

TANK Collaborative Stakeholder Group

Meeting Twenty-Nine - Record



When: Wednesday 14 June 2017, 9:30am – 5:00pm

Where: Te Taihenua o Heretaunga, 821 Orchard Road, Hastings

- Note: this meeting record is not minutes per se. It is not intended to capture everything that was said; rather it is a summary of the proceedings with key comments noted. *Text in italics indicates a response from HBRC to questions posed during the meeting.*
- *Where additional information has become available subsequent to the meeting (such as answers to questions unable to be answered in the meeting), this is included in red italics*

NAME	ORGANISATION
Aki Paipper	Operation Pātiki ki Kohupātiki Ngāti Hori
Brett Gilmore	Hawke's Bay Forestry Group
Bruce Mackay	Heinz-Watties
Connie Norgate	Department of Conservation
Craig Thew	Hastings District Council
Emma Taylor	Gimblett Gravel Grape Growers' Assoc.
Hugh Ritchie	Federated Farmers
Ivan Knauf	Dairy industry
Jason Strong	Napier City Council
Jenny Mauger	Ngā Kaitiaki o te Awa a Ngaruroro
Jerf van Beek	Twyford Irrigator Group
Joella Brown	Ngā Marae o Heretaunga
John Cheyne	Te Taiao HB Environment Forum
Kim Anstey	Napier City Council
Lesley Wilson	HB Fruitgrowers' Association
Mark Clews	Hastings District Council
Marei Apatu	Te Taihenua o Heretaunga
Matt Brady	Department of Conservation
Mike Glazebrook	Ngaruroro Water Users Group
Nathan Burkepille	Fish and Game NZ (Hawke's Bay)
Neil Eagles	Royal Forest and Bird Society (Napier)
Ngaio Tiuka	Ngāti Kahungunu Iwi Inc.
Nick Jones	Hawke's Bay District Health Board
Peter Kay	HDC Rural Community Board/Sheep & Beef Sector
Scott Lawson	HB Vegetable Growers
Te Kaha Hawaikirangi	Ngā Hapū o Tūtaekurī, Maungaharuru-Tangitū
Tim Herman	Pipfruit NZ
Vaughan Cooper	Royal Forest & Bird Inc.

NAME	ORGANISATION
Xan Harding	Hawke's Bay Winegrowers
Desiree Cull	HBRC Programme Leader
Drew Broadley	HBRC Communications Team
Iain Maxwell	HBRC Group Manager Resource Management
James Palmer	HBRC Group Manager Strategic Development
Jeff Smith	HBRC Team Leader/Principal Scientist Hydrology
Jim Sinner	Cawthron Institute
Judy Buttery	HBRC Committee Secretary
Mary-Anne Baker	HBRC Senior Planner
Robyn Wynne-Lewis	Facilitator - Core Consulting
Rob Waldron	HBRC Hydrologist
Stephen Swabey	HBRC – Manager Science
Peter Bevan	HBRC Councillor
Tom Belford	HBRC Councillor
Marie Rohleder	HB District Health Board
Cameron Ormsby	HB District Health Board
Chris Dolley	Napier City Council

Meeting Objectives

1. Continue focus on GW modelling
2. Introduce the SOURCE model and explain how it works in relation to surface water takes
3. Consider an out-of-stream storage option for augmenting flows in the Ngaruroro River
4. Provide a tool for deciding combinations of possible management solutions for future modelling.

AGENDA ITEMS

1. Welcome and karakia

Robyn Wynne-Lewis welcomed everyone.
A Karakia was given acknowledging the rising of the sun.

2. Agenda, early discussion and introductions

- Housekeeping matters covered.
- Apologies were confirmed (see attendance table above).
- The meeting agenda and objectives were outlined.
- Ground rules for observers confirmed.
- Engagement etiquette was covered.
- Open floor for TANK members for notices and announcements.

Sheep and Beef Reference Group are meeting on Monday, 19 June 2017, from 2.00pm to 5.00pm at the Puketapu Hall. All welcome.

An additional meeting in August planned, 17th or 18th, this to be decided at the end of the meeting. **Later agreed on Thursday, 17 August and Nicky van Pelt, HBRC subsequently sent a meeting invite.**

Robyn asked the meeting if there was an appetite to extend meetings until 5.00pm if there were additional matters to be covered. Discussion ensued of the options of 9.30 to 5.00 or would people prefer to start at 9.00am until 4.30pm. The majority preferred starting earlier.

