaccuracies that may in future be found in the information made available with the application. (Notice may be served at any time for this reason.)
- To determine whether the Consent Holder might proceed to subsequent stages in the Project, based on the findings of conditions of this consent, and any other information provided by the Consent Holder in relation to environmental effects.
- To alter the scale, location, orientation and layout of the established turbines.
- To review the adequacy of and the necessity for monitoring undertaken by the Consent Holder.
- To determine whether the consent will be considered under Condition 4 if the consent has not been exercised within required time, or time agreed by the Council.
- To determine the value of the Bond for each successive stage to stage 1.

The Consent Holder shall meet all reasonable costs of any such review.

EXPIRY DATE: 30 MAY 2043

