FLAG MEETING NOTES: 24 April 2015

Purpose:	Takaka Freshwater and Land Advisory Group (FLAG)– Meeting 9
Date:	24 April 2015
Time:	9.30am-3.00pm
Venue:	Takaka Fire Station
Present:	**FLAG members:** Graham Ball (GB) Greg Anderson (GA) Mirka Langford (MLa) Neil Murray (NM) Mike Newman (MN) Tony Reilly (TR) Mik Symmons (MS) Mike Newman (MN) Kirsty Joynt (KJ) Piers MacLaren (PM) Matt Rountree (MR) Margie Little (MLi- iwi representative on FLAG) Martine Bouillir (MB- council representative on FLAG) **Staff:** Mary-Anne Baker (MAB - Environmental Policy Planner) Lisa McGlinchey (LM -Environmental Policy Planner) Joseph Thomas (JT -Resource Scientist - Water & Special Projects) Trevor James (TJ- Resource Scientist) Glenn Stevens (GS - Resource Scientist - Water & Land) Rochelle Selby-Neal (RSN -Independent Facilitator) Andrew Fenemor (AF -Landcare Research)
Apologies:	None
Notes taken by:	Lisa McGlinchey (supplemented by other staff)
Definitions and Abbreviations	FLAG = Freshwater and Land Advisory Group NPS-FM 2014 = National Policy Statement for Freshwater Management 2014 NOF= National Objectives Framework TRMP = Tasman Resource Management Plan (the Plan) TWMC = Takaka Water Management Catchments SOE = State of the Environment WCO = Water Conservation Order application for Te Waikoropupu Springs and recharge area **Unconfined aquifer** = are those where permeable strata are open to the ground surface. Surface water (rainfall and/or river flow) is able to seep from the ground surface directly to the aquifer. **Confined aquifer** = are those where permeable groundwater bearing strata are separated from the land's surface by an impermeable layer (such as silt or clay) that prevents surface water from directly seeping into the aquifer. Groundwater migrates to confined aquifers from an unconfined recharge area located elsewhere.
Note: records of discussion points have been grouped into similar topics and are not necessarily in the order discussed at the meeting.	
FLAG MEMBERS PLEASE NOTE: If you have any questions or need anything between meetings, then please contact Mary-Anne Baker by email: marya@tasman.govt.nz or by phone ddi 03 543 8486.	

Purpose of Meeting

- *Update on outcomes/work plan from consultation and attribute sub groups and agreement from FLAG to proceed*
- *Increase understanding of local nitrate levels and implications for local ecosystem values*
- *Determine freshwater management zones*
- *Discuss range of methods/tools for implementing freshwater management [item delayed until future meeting due to time constraints]*

Welcome and Karakia

RSN welcomed the group and MLi lead the FLAG in the karakia.

Check in

No check-in topics raised by the group.

Session 1 – Updates

Meeting with local iwi

MAB and MS met with iwi members of Manawhenua ki Mohua on 23 April 2015.

Key points:

- *Discussed drivers for consultation and iwi involvement*
- *Did not arrive at a specific agreed process , but iwi are keen to have regular discussions with the FLAG*
- *FLAG has a commitment to keep the process as local as possible*
- *Still a question of the role of Te Tau Ihu Freshwater Advisory Komiti (TTIFAK)*
- *Iwi were provided with drafts of the values and management objectives and attributes information*
- *Iwi were happy to see that maori terms and concepts were integrated into the front end of this process, rather than just being tacked on the back of some big report.*
- *Iwi reiterated the importance of the health of environment and a holistic consideration of water*
- *Iwi mentioned a cultural health assessment commissioned by Council's engineering department during their review of the pesticide programme for river management.*

- *Suggest an email/letter sent to Ngati Koata to ask them what their involvement should be concerning the Anatoki Catchment given their Statutory Acknowledgement in this area*
- *All iwi have Statutory Acknowledgement areas over the coastal area*

Action: *Staff to email/send a letter to Ngati Koata to ask them what their involvement should be concerning their Statutory Acknowledgement in the Anatoki Catchment.*

Will FLAG members attend the mana whenua meetings?

There is a commitment to keep the mana whenua up to date.

Water Conservation Order

- *Staff still to set up a meeting date with all parties - expecting a date to be set soon.*

Action: *Staff to advise FLAG of meeting date with WCO parties asap.*

Totora tree removal for irrigation infrastructure

- *We can't change the RMA - that is not the FLAG's role. If farmers want to do things with their land, we can't stop them if they are within the current rules.*
- *There is discussion within the farming community on this issue too.*

Nitrates presentation (17 April) – Mirka Langford

- *The FLAG thanked Mirka for a good presentation*
- *Mirka brought the FLAG copies of two publications used for her presentation for the FLAG:*
  Nutrient Management on your dairy farm, A farmers guide to understanding how nitrogen and phosphorus enter, cycle and leave your dairy farm. DairyNZ, Hamilton 2013 (www.dairynz.co.nz/publications)

  More than just a number, Your guide to improving nitrogen-use efficiency on your farm. DairyWomen's Network together with Ballance, DairyNZ and Fonterra. Ballance Agri Nutrients, Tauranga

Discussion on Nitrate Management Presentation (17 April):

I don't think OVERSEER is a tool we can use for regulation as there is far too much variability in the modelled nutrient loss rates.

