Draft Meeting Minutes

Rotorua RPSC

Technical Advisory Group Meeting #5

Date:	Thursday 20 November 2014
Time:	10am – 4.10pm

Venue:	RDC – Transport Solutions Meeting Room *Time:* (10am – 3.45pm)
Chairperson:	Jim Bradley
Attendees:	Andy Bruere, David Hamilton, Greg Manzano, Eric Cawte, Alison Lowe (10am-3pm), Helen Ferguson,(Minute taker) Kepa Morgan (11am – 4.10pm), Riaan Rossouw (11.45am – 4.10pm), Andy Bell (1.35pm-4.10pm), Presentations: Kevan Brian of Mott McDonald (10.00am-4.10pm), Michael Quintern (1.35am-2.45pm) John Darmody of MWH (by telephone conference 3.00pm-3.25pm)
Apologies:	Chris McBride and Warren Webber

JB - welcomed all attendees especially Eric to the decision making stage
Karakia deferred and done retrospectively and with a blessing for the lunch by Kepa

1. Confirmation of previous minutes

Moved:

1. That the Minutes of the 1st Meeting held on 5 June 2014 be accepted as true and correct
   Moved/Approved: Jim Seconded: David
2. That the 2nd Minutes held on 8 July be accepted as true and correct,
   Moved/Approved Jim Seconded: David
3. That the 3rd Meeting of 29th July be acknowledged as "**informal only**".

That the Summary Minutes of the 4th Meeting held on 12th September be accepted with the following minor changes: (Item 4 – hui with - lowercase h, Effects study - remove (needs work), ANZAC should read ANZEEC).
Moved/Accepted by Jim Seconded by Greg

2. Discussion on Summary Minute Approach vs Verbatim

- JB -Because we have both Verbatim and Summary minutes for Meeting #4, I thought that it was appropriate to "table" both sets. Especially in view of the confusion over the MauriOmetre.

- AL - We asked about having all our documents siting on a server with designated log in but it is not currently possible to restrict access here at RDC, all the documents would be for public viewing
- ***Action - AB to advise on use of Water Quality TAG, secure website for RPSC TAG***

3. Report on RPSC Activities including RPSC cultural Sub-group

- Eric Cawte reviewed the two presentations on Wastewater Project that he gave to the RPSC on 11 November 2014:
  a) Water Strategy
  b) Inflow & Infiltration (both were attached to the RPSC #5 minutes previously sent to TAG on 11th November 2014)
  Eric mentioned Gina's discussion around Water Supply reductions, rainwater tanks etc.

Actions for Eric–

- ***to provide Andy Bruere with Water Supply Strategy, and Cost Benefit Analysis.***
- ***to give Andy Bruere the link to the 2009 Water Concentration Strategy.***
-

- GM – reported on the 2 RPSC hui meetings:

(1) Whakaue Marae, Maketu Public Meeting (8th November) was attended by 40 – 50 local folk, plus (Chairman) Warren Webber, Dave Donaldson, Kepa Morgan and myself. GM paraphrased the report that Warren prepared:

a) A number of people spoke against the option of direct discharge to the Upper Kaituna
b) A request for Maketu iwi to participate in both the cultural subcommittee and the RPSC, which Warren agreed to facilitate.
c) Michael Quintern commented on land disposal, Warren invited Michael to attend today's TAG discussion.
d) Request from some specific advocate for the Mauri model be adopted for the RPSC process but no there was no commitment to go this way; but I am sure that it will be up for further discussion.
e) Strong advocacy to put the parked LTS (Option 5) back on the "Active consideration" table. (JB – On agenda for 1.30 today).

(2) GM reported that a cultural assessment subcommittee had been formed:

Chaired by Gina Mohi, and including Geoff Rice, Peter Staike and Alamati Hepu

The sub-committee of the RPSC had a presentation from Antoine Coffin on how to approach this and I am waiting on Antoine's proposal, but I understand that he has left his employ to go out on his own.

Andy Bruere raised the issue of going to land disposal as another alternative. Jim, the reason that I raise this is that the last water quality TAG meeting the issue of moving out of the land disposal system was raised and there was some concern about that, and there was a comment from one of the members requested that a statement be put out. I said that I felt that we should be talking to the powers that be at the District Council to be putting out a water quality statement because there are too many 'pc' implications around this. Kit Rutherford and Chris McBride are presently working on how we got the 30 tons and the implication that this will have on the lake.

(JB –Lets hold until we get to Item 6).