Action Item

29.1 Staff to ensure that bookings allow for earlier start at future meetings.

3. Item # 2 – Meeting Record 28 and Action points

Please record Marei Apatu's apology for the last meeting, he was overseas at a bereavement.

Some concern was expressed that no record of whether the meeting agreed or disagreed about spring fed streams being best managed by flow augmentation (i.e. not by restrictions on takes) because zones cannot be delineated, and accounting for cumulative impact of all takes is important. Desiree explained about the quality of the recording from the last meeting which affected the minute taking. She asked the meeting if the following was what the members recall and if so, to include it in the Meeting Record.

Based on the hydrologists recommendation that it may be feasible, the TANK Group agreed to explore rolling out an augmentation scheme across the Heretaunga Plans for widespread takes but noted that a management group (similar to the Twyford scheme) is essential to "lean" on users. The model is not at a scale capable of accounting for observed stream depleting effects from particular takes. One option is to treat these as surface water takes.

There was a request that the group remember that though it may be feasible this was putting the cart before the horse, as we haven't established the sustainable quantum of groundwater resource that we are able to taken. This reflects the approach advocated by the Mana Whenua Group to put Wai first. There was a general level of discomfort about the decision making process and concern that it was important to understand how much was available before talking about allocation or mitigation measures such as augmentation. There was widespread support (via a show of hands) for understanding the sustainable use of the groundwater resource first. **This is consistent with an action point from the previous meeting (action point "28.2 HBRC Scientists to come back with more information on GW levels").**

Mary-Anne told the group that some criteria in which to judge if it is going to be acceptable will be bought back to the group in terms of the desired flows in relation to either the habitat or oxygen and temperature. This will be a way of testing whether a management option will give the outcomes being sought. She acknowledged that it is a little bit back to front but the modellers require some direction on stream depletion first so that different choices can be modelled and reported on.

In terms of the tangata whenua input into this conversation, it was important because unless we agree on how we are going to make our decisions there is liable to conflict at the end of the process.

It was then suggested that the group had agreed to develop the model, not to explore an augmentation scheme, this was mainly looking at getting better information.

Jeff Smith gave some further explanations on stream depletion including in relation to recharge of the aquifer and discharge at the coastal margins. He reiterated that the modelling was providing a means to explore options for management and that managing the spring discharges is a more effective way of managing GW and SW than percentage of discharge.

Following the discussion, the Group agreed that the new wording (in italics above) be included in the record of Meeting 28 and it was confirmed as an accurate record.

The word 'augmentation' was used in several different ways, and it was clarified the use of the word augmentation by this group was for augmentation of surface water flows, not augmentation of irrigation supplies.

4. Item # 3 – Summary of Science

Dr Jeff Smith presented on the following topics:

1. Summary of the stream depletion modelling to date
2. Responses to questions from previous meeting
3. Introduction to sessions today
4. Looking ahead to next meeting.

He went through the list of options on the whiteboard from the previous meeting:

- Augmentation from a dam to Ngaruroro, Raupare and Karamu, that show the quantum of augmentation required
 - This will be discussed this afternoon.
- Flooding Roy's Hill Maraekakaho river flats to use as a recharge: turn into a wetland for co-benefits of increased flows and habitat.
 - Dr Smith found it hard to see how this would work. He could not see how a wetland could be used for recharge, because recharge schemes go dry.
- Use of aquifer water without compromising sustainability.
- Any excess of use over allocation,
 - a sliding scale of takes not fully used
 - protecting GW levels risks of contamination and bores running dry. Will be modelling that.
- Using GW allocation limit to protect GW levels long term.
- Cost to replicate the Twyford scheme?
- Methods to make urban and industrial more efficient.
 - Dr Smith noted that Hydrological modelling can't provide all the answers but are important considerations for later.