RSN: Does the FLAG group agree that OVERSEER is not a useful tool for managing farms?

- *I don't think we can put nutrient limits into the TRMP based on OVERSEER.*
- *It is useful for comparison of farming systems to instigate discussions between farmers.*
- *Fonterra are currently using OVERSEER as a comparative tool – looking across catchments and looking at farms that have particularly high leaching rates and why this might be.*
- *There are also issues with version control – different versions will give different output numbers.*
- *OVERSEER is currently being used by councils in some plans – and those rules are being upheld in Environment court.*
- *We shouldn't say no to OVERSEER, before we have looked at what the other options are.*
- *OVERSEER is being worked on all the time and a lot of money is going into improving it.*
- *One of my concerns is the delay between nitrates going on the land and the time it takes to get into water bodies. Holding existing farmers to account for historic issues is unfair.*
- *OVERSEER seems limited in what farming aspects it could include for modelling.*
- *Winter management seems key to nutrient management.*

Outcome of discussion: OVERSEER is a useful tool, but as yet the FLAG is not clear on how it might be best used.

RSN: If anyone in the FLAG is finding useful information on nutrient/land management please bring this to the group. Staff can collate this into a bundle of information for discussion at a future FLAG meeting.

- *Our karst aquifer system means that rules used elsewhere may not be appropriate here. We may need to look internationally at land management in karst for information – Andrew's book Karst Geomorphology and Hydrology by Paul Williams is worth a read.*
- *We can also get Rick Pridmore to give us information at the next FLAG meeting.*
- *JT: The irrigators group have asked staff for the data for Te Waikoropupu Springs that was given to Don Mead for them to look at independently.*

Action: *FLAG to send questions or information on nutrient management to staff for collation.*

Consultation subgroup feedback

Key points from meeting:

- *Having the information we have available on the website is important so there is good transparency.*
- *There will be a lot of people interested in the outcomes.*
- *Important to keep connections with iwi.*
- *Website is our key resource for communications.*
- *Time to have an update in the GB Weekly.*
- *Martine has been putting out updates through her email network.*
- *Need to consider using Facebook – either through the Council's Facebook page or via the Takaka Notice Board Facebook page).*
- *Need also to update GB Community Board – MS to update next GBCB meeting*
- *We need to make sure that comments made by the FLAG are agreed by the FLAG*
- *Staff to put FLAG member bios on website (next week)*

Can people provide comments on topics?

They can ask questions on the website, and could have discussions on the Facebook page

> ***Is this the council or the Takaka Notice Board Facebook page?***
> *The Council one – we can link the two with a Takaka Notice Board comment to visit the Council Facebook page.*

Facebook pages

- *Ruamahanga group has a Facebook page. RSN has met with their facilitator and one key thing from Facebook pages was it works if someone looks after it and manages it, but otherwise public discussions can go wrong.*
- *Some people can also monopolise the discussions and provide incorrect information.*
- *Facebook can be set up to control who can make comments – would prefer an email questions and answer system.*
- *Takaka Notice Board Facebook page can get very emotional on issues being discussed.*

Is anyone on the FLAG who is on Facebook a lot that is keen to keep an eye on this?

There was no specific identification of anyone with the time availability for this role, but MLa volunteered to keep a watch on the Takaka Noticeboard FB page.

Consultation for management objectives and values

- *We should not have public meetings, but put the document out in the public arena and welcome feedback.*
- *If we table it at the GBCB it will be public.*
- *Most people won't be interested in the process, but in the results.*
- *There will also be a legal consultation process and we want to ensure what goes into that is as robust as possible, but we don't want to raise expectations too much at this stage of the process.*
- *People asking about process are often happy just to hear that things are progressing – not necessarily after a lot of the detail.*

Action *– staff to send website hits summary to FLAG*

Discussion outcome: *FLAG agreed the use of the website and a low-key release of the values and objectives summary for feedback was a good approach.*

Action: *staff to organise website for receipt of public feedback on values and management objectives document*

RSN facilitators update

- *Having met with other facilitators from similar collaborative groups around the country, I am confident that this group is progressing well.*
- *Other groups have made their meetings public which has caused problems getting things progressed. Also information is being put into the public arena before the group has had a chance to see it.*
- *Other facilitators are impressed with this group's project management and we have had a request from the Ruamahanga group for a copy of our values and objectives document. Staff are keen to provide this information, but identified that the Ruamahanga group would need to keep anything not already publically released confidential. Decided that anything already on the website can be used as it is public already.*

Is the group happy with this approach?
Members indicated they were happy.