GM listed the next hui that will be held starting with the

- Saturday 22 November 10.00pm – 2pm, at Ohinemutu Hall (and also)
- Public open day at the Wastewater Treatment Plant from 10am – 2pm which Alison will be facilitating. 3. The last public meeting will be on Tuesday 25 November 7.00 – 9.00pm at the Sir Howard Morrison Performing Arts Centre. Information Booklet available on the website, copies distributed at the meetings. Copies were made available to TAG members at this meeting.

11-00 am – Kepa arrived and apologised for his lateness.

KM – Sought clarification on the minute taking of the last item of the TAG minutes where we discussed the process on the whiteboard regarding the use of the MauriOmeter model in the process, but it is not clear in the minutes what was decided there. JB – The verbatim record shows that it was discussed at some length with comments from both David and Alison, that it was to be recorded that it could be one of the tools to be used. There was some discussion lead by yourself Kepa, regarding the cultural health impact in that assessment. Alison and I felt that we fairly represented that in the slides that were produced and shown at the RPSC on 14th October 2014 along with your slides KM. (Item 12) Your point is; is it adequately reflected in the summary minutes?

AL – Should we add then that there was discussion including the MauriOmeter as a tool that could be used for evaluation assessment. Kepa commented that he raised the Cawthorn report and based on that report the MauriOmeter could be viewed as the gold standard assessment tool as far as decision making goes.

JB – It is also recorded in **Item 9** how it is to be built into the table. AL - There was discussion around this and an agreement that it would be included as a tool for consideration. KM – OK.

Further "moved" by JB and "seconded" by David. (Comment Arising) - David further stated that the RPS & NPS are statutory and the MauriOmeter is a tool which we need to be clear on.

4. Technical review – by Kevan Brian of Mott McDonald

GM re project management – Brief was to develop the options identified by the RPSC and initially evaluated by the TAG to a level where cost estimates are identified, concepts developed, risks identified to give us a good idea of what those options looked like including what the costs and risks. In terms of the agreement the requirement was to submit a draft report by the 5th November to submit to this TAG for review. Mott McDonald to then finalise the report ready for the 5th December.

Kevan Brian's presentation **(Attach back page of Rotorua Wastewater Treatment Review Project)**
(JB –Suggested that Kevan include TERAX interaction as appropriate but we will revisit when Michael comes after lunch particularly from a land treatment system interaction.) We have not identified where the Ecosystem entry options are as we don't actually know, so there is some limitations on the pricing of the technical details, so they are really just generic schematics. On the treatment side of things, we have come up with some concept layout of where they might go but the actual location details will need to be sorted out at a later stage depending on how far things need to be pumped therefore, the opex costs may be quite variable.

Option 1 – Base Option –- Includes flow balancing of 2 treatment tanks on the right hand side of the treatment plant that where looked at for storing flows particularly during the morning peak and trying to even the flow out to the rest of the process to make it work more efficiently. Phosphorous removal, the mechanism for that was through chemical addition, it is worth noting that the plant does actually achieve some biological phosphorous removal, but the option was to look at chemical removal and on the end of the plant after treatment, and also include UV disinfection for pathogen reduction. This base line option applies to all the other options that we will look at as well, so that base line option has been added to option 2A, B, C and option 3 also, so it is basically building a stack so those things belong to all the other options as well.

JB–Just a clarification, I was under the understanding that TERAX and flow balancing was already in an LTP or AP and was taken as a starting point, Kevan, you built flow balancing of $2M into the base option is that compatible where Council's financial planning is? Greg, I think that the work has been allowed for at $¾ M for the year. Kevan -TERAX process has been mentioned in here but we have not looked at the capex of that is not relevant as it is not a main process. JB – So your whole option study has assumed TERAX to be in place. KM – Can we just note where the decision originates from? JB - The decision was not this TAG's, but this TAG needs to be mindful of it because it has quite a few implications. Eric – As far as the flow balancing goes it is something that we would be looking at doing anyway and going the next step. JB – TERAX. GM – TERAX is a separate project through a separate decision making process. Kevan – The technology itself is focused around bio-solids not the liquid stream, because it is a closed loop system it does have a knock on effects to the liquid stream but it is actually targeted to the bio-solids. The knock on/ or potential knock on effects will be identified separately.

Option 2 – Base Option + Basic Filtration- Which is basically a stack with the base line option applying to the others so Option 2 is Base line + filtration,- with membrane filters, disc filters and sand filters which are physical processes combined with the option above.

