

Alternative Options for the Rotorua LTS

TAG Meeting Thursday 5 June 2014, Rotorua Wastewater Treatment Plant

## Meeting Notes

---

### Core TAG Members

#### Present:

**Jim Bradley** BE(Hons), Dip SE Delft(Distinction), FIPENZ, CEng(Civil, Environmental), IntPE, MCIWEM, ANZIM, DEE  
Consultant, MWH NZ Ltd

**Greg Manzano** MIPENZ, CEng, IntPE  
General Manager, Hydrus Engineering Consultants, Rotorua District Council

**Andy Bruere**  
Lakes Operations Manager, Bay of Plenty Regional Council

**Alison Lowe** NZCF, MScTech(Hons)  
Senior Environmental Scientist, Rotorua District Council

Phone link (1:40-2:00pm, 2:20-2:35pm)

**Dr Te Kipa Kapa Brian Morgan** BE(Civil), MBA, PhD, FIPENZ, CEng  
Senior Lecturer, University of Auckland

#### Apologies:

**Professor David Hamilton**  
Bay of Plenty Regional Council Chair in Lake Restoration, University of Waikato

#### Invited Attendees:

**Chris Mc Bride** MSc(Hons)  
Technical Officer, The University of Waikato

---

## 1. WELCOME AND INTRODUCTIONS

10:00 Jim welcomed everyone

## 2. DRAFT AGENDA – REVIEW AND ADJUST

JB presented the draft agenda, which was discussed and adjusted.

## 3. STEERING GROUP/ CHAIR/ FACILITATOR /TAG – ROLES, RELATIONSHIP, TAG TERMS OF REFERENCE (TOR)

WW discussed the TOR

WW mentioned that there had been discussion on this including how the minority view was recorded and reported

JB Agreement had been reached on Friday

JB To send specific clause to Warren as chair

WW-RDC To reissue TAG TOR with minority view clause

#### 4. PROJECT BACKGROUND AND UPDATE

GM discussed. There are 2 major things happening:

1. Resource consent application to vary some conditions in the existing consent (due to expire 2021): to change monitoring point from 30 t nitrogen in Waipa stream to 51 t nitrogen at the end of the WWTP, and to change P in Waipa stream from 3 t to 4 t. There were around 18 submissions received, the majority of the submissions were supporting CNI's submission that opposed the Change. We are expecting a BOPRC officers report next week on the application and the hearing has been set for 1&2 July.

CNI will be signing a head of agreement with RDC tomorrow. The key point is for RDC to exit the LTS by 2019. Milestones have been set in the agreement to achieve this. There are very tight timeframes around the milestones. It will be signed by the Mayor and CNI director. There will be a media release subsequent to this. It is possible that once this is signed they might pull their submission opposing the consent change, because the key point is RDC's agreement to exit the LTS.

It is likely that a media release will follow about the Steering Group and process that is looking at alternatives.

2. We have been discussing with the Councillors and the BOPRC the difficulty, cost and risk associated with developing a solution that attempts to achieve 30 t nitrogen and 3 t total phosphorus limits. There has been discussion around the possibility of the Lakes Programme considering other actions to offset the residual nitrogen.

The purpose of local government changed under the recent reform: to "meet the current and future needs of communities for good quality local infrastructure,....in a way that is most cost-effective for households"; to minimise rates, lower debt, and provide high-quality infrastructure in a cost-effective way; to work with communities to decide to decide what local infrastructure will be provided and at what cost.

- JB. In terms of setting consent conditions, there has been a move nationally towards more rigour around efficient and effective conditions that the discharger has control over. There is strong support for end-of-pipe [end of treatment plant] type of approaches rather than in-river or in-the-environment type of conditions.

WW There is a perception that RDC is asking to increase the load to the lake with the Consent change, but the 51 t is at the end of the WWTP and will not increase the load of N to the lake. There has been a very large increase in nitrogen in raw sewage coming to the WWTP, from around 150 t in the late 1908s when the consent limit and lakes targets were set, to around 350 t. If we add the nitrogen in the untreated sewage to any graphs that show the nitrogen in the discharge from the WWTP, people could see the very large load of nitrogen that is being removed.

- JB Yes. The TAG should be proactive in ensuring the Committee has appropriate technical information to communicate out to the wider community. There was general agreement.

WW The Steering Committee should be taking a lead in communications. There was general agreement.

- JB Should we suggest that the steering committee consider setting goal posts to give some guidance to TAG, so we can be mindful of these when working with the technical aspects of the options (for example, whether the goal is a discharge in/out of the catchment etc).

AB We could go back to the committee quickly with this long list of options and costs.