Update sessions feedback

RSN: Are the update sessions useful to the group? This can be useful, but does take up the first hour. Does the FLAG want the update session left in or would you prefer these to be covered in email?

- *I'm happy with the face to face discussion of these.*
- *Time is of the essence – landowners need outputs so meetings must be kept tight.*
- *As long as the FLAG is on track then I am happy to retain them, but if we start falling behind then perhaps review how we are doing things?*
- *We are tracking well and we are very aware of the need for an efficient process with a lot of work done behind the scenes between meetings.*
- *To get an efficient process - I think we need staff to say what they think and allow FLAG to take a review role.*
    - *If this approach is used the FLAG needs to voice their opinions if they have concerns.*
    - *Need also to consider staff resource capacity for doing all the work in between meetings.*

Management Objectives Overview

LM gave an overview of progress on revision of the values and management objectives following the FLAG discussions at the last meeting.

- *Changes suggested at the last meeting have been made*
- *A suggested note on interpretation regarding bilingual language has been added*
- *Two new management objectives have been developed for the drinking water value*

Action: *staff to send out reviewed values/management objects document to FLAG for review and comment.*

Attribute subgroup update

AF went over a revised attribute table:

- *Blue are environmental, red = economic, browny ones = social, (light-mid-dark shading reflects pressure-state-response categories)*
- *The table includes FLAG member comments from the 17 April workshop on why some attributes were excluded, etc.*
- *Some value sets did not have an attribute highlighted, but were indirectly addressed by other attributes.*
- *Since the subgroup meeting AF has considered the discussions and highlighted for discussion 16 key attributes (green highlighted attributes in table) which could be used in a WaterWheel*

- *Further consideration needed on where each attribute would apply (pinch points or composite etc)*

Attributes identified following discussions (in summary):

- *Dissolved Oxygen*
- *E.coli for surface water recreation*
- *E.coli for groundwater drinking water supplies*
- *Freshwater fish for mahinga kai*
- *Macro invertebrates*
- *Nitrates (possibly at Fish Creek Springs)*
- *Periphyton*
- *Surface water environmental flow limits*
- *Groundwater levels in Takaka township*
- *Cow numbers (in lieu of irrigated area)*
- *Allocation limits and security of supply (consumptive uses only)*
- *A cultural/social indicator yet to be confirmed*

Irrigable area changes and riparian vegetation to be used as scenarios in the modelling rather than attributes for the WaterWheel. The group on 17 April agreed to limit attributes to no more than 12-15 for the WaterWheel.

Discussions on the attributes are outlined below:

The list has 2 freshwater fish attributes, one relating to native fish and the other to food species of freshwater fish. Could they be merged?
AF: We looked at freshwater fish and there was a question of whether this was for ecology or mahinga kai uses – the modelling work will be looking at the Takaka Valley and not the western coastal catchments where the fish ecology was key, so the attribute is proposed only to be used for mahinga kai measures.

So these sites (listed in table) are where you would look at monitoring these attributes?
AF: To populate the WaterWheel we need actual data – the sites mentioned are those sites where this data would be taken to populate the wheel.
Within the WaterWheel approach we would be looking at comparing scenarios – if these attributes are decided to be sufficiently important or are progressed through to limit setting – these sites might also then be monitoring sites.

Are these attributes (eg Dissolved Oxygen) monitored on the Takaka River?
Dissolved Oxygen is available as spot monitoring, but these don't give the daily minimum – we have daily monitoring of DO recorded at Motupipi.

I'm not clear how we will be using the WaterWheel in the modelling – if we are looking at irrigation scenarios – how will this affect the water in Motupipi?
These two areas are addressed differently – this will be covered in the zones and nutrient modelling presentations later.

What would be the most sensitive location in the value for Macro Invertebrate indicators?
TJ: Probably Paynes ford. This was the first year we monitored there and it should probably be considered as a site for future SOE monitoring. It is also one of the areas with an issue of periphyton growth.

JT: Much of the water in summer (in the Takaka River above the Waingaro confluence) is coming from the karst aquifer so there is a question of whether Paynes Ford would be representative of what is going on in the upper catchment or not.

This area is also very low flow at dry summer times which will affect macro invertebrates.

What are your thoughts on using 'above and below' monitoring sites at Paynes Ford bridge?
JT: this could be done at Lindsays bridge and Paynes Ford. But there is not much ability to measure MCI between these sites due to drying of bed.
AF: could do a ratio and look at trends between these sites.

An assessment of MCI from the springs was done as part of the salmon farm consent application – what is the correlation between this and what is happening in the upper catchment*?*
The MCI results have not changed in the last 20 years.

The Waingaro system is an indicator for the Te Waikroropupu springs.