Option 3 – Base Option + Denitrifying filtration – Flow balancing, phosphorous removal, UV disinfection with the addition of carbon beds or denitrifying sand filters. Note on carbon beds – to get a proper comparison we have added sand filtration as well because it is a nitrogen removal process rather than a filtration process, which was not in the brief so it is therefore a deviation, if it was not in there, you would not get the effect of the filtration options first. AL – Absolutely, I think that it would have been an error not to include it.

KM – Is the filtration aspect absolutely necessary? Kevan – That is open for debate, depending on what your targets are, but to get a fair comparisons between the options we thought that we should put it in there, otherwise it skews the playing field and I didn't want to look at sub options because that was not in the brief, buy yes it could be taken in or out if that is what the TAG wishes. KM – It would be really helpful if we could approach that option with it clearly defined what the saving is without the sand filters come out. DH – So it is either/or, carbon or sand?

Kevan – As we get further through this presentation it should answer more of your questions. For the record there are generic risks that we need to discuss as this is just a snapshot of the data and all the projections are based on this snapshot based on 2013 to get consistency of the data set, but it is not the only data that is available. JB – So the TN for the MBR is down to 2.81mg/L – I did not know that it was that low. AL – It depends on how we run the MBR and the Bardenpho, but the average will roughly be around the same. KM – So this is the most representative dataset of the current situation? Kevan – Yes and I am confident that it is representative of the other studies we have done, so it is easier to compare.

Kevan - (the separation of the flow = MBR takes about 7,000 cubic metres /day and the balance of 12,000 goes through the Bardenpho, as flows change 7,000 stays at that level and the Bardenpho creeps up with any increases which is important from a mass balance point view. Therefore there is a heavier weighting in the top box on the table over time.

With regard to the Report on page 7 – The flow data of the plant has not changed significantly in seven years, excluding the 2008 drought. A capacity study was done by Harrison & Grierson around 2005 and those flow projections are in the report under 3.4.1, one of the risks here is that the growth isn't realised, or is higher or lower, historic data is relatively flat, we are basing our study on an increase of 3 – 4 megalitres/day which is a significant risk on a mass point of view. The per capita flow is difficult to estimate as Rotorua is a Tourist Destination.

(1) Base Option

- Chemical dosing based on Alum –(aluminium binds soluble phosphorous to solids),
- UV disinfection (pathogen reduction),
- Flow balancing, (fewer peak flows),
- Control benefits for filtration and chemical dosing,
- More consistent UV Dose rate,
- Some reduction is size of tertiary processes,
- Option by itself is difficult (but not impossible) to implement with TERAX,
- TERAX does not presently include for chemical sludge from Alum dosing

AL - So Kevin, are you suggesting that as it stands at the moment we can't integrate the TERAX scope because it is not good enough? KB- Unless you change the scope of the TERAX Yes, AL- does that mean that we have to look at alum dosing option separately. Kevan – That is not an option here, when filters come along then that option opens. JB - Because there is only one solid stream.

GM – Going forward – potential implications of TERAX have recently come to light, especially the "transmissivity," we know of some nitrogen complications but we felt that it was not too much of a complication at this stage

and came to the project to decide how to align these 2 projects together, scoping the implications as if TERAX was put in - we are going through the process in this study of scoping this project as if the TERAX was put in there, what are the implications.

KB - The risks are actually difficult to quantify because part of this process we don't know what targets there are, we do not know what the pathegon kill, we don't know what the Goal Posts are:

KM Just so it is clear where I am coming from, I have a Colleague who used to work for Landcare and knows a great deal about those processes, he said that there needs to be a great deal of care around TERAX processes as there is an international movement away from it, this could leave us vulnerable. My concern is that if we get locked into a particular option because TERAX has already been sighted on, I suggest that we should be a little more flexible on how we look at this. There are question marks there as this is not the direction that others are going.

JB – I am feeling vulnerable as a TAG in terms of the implication of TERAX, as we are being asked to come through to Warren's Committee with some fairly strong direction on technical solutions, once we can bring it back in and match it to effects study working back from the receiving environment, we have kind of got this elephant in the room, or have I got that wrong?

AL – Do we want to put a question from the TAG to RDC that any extra work that is looked at around the impact of TERAX regarding the treatment plant processes and how they would be mitigated, or what the back up plans are, and come back to the next TAG meeting? We want that study to report back to this group – don't we?

DH – Sure, we need as much information as possible.

JB – Yes because we came up as a TAG with option 1 – "bugs" and phosphorous, we heard that phosphorous is potentially becoming a greater problem it looked great on the base of it but now there is a couple of large question marks on the implications of that which we as a TAG are not answering.