Matters raised by TANK members:

- The natural area of recharge can be increased by creating a leaky wetland i.e. not a year round wetland. The area was an old flood plain and good functioning wetlands have been proven to recharge aquifers. A floodplain is a unique wetland which dries out in the summer. *This is an option that could be investigated further.*
- A request was made that the group be aware of the numerous people who have lived close to streams for generations and to take on their knowledge. *Dr Smith said that he was keen to learn more about Matauranga Maori.*
- Do we have any data of how efficiently water is being used? *With modelling the assumption is made that water is being used with 80% to 90% efficiency. But with consenting HBRC use a model (SPASMO) to ensure water is not given extravagantly to consent holders. This takes into account the land use, soil, climate and the area which they wish to irrigate and limits the amount of water allocated.*
- Could there be more investigation into actual use? Could we get twice as much effect from the water allocated? *This is fundamental to all that is to be decided.*
- Could efficiencies in water use be a criteria for issuing resource consents?. Should it be an option to include in newly drafted rules? *Need to define efficiency as there are numerous definitions in the RRMP. Modelling assumes worst case, and not try to include any efficiencies.*
- Does managing groundwater levels manage stream depletion (feedback loop)? *This will be looked at for the next meeting.*
- Why aren't irrigation efficiencies part of plan? *That was because we have been focussing on irrigation takes, and the request was to look at how we can also look at urban and industrial.*

Since the last meeting:

The science team has recalibrated the Groundwater Model to ensure that their findings were as accurate as possible taking into consideration new knowledge on the variance in stream bed conductance (i.e. that during winter groundwater pours into streams). The result in terms of water budget was less river leakage (loss to or from streams so a net gain to GW) and less offshore discharge. Dr Smith explained this in detail to the group. Then the team remodelled previous scenarios to correct for extra spring flows in winter, checked results and confirmed no substantial changes. The significance is that the modellers and are very happy with how the model is now performing and can carry on with their modelling with confidence.

Matters raised by TANK members:

- Does this have any impact on the view that the HBRC might take as to what is a safe level of abstraction of ground water? *No because this is not in summer.*

Jeff then spoke of what was coming up later in the day and what was planned for the next meeting. He then presented a 3D conceptual diagram which illustrates water flows through the various ground and surface water systems.

Matters raised by TANK members:

- If you recharge the aquifer, will all lowland streams benefit i.e. will the smaller streams necessarily benefit? *Probably a distributed recharge would work better. A managed aquifer recharge scheme can have unexpected side effects.*
- The impact on the Ngaruroro a lot bigger than previously realised, about 50% of the actual pumping is static pumping 365 years per year. Other 50% is for irrigation only during season of 3 – 4 months. It is all about the impact. The timing during the year that the abstraction is happening is the important point. *Pawel is modelling a worst case scenario for that 150 days in terms of irrigation demand. Jeff has looked at data from 2008 – 2016 and the model is showing during that period the maximum stream depletion effect to the Ngaruroro is 800l/s, so that is what he has based the augmentation flow requirements on.*
- Well pumping was 75.7 Mm³/yr total water abstracted which means less than half of consented water is actually being abstracted. It was requested that Full consented water takes needs to modelled.

Action Item

29.2 Staff to model fully consented water takes.

5. Item # 4 –Water age in drinking water supply wells in Heretaunga aquifer (Dr Uwe Morgensern)

Dr Jeff Smith introduced Dr Uwe Morgenstern Team Leader Isotope hydrogeology and Water Dating Lab at GNS Science.

Dr Smith explained that Uwe was a co-author of the Hastings District Council report on ground water in the water supply wells, and the various hypotheses that have been put forward.

Let the water tell the story.

Where does the water come from and how old is it? Flow dynamics in the Heretaunga Plains (HP). Many studies in the past but this talk is looking at the signature of the Isotope and also the chemistry signature in the water.

The water in the aquifer has two recharge sources. The recharge source is important to understand in terms of carrying contaminants. River water is normally safer from drinking water purposes, because it comes from pristine environments. River water is high altitude river source, not run off from rain from the catchment. Recharge in the HP in the north is mainly river recharge signature and in the south mostly local rain recharge. Napier has a very overwhelming indication of river recharge, which is different to previous understanding. In the HP the gravels are

extremely highly conductive which means there are very fast ground water flows. Preferential flow paths which can contribute to some young groundwater, which is prone to carry live contaminants. Very complex geology, but there are areas in the HP which have secure and less secure groundwater. The aim for drinking water purposes is to find the more secure sources of water.

Uwe spoke of the 4 different methods which are used to determine the recharge source of the water and the age of the water.