Possibly good sites suggested for MCI monitoring:
- *Kotinga*
- *Lindsays bridge*
- *Waingaro*
- *Paynes ford*

Summary of discussions – agreement that MCI is used, but further consideration of suitable sites and further information/ direction is provided from staff.

Action: *staff to consider which sites that will represent what is happening in the upper catchment and report back to FLAG via email.*

Could we use town bores going dry as an indicator for drinking water protection?
- *Yes, we could do this - if this was considered a 'canary' (early warning indicator).*
- *Groundwater level is one of the attributes on the table – we need to determine what site is monitored for this.*
- *The FLAG considered this is an important concern in the local community.*

The water table seems to be steady at the fire station bore (total bore depth is ~40m). While this bore is deeper than many of the town bores, the depth to the water table is the same across all the bores. Many of the town bores are at 6m so if there are shallow bores going dry, but the fire station bore is fine, then it is more likely that bore issues are due to aging bore infrastructure or maintenance issues, rather than the groundwater level dropping. Groundwater level is likely to be more critical in sustaining spring flows into Motupipi and Te Ka kau

Discussion outcome: site for monitoring of groundwater levels to be focussed on town and utilise the existing bore monitoring sites (fire station and TDC office bores).

Don Mead suggests there are faster reactions for nitrate from the shallower springs (ie. Fish Creek Spring) so can we pick up some of them to show up impacts of current land use?
Potentially, however the vast majority of flow is coming from the deeper aquifer so that masks the shallower springs.
AF: Work is currently being done looking at separating the Fish Creek system from the main spring for monitoring to see if this is a viable approach.

Action: *Staff to report back to FLAG on outcome of spring separation work when complete, likely at the May meeting.*

Do we need to consider both periphtyon and MCI?

- *If we look at periphyton it gives some indication of why the MCI is what it is*
- *Swimmers are more aware of periphyton issues than MCI*
- *Periphyton is a good measure of nutrients effects, including both N and P*
- *The toxic effects of nitrates comes in at a higher level, so periphyton is the earlier indicator of aquatic ecosystem health*

Discussion Outcome: periphyton to be included in attribute list along with MCI

Are riparian aspects within the FLAG mandate?

- *We should leave in the riparian vegetation assessment attribute, as it affects other aspects such as E.coli and sediment, temperature and dissolved oxygen, etc*
- *Instead of an attribute, riparian vegetation could be used as a scenario – eg if all streams were planted what would happen to the other indicators - vs if they were all unvegetated*
- *Stream habitat score could be treated similarly, or combined.*

Discussion outcome: agreement that using riparian vegetation as a scenario rather than an attribute was a good option to look at.

Action: *staff to look at riparian vegetation as a scenario in the modelling work*

Is visual water clarity needed as well as other water quality parameters?

- *It is very noticeable and important to swimmers and fishers so worth retaining*

Could trends in irrigated area *be a scenario rather than an attribute?*

- *This has been considered, but it has been left in as an attribute for now, as it seems to be primary driver.*
- *The number of cows seems to be a better indicator, as there can be lots of cows with no irrigation still causing leaching issues.*
- *Stock units could be better than number of cows, but cows are the ones having the most impact on nutrients in waters*
- *What about using the area of exotic grass instead?*
- ***What correlations do we have between stock rates and irrigation increases?***
    - *Stock numbers often don't go up, but production per cow increases.*

Discussion outcome: *Irrigable area to be used as a scenario description. Attribute to use being "number of cows".*

Is there a consumptive/non-consumptive distinction in the allocation system?

- *Yes, so the Water Allocated attribute should just refer to consumptive takes.*

[Note: consumptive use means water is used and not returned to the system (eg drinking water), non-consumptive use means the water is used, but then is returned to the system (eg hydro-generation)]

Discussion outcome: Attribute to be moved to reflect the livelihood value, rather than hydro-generation.

There has been some thoughts expressed that no attributes are needed for social values, as they're covered by other values. Others have raised cultural health indicators as an option – what do the rest of the FLAG think?

- *An alternative approach could be that we require all attributes to incorporate maori and cultural aspects, rather than being separately addressed.*
- *We could also look at the green attributes chosen and collate those that are applicable into a new cultural indicator.*
- *The FLAG may need to look at defining a new cultural health indicator for the catchment*
- *We also need to take a step back to consider holistic consideration of the catchment.*

Action: *staff to review Cultural Health information for Golden Bay (eg engineering pesticides and salmon farm consent) and look at whether this information is useable in the modelling.*

Other areas (eg Waimakariri) have talked to industries that are dependent on water – FLAG may need to talk to the tourism industry and aquaculture industries.

- *Tourism both a social and economic aspect.*

Action: *Staff to consider how water dependent industry feedback might be incorporated into the modelling work.*

As the modelling proceeds there will be questions raised that mean it will be an iterative process.