GM -The way to go is as Alison has been suggesting, initiate a study based on treatment of this project if the TERAX effluent goes to the plant and if it is possible to mitigate them what needs to be done. AL – Which we are discussing further with Kevan on Tuesday. KB – There needs to be risk and likelihood matrix put around that also, some are low risk but high impact. GM – Bottom line, if the implications are too onerous then the TERAX does not go back into the treatment plant and then look into the cost implications of that in terms of the business case to justify TERAX.

(2) <u>Base Option + Basic Filtration</u>

- All basic filtration
- No additional effects from implementation of TERAX
- Ability to take out separate

JB – Raised Disc Filter Fabric/mesh size(s)

- ***Action: Kevan to check the supply information on the micron mesh size as it needs to be noted in the report.***

(3) <u>Base Option + Basic Denitrifying Filtration</u>

- The Base option (Option 1) does not do anything to improve particulates except for making clarifiers work slightly better. The basic filtration options take out almost all the particulates some N & P, but

you still have N left over once you have filtered everything as it is soluble and can't be removed. The next step is to filter and put in some other N removal mechanisms.

- The carbon bed has been costed on the end removal basis, so it compares best with the other end removal basis which is the sand filter.

JB Re Moving Bed Bioreactor – did we miss a trick not putting this in your brief Kevan with the 2 denitrifying options that we looked at, and we need to keep in the back of our minds when writing up an alternative assessment. Kevan – I don't think so, when we come to the summary it will tell us some interesting things about the denitrifying sand options look like compared to the others.

Ecosystem Entry/Disposal System Options

- These were investigated without any sites being identified.
- None of them provide any treatment except the Wetland which has the most potential to remove N. (this sits in both camps, it could be a treatment or a disposal option depending on how it is configured).
- All the others are really conveyance and entry options rather than having treatment in them.
- The Wetlands has a down side as there is uncertainty about introducing organic loads from plants, birds and wild life as it is not really controlled and the water may come out worse than how it went in.
- No additional effects from implementation of TERAX unless there was a colour issue.

Feasibility/Constructability of each Option (These options can all be inter-changeable)

- Pipe direct with diffuser
- Rock Passage
- Wetland- we have sized 3 different levels of treatment
- Rapid Infiltration Basins (RIB) - we do not think that the soil and ground types are suitable for this.
- Gabion Baskets /Riparian – reasonably simple to design and implement.
- Monitoring Pond – When we looked at the brief we were not exactly sure what that would look like – but this option looks cheap because the assets are already there. What was the intent of the monitoring pond?

JB - We have done quite a bit of work on this with the Committee including on the hikoi. The monitoring pond type concept was based on the Palmerston North one which was based on the reintroduction back into nature, (if the birds died then you were in trouble), it was that kind of concept, very brief contact time which is similar to your 1 hectare or less wetland.

Summary of treatment options (Risks as shown in the appendices of the draft report)

- (Eric) That Opex does not take into account any reduction in costs which we are not incurring by not pumping up into the forest as pumping is quite significant at 400 and electricity at $300pa. with a total of $800-900pa. including labour to run the forest. (KB) that is correct. (JB) – That is significant.
- (KB) – Looking at filtration options is the moving particulates like P dropping in residual form and TN, from 0.6 to 0.1 basically to nothing which has a knock on effect to the TP loads from 6 tons to 3 tons, to

  47, to 42, to 40, to 38 is what you can see with filtration.
- The Opex numbers include Alum. (basically maintenance, with no depreciation)
- N in the discharge is the most significant part of the load. The Capex difference between Option 2 and 3A is not that high because the sand filtering is essentially the same and you have already got carbon dosing which means that you do not have to pay for it again, just the chemical itself.
- Carbon beds are OK for N – with regard to risk we don't have many references for any carbon beds that big and we don't have any information for the sizing of this scale.

- (AL) We are not finding any extra particulate material leaving the carbon beds, it is an unquantified risk therefore this is the best way that this could function.
- (JB) – Your report says that you are at or below the limit of technology how confident are you about that because it throws your N numbers around a lot. (KB) – Ye it does, I am reasonably confident, I think it would be good to get reference plants and we know of a number operating in Australia with this system, get the data and have a look, that would probably be the best check.
- (JB)- What is your total TN concentration for the combined MBA Bardonflo in option 3 because we have a Chairman who is fixed on the fact that 3 is pretty much the limit. (KB) Just over 3.

Kepa gave retrospective Karakia and blessed the lunch

Broke for lunch at 12.45pm

Reconvened at 1.25am

(KB finished his technical discussion with the last 2 slides of his presentation).