WW Yes they are not really aware of the technical constraints and discharge quality. There needs to be more of an understanding about the quality of the water, and the Steering Group needs

to have that discussion. There are 7 goals that the Steering Committee developed and listed in their TOR, and these have been through the committee and it will be signed next Tuesday:

## 5. GOALS

**The Committee is to select an alternative to the LTS, that is the overall Best Practicable Option, based on agreed goals, ie the extent that the option:**

- Contributes to improving the water quality in Lake Rotorua by reducing nutrient and contaminant flows from the WWTP;
- Acceptably meets the cultural needs of tangata whenua;
- Achieves acceptable community environmental outcomes;
- Acceptably safeguards public health;
- Complies with regulatory requirements;
- Is acceptably cost effective for local rate payers as well as RDC; and
- Has acceptable community support.

TAG acknowledges that the Steering Committees Goals are appropriate will consider them when working up and reviewing technical options

## TIMEFRAME

GM Discussion around timing and the need to make a decision, as follows...

**Date** refer timeline slide previously sent to TAG by Alison on 11 June 2014 as was presented at the RPSC on 10 June 2014.

Key TAG date is to have short list of options developed by 15 July 2014 for consideration of RPSC on 16 July 2014.

## 6. 11:30 – 12:00 INDIGITECH PRESENTATION (INFORMATION PREVIOUSLY CIRCULATED PRIOR TO PRESENTATION) – VICTOR MAIN

Other interested parties had been invited (Wally Lee, Peter Staite, Alamoti, Ian McLean Warren Webber....?) and those who could attend arrived for the presentation

Victor Main from Indigitech presented and discussed their technology.

Pass any further questions to Alison to collate and send to Victor.

## 7. TAG'S BASELINE CRITERIA

There was discussion around the TAG having a set of 'baseline' criteria – ie criteria that would be a minimum requirement for an option to be successful, and options that could best meet the these minimum criteria would be shortlisted for the Steering Group to further evaluate. The minimum requirements were agreed upon below, with there was agreement that these be presented to the Steering Group at their next meeting.

<b>TAG minimum requirements</b>	<b>Criteria</b>
Economically viable	<ul style="list-style-type: none"> <li>Rank \$/kg N</li> </ul>
Meets LGA purpose	<ul style="list-style-type: none"> <li>Meets current and future needs in a way that is most cost-effective for households and business</li> </ul>
Technically viable	<ul style="list-style-type: none"> <li>Integrates with WWTP</li> <li>Complete solution, technically possible, proven robust, reliable, flexible</li> <li>Engineering resilience (natural hazards and climate change)</li> </ul>
Legally viable and consentable from a technical perspective	<ul style="list-style-type: none"> <li>Meets key planning and statutory requirements</li> <li>Appropriate available land access and long term use</li> </ul>
Meets Consent order (following abatement notice March 2012)	<ul style="list-style-type: none"> <li>To select and pursue a "viable alternative", "the objective being to minimise, as far as practicable, the discharge of nutrients entering Lake Rotorua and its tributaries"</li> </ul>
Meets previously agreed upon principles from the Clean Water workshop (Oct 2013)	<ul style="list-style-type: none"> <li>If discharging to water, is pure enough to support life</li> <li>Discharge in the Rotorua Catchment (unless agreed by those outside catchment)</li> <li>Pathogen kill eg UV light</li> </ul>
Meets previously agreed upon conditions in principle relating to use of CNI land	<ul style="list-style-type: none"> <li>Does not discharge to CNI land</li> <li>Could potentially be commissioned by 2019</li> </ul>
Protects Public health and avoids nuisance	<ul style="list-style-type: none"> <li>Protects Public health and avoids nuisance</li> <li>Protects water supplies, food sources, recreation</li> </ul>

## 8. OPTIONS REGISTER/LONG LIST

Alison presented table showing predicted mean quality of the discharge water in 2051 with the WWTP as it is, and if there was flow-balancing + Terax + UV, which has been used as the base-case, which has been called 'ex-LTS' in the table.

<b>WWTP nutrients: Status Quo, 2051 loads, MEAN nutrients</b>	<b>ADF</b>	<b>DRP</b>	<b>Part-P</b>	<b>Total-P</b>	<b>NH4-N</b>	<b>NO3-N</b>	<b>Org-N</b>	<b>TN</b>
<u>Concentrations</u>								
Current raw sewage	23800	3.6	2.5	6.1	30	0	20	50
Current Bardenpho discharge	15600	2.5	0.8	3.3	0.5	3.1	2.6	6.2
Current MBR discharge	8200	1.7	0	1.7	1	2	1.0	4
Current WWTP combined discharge	23800	2.2	0.5	2.7	0.7	2.7	2.0	5.4
<u>Loads</u>								
Current raw sewage		31	22	53	261	0	174	434
Current Bardenpho discharge		14	5	19	3	18	15	35
Current MBR discharge		5	0	5	3	6	3	12
Current WWTP combined discharge		19	5	24	6	24	18	47
<b>WWTP nutrients: With flow balancing + Terax + UV; 2051 loads, MEAN nutrients</b>	<b>ADF</b>	<b>DRP</b>	<b>Part-P</b>	<b>Total-P</b>	<b>NH4-N</b>	<b>NO3-N</b>	<b>Org-N</b>	<b>TN</b>
<u>Concentrations</u>								
raw sewage	23800	3.6	2.5	6.1	30	0	20	50
Bardenpho discharge	15600	0.2	0.6	0.8	0.5	2.8	3	6.3
MBR discharge	8200	1.7	0	1.7	1	2	1	4
WWTP combined discharge	23800	0.7	0.4	1.1	0.7	2.5	2.3	5.5
<u>Loads</u>								
raw sewage		31	22	53	261	0	174	434
Bardenpho discharge		1	3	5	3	16	17	36
MBR discharge		5	0	5	3	6	3	12
WWTP combined discharge		6	3	9.6	6	22	20	48