Indicator 1 - isotopes

Stephen Swabey explained the isotope ratios. The ratio between ¹⁸Oxygen which is less common than ¹⁶Oxygen which is very common and ²Hydrogen which is less common and ¹Hydrogen which is more common. The ratios between them change as you shift the water from a solid state (ice) to a liquid state (water) and a gaseous state (the stuff in the atmosphere) the ratios change because the energy required to evaporate or to freeze works differently on the weight of the isotopes. They can tell from the isotopes just where the water has come from river or rain.

Indicator 2 – Air in groundwater

High excess air from rain recharge and low excess air from river recharge.

Matters raised by TANK members:

- What about the effect of pressure? *Collecting a sample for gases can get wrong results. It is very complicated. The groundwater systems are extremely complex. At the moment scientists are measuring argon and nitrogen.*

Indicator 3 - CFCs.

Water from a river does not contain CFCs.

Indicator 4 – hydro chemistry

To tell how similar or dissimilar groundwater are to others. As many chemical indicators as possible are used.

Age of water

The mean residence time of groundwater. What is significant is that in relatively deep wells there is some quite young water. Heretaunga Plains is an extremely conductive system.

Matters raised by TANK members:

- What is the definition of young and old water? *Young is 1 - 5 year. Old 50 - 80 Years.*
- Drinking water standard only allows half an eyedrop of young water in 1 litre.
- How do you determine your sampling intensity so that you can work out the standards and accuracy? *Understanding that in some wells you can have seasonal variability, now doing seasonal sampling. Data being used to validate the ground water levels. There can be quite young water at quite deep depths. Now doing seasonal sampling in both Hastings and Napier. Sampling four times per year. There could be some event based sampling. The constant sampling identifies that the aquifer is stable. For drinking water security we need to stay away from 1 year old water. Even if there is one well field not all the wells in that field will have the same water.*

HDC gave further explanation of the age of the Eastbourne water graphs. A lot of thinking has gone into understanding the quality of water. There is a need to rethink some of those things that we have taken for granted. In the past there were no tools to measure the water age and quality. HDC doing more investigations into seasonal variations.

Matters raised by TANK members:

- Are we changing the physiology of the wells by the very high rates of takes of water? *We do not have any data to understand the physiology of the wells.*

- Is there any coincidence between that fact of unconfined aquifers adjacent to those areas where you are showing young water? *These are extremely highly conductive river beds and most of the young waters are related to these. So the rainwater is falling on the unconfined aquifer and very quickly appearing in the wells.*
- We have rainfall but we also have irrigation water moving through the system very quickly, what about fertiliser use? It's not just runoff affecting the Karamu also nutrients. *Irrigation can very much mess up the whole situation. Dr Jeff Smith told the group that there was a nutrient transport model being developed by GNS but it is not quite ready yet.*
- Are there other factors not taken into account for example, 800 piles below the southern motorway in Canterbury? Will this have an effect on aquifers? *Yes it could.*

Dr Jeff Smith noted there will be a mini-symposium in Council Chamber on Friday looking at the effects of sea level rise on groundwater. TANK members also invited to attend.

- Is abstraction changing the groundwater properties? *No evidence of declining GW levels over the plains in the last 20 years.*
- Are HBRC going to be doing seasonal sampling for water aging? *We do not have resources at the moment but we are doing a comprehensive all-encompassing review of all our monitoring network at the moment, so it will be included in that review, and it will be considered through that process.*

Action Item

29.3 Staff to provide a copy of Uwe's presentation after the meeting.

6. Item # 5 Source Model and SW takes (Rob Waldron)

Water Quantity Modelling:

Rob gave an update on progress and how the SOURCE model is configured. The SOURCE model simulates surface water. Approximately 1500 current consented abstractions will be simulated using a combination of both the SOURCE model and the MODFLOW model which simulates groundwater.

Rob proposed rationalising the current 14 active minimum flow sites to 10 as it was thought that we would get better information from the proposed 10 sites. The sites may be used to trigger restrictions, staged reductions, augmentation and artificial recharge. If we do not achieve what we want from the 10 then it needs to be rethought. Some of the sites as proposed are from Thomas's oxygen flow monitoring. Whether or not we wind up going with a restriction approach or we go with an augmentation approach the new sites can be used.