- Some pros and cons – with more detail on the advantages and disadvantages and risks
- Disc Filtration – Jim was saying has been used quite a lot
- Sand filtration is used in Mangere and a lot in Australia for P & N removal
- Potential saving on membrane filtration
- Most effect on N is with the denitrifying options
- Reliance on Ethanol on the tertiary N removal
- TERAX minimises Ethanol use (as provides a Carbon source).
- Carbon beds are relatively expensive because of the filtration up front and also due to it being very difficult to quantify leaching of the nutrients of the carbon bed. There are no reference sites of this scale.
- Base options - flow balancing needs more investigation, because as you have seen in the report, the overall effect on composite basis of the samples is not that high, to ensure that if you invest the capital you get the return that you are after.
- Capex report has some errors in the costing of disposal options which needs sorting out.
- Basically the wetland has good potential for N removals and to add nutrients back in
- Watch "Add on" costs like the values in control systems and pipes etc for flow balancing.
- JB – TAG you will recall that we had a healthy discussion about carbon beds at the time of Rotoiti/Rotoma, this report here deals with the large scale installation questions as I read it.

- ***Action for KB***
- ***- Kepa requested that more details be put around the "cons" of the Bardenpho and sand filter, because to say that it is relatively old technology would not cut it, it needs to be more specific.***
  - JB - We need to make a couple of conclusions on Kevin's work and where that goes (Greg) in terms of variations on the theme or different combinations, we need to clarify the land application and an update on the effects side of things (and leave the action list review). Direction from Kevan on a TAG point of view compared to a project manager RDC point of view.
  - DH – I would like to thank Kevan on an excellent presentation
  - GM – If you could all put your comments to Jim, he will coordinate and get back Kevan, who will have had most of the comments already from all these discussions by the close of play this time next week. Is this possible Gentlemen?

GM - Kevin's Deadline – Need to allow a week for him to get the comments together and back to RDC by 5th December with a final report.

5. Michael Quintern – TERAX and Land Treatment System Options

Jim welcomed Michael Quintern - Agricultural Soil Scientist, (1.30 pm – 2.45pm)

(on Warren's invitation from last Saturday's hui) to discuss his thoughts on land treatment system of effluent wherever possible and also TERAX and its interactions:

Jim mentioned that we have been asked to put Land Treatment System (LTS) shortlisted options 4 & particularly 5 back on the Agenda. From a RMA process point view I feel that it is sensible that it is further addressed.

- Greg gave brief background as to where the alternative land treatment site investigations had got to. Around 650 hectares with a capital cost tag of about $48M had been previously determined.

- Andy Bell stated that TERAX is at the stage of detailed design, gone out to tender on long lead options and some have been received, though nothing has been signed yet. Looking at impact of TERAX on WWTP or visa-versa.

- Kevan Brian discussed the TERAX process ' thermal oxidation' of solids
- 1st stage – fermentation
- 2nd stage – wet oxidation, nutrient recovery N & P from the balance
- Liquor has useful residual COD that is returned to WWTP (W some N) to reduce ethanol
- Removes some DRP and reduces the requirement for alum
- Risks/impacts – DON
- Risk around colour that might upset UV treatment and/or a visual effect on the environment
- Some sizing in TERAX design in additional chemical sludge
- Destroy solids on site and manage them.

Michaels's perspective – I understand that the WWTP is designed to extract as many nutrients and hazardous materials as possible, and also that bio-solids are currently reused. The TERAX model will pick up on this however, is it adding N to the effluent 3-4l/yr? AL – We have a fraction of the N returned to the WWTP, 85% is recovered and the rest is ammonia with 15% that will go back to the WWTP and be treated in the treatment plant apart from some residual dissolved organic N (being roughly 3-4 tons).

Action 1: AL - Email Michael and Kevan Brian the TERAX report.

Action 2: AL - Email TERAX heavy metals report/partitioning)

- *P in ash goes to Balance*
- *Silver etc. piloted BNR with TERAX liquor*

Andy Bell – Just a word of caution here Michael, this isn't the TERAX team here, this is the land disposal alternative wastewater system TAG group - this group is not governed to answer your questions on the TERAX process. Michael – I understand that but the only reason I ask this question is the effect on the effluent.