Action: *AF to amend the attributes list/sites as per the outcomes noted above and progress modelling work and report back to FLAG*

Session 2 – Nitrates and Ecosystem Values

Nitrate Information Summary

- *Don Mead has asked for his paper to remain confidential until it is finalised and accepted for publication.*
- *Staff still have some concerns over some of Don's conclusions.*
- *The data that Don's paper is based on is publicly available.*
- *The irrigators group has asked Council for the raw data to have their own analysis done. This is being provided to them by staff.*
- *The FLAG cannot use information from Don's paper until it is made public.*
- *Council has asked John Stark to look at nutrient data from Te Waikoropupu Springs and provide a report with recommendations on appropriate limits.*
- *Council has also asked Chris Hickey (NIWA) to provide guidance on nitrate toxicity in relation to water hardness.*

Who is John Stark and what are his affiliations?
TJ: John developed the Macro Invertebrate Community Index back in the 1980s – he is one of the most respected freshwater invertebrate specialists in the country and he has been monitoring the consent for the salmon farm for many years and has a good understanding of the situation.
MAB: he was at Cawthron Institute for many years but now is independent and has his own company.

Action: *staff to supply John Stark's report to the FLAG and irrigators group once complete and add to the website to make it publicly available.*

Are John Stark and Don Mead's reports agreeing on nitrate trend? - if not their conclusions?

- *They are looking at the issue in different contexts so it is difficult to compare them.*
- *You need to read John's report as an independent report on nitrates in the springs – including consideration of the effects of nitrates on the springs.*

- *John has been commissioned to consider recommendations on nitrate limits for the springs.*
- *Don has commented on the perceived causes of the nitrate levels.*

With nitrate levels, aren't we looking at levels from land uses from 12 years ago?

- *It's not that simple as that's an averaged age of all water sources arriving at the springs*

Some general discussion had over the timing of nitrates and land use effects and the differing ages of water from different sources.

Can we have Don Mead at a FLAG meeting to discuss his work?
Don has said he is available to meet with the FLAG – possibly at the May meeting.

Action: *FLAG/staff to question Mike Scarsbrook on the effects on stygofauna at the May meeting.*

Takaka Nutrient Modelling – presentation by Andrew Fenemor

Andrew Fenemor provided a summary of the modelling work done to date, noting his slides are to show the methodology but the numbers are interim and could change:

- *Julian Weir (Aqualinc) to present further work on flows at the next FLAG meeting.*
- *Modelling separates catchment areas based on: groundwater extents and levels, landuse, soils, irrigation, nitrate data, etc*
- *Takaka river dry about 170 days per year on average*
- *Have looked at what recharge to groundwaters the rainfall provides and the level of the river recharge. The river recharge is only about a third of that provided by rainfall.*
- *Have mapped irrigated land in the catchment and those on the waiting list – representing immediate potential irrigated land – but now need to complete the assessment with the Takaka Irrigators Collective of potentially irrigable land for modelling*
- *General trends show flow from Te Waikoropupu springs has increased on average and the nitrate has also – however numbers are still to be checked. Nitrate concentrations seem to be relatively flat in the last five years with a reasonably constant load of nitrates. Some questions over historic lab analysis which identify data points with low confidence.*
- *Groundwater flows and contributions have been identified*
- *Have calculated the surface water nitrate loads to use in scenario comparison:*
    - ***Is the Waingaro included somewhere?***
        - *Yes at the Kotinga site (river flow there is all Waingaro when Takaka R is dry) and also through Te Waikoropupu Springs.*
    - ***What is the base load?***
        - *This can be looked at in the scenarios.*
- *The initial modelled nitrate loads based on measured concentrations in surface waters are in the same order of magnitude as that estimated from leaching losses from all the valley land uses, so this gives some confidence in the model*
- *Development scenarios identified:*
    - *1. Turn off all consumptive takes (all irrigation stops) – quasi natural state*
    - *2. Double development (eg some level of increased irrigation)*
    - *3. All existing irrigation taken from groundwater (not surface waters)*
    - *4. Effect on flows and nutrients without the Cobb dam*
    - *5. No Waingaro river recharge of Te Waikoropupu springs*
- *The model could also look at historic land use to give an estimate of historic inputs to help answer the question between past and future land uses.*

Could there be a scenario of percentage of on farm storage? - ie the same level of development, but 50% of water is from storage?

- *This is effectively a no water take, but increase in stock units scenario – as storage would provide the potential for more stocking.*
- *This would take more water only at high flows, but it would have the same quality issues as irrigation.*
- *More irrigation can result in elevated groundwater levels because of increased recharge, though this depends how efficient the irrigation is.*

Potential new scenarios identified:
- *2a: Water storage – takes at high flow*
- *Riparian vegetation increase or decrease*

Action: *if FLAG have further ideas on scenarios they should send these to AF.*

Should we remove the 'no Cobb dam' scenario as this is not a realistic outcome?
- *This scenario is to help identify what effect the Cobb dam is having on the system, rather than suggesting it could be removed.*
- *I think this will be good for informing public opinion of the effect of Cobb dam on the Takaka River drying up.*
- *Potentially we could combine scenario 1 and 4 to give a more 'natural state' scenario*

Should we model takes under existing consents?
This will be included in Scenario 2.
Can also look at proposed and maximum irrigated areas.
Assumptions to be made regarding stock type and numbers.

