P.O Box 965
Nikao, Rarotonga
Cook Islands
P: (+682) 24479
E: totatouvai@cookislands.gov.ck
W: www.totatouvai.co.ck

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Director
National Environment Service
Rarotonga

Attention:
Vavia Tangatataia, Acting Director

Kia Orana Vavia

Subject: Response to submissions to the EIA Report on Water Treatment Plants On-Site Discharges

Firstly, accept our apologies for the delay in responding to the two submissions regarding the above. Please find attached our response to the points raised in the submissions.

We await your considerations and look forward to hearing from you.

Kind regards

Apii Timoti
Chief Executive Officer

24 August 2021

TTV's Response to Submissions to the "EIA Report on Water Treatment Plants On-Site Discharges"

- **Statutory constraints**
  The focus of the Environmental Impact Assessment is on addressing the requirements of the Environment Act which relate to environmental protection. We note issues have been raised concerning another Act, the Public Health Act, which is administered by Te Marae Ora. We have consulted with the Ministry of Health which has concluded the discharge does not create any public health issues.
- **Uncertainty regarding the long term impacts on freshwater ecology**
  The ecological assessment provides the basis for evaluating both immediate and long term impacts, using trigger values to evaluate this. These are based on international examples and the data to date suggests the discharges will comfortably fall below the relevant trigger values. The assessment considers the impact of the proposed discharges and concludes that these will not have an adverse impact.
    - Precautionary Principle - this says that you should assume there is an issue until there is evidence that there isn't. The assessed evidence supports the conclusion that the discharge will not have an impact. In evaluating the discharge we have not identified any evidence that suggests there will be immediate or long term effects. Rather the evidence suggests that there won't be. This deals with the precautionary principle.
    - Sustainability & Environmental preservation - as above
    - Ecological flows - this relates to the right to take water (not the subject of this EIA).

  A stream discharge is proposed. Whether it is standard practice is not a matter to be proved or disproved. The EIA explains why this approach has been adopted (a non-pumped system) and has evaluated the impacts to determine whether this approach can be adopted without adverse environmental impacts. The conclusion of this assessment is as noted above.

  While an alternative monitoring regime could be adopted, what is proposed is considered sensible without imposing unreasonable cost for limited additional benefit. TTV is open to adjusting the monitoring regime where this can provide additional assurance of the performance of the system at reasonable cost.

  TTV will optimise pond discharge on an ongoing basis with a focus on minimising environmental impacts within operational constraints. Experience gained during commissioning will assist in defining how this will be done.
- **Wetland treatment**
  Wetlands treat water for discharge to groundwater or more typically surface water. Given the relatively high sediment loads going into the ponds TTV expects that they would clog/need regular refurbishment including removal of sediment (and wetland plants) followed by planting and reestablishment. In short a wetland may be an option but most sensibly as an additional treatment step and depending on the plants and fauna (e.g. birds) may actually negatively impact some water quality parameters. Wetlands will ultimately discharge to groundwater or surface water i.e. they are not an alternative to discharge.
- **Alternatives to PACl use**
  The Environmental Impact Assessment considers a range of alternatives including water treatment without the use of coagulants. As outlined in the Assessment there are several reasons why the use of PACI as a coagulant is considered appropriate for the water treatment plants on Rarotonga.
  Key considerations include:

- The use of coagulant is an important component of an effective water treatment process. Any filtration method that does not include pre-treatment using a coagulatnt can be considered a 'roughing filter' to remove physical contaminants only.

  The WHO guidelines for drinking water note that '*Chemical coagulation is the most important step in determining the removal efficiency of coagulation/ flocculation/ clarification processes. It also directly affects the removal efficiency of granular media filtration units and has indirect impacts on the efficiency of the disinfection process'*
- Only a coagulation process can make surface water consistently suitable for further treatment to drinking water standards. Te Vai Ora Maori in their submission say 49% of Watercare turbidity samples had shown sufficiently low turbidity to be considered not in need of any further treatment (by coagulation). But this is only part of the picture. While the 50% of the water has low turbidity– tanins, colour, fulvic and hulmic acids can linger for weeks impacting on the effectiveness of downstream treatment. For example, UVT, which measures the efficacy of UV use, is also an important factor in UV efficacy and this will only be satisfactory if a coagulant is used..
- PACl is not a disinfectant. Rather PACl as a coagulant is an important part of the overall treatment process, contributing to ability to remove microbial contamination.

➢ **Diversion and storage**

Storage and hydraulic supply is an important consideration in delivery of safe drinking water across Rarotonga. Generally rain will occur on either the south side or the north side. Occasionally we receive rain across the entire island. At low flows (and low pressure) the following storage applies:

- Avatiu : 74 hours
- Takuvaine : 24 hours
- Tupapa : 38 hours
- Matavera : 17 hours
- Turangi : 44 hours
- Avana : 26 hours
- Totokoitu / Taipara : no storage. One plant will always need to be functional.
- Papua : 24 hours
- Ngatoe : 74 hours

Not all intakes have the hydraulic head to feed other supply areas. Where rediverting water to other intakes is required, the storage time can be subtracted from the other intakes that are supplying it. High turbidity events will usually occur at half the intakes at a time.

Diversion (if power was to be installed at the sites) with the current storage at sites can only be considered a feasible option for 24 hours or less without a significant pressure reduction in the network. Pressure reduction causes customers in higher areas to be without water.

Rain frequently occurs for more than 24 hours at a time in Rarotonga. High turbidity events will usually take place on 3 to 4 intakes or on all intakes at a time which will make the rerouting of water impossible when treatment plants stop producing.

➢ **Cultural values**

The assessment is clear that the discharge will not result in measurable adverse impacts (ecology, water chemistry). Cultural impacts are harder to define and therefore measure.

We refer to and reiterate the comments in Section 9.8 of the Environmental Impact Assessment.