JB –As Greg informed us in his summary on the consultation at the Maketu hui as a TAG team we came through with 5 options that went through to Warren's Committee and after in depth discussion option 4 & 5 have been "parked" pending technical and cultural reports, and now the TAG we have been asked to further consider the possibility of land treatment system (both a full or dual discharge system). Jim asked Greg for history – Scoping report estimated land area (to replace the existing system) and it showed a 600 ha based on current crop regime LTS cost $48 - 50m (including the requisition of extra land). No work has yet been undertaken to identify potential suitable land. If we want it on the table it needs further investigation with a feasibility study of a possible alternative site, (in or out of catchment).

JB – From RMA perspective, someone needs to review alternatives assessment before the decision is made. JB asked Michael to share his thoughts.

MQ - (1) I am concerned about the options being "parked" in view of the short time frame and would like to see them "unparked". Can this be reactivated and if so when and how is it considered? Andy Bell – There is no closed door here Michael, at the end of the day we want what is best for the community.

(2) What is the chance of a review to reconsider the impact of Tn on waterways 39T/pa to forest, 23 to lake, < 23t Kaituna, 5.5 mg/L reduced to 3 mg/L to lake. (30) c.f. 3-4 Ex TERAX. Suggest Taupo like system therefore we need to Alum dose.
Alternative – Run it at a lower level (?), 80 ha Airport based on N loading

Andy Bell - The Land Owners of the Forest want us out as soon as possible, the agreement is by 2019 which is 2 years ahead of our consent requirements.

Action – AL – To send Taupo Report to MQ

Comments then made:

- *Talk to current landowners on LTS*
- *Peter Beets Report (Overseer handles the Taupo Scheme)*
- *Anaerobic Digester – heat for schools*
- *Can we use Overseer or Wang's Model?*

(MQ – left meeting at 3.00pm)

5A. Land Treatment System

(JB) -Land treatment system to stay with the current technology and variations on total or partial land application. We got to the point that we considered as a TAG, that we should go back to the committee with an outline of how much further we should go as a next step. That would include preliminary sizing based on both N and hydraulic loading of soil characteristics of that general region, a high level economic assessment and first cut (very high level) effects type assessment putting it into a catchment context.
(KB) – Could be done, just taking up on Andy's point you mention soils in the area but if there is no land where do you choose to put the pin.
(JB) – The way we have done this in the past is to put within a radius, from a cost point of view and don't put points on a map, with pros and cons risks.
(GM) – We need to decide if we proceed with the workshop.

Action: There was general consensus that the TAG Happy that (Greg, Alison and myself) draw up a brief for the land treatment system for option 4 & 5 and get approval from the Steering Committee?

Discussion (Cont.) on Land Treatment System Options

(Andy Bruere) – My concern about that presentation was that there was nothing technical presented, if people come and occupy an hour of our time, I feel that they should have a prepared technical presentation before they turn up.
(Andy Bell)- I think that these land disposal questions (and not the TERAX questions), could have been handled better, they are not going to go away, the TAG need to rethink and work through what is appropriate to consider before we move on.
(Andy Bruere) – I guess then that outcome is that we need to get a message back to Warren that he can feed information to us but that he does not have authority to send people to the TAG meetings.
(Andy Bell) – The question has been raised, what does the TAG group suggest or recommend to the RSPC group and how should the RSPC group respond to that issue.

(JB) - So Andy are you suggesting that we make a decision now, that we open the door at a TAG level, revisit and scope out further some of these mix and match concepts rather than full scale land combinations.

(Andy Bell) - Have a think about what is involved and what the outcomes are likely to be with the time and resources that we have got and make a recommendation to the Steering Committee.

(Andy Bruere) – As you mentioned Jim the question here is that whatever resource consent application you go through you are going to have to add support to the team and justify why you choose an alternative and why you eliminated other alternatives.

(GM)- My suggestion is that we need to bring this to the same level as what Mott McDonald has done to make it comparable.

(KM) - The 2019 Deadline has painted the whole process into a corner and you need the land treatment disposal on the table to achieve this.

(GM) - From a RMA point of view I am nervous as to where we are at present particularly with the kind of questions as to how we would defend the alternative assessment. How do we pull this together with a resolution today and how much further we go forward?

(Andy Bruere) – Don't we make a resolution that goes back to the Steering Group, so we say that we need to get some economic assessment / high level environmental assessment /social assessment of the two options that are parked.

(GM) - I can write the brief. The intention was to have a workshop on this but I am not sure that this will happen. If we are going to look at option 5 then we need to bring it to the same level as Kevin's report.

Action - (JB) - Is the TAG happy that we (Greg, Alison and myself) draw up a brief for the land treatment system for option 4 & 5 and get approval from the Steering Committee?