Alison presented a table of the long-list of the options that have been up for consideration to date, that included a 'guestimates' for the concentration of DRP, P, N, Capex and \$/kg N removed.

Options	Components of options	DRP	Pore-P	AMMON Total-P t/yr	AMMON TN t/yr	TN (yr reduced)	CAPEX	\$/kg N reduced	Comments
<b>New - IN-catchment</b>	New LTS (could be other crops etc), any WWTP upgrade requirements not included in cost			3	30	21	40	1905	
<b>ex-LTS + Cleanwater 1</b>	WWTP upgrade: FB + UV + DRP + C-bad + wetland + re-entry	<3	7	1	35	13	79	1731	Incorporates all components proposed at the cleanwater symposium. Potential issues with bacteria and particulates from the wetland
<b>ex-LTS + filtration</b>	WWTP upgrade: FB + UV + DRP + filtration + re-entry	<3	<1	3	40	8	19.5	1635	Likely minimum + filtration to reduce particulate fractions
<b>ex-LTS + indigitech</b>	WWTP upgrade: FB + UV + Indigitech + re-entry						7	1625	Likely minimum + filtration to reduce particulate fractions
<b>ex-LTS + Cleanwater 2</b>	WWTP upgrade: FB + UV + DRP + De-nitrification filter + re-entry	<3	<1	3	35	13	20	1030	Modification of above to reduce cost and achieve same quality in the discharge
<b>New - OUT catchment</b>	New LTS end of catchment, eg to farm in Reporoa, any WWTP upgrade requirements not included in cost			0	0	51	40	833	88.55m BOPRC might contribute \$12M
<b>ex-LTS + Best for Lake</b>	WWTP upgrade: FB + UV + DRP + bypass-lake (pipe to lower end of catchment) + re-entry (eg 10% to lake)	<1	<1	1	4.8	43	20	313	
<b>Base</b> <b>ex-LTS</b>	WWTP upgrade: FB, UV, ORP, + re-entry	<3	7	10	48	0	6.5		Likely minimum requirements for exiting LTS. Dissolved-P removed but some residual particulate-P in the discharge
<b>Dual discharge</b>	WWTP upgrade: FB + UV (MBR) + DRP (MBR) + MBR-re-entry and Bardenpho continue to LTS)			3	30	21	6.5	310	
<b>Treated water back to homes for non-potable use</b>	WWTP upgrade: FB + UV (MBR) + DRP (MBR) + MBR-to non-potable domestic use and Bardenpho continue to LTS)								
<b>Algae</b>	WWTP upgrade: FB + UV + grow algae to scavenge rest of nutrients + filtration								tried growing algae in WWTP discharge water unsuccessfully
<b>Geothermal aquifer</b>	WWTP upgrade: FB + UV + DRP + discharge to below-ground aquifer								
<b>zeolite</b>	Partial option for inclusion to remove ammonia or modified-zeolite to remove DRP								Not advantageous for reducing N in the discharge as virtually no NH4 in the discharge.
<b>struvite</b>	Partial option that could be included in WWTP to remove some ammonia and DRP								these fractions will be targeted by Terox
<b>MicroV</b>									
<b>Amminox</b>									

KM Suggested collection options of separation of greywater and other arrangements including use of older pipe systems for dual conveyance to different part of the WWTP. Could be included in the dual discharge option and others.

JB Can TAG work up a paragraph around the incentives programme relative costs to reduce N in the Rotorua catchment. They are indicative.

TAG with there was agreement that these be presented to the Steering Group at their next meeting. They could be listed in order of cost \$/kgN from lowest for presenting to Steering Group, but only list the options and costs at this stage as the rest needs to be further developed.

JB A comparative qualitative assessment around opex would be useful

## **9. PENDING HIKOI – TREATMENT PLANT/SCHEME VISITS**

JB discussed the pending Hikoi

Hikoi July 8 (now Monday 7 July)

Chapel Street Tauranga WWTP &- UV

Te Maunga - Wetlands

Te Puke – diffuse discharge

Maketu – MBR and sub-surface drip irrigation

## **10. THE TAG WAY AHEAD**

JB Summarised what to take to the Steering Group next Tuesday and TAG agreed.

## **11. GENERAL BUSINESS**

Watercare will be visiting Rotorua towards the end of July – 5 Iwi leaders and 4 senior managers

CLOSED 2:45PM