Does it make a different what stock type is used? With current markets if there was a change to the stock type?
Yes – more sheep or beef cattle etc would affect the numbers.
This could happen if the dairy returns stay low for a number of years – it is a matter of economics.

If irrigators come up with an irrigation scenario – is it possible to zone land to allow certain land for intensification and irrigation and if landowners wanted to add to this area it would require a consent?
MAB: Yes - this is an option for the rules in the TRMP, but it would depend on the appropriate drivers.
This is happening around the Waituna Lagoon (Southland) – dairy conversions require aresource consent.

Do we know what the proportion of surface take is compared to groundwater?
AF: We do have this data – consent data show 75% of land irrigated is irrigated from surface water sources

Session 3 – Freshwater Management Zones

MAB summarised the management role of zones and why these are needed.
Key points:
- *Zones are a management tool that enable connected water resources with similar issues to be managed effectively*
- *Each zone requires a package of management options specific to that zone to be developed*
- *Zones are established so that each water body is in one zone – however, they can be overlapping in that surface zones can overlie groundwater zones. The Waingaro R demonstrates the complexity that can arise in a karst system as it is part of groundwater recharge to the TWS, surface water flows in the Waingaro and Takaka and also contributes to the Takaka gravel aquifers.*

- *Each zone generally has specific environmental triggers linked to how triggers are set. This will include minimum flow regimes or water quality requirements.*

LM and JT gave a presentation outlining the proposed zones and how they were developed.

Key Points:

- *The presentation identifies the key physical drivers and water values drivers for the zone boundary locations*
- *Uses a three tiered approach:*
  - ***Confined Arthur Marble Aquifer Zone***
  - ***Surface Zones** covering the management area which consider both quality and quantity and the interactions between land use, surface water and unconfined groundwater –these zones have differing drivers depending on these linkages*
  - ***Coastal margin zones** –low-lying areas adjacent to soft shores and estuaries where there could be a risk of salt water intrusion to groundwater (managed through quantity controls)*

Confined Arthur Marble Aquifer (CAMA) Zone

- *Focus on quantity*
- *Currently only small scale take pressures - it is very hard water which has a big impact on pipe infrastructure etc.*
- *It is a deep layer – one bore behind Te Waikoropupu springs is at 110m deep. The Papa layer (the impermeable confining layer of mudstone) there is very thin.*
- *TDC also has monitoring bore at the Springs as that's where marble meets the surface, but further to the east it is much deeper.*

AMA-Eastern Catchments

The triangle of catchments to the east of the Confined AMA zone (from the upper parts of Ellis Creek to the upper parts of Rameka creek) is unlikely to contribute to flows to Te Waikoropupu Springs – however it is not hydrologically confined so not technically in the confined AMA, but it has been pragmatically added to the confined AMA zone as it adds to water going out to sea through the AMA.

This area is also called the "AMA –Eastern Catchments" in the surface zones section of the presentation. [Some further discussion may be needed on inclusion of this area in the 'Confined AMA' zone rather than as a separate surface zone]

Surface Zones

The boundaries of the zones are determined by:

- *Surface catchment boundaries*
- *Recharge areas for the unconfined parts of aquifers (AMA, Takaka Gravels and Karst aquifers)*
- *Direction of flow of groundwater*

Coastal margin zones

These will overlie the surface zones where there is risk of saltwater intrusion. The zone boundary follows the 3m contour so accommodates some sea level rise.

Questions and topics of discussion arising from presentation:

Could gorse and land use in the AMA - Eastern Catchments area have an impact on the Motupipi River?

There is no marble aquifer recharge of the Motupipi. The Coal measures in this area affect how the groundwater flows as this caps the underlying AMA from the limestone which partially recharges Motupipi. The areas draining the limestone from Ellis, Gibson and Kite te Tahu Creeks flow north to the Clifton-Pohara area, while the areas from the upper Rameka

and Dry River flow towards Motupipi. The groundwater signature is different in these two areas and the zone boundary was in part determined by the divide between the groundwater flows. The groundwater Nitrate signature is different in the upper boundary (about 2mg/L) compared to Clifton where the Nitrate is higher (about 6mg/L).

Surface flow from Dry creek can contribute to Motupipi flow but this only occurs during high rainfall periods- but also acknowledge that Dry creek goes dry just below the gorge off Packards Road and this water seeps into the limestone adding to the limestone storage and consequent discharge as well.