6. Add-Ons

Presentation on Microvi Water Technology by John Darmody – MWH via Speaker Phone talking to slides – Refer attachments on last page of minutes

(Note a "Whitepaper on Microvi had been previously circulated to TAG).

Creating a natural habitat for microorganisms - instead of modifying the microbe to adapt to our "world," we create a world to suit the microbe.

- Slide 1

  Microvi uses only effective microbes, and provides them with an ideal environment of active microbes.

  (It took more than a decade to achieve their aim but they are able to form a bio-catalyst).

- Slide 2

  Microbes from colonies – highly efficient in pollutant removal compared to individual microbes in solutions.

  The reasons why they are so effective when you bring them to the bio-catalyst is:

  a. As a single purpose microbe you are able to get a very high number of very densely packed microbes, (3000>5000 in activated sludge maybe).
  b. Microbes in soil and recognising that they have full colonies which gave them the capability to be very efficient, they communicate through communication pathways, but most importantly they grow to be very mature and form colonies and in the water environment where we encourage them to grow for our wastewater treatment their lives are measured in days or if they are lucky weeks therefore, they are immature and compete for pretty much everything that they are doing).

- Slide 3

  Current biological processes are not an efficient mechanism for contamination removal.

  The problems that we have with conventional treatment which is low microorganism density environmental stress and toxicity comes from being competing with many other microbes in a given area, the completion that you have from unproductive organisms with a short life span that I have just talked about, it ticks all the boxes are as far as arguments are concerned. A reactor is nothing more

to us than just a box, with work that we are doing at the moment we are looking at retrofitting the biocatalyst into those boxes.

- Slide 4

  Wastewater Treatment Applications – We have four application areas, wastewater, ground wastewater, industrial water and drinking water. If we look at wastewater treatment application BOD & COD removal and nitrify and denitrify with removal of ammonia and nitrate also hydrocarbons and if we use biocatalyst because of large numbers of effective microbes being in contact with water we end up with a very small footprint.

- Slide 5

  Key Benefits - Microvi offers full lifecycle advantages for wastewater treatment, 10 times smaller footprint, reduced chemicals, minimized sludge, reduced energy, increased process stability and easy to retrofit an existing plant.

- Slide 6

  Selected case studies – (a) Ammonia Removal- UK, (b) Perchlorate Removal USA, (c) Nitrate Removal USA and one about to be trailed in Sydney

Discussion took place

DH – This is the 2nd time today that we have been subjected to "Hard sell advertisement" – we are a technical group and need all technical details in order to evaluate seriously, maybe the technology is there but looking at the 2nd page, the crosses against the conventional treatment are simply incorrect. I think that it is partly our fault that the briefs have not gone out properly, but we are not a group interested in evaluating this point of view, we need technical details put in front of us therefore,

My recommendation to Jim is that we "park" this until we have "quantitative" technical details

John Darmody – I know that it is late in your process, I guess my question is are you interested in doing anything with this data at all, is there specific information that we could offer that would allow you to take it forward to your next step, I can certainly try and get that to you.

KM – (1) Can you comment on the tolerance to variability and flow? John – It is excellent, one of the key features about it is that the microbes essentially become dormant and reactivate very quickly, and obviously the longer they are dormant the longer it takes for them to reactivate. (ie. If dormant for a year or more then they take a week to reacclimatise, if the load doubles or triples they basically follow the load up and out).

KM - (2) My understanding is you are reducing the diversity of the microbe population, so what is the vulnerability to the changes, you might have something coming through in the flow that might kill it off? John - As they grow older and mature they set up communication pathways and also produce a skin if you like, or protective coating over the top of the microbe itself, I have results quoted to me that though they get knocked back they quickly recover.

KM – (3) You mentioned that they have been developing this for ten years, what is the longest trial operating and what is the efficiency/reliability over the length of that trial? John – The longest trial would be the wastewater trial in the Bay area that piloted full scale for 18 months, (not continuously because of varying parameters) and had excellent results – **I can get you overall results**. All trials have been interrupted for a couple of days to make changes and replaced parts, you are not looking at continuous data but you are seeing months of stable data.

Action – (John) – Jim if I can please have a specific list of what you require so I don't misread what you require.

7. Effects and Discharge Locations Study & Programme - (University of Waikato Submission)

GM – Thank you for the proposal David, we are happy with the way it was written, we just have some budget problems requiring internal approvals underway. Jim I was away when the costs were finalised.

DH – With regard to programmes, sometimes delays are not a bad thing because we are still refining around the three different options available with potentially 4 or 5 options. GM -It buys you time. DH – Exactly.