Matters raised by TANK members:

- Are you proposing to change the State of the Environment monitoring? *No this is trying make sure that we have the right sites to manage abstractions i.e the right sites to achieve certain flows in tributaries, streams and rivers across the whole area.*

The more sites that are put in the more demand on monitoring. If the ten sites do not work the modellers will be adding more sites back in.

- A question was asked about the Karamu Stream and the diversion (to do with the Whakatu Arterial project) which has happened prior to the floodgates. *The river will now follow a new path. The changes as proposed were discussed with the engineers. The monitoring site needs to be close to the confluence.*
- There is concern about the pro-development approach around Clive and the adverse impacts on maori communities who have been the sacrificial group...if you are going to choose a new sample site in future, could we place one close to each marae that have had the major impacts so we can start quantifying the

major impacts? *You could do that but there could be other reasons for choosing new sites. If you can achieve the same outcome with a site further up that may be better option.*

The group broke for lunch to return at 1.00pm.

7. Item # 6 Te Tua out-of-stream storage specs and modelling (Mike Glazebrook and Dr Jeff Smith)

Mike Glazebrook, of the Ngaruroro Water Users Group spoke of a possible out of stream storage option on his property Te Tua. The ideas expressed in his presentation were his own. His presentation is available on the portal and online.

Mike has suggested this storage scheme as one option but stressed the importance of looking at all the options to determine what are the best ones i.e. other sites and other areas to store water for the TANK catchment. We need to look at how we can change things to make it easier to store water. There are a lot of suitable sites and at the moment there are a lot of restrictions on where you can build a dam.

Matters raised by TANK members:

- It was shown a couple of meetings ago that mother nature has a far greater effect than irrigation, so would we be able to use the out of stream storage in times of drought only? *Just for flow levels, storing water in the winter to use in the summer. Yes.*
- Do you have costs of this dam? Only very rough approximations. No knowledge of extra complications, i.e. regulatory matters. In broad numbers very comparable per cubic metre to larger schemes. On the face of it pretty cost effective.
- What would be the water source? *It would all come from the Ngaruroro.*
- Do you know at this stage where the fill would come from? *Probably, take it off the edge of a hill, disadvantages no additional storage.*
- It was calculated by a TANK member that at 1 cumec you would have flow for 58 days. That's quite a lot of water.
- When you store water in a lake like this, for the first year or two it would be great. Then you start to get weed growth (a form of oxygen weed). Then algal blooms start to happen with depleted oxygen. How do you preserve the quality? *Release grass carp to stop the weed cycle to keep the health of the water. Some effect but not the total answer. Also a weed harvesting boat, to stop the weed shading itself. A deeper lake would be better. Trialled stripping top soil, to reduce nutrient. Some sort of filtration or biofiltration before the water is released.*
- How many sites have you seen/know about? *A lot of private lakes have been put in. Quite a collection of small lakes. It was felt that we need more. There look to be other potential sites. In the long run 2 or 3 of the same size lakes. There could be as many as half a dozen of these low impact lakes.*
- From the book of dams, is this a "run of the mill" same as many around the world? *Yes pretty much. A standard earth dam.*
- To give me an idea of the capacity of it - how many neighbouring farms would be benefit from the lake being enlarged and how will they get the water? *It would cover 5000 hectares, and most people are irrigating from the river at the moment and have a take that is deemed stream depleting.*
- Would they have to truck it from the lake? *The only real practical way to move the water is to run it down a pipe or a drain. So some would be going into groundwater and some into the river. This proposal is to put water back into the river.*

- I'm concerned about quality issues. Different dams are built for different purposes such as a large scale operator with a large requirement for water. Could there be other small dams for other purposes for small communities? *This sort of dam could enhance the land further down to get water to wetlands and habitat enhancement could go quite nicely together.*
- A comment about paradise ducks, Canada geese and swans causing problems for neighbours.
- What would be the releasable volume in a dry year?
- What would it look like during dry times? *Actually the mud bleaches and doesn't look quite so bad.*
- Have you thought about a Business case/model for this? *There are a whole lot of different way it can be done. It can done by stakeholders who form a company. Or maybe the HBRC could do it. Mike is open minded on ownership structure.*

Presentation from Jeff Smith:

Jeff presented the storage modelling that he did on the scheme that Mike proposed for augmenting flows in the Ngaruroro and the assumptions that he used in the model. It is a first cut feasibility exercise with a fair amount of assumptions.

- Who would be pay for the dam, i.e. who would be benefit from the dam? *A very good question. The same with the groundwater augmentation scheme that staff have been modelling. If something can be found that works, who is benefitting and who is paying is the question.*
- If the urban and industrial are taking half the abstractions and irrigators are taking the other half, there could be a levy on the bores.
- Part of what is struggled with is that smaller dams cost 4 or 5 times the cost of a larger dam and that is the rationale for having one large dam. *You need to distinguish between the cost of the dam and the cost of the distribution system. This proposal is just a dam and gravity, into the river and streams and it has done away with the need for a distribution system altogether.*
- The irrigators who are the direct stream depleters are going to wear a chunk of that cost. The sooner some kind of a ball park figure is obtained the better. It is very simple from this point, once we get a ball park figure.
- Questions were asked about upstream users. *Jeff to not sure about upstream, they used the data for naturalising at Fernhill.*
- With a lot of public subsidy does this mean that we all have a stake in Mike's dam? *Mike imagines that it would be paid for by users, not by public subsidy.*
- It was considered that we should not be hung-up on the cost/litre. This aquifer is one big bucket and every user from it is stream depleting. A member expressed support for the idea that all consent holders will contribute to the cost of augmentation.
- There remained a concern about what is in the aquifer, before any decisions are made on how to augment. *Further modelling is to be done to work out the impacts of the various management regimes and what they mean for aquifer levels and recharge.*
- There was also a concern about mixing waters, there still needs to be water coming through to Paritua. Concern about the stream behind their marae containing the blue/green algae which is dangerous to children. *Mike commented that it takes a lot of water to refill streams during drought times so unclear what downstream impact it will have. It takes days and weeks, and takes a lot of water to make a difference. Mixing of water is unavoidable.*

- It was noted by a TANK member that the scheme has a lot of value to carry on looking at but that there is a danger of finding solutions before we are sure of the problem. We could get into a lot of discussion and economic models and about who is going to pay, but it's not about managing the averages it is about managing the peaks.
- Another view expressed was that we have an environmental issue that we wish to deal with and we have one solution for dealing with it, we need to cost it because we need to know what level of environmental protection in terms of naturalised lowflows and security of supply. If it is a worthwhile solution and if this is a potential solution we need to pursue it further before we worry about who will pay for it.

What are the next steps in progressing this as an option?

1. Confirm that it meets the need.
2. Do further investigations into feasibility.
3. Consultation with interested parties and stakeholders

- A Councillor spoke of money in the LTP which is earmarked for looking at dams and could be broadened to look at augmentation solutions. This could be used for feasibility studies.
- It was noted by a TANK member that iwi are not opposed to water storage, but want to look at best practice for water storage.
- Another TANK member noted that we haven't looked at what the low flow etc. is for the Tutaekuri. *We are in the process of doing that. Should be available at the next meeting.*

Jeff commented that he would do some more work for the next meeting. Next steps regarding water storage on the Ngaruroro, are not about making a decision. Jeff's approach with modelling is to start simple and build complexity as required. He has started simple with the modelling and his next steps are to tighten up those assumptions and to look at the effects on the river itself.

He is also looking to the TANK Group as to what else they would like done, it is also a case of Jeff not yet knowing what might be required in terms of minimum flows for example (no certainty here) but also other assumptions regarding where we want to augment for the effects of groundwater takes and surface water takes as well, or would we be happy with surface water takes being restricted and managed that way. One of the main reasons this storage scheme is attractive is that we can probably manage lowland streams using augmentation from ground water, but there is no other option for the Ngaruroro.

It was suggested that the HBRC should pick up Mike's suggestions as an augmentation model to be further considered. And that the scope should be widened to consider this proposal in other parts of the TANK area and include multiple sites.

Guidance from the group would be that acceptance of a scheme such as this would be to offsetting the effects of abstraction and not to trying to maintain minimum flow and also that offsetting groundwater takes only.

The horse and cart were mentioned again (in terms of storage discussions being a cart ahead of the horse) but it was felt that it doesn't matter which order things are done. A broader scope to the enquiry (the whole Heretaunga Plains, may need some kind of augmentation) and moving forward a variety of options in parallel was supported as was the need for some rough order of cost to be satisfied that solutions are economically viable. It was also noted that the Group was keen to hear from the wetland groups as to how a scheme for water storage can overlap with a wetland and what impact vegetation can have in keeping water in the land and adding to the surface water.

This group has been focussed on what are the elements of a plan change but it will eventually get to the point that it is presumed to sit alongside an augmentation scheme. These are two different calls to make but need to

be moved together so that ultimately we don't write a plan change that presumes something is going to happen that people have not agreed to.

The status of the Ngaruroro pre-feasibility work done earlier was raised. Was the Otamauri water storage scheme and the economic report still an option of storage? Some information is already available including a Tonkin and Taylor report which identified about six sites, Kereru station was one of them.

The TANK Group thanked and complimented Mike and Jeff for their presentations.

Action Item

29.4 Wetland Working Group to consider how a storage scheme can overlap with a wetland.

29.5 Staff to update TANK Group on what's happened to the work done by Monique Benson on Otamauri?

8. Item #7 – Decision-tool showing possible combinations with pros/cons.

Mary-Anne explained the Water Allocation Options Assessment through her power point presentation.

Robyn pointed out that:

Today we have been zooming in on a couple of options for managing groundwater. Just because we are zooming in on a specific option it does not mean that we are ignoring the other options. Sometimes our discussions go down a rabbit hole but everyone does support putting the horse before the cart.

9. Item #8 – Verbal update from Working Groups

The next meeting date will be Thursday, 17th August.

Engagement Working Group:

Drew advised the group that work is underway to arrange speakers on

- farm plans and Gap, experiences gained from the Tukituki Plan,
- a focus on the horticultural industry,
- nutrient footprint, and
- soil health and organic methods, security of supply.

Drew will circulate more information on this to the Group. The list will contain suggested speakers, but if you have any other suggestions please let us know. Next action for Comms, is a Think Tank from this meeting by 20 June and then Tank Talk 1-pager to go out into the community papers. HBRC will also have a stand at that National Horticultural Field Day focussing on the TANK Group. All NCC and HDC Councillors are now included in communications as well as HDC rural community board members.

Economic Assessment Group

It was reported that the group met again last week. AgFirst who are doing the economics assessment work have now modelled pip fruit, kiwifruit, summer fruit and pastoral farms, they just have to finalise grapes and then they can start comparing a base case to different combinations of flow restrictions and allocation limits. The horticultural crops will be run through SPASMO, to determine both yield impacts from water curtailments. Then various contaminant mitigation measures will be modelled. These meetings are starting to talk about good agricultural practices and farm environment management plans. We have agreed to try an focus on the big ticket items, riparian plantings, stock exclusion, shading of waterways and sediment. They are getting very close to getting some answers.

- Is there scope for Tourism reporting? *Bruce says yes it has been talked about, as part of the social and cultural impacts. Social impact is being looked at.*

Stormwater Group

A lot happening behind the scenes. Report to next meeting.

Wetland Group

No meeting since last update.

Mana Whenua

The group, will be meeting before the next TANK meeting. Issues and objectives part of the framework will be sorted out for everyone to have a look at. They are starting discussions about other waterways other than the Ngaruroro and identifying values and the objectives.

HDC Councillors very interested in TANK and some of their councillor would like to be involved.

Some discussion took place of who will be taking James Palmer's place.

Other issues

Concern about the lack of discussion on Ahuriri. Submitters brought this issue up in HBRC Annual Plan process. A presentation dealing with this is due from NCC at the next meeting

10. Agenda for next TANK Group meeting

- Management options for the Clive River
- Draft plan change.
- Stormwater and presentations from the local councils
- Further modelling results

Could be a 9.00am start.

11. Closing Karakia

The closing karakia was said together.

Summary of Action Points

ID	Action item
29.1	Staff to ensure that bookings allow for earlier start at future meetings.
29.2	Staff to model fully consented water takes.
29.3	Staff to circulate a copy of Dr Morgenstern's presentation to the Tank Group.
29.4	Wetland Working Group to consider how a storage scheme can overlap with a wetland
29.5	Staff to update TANK Group on what's happened to the work done by Monique Benson on Otamauri?