Is the AMA Eastern zone a potential water supply?
Yes there are surface takes in areas where the rivers do not run dry mainly in the upper parts and potential for groundwater takes from the unconfined AMA and any parts of the karst aquifer that have sufficient volumes – there is not much water available in these parts of the karst system. Whether this justifies setting any sort of take limit is debateable though especially as flows are limited in summer with many lower reaches of these creeks being dry.

Is the boundary between the confined and unconfined AMA boundary accurate enough?

- *The line is based on the best available information we have. It could be 100 – 200m out, but we would need more drilling to confirm in more detail.*
- *The line is also based on the presence of sinkholes (based on current and historic records).*
- *Difficulty in working out boundaries between surface water contributions and AMA.*
- *Drawing line always subject to debate – we need to make sure the rationale is accurate enough to understand where it should be.*
- *Certain amount of money invested in this level of accuracy – more accuracy would need to be supported by more science such as drilling. The 'line' can be further refined through consent process.*

Could we use water quality [chemical signature] in a TRMP rule to help define what resource is being accessed by bores?
We can in some places where groundwater has a different chemical 'signature'. Writing a rule like that creates some uncertainties

Next steps
At the May meeting we will populate the zones with what we know. The aim is to discuss flows and levels and relationship to values.

Action: *Staff to provide explanation about how allocation limits have been calculated elsewhere, especially for surface water flows.*

AF: Pinch Points or 'Points of Obligation' are most likely needed for each zone. The Pinch Point will drive what happens in that zone. For example, only Takaka River takes above Harwoods have rationing triggers – none of the other AMA takes have rationing triggers. FLAG will need to consider what kind of triggers are needed to manage the Te Waikoropupu Springs flows as well as provision for stepwise reduction or cease takes.

MAB: the FLAG also need to consider current permitted take quantities and stock water provisions - are these current provisions appropriate?

Pinch points and values for zones
FLAG had a discussion on possible pinch points led by Andrew Fenemor:

Possible pinch points: **existing council monitoring sites*

- Te Waikoropupu springs*
- Takaka River at Hardwoods flow site*
- Oxbow springs (or as a proxy Takaka River at Paynes Ford)
- Waingaro at hanging rock*
- Paynes Ford*
- Takaka fire station bore*
- Takaka office bore*
- Takaka river at Kotinga*
- Waitapu, Takaka and Motupipi* Rivers
- Lower Anatoki River
- Upper part of normal drying reach (near Sowman's take) – although the location of the drying reach changes over time

What about the other Takaka Springs? (Spitalls, Oxbow, Eastern Takaka, Motupipi, etc)?
Several of these springs dry up, Spitalls Spring dries up, but this is natural and these springs are not affected by any takes 'upstream' of it.
Oxbow spring does not dry up (owned by DOC)

Could Oxbow Springs be a good early indicator for Motupipi River flows?
Possibly.

Irrigators taking from upper catchment can only irrigate when the Takaka R is above 1600l/sec either naturally or as a result of Cobb dam generation and release.

The Takaka fire station and office bores are much deeper bores than most town bores – can the fire station bore still be used as a trigger for the shallower town bores?
The ground water level measured in the Takaka fire station bore will be the same as the bores around town so it can still be used to measure the ground water level for a trigger. We still need to determine what the trigger level is – eg 2.5m?

How often is the groundwater level monitored?
The office and fire station bores are monitored in real time and are being telemetered meaning this data can be made publicly available in real time on line. This is work is underway to make the data available though TDC website.

Action: *Staff to collate d*ata about groundwater levels over time and provide to the FLAG

Session 4 – Project management

Project progress

RSN showed the FLAG the 'FLAG process summary diagram' and highlighted that the group had reached the milestone of confirming the values and objectives and was moving into the 'how we are going to achieve this' section of the process.

The May meeting will be on allocation and flows and with more on nutrients:

- Presentations by Mike Scarsbrook and Rick Pridmore.
- Don Mead could also be invited.
- John Stark information will be available

Also considering key issues of nutrient management and management methods.

RSN: I am concerned that there is a lot to do over the next few meetings. We may need a few half day FLAG meetings to keep up with the work load.

RSN handed out copies of the action point summary for meetings so far.

Action: staff to send out copy of actions points in the week after FLAG meetings.

Can we provide the council with this so they can see how much work is being done?
Yes, a copy can be provided at the next EPC update.

The Dairy NZ group need to know when Mike and Rick will be available to meet them. The FLAG could have them either before lunch or after – which do we prefer?
FLAG Preference will be for before lunch 10.30 (as soon as they arrive) to 1pm (including lunch).
Action: Tony R to advise Dairy NZ of Mike and Rick's availability.

There is new water storage in Packard road – this could be a site for a visit for FLAG members – does the group need to visit?

- *It has 30 days supply of water in storage and it had to be sealed.*
- *They don't have any other surface or groundwater sources*
- *Being filled by diversion from creek upstream – filling up slower than they would like to protect the liner from sun damage*

Decision: no need to specifically visit, FLAG members can ask landowner to visit if desired. If there is not enough water following the FLAG process – storage will be an option for individual landowners to decide on.

Action: staff to forward some information on the new storage from the consent application to FLAG

FLAG social event

RSN: Does the FLAG want to have a social event? - perhaps follow on drinks after a meeting?
There was general interest expressed in having a more social event, with a suggestion that partners be invited as a thank you in recognition of their efforts in supporting FLAG members involvement in the group.
Action: RSN – to look at connecting a social event this with a meeting

Lake Killarney update

MAB provided the group with a brief update on where this project was at.

- Claire Webster (TDC Education & Partnerships Officer) enthusiastic on this – already has people interested and some small projects underway.
- Rob Smith (Environmental Information Manager) involved with understanding causes of issues.
- Claire having discussions with Joseph T and Glenn S and Trevor J to discuss issues and options
- Keen to do floating wetlands
- Looking for external funding options – likely to make Cobb Dam restoration Fund application by end May when nature and details of restoration project known in more detail.

Future meetings:

22th May (flow and allocation)
26 June (implementation methods)
24 July (modelling review and limit setting) – AF away – Julian Weir to attend?

Action Points – Council Staff/Facilitator/Advisor

No.	What	Who
1.	Staff to email/send a letter to Ngati Koata to ask them what their involvement should be concerning their Statutory Acknowledgement in the Anatoki Catchment.	MAB
2.	Staff to advise FLAG of meeting date with WCO parties asap.	MAB
3.	Staff to send website hits summary to FLAG	LM
4.	Staff to organise website for receipt of public feedback on values and management objectives document	LM
5.	Staff to send out reviewed values/management objects document to FLAG for review and comment.	LM
6.	Staff to consider which sites that will represent what is happening in the upper catchment and report back to FLAG via email.	AF/JT
7.	Staff to report back to FLAG on outcome of spring separation work when complete, likely at the May meeting.	AF
8.	Staff to look at riparian vegetation as a scenario in the modelling work	AF
9.	Staff to review Cultural Health information for Golden Bay and look at whether this information is useable in the modelling.	LM/ MAB
10.	Staff to consider how water dependent industry feedback might be incorporated into the modelling work.	AF/ MAB
11.	AF to amend the attributes list/sites as per the outcomes noted above and progress modelling work and report back to FLAG	AF
12.	Staff to supply John Stark's report to the FLAG and irrigators group once complete and add to the website to make it publically available.	MAB /LM
13.	Staff to provide explanation about how allocation limits have been calculated elsewhere, especially for surface water flows.	MAB /JT
14.	Staff to collate data about groundwater levels over time and provide to the FLAG.	JT
15.	Staff to send out copy of actions points in the week after FLAG meetings.	LM/ MAB
16.	Staff to forward some information on the new storage from the consent application to FLAG	MAB
17.	RSN – to look at connecting a social event this with a meeting	RSN

Action Points – FLAG members

No.	What	Who
18.	FLAG to send questions or information on nutrient management to staff for collation.	ALL
19.	FLAG to question Mike Scarsbrook on the effects on stygofauna at the May meeting.	ALL
20.	If FLAG have further ideas on scenarios they should send these to AF.	ALL
21.	Tony R to advise Dairy NZ of Mike and Rick's availability.	TR

Action Points – FLAG Sub-groups

No.	What	Who
	none	

Scheduled FLAG and FLAG Subgroup meetings

Date	Friday 22 May 2015 (FLAG Meeting 10)
Time	9.30am -3pm
Venue	Takaka Fire Station
Agenda Items	Allocation

Date	Friday 26 June 2015 (FLAG Meeting 11)
Time	9.30am -3pm
Venue	Takaka Fire Station
Agenda Items	Implementation methods

Date	Friday 24 July 2015 (FLAG Meeting 12)
Time	9.30am -3pm
Venue	Takaka Fire Station
Agenda Items	Modelling review and limit setting

Information and resource documents identified during meeting

Date	Title	Author/Source
2013	*Nutrient Management on your dairy farm, A farmers guide to understanding how nitrogen and phosphorus enter, cycle and leave your dairy farm. DairyNZ, Hamilton 2013 (www.dairynz.co.nz/publications)*	Dairy NZ (refer Mirka Landford)
	More than just a number, Your guide to improving nitrogen-use efficiency on your farm. DairyWomen's Network together with Ballance, DairyNZ and Fonterra. Ballance Agri Nutrients, Tauranga	Dairy Womens Network (et al.) (refer Mirka Landford)
2007	*Karst Hydrogeology and Geomorphology (Derek Ford and Paul D. Williams. Publisher: Wiley)*	*Ford and Williams*

**Key documents available electronically will be added to the online PDF document bibliography.*

Issues or topics identified during meeting for future consideration

Topic/Issue Description	Requester
none	

**Issues or topics unable to be addressed at the meeting, but requiring future consideration will be recorded in the Takaka FLAG 'Information Eddy'.*