Andy Bell –Kevan, I know that you have not received a brief yet but what would your timelines be for :LTS investigations?

KB - I would say 3 – 4 weeks depending of level needed. If we are doing it at a high level we do not need to do site investigations, it's more about working out pipe routes and irrigation quantities, soil structures and loading rates.

GM – Stage 1 for David was due on 5th December but that is not going to happen (DH - It can't end before it starts). The scheduled TAG workshop to review the Waikato Effects Study on 9 December, and we finalised a super short list on another TAG meeting either by correspondence or possibly telephone conference on either 15th or 16th with the intention to have a joint TAG/RPSC workshop on 17th December, however the implications to this is that we will not have enough information to either meet on the 5th or 9th or to have the workshop on 17th so these will need to be held after Christmas. And with this other bit coming in I will have to review how we are going to adjust everything but not moving 2019.

Action - Jim, I think that there is little point that the TAG meet on the 9th and I therefore suggest that it be cancelled.

JB Correct. GM – We need to discuss with Warren if we are going to still have the joint TAG/RPSC workshop and I will schedule a telephone conference meeting when Warren comes back, with JB, Warren and myself. David, what is a realistic time frame for you know. DH – We would need to push it out a month at least, out to May 2015.

8. Deloittes Study on relative cost of N reduction actions – as may be appropriate to this RPSC Project.

Andy Bruere – With the Tikiteri N Absorption Project, we wanted to check the cost/unit of N against some other technologies including land use so we went to Deloittes as they have done previous work for us on the value of weed harvesting versus land use change. I have not got final figures yet but we are doing it in two stages - Stage 1 - Tikiteri land use change with the costings that Alison has given us for running the treatment plant as it is now, and that information should be ready at our next TAG meeting (I am expecting), Stage 2 - being the cost of nutrient reduction for Rotoma/Rotoiti, our in house economist has volunteered to do this work.

9. Wastewater Inputs/Water Conservation

10. Action List Review – GM, AL & JB will complete off line and circulate

11 – General Discussion

a) Further to the discussion on RDC website - we do have a TRIM system within Council and we can access and copy off information required

Action - Andy Bruere is going to look at the possible use of the Base programme website.

b) Andy Bruere – If we want someone to present to this group we should be for technical information to be provided prior to the meeting – (the Microvi Whitepaper presented did not cover technical info) – often people come because they want funding as we are not in that game. DH – Echo's Andy's sentiments and wishes to thank Kevan on an excellent tabled presentation.

c) Andy Bell – I feel that we need a process for the "add-ons" into a proper format for consideration

d) KM- Since our last TAG the Steering Committee formed the cultural sub-committee for them to do cultural assessments for the effected iwi groups which is great, but I feel that Warren interrupts that as a substitute MauriOmeter analysis, CIA is not the same as a MauriOmeter.

Secondly, Warren felt that my email on the Cawthorn report was self-promotion, I felt that that was uncalled for as I had nothing to do with it and felt that it made things simple. I think that this needs to be clarified, my expectation is that we will do a holistic options to present back to the Committee, I am happy to do the MauriOmeter analysis as it certainly clarified a lot of issues last round, if not that, then what? But I think that we do need to flag something. Is the steering committee going to tell us that we can't take cultural issues into account. This is a big one that needs to be flagged for discussion. Don't make cultural assessment an add-on.

e) Andy Bell - I agree with Kepa, the problem that we arrived with RRSSC was that the cultural assessment came far too late last time and set us backwards by time and cost us money and caused negative vibes that could have been avoided. We need to learn from this and improve on it.

f) GM - It shouldn't be trumping or agreeing it should be integrated.

g) Andy Bruere - How do you make that work though? If you have a cultural group reporting to the steering committee, that information will never come to us. KM – Well it needs to, otherwise it sets us up in competition.

h) GM - That study information has to go to the project steering committee, we look at technical and environmental give it to the committee and they put it together and make a decision.

It should be an exercise of the cultural group and the TAG coming together and agreeing on a tool.

As project manager, I am concerned about the timelines, and the implication of all this new information and project implication also. I don't believe that 2019 is movable, we have milestones to meet and I will need to have a serious discussion with the Chair.

i) With land disposal and what we were talking about on Tuesday we need to bring those two together because there are some common answers there that are overlapping.

4.10 – Kepa closed the meeting

Attachments:

Detailed Feasibility Study.pptx

(Kevan's presentation)

SKMBT_C364e14120409330.pdf

(Kevan referenced during his presentation)

SKMBT_C364e14120409390.pdf

(John Darmody MWH – Microvi Whitepaper